2022 JOINT MMM-INTERMAG CONFERENCE PROGRAM

Based in New Orleans, LA

SCOPE OF THE CONFERENCE

The 15th Joint MMM-INTERMAG Conference (2022 Joint) is sponsored jointly by AIP Publishing and the IEEE Magnetics Society. Members of the international scientific and engineering communities interested in recent developments in fundamental and applied magnetism are invited to attend and contribute to the technical sessions. The technical program will include invited and contributed papers in oral and virtual poster sessions, invited symposia, and a plenary session, with about 1500 presentations overall. This Conference provides an outstanding opportunity for worldwide participants to meet their colleagues and collaborators and discuss developments in all areas of magnetism research.

NEW THIS YEAR!

The 2022 Joint Conference will offer both in-person and prerecorded on-demand content.

For Onsite and Virtual registrants, all presentations will be prerecorded and available online for on-demand viewing starting December 29, 2021. Q&A for the prerecorded content will be conducted via the online Chat Boards.

During the Conference week, there will be live programming on the virtual platform for a virtual Women in Magnetism event, a virtual Meet the Experts, and a virtual Entrepreneurship in Magnetism Session.

Onsite registrants will attend in-person talks, Q&A, and networking events live in New Orleans. Select talks presented onsite in New Orleans, including the Symposia, the Plenary and the IEEE Awards Session, will be recorded and made available to registrants on the virtual platform within a week after the Conference.

All content will be available on the virtual platform through March 15, 2022.

OFFICIAL HOTEL & CONFERENCE LOCATION

Hyatt Regency New Orleans
601 Loyola Ave, New Orleans, LA 70113
(504) 561-1234

TIME ZONE

New Orleans is located in the US Central Time Zone.

REGISTRATION

The Conference Registration Desk will be located on the third floor of the Hyatt Regency outside Celestin D. **IMPORTANT:** All attendees must check in at Registration and show ***either*** proof of vaccination as noted below ***OR*** a negative COVID-19 PCR or antigen test within 72 hours, in order to pick up their name badge. **Name badges must be worn at all times during Conference sessions and events.**

Registration hours:

Monday	12:30 pm - 6:00 pm
Tuesday	7:45 am - 6:00 pm
Wednesday	8:00 am - 6:00 pm
Thursday	8:00 am - 2:00 pm

COVID SAFETY PROTOCOLS ONSITE

- For the most current information on U.S. COVID-19 entry requirements, please visit the U.S. Department of State website: https://travel.state.gov/content/travel.html

- Click here for the most current updates on New Orleans COVID Safety Plan.

- As of October 29, 2021, the mask mandate in Orleans parish has been lifted, with the exception of K-12 schools, healthcare facilities, and public transportation. **However, anyone over the age of 2 who is not vaccinated is encouraged to wear a mask in public indoor spaces.**

- **IMPORTANT:** Proof of vaccination for all eligible individuals 5 years and older, or a negative COVID-19 PCR **or antigen test** within 72 hours, will be required at most indoor venues in Orleans Parish and outdoor events where more than 500 people are in attendance. **This will include the meeting rooms at the Hyatt Regency for the 2022 Joint Conference.**

- **When you check-in at the Conference registration desk, you will be asked to show either your proof of vaccination OR test results as noted above, and then you will receive your Conference name badge.** You must wear this name badge at all times when at Conference events in the hotel.
    - NOTE: If you have a guest who will be attending any sessions or events with you during the Conference, your guest must also check in at the Conference registration desk, show their proof of vaccination or test results as noted above, and then they will also receive a name badge which must be worn at all times when at Conference functions.

- **The following are acceptable forms of proof of vaccination:**
    - Your original CDC vaccination card, photocopy or digital copy (both sides) showing attendee has received at least one dose of a COVID-19 vaccine that has received full approval or emergency use authorization from the U.S. Food and Drug Administration.
    - An official vaccine record issued by a U.S. state, foreign nation, or the World Health Organization (original record, photocopy or digital copy).

- NOTE: Vaccination records must clearly show the name of the vaccinated attendee, type of COVID-19 vaccine administered, and date(s) of each dose administered. A valid photo ID must be provided as well (government-issued ID recommended).

- **Additional measures are being taken by the hotel with a focus on your safety and peace of mind, including:**
  - Extra space between chairs in session rooms
  - Sanitizer stations prominently placed throughout hotels
  - More frequent cleaning of public spaces and guest room surfaces
  - Enhanced food safety and hygiene protocols
  - Social distancing signage
  - Elevator spacing and revised maximum capacity guidelines
  - Knock-and-go contactless room service
  - Digital check-in and checkout
  - Digital key
  - Grab-and-go meal ordering
  - Daily housekeeping service has been suspended, however, fresh linens, towels and amenities provided upon request

COVID TESTING AVAILABLE ONSITE

- For attendees who require a test onsite, a mobile clinic from The Urgent Care will be available in Imperial 4 on the fourth floor of the hotel during the following times (no appointment necessary):
  - January 12, 12:00 pm - 5:00 pm
  - January 13, 8:00 am - 5:00 pm
  - January 14, 8:00 am - 12:00 pm
- **Costs to be paid by the individual** *(Insurance is not accepted - cash or credit card only.)*
  - Standard PCR (results within 6-8 hours) - $89
  - Rapid test (results within 2 hours of staff returning to the lab) - $150
  - Antigen test (results within 15 minutes and can be emailed as a PDF) -$50
- If an attendee prefers to pay the test fee through their insurance, they must have the testing done at The Urgent Care Mid-City at 231 North Carrollton Avenue (a 15-minute cab ride from the hotel). Walk-ins are welcome but appointments are recommended by calling 504-323-6060.
- If an attendee is staying in New Orleans a few days after the Conference and they require testing after January 14, they can set up private testing to take place in their hotel room through The Urgent Care by calling 504-323-6060.

CONFERENCE PROGRAM & ABSTRACT BOOKS

The Conference program book and abstract book are available for download HERE.

ITINERARY PLANNER

Use the Online Itinerary Planner to plan your days onsite. This is the best way to know what is happening and where each day onsite.

MOBILE APP

The MyItinerary by ScholarOne mobile app provides onsite attendees with instant access to the entire onsite Conference program including abstracts, speakers, and the schedule of events. You can also use it to build your own customized schedule and to get in touch with other attendees. Download the app before you arrive!

SOCIAL MEDIA @Joint Conf

New this year! We are crowdsourcing our Conference photos, so all onsite attendees are encouraged to share their best photos from the Conference and the IEEE Awards Ceremony using **#liveJointConf2022**. Please do not include any presentation content in the background of your photos.

GROUND TRANSPORTATION

Information on airport transfers and the best ways to get around the city can be found here: https://www.neworleans.com/plan/transportation/

CITY INFORMATION

Check out all there is to do in New Orleans: https://www.neworleans.com/
Download your FREE New Orleans Guidebook: https://www.neworleans.com/plan/request-a-guide/

DAILY EVENTS

Morning Coffee and Beignets!
Tuesday - Friday
8:00 am – 11:30 am CST
Storyville Hall
Join us each morning from 8:00 – 11:30am for coffee and fresh, hot beignets! Afternoon coffee will also be available from 1:30-3:30 pm.

Nightly Bierstube
Monday, Tuesday, and Thursday
4:30 pm – 6:00 pm CST
Storyville Hall

Monday Bierstube supported by: Lake Shore CRYOTRONICS

Tuesday Bierstube supported by: MATERION

Join us each evening from 4:30 pm - 6:00 pm for live music and a taste of the best local beers in town!

Oral Sessions and Symposia
Tuesday 8:30 – 11:30 am and 1:30 – 4:30 pm CST
Wednesday 8:30 – 11:30 am CST
Thursday 8:30 – 11:30 am and 1:30 – 4:30 pm CST
Friday 8:30 – 11:30 am CST
We will have four oral session rooms daily on the fourth floor of the Hyatt Regency. Any Symposia talks presented in Celestin D will be recorded and posted on the virtual platform within one week. Use the Online Itinerary Planner to see exactly which presentations are happening live onsite.

Symposium SA supported by: ELSEVIER — materialstoday ELECTRONICS — JOURNAL OF ALLOYS AND COMPOUNDS

Symposium SC supported by: nami — the quantum wave

Symposium SF supported by: Lake Shore CRYOTRONICS

VIEW SYMPOSIA SPEAKERS HERE

Magnetism as Art Showcase

Supported by:

AIP Advances

This event highlights the beauty of magnetism and magnetic materials. The winner will be selected by popular vote so be sure to visit the four finalist's posters displayed in Storyville Hall and then cast your vote on the Virtual Conference Platform! **Voting closes Tuesday, January 11 at 12:00 pm CST and the winner will be announced at the Awards Ceremony on Wednesday afternoon.**

Best Student Presentation Awards

Supported by:

IEEE MAGNETICS

APS physics GMAG MAGNETISM

This award recognizes and encourages excellence in graduate studies in the field of magnetism. There will be a $1,000 one-year fellowship for the winner and $250 one-year fellowship for the remaining finalists. Conference attendees are encouraged to attend the talks and support these young scientists.
The winner will be announced at the Awards Ceremony on Wednesday afternoon.

Congratulations to the 2022 Joint Conference Finalists!

Yong Hu, *University at Buffalo, The State University of New York, Buffalo*
BOD-07 Proton Switching Molecular Magnetoelectricity

Daniel Casaleiz, *IMDEA Nanociencia*
DOD-01 A Sustainable Route for Permanent Magnets Fabrication: Additive Manufacturing Applied to Recycled Ferrite Residues

Sujung Kim, *University of California Santa Cruz*
FOC-12 Maximizing Strong Magnon-Phonon Coupling in a Single CoFe Nanomagnet

Stefan Pollok, *Technical University of Denmark*
IOI-11 Magnetic Field Prediction Using Generative Adversarial Networks

Best Poster Awards

Supported by:

SEAGATE

All Posters are virtual this year and can be found on the Virtual Conference Platform. Winners are determined by the Poster Session and Program Chairs, and are based on the level of research, quality of the poster, and clarity of the presentation. Please be sure to visit the winning posters displayed in Storyville Hall.

Wifi for Attendees in the Meeting Space
Network 2022Joint
Password: GoAwayCOVID
Note: password is case-sensitive

SPECIAL SESSIONS

Tutorial: Quantum Magnonics

This session will be available ONLY as a virtual event and will consist of three prerecorded talks released on January 10 at 8:00am CST on the virtual platform. Following each talk will be interactive live Q&A on the virtual platform.

Virtual Session!

Monday, January 10
8:00 am – 10:30 am US CST

A new field has emerged in the last years at the intersection between Condensed Matter and Quantum Optics - "Quantum Magnonics". This field strives to control the elementary excitations of magnetic materials - magnons - to the level of the single quanta, to interface them coherently to other elementary excitations such as photons or phonons and can be adapted to microwave superconducting quantum circuits.

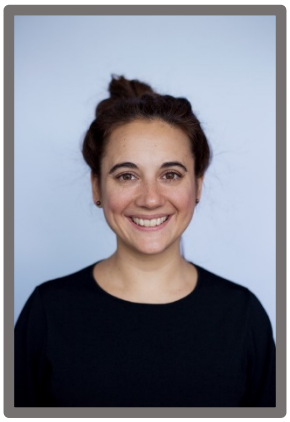
Session Chair: Sara Majetich, *Carnegie Mellon University*

Speakers:

Quantum Magnonics with a Superconducting Qubit

Yasunobu Nakamura
Tokyo University

Cavity Magnonics



Silvia Viola Kusminskiy
Max Planck Institute for the Science of Light

Emerging Opportunities for Coherent Information Processing at the Intersection of Superconductivity and Magnetism

Yi Li
Argonne National Laboratory

VIEW SPEAKER BIOS HERE

Current Trends in Magnetism

This session will be available only as a live onsite in New Orleans. The recording will be available on the virtual platform within one week.

Onsite in New Orleans!

Monday, January 10
2:00 pm - 4:30 pm US CST
Celestin D

This special session will feature four eminent scientists and engaging speakers who will enlighten and entertain us with their insights into topical areas in magnetism research. Curious about sending spintronics into orbit? Want a peek into the fascinating world of magnetic garnets? How about surprises in magnetization dynamics in the mesoscale and learning about fundamental damping mechanism in iron? Then you have to attend this session in person in New Orleans. You will have plenty of opportunities to interact with the speakers during the session and in the bierstube that follows.

Session Chair: Hariharan Srikanth, *University of South Florida*

Speakers:

Mesoscale Magnet Dynamics:
A Statistical Mechanics Surprise

Dan Dahlberg
University of Minnesota

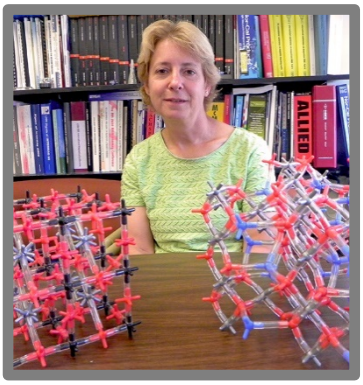
Spintronics Entering a New Orbit?

Axel Hoffman
University of Illinois at Urbana-Champaign

Damping in the Prototypical Ferromagnet Iron

Tim Mewes
University of Alabama

Magnetic garnets for spintronics and photonics



Caroline Ross
MIT

VIEW SPEAKER BIOS HERE

Symposia

The symposia consist entirely of invited talks by experts in the field. All symposia talks will be prerecorded and posted on the virtual platform on December 29. Additionally, some symposia talks will also be presented as live presentations onsite in New Orleans. The live presentations will then be recorded and posted on the virtual platform within one week.

To find out which Symposium are being presented live onsite view our Onsite Agenda HERE.

SA: Application of Symmetry Breaking in Correlated and Quantum Magnetic Materials

Supported by:

SB: Spintronic Diodes: Challenges and New Directions

SC: Exploring Magnetism at the Nanoscale with Scanning NV Magnetometry

Supported by:

SD: Frontiers of Orbital Physics: Statics, Dynamics, and Transport of Orbital Angular Momentum

SE: Freestanding Complex Oxide Films: A New Paradigm for Magnetic Heterostructures

SF: Soft Magnetic Components and Materials for Emerging Power Conversion Applications

Supported by:

SG: Next Generation Electrical Machines

VIEWALL SYMPOSIA SPEAKERS HERE

Women in Magnetism Networking Event

This event will be offered twice during the Conference week, once as a live networking event onsite in New Orleans and once as a virtual event.

Virtual Session!

Tuesday, January 11
8:00 am - 9:30 am US CST

Supported by
:

The virtual session will feature a panel of women who will share their professional experiences with a focus on overcoming adversity, helpful career tips, and general advice for other women in the field. After the panel, there will be open discussion and virtual networking.

Panelists:

Michaela Kuepferling, *INRIM*
Paola Tiberto, *INRIM*

VIEW PANELIST BIOS HERE

Onsite in New Orleans!

Tuesday, January 11
4:30 pm - 6:00 pm US CST
8 Block Kitchen & Bar

Supported by:

SEAGATE

Expand your professional network! Don't miss this fantastic opportunity to become acquainted with women in the profession and discuss a range of topics including leadership, work-life balance, and professional development. All students, researchers and retirees are encouraged to attend. Plenty of delicious food and drinks will be served!

Entrepreneurship in Magnetism

This event will be offered twice during the Conference week, once as a live networking event onsite in New Orleans and once as a virtual event.

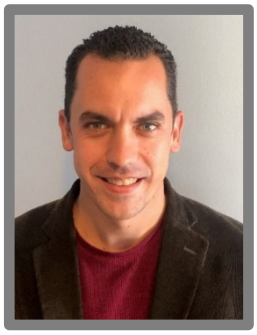
Onsite in New Orleans!

Tuesday, January 11
11:45 am - 1:15 pm US CST
Celestin FGH

Moderator: Joe Davies, *NVE Corporation*

Speakers:

Sam Kernion
CorePower Magnetics



Paul Ohodnicki
University of Pittsburgh and CorePower Magnetics

VIEW ONSITE SPEAKER BIOS HERE

Virtual Session!

Wednesday, January 12
8:00 am – 9:30 am US CST

Moderator: Ivan Skorvanek, *Slovak Academy of Sciences*

Speakers:

Jean-Philippe Attané
Spintec Laboratory, Grenoble, France

Lucian Prejbeanu
Spintec Laboratory, Grenoble, France

VIEW VIRTUAL SPEAKER BIOS HERE

Meet the Experts

This event will be offered twice during the Conference week, once as a live networking event onsite in New Orleans and once as a virtual event. You must pre-register to attend. SOLD OUT!

This event provides young researchers with the exclusive opportunity to participate in either a small-group discussion over lunch onsite, or a virtual video discussion, and get expert advice on career planning, technical paper writing and publication, job searches and interviews, society involvement, and more.

Onsite in New Orleans!

Wednesday, January 12
11:45 am – 1:15 pm US CST
Imperial 5

Supported by

Lake Shore CRYOTRONICS

Onsite Experts:

Axel Hoffmann, *University of Illinois at Urbana-Champaign*
Spin Transport, Magnetization Dynamics, Thin Film Growth

Beth Stadler, *University of Minnesota*
Magneto-optical Garnets in Si Photonics, Magnetic Nanowires in Electronics & Biomedicine

VIEW ONSITE EXPERT BIOS HERE

Virtual Session!

Thursday, January 13
8:00 am – 9:00 am US CST

Supported by

evicomagnetics

Virtual Experts:

Russell Cowburn, *University of Cambridge*
Domain walls, Spintronics, Biotechnology, Kerr effect, Nanofabrication

Michael Farle, *University of Duisburg-Essen*
Nanomagnetism, Spin dynamics, Nanostructures, Theranostics, Magnetosomes

Julie Grollier, *CNRS Thales*
Spin-torque, Neural Networks, Non-linear Dynamics

Yuko Osokoshi, *Osaka Prefecture University*
Molecular Magnet, Quantum Spin System, Frustrated Magnet, Organic Radical Crystal

Hua-Xin Peng, *Zhejiang University (PR China)*
GMI Materials, Nano-/micro-wires, Soft Magnetic Composites, Metacomposites

Prem Piramanayagam, *Nanyang Technological University*
Spintronics

Ramamoorthy Ramesh, *University of California, Berkeley*
Materials Physics, Correlated Oxides

VIEW VIRTUAL EXPERT BIOS HERE

IEEE Awards Ceremony and Plenary Session

Wednesday, January 12
2:30 pm – 4:30 pm CST
Celestin D

This session will be available only as a live onsite in New Orleans. The recording will be available on the virtual platform within one week.

The IEEE Awards Ceremony will recognize the winners of the following awards:

- **2022 Achievement Award, Professor Hideo Ohno**
  For fundamental discoveries of spintronic phenomena and their applications in memory and computing technologies.

- **2022 Mid-Career Award, Professor. Ilya Krivorotov**
  For seminal contributions to the understanding of the interplay between spin transport and magnetization dynamics due to spin torques.

- **2022 Early-Career Award, Professor Qiming Shao**
  For contributions to exploring spin-orbit torque devices with quantum materials and systems.

- **2022 Distinguished Service Award, Professor Pallavi Dhagat**
  For exceptional services to the IEEE Magnetics Society as seen in her outstanding leadership during the pandemic, her dedicated efforts to modernize the Society and implement new ways of work and communication through virtual conferences as well as promotion of professional and leadership development opportunities for early-career professionals and women in magnetism.

Awards and recognition will also be given to the New Fellows, Distinguished Lecturers, Best Student Presentation Finalists, and Magnetism as Art Finalists.

The Plenary lecture will follow the awards presentation:
Nanoscale Magnetoelasticity, An Overlooked Opportunity
Greg Carman, *UCLA*

VIEW PLENARY SPEAKER BIO HERE

Magnetics Society Annual Meeting
This Annual Meeting will immediately follow the Plenary lecture and is open to all Conference attendees. Join us to learn more about what the IEEE Magnetics Society is doing to support and strengthen the magnetics community, and about the benefits of belonging to the Society. To join today, go to www.ieeemagnetics.org

Plenary Reception
Wednesday, January 12
4:30 pm – 6:30 pm CST
Storyville Hall

Supported by:
GMW Associates

Laissez les bons temps rouler! Join us for a Big Welcome to the Big Easy! Lots of delicious Cajun and bayou-inspired food and drinks, incredible live jazz music and the chance to mix and mingle.

CONEFRENCE ORGANIZATION

CONFERENCE MANAGEMENT COMMITTEE

General Chair
Victorino Franco, *University of Seville, Spain*

Chair-Elect
Yayoi Takamura, *University of California, Davis, USA*

Past Chair
Christopher Marrows, *University of Leeds, UK*

Treasurer
Chris Rea, *Seagate Technology, USA*

Program Committee Co-Chairs
Rie Umetsu, *Tohoku University, Japan*
Matthew Willard, *Case Western Reserve University, USA*

Publications Chair (AIP)
Cindi Dennis, *NIST, USA*

Publications Chair (IEEE)
Nicoleta Lupu, *NIRDTP, Romania*

Exhibits Co-Chairs
Brad Dodrill, *Lake Shore Cryotronics, USA*
Michael McHenry, *Carnegie Mellon University, USA*

Students Awards and Travel Chair
Brian Kirby, *NIST, USA*

Publicity Chair
Diana Leitão, *TU Eindhoven, The Netherlands*

Special Events Chair
Hari Srikanth, *University of South Florida, USA*

IEEE Magnetics Society Representative
Rudolf Schäfer, *IFW Dresden, Germany*

AIP Publishing Representatives
Bill Burke, *AIPP, Czech Republic*
Melissa Patterson, *AIPP, USA*
Diana Schlamadinger, *AIPP, USA*

Conference Manager - Molly Bartkowski
Abstracts/Publications Manager - Regina Mohr
Special Events & Partner Support Manager - Shelbie Jenkins
Registration Manager - Ashley Cesare

PROGRAM COMMITTEE

I. Fundamental properties and cooperative phenomena	Xiaolin Wan	University of Wollongong	Australia
	Durga Paudyal	Iowa State University	USA
	Yuko Hosokoshi	Osaka Prefecture Univ.	Japan
II. Magneto-electronic Materials and Phenomena	Jairo Sinova	Guttenburg University	Germany
	Sabine Wurmehl	IFW	Germany
	Hao Zeng	University of Buffalo	USA
II. Magneto-electronic Materials and Phenomena	Claudia Felser	MPI	Germany
	HidetoYanagihara	Tsukuba University	Japan
	Di Wu	Nanjing University	China
III. Soft Magnetic Materials	Paul Ohodnicki	Univeristy of Pittsburgh	USA
	Naoki Ito	Hitachi Metals	Japan
	Ivan Skorvanek	Slovak Academy of Sciences	Slovakia
IV. Hard magnetic materials	J. Ping Liu	Univeristy of Texas at Arlington	USA
	Hossein Sepehri-Amin	NIMS	Japan
	Matt Kramer	Ames Lab	USA
IV. Hard magnetic materials	Jeffrey E. Shield	University of Nebraska at Lincoln	USA
	Wei Zhang	Dalian Univ.	China
	Felix Jimenez-Villacorta	Consorcio ESS-Bilbao	Spain
V. Structured Materials	Paola Tiberto	National Institute for Metrological Research (INRIM)	Italy
	Arcady Zhukov	Basque Foundation for Science	Spain
	Fanny Beron	University of Campinas	Brazil
V. Structured Materials	Taro Nagahama	Hokkaido University	Japan
	Ricardo Ferreira	INL	Portugal
	Melissa Loving	Northrup Gruman	USA
VI. Materials with Coupled Magnetic Functionality	Ramanathan Mahendiran	National University of Singapore	Singapore
	Tino Gottschall	HZDR	Germany
	Fengxia Hu	Chinese Academy of Sciences	China
VII. Spintronics: Fundamentals and Devices	Connie Li	Naval Research Lab	USA
	Ivan Vera-Marun	University of Manchester	England
	Xiuzhen Yu	RIKEN	Japan
VII. Spintronics: Fundamentals and Devices	Gerrit Bauer	Tohoku Univ.	Japan
	Hidekazu Kurebayashi	UCL	UK
	Roberto Troncoso	Norwegian University of Science and Technology (NTNU)	Norway
VII. Spintronics: Fundamentals and Devices	Manfred Albrecht	University of Augsberg	Germany
	Takayuki Nozaki	AIST	Japan
	Stephane Mangin	Lorraine University	France
VII. Spintronics: Fundamentals and Devices	Lucian Prejbeanu	Spintec	France
	Zhiyong Qiu	Dalian University of Technology	China
	Eric Evarts	IBM Research @ SUNY:CNSE	USA
VIII. Magnetization Dynamics and Micromagnetics	Andre Thiaville	Universite Paris - Saclay	France
	Valentine Novosad	Argonne National Lab.	USA
	Satoshi Okamoto	Tohoku Univ.	Japan
VIII. Magnetization Dynamics and Micromagnetics	Olle Heinonen	Argonne National Laboratory	USA
	Anna Semisalova	Duisburg University	Germany
	Attila Kakay	HZDR	Germany
IX. Magnetic Recording	Kaizhong Gao	International business and technology service corporation	USA
	Paul Nutter	University of Manchester	England
	Hiroko Arai	AIST	Japan
X. Sensors, High Frequency, and Power Devices	Pin-Wei Huang	Seagate	USA
	Yasushi Endo	Tohoku Univ.	Japan
	Feiming Bai	UESTC	China
X. Sensors, High Frequency, and Power Devices	Philip Pong	New Jersey Institute of Technology	USA
	Joe Davies	NVE	USA
	Mochimitsu Komori	Kyusu Tech. University	Japan

XI. Microscopy, imaging and characterization	Dario Arena	University of South Florida	USA
	Evangelos V Hristoforou	National TU of Athens	Greece
	Katrin Schultheiß	HZDR	Germany
XII. Interdisciplinary and Emerging Topics	Montserrat Rivas	University of Oviedo	Spain
	Ravi Hadimani	Virginia Commonwealth University	USA
	Balachandran Jeyadevan	The University of Shiga Prefecture	Japan
XIII.Wound Field, Induction, High Speed and Special Electrical Machines	Min-Fu Hsieh	National Cheng Kung U	Taiwan
	Ronghai Qu	Huazhong University of Science and Technology, Wuhan,	China
	Geyverson Teixeira de Paula	Federal University of Goiás	Brazil
XIII.Wound Field, Induction, High Speed and Special Electrical Machines	Fei Zhao	Harbin Institute of Technology	China
	Xiao Chen	Sheffield	UK
	Parag Upadhyay	Hitachi ABB Power Grids	USA
XIV. Linear machines, Energy Harvesting and Vibration Analysis	Jonathan Bird	Portland State University	USA
	Mi-Ching Tsai	National Cheng Kung U.	Taiwan
	Amr Adly	Cairo University, Egypt	Egypt
XV. Flux Modulating and Reluctance Machines	Siavash Pakdelian	Univ. Mass Lowell	USA
	Shuangxia Niu	HK Polytechnic Univ.	Hong Kong
	Kais Atallah	Sheffield	UK
XVI. Surface and Interior Mounted Permanent Magnet Electrical Machines	Kenji Nakamura	Tohoku Univ.	Japan
	Metin Aydin	Kocaeli University, Izmit	Turkey
	Ebrahim Amiri	The University of New Orleans	USA
XVII. Modeling and Design of Electrical Machines	Yacine Amara	Universite de Le Havre	France
	Ningning Chen	Ansys	USA
	Pierre-Daniel Pfister	Zheziang Univ.	China
XVII. Modeling and Design of Electrical Machines	Kazuhiro Muramatsu	Saga University	Japan
	Ciro Visone	Università degli Studi di Napoli Federico II	Italy
	Jang-Young Choi	Chungnam National Univ.	South Korea

ONSITE SESSION CHAIRS

AA	Thin Films, Patterned Elements, and Multilayers	Mateusz	Goryca	University of Warsaw	Poland
AB	Magnetization Dynamics, Damping, and Ultrafast Switching	Olof	Karis	Uppsala university	Sweden
AC	Magnetocaloric and Other Coupled Phenomena	Jia-Yan	Law	University of Seville	Spain
AD	Biomedical Applications and Emerging Topics	Manh-Huong	Phan	University of South Florida	USA
BA	Skyrmionics and Noncollinear Spin Textures	Paul	Crowell	University of Minnesota	USA
BB	Spin Waves and Magnonics	Axel	Hoffmann	University of Illinois at Urbana-Champaign	USA
BC	MagnetoElastic and Structured Materials	Ian	Gilbert	Seagate Technology	USA
BD	Magnetic Characterization and Magnetoelectronic Materials	Amit	Chanda	University of South Florida	USA
CA	Soft Magnetics for Emerging Power Conversion Applications & Next Generation Electrical Machines	Paul	Ohodnicki	University of Pittsburgh	USA
CB	Spin Currents, Spin Pumping, Spin Hall, and Related Effects	Vijaysankar	Kalappattil	Colorado State University	USA
CC	Hard Magnetic Materials	Matthew	Willard	Case Western Reserve University	USA
CD	Antiferromagnetic Spintronics and Magnetoresistance	Enrique	del Barco	University of Central Florida	USA
DA	MRAM, Magnetic Logic, and Related Devices	Stephane	Mangin	Université de Lorraine	France
DB	Spin Waves, Magnonics, and Modeling	Jaroslaw	Klos	Adam Mickiewicz University, Poznań	Poland
DC	Soft Magnetic Materials and Devices	Michael	McHenry	Carnegie Mellon University	USA
DD	Magnetization Dynamics and Other Topics	Mingzhong	Wu	Colorado State University	USA
EA	Domain Wall, Vortex, and Skyrmion Dynamics and Devices	Andrei	Slavin	Oakland University	USA
EB	Voltage-Controlled Switching and Other Spintronics Topics	Jayasimha	Atulasimha	Virginia Commonwealth University	USA
EC	Nanoparticles and Nanowires				
ED	Fundamental Properties and Cooperative Phenomena	Jinke	Tang	University of Wyoming	USA
FA	Spins in Graphene, Topological Insulators, and 2D Materials	Paula	Mellado	Universidad Adolfo Ibanez	Chile
FB	Spin Currents, Spin Torques, Spin Pumping, Spin Hall, and Other Spintronics Topics	Olaf	Van 't Erve	Naval Research Laboratory	USA
FC/FD	Magnetic Recording and Sensors and Motors	Chris	Rea	Seagate	USA
		Ebrahim	Amiri	The University of New Orleans	USA

VIRTUAL ORAL SESSION CHAIRS

AOA	Fundamental Properties and Cooperative Phenomena I	Durga	Paudyal	Ames Laboratory	USA
AOB	Fundamental Properties and Cooperative Phenomena II	Eleanor	Clements	National Institute of Standards and Technology	USA
AOB	Fundamental Properties and Cooperative Phenomena II	Roberto	Zivieri	University of Ferrara	Italy
AOC	Fundamental Properties and Cooperative Phenomena III	Amilcar	Bedoya Pinto	Max Planck Institute of Microstructure Physics	Germany
AOC	Fundamental Properties and Cooperative Phenomena III	Aurelian	Rotaru	Stefan cel Mare University	Romania
BOA	Magnetoelectronic Materials and Phenomena: Heuslers and Related Materials	Atsufumi	Hirohata	University of York	United Kingdom
BOB	Magnetoelectronic Materials and Phenomena: 2D and Topological Materials	Yu-hang	Li	University of California, Riverside	USA
BOB	Magnetoelectronic Materials and Phenomena: 2D and Topological Materials	Jiawei	Jiang	Tianjin University	China
BOC	Magnetoelectronic Materials and Phenomena: Complex Oxides	Jing	Wang	The Institute of Physics, Chinese Academy of Sciences	China
BOD	Magnetoelectronic Materials and Phenomena: Magnetic Semiconductors and Multiferroics	Karin	Leistner	IFW Dresden	Germany
BOD	Magnetoelectronic Materials and Phenomena: Magnetic Semiconductors and Multiferroics	Atsufumi	Hirohata	University of York	United Kingdom
COA	Soft Magnetic Materials I: Amorphous and Nanocrystalline	Ahmed	Talaat	University of Pittsburgh	USA
COB	Soft Magnetic Materials II: Amorphous and Nanocrystalline	Ivan	Skorvanek	Institute of Experimental Physics SAS	Slovakia
COC	Soft Magnetic Materials III: Ferrites	Paul	Ohodnicki	University of Pittsburgh	USA
COD	Soft Magnetic Materials IV: Bulk Crystalline	Natan	Aronhime	Carpenter Technology Corporation	USA
DOA	Rare-earth Hard Magnetic Materials	Hossein	Sepehri-Amin	National Institute for Materials Science	Japan
DOB	Permanent Magnets and Processing I	Wei	Tang	Ames Laboratory	USA
DOC	Non-Rare Earth Permanent Magnet Materials and Nanocomposites I	Adrian	Quesada	Institute of Ceramics and Glass (CSIC)	Spain
DOC	Non-Rare Earth Permanent Magnet Materials and Nanocomposites I	Alberto	Bollero	IMDEA Nanociencia	Spain
DOD	Advanced Processing of Permanent Magnets	Isabelle	de Moraes	Institut Jean Lamour, Université de Lorraine	France

DOD	Advanced Processing of Permanent Magnets	Jeffrey	Shield	University of Nebraska-Lincoln	USA
EOA	3D Nanomagnetism and Nanowire Arrays	Pavel	Ripka	Czech Technical University	Czechia
EOB	Magnetic Nanostructures and Exchange Bias	Lise-Marie	Lacroix	Université de Toulouse	France
EOC	Magnetic Nanostructures	Victor	Prida	University of Oviedo	Spain
EOD	Thin Films I	Ricardo	Ferreira	INL - International Iberian Nanotechnology Laboratory	Portugal
EOD	Thin Films I	Akinobu	Yamaguchi	University of Hyogo	Japan
EOE	Thin Films II	Melissa	Loving	Northrop Grumman Corporation	USA
EOE	Thin Films II	Susana	Cardoso de Freitas	INESC-MN	Portugal
EOF	Patterned Films	Tom	Thomson	University of Manchester	United Kingdom
EOF	Patterned Films	Hikaru	Nomura	Osaka University	Japan
FOA	Magnetocalorics I	Tino	Gottschall	Helmholtz-Zentrum Dresden-Rossendorf	Germany
FOA	Magnetocalorics I	Jiazheng	Hao	Institute of High Energy Physics	China
FOB	Magnetocalorics II	Fengxia	Hu	Institute of Physics, Chinese Academy of Sciences	China
FOB	Magnetocalorics II	Jia-Yan	Law	University of Seville	Spain
FOC	Magnetoelastics and Magnetooptics	SN	Piramanayagam	Nanyang Technological University	Singapore
FOC	Magnetoelastics and Magnetooptics	Radhika	Barua	Virginia Commonwealth University	USA
FOD	Thermoelectrics and Magnetocalorics	Ramanathan	Mahendiran	National University of Singapore	Singapore
FOD	Thermoelectrics and Magnetocalorics	Sunil	Nair	IISER	India
GOA	Spins in 2D Materials and Graphene	Josep	Ingla-Aynés	Delft University of Technology	Netherlands
GOB	Spins and Spin Orbit Torque in Topological Insulators	Olaf	Van 't Erve	Naval Research Laboratory	USA
GOC	Skyrmion Dynamics	Sadamichi	Maekawa	RIKEN	Japan
GOD	Skyrmion Stabilization, Voltage Control, and Neuromorphic Applications	Jan	Masell	RIKEN	Germany
GOE	Skyrmions in Antiferromagnets and Ferrimagnets	Steven	Bennett	U.S. Naval Research Laboratory	USA
GOF	Skyrmions, Antiskyrmions and Topology	Max	Hirschberger	The University of Tokyo	Japan
GOG	Fundamental Interactions in Skyrmions and Novel Phases	Aisha	Aqeel	University of Munich	Germany
GOH	Spin Dynamics	Jun'ichi	Ieda	Japan Atomic Energy Agency	Japan
GOI	Magnetization Control	Chuanpu	Liu	Colorado State University	USA
GOJ	Metal Spintronics	Mingzhong	Wu	Colorado State University	USA
GOK	MRAM, Magnetic Logic and Related Devices I	Stephane	Mangin	Université de Lorraine	France

GOL	MRAM, Magnetic Logic and Related Devices II	Denys	Makarov	Helmholtz-Zentrum Dresden-Rossendorf	Germany
GOM	Voltage-controlled Magnetic Anisotropy and Switching	Minori	Goto	Osaka University	Japan
GON	Magnetoresistance in Heterostructures (GMR, TMR, TAMR)	Gaspare	Varvaro	Consiglio Nazionale delle Ricerche	Italy
GOO	Antiferromagnetic Spintronics I	Jean Anne	Incorvia	University of Texas at Austin	USA
GOO	Antiferromagnetic Spintronics I	Vincent	Baltz	Spintec	France
GOP	Antiferromagnetic Spintronics II	Romain	Lebrun	Unité Mixte de Physique CNRS/Thales	France
GOQ	Spin Injection and Spin Transfer Torques	Hélène	Béa	Université Grenoble Alpes, Spintec	France
GOQ	Spin Injection and Spin Transfer Torques	Emilie	Jué	National Institute of Standards and Technology	USA
HOA	Ferromagnetic Resonance	Kyongmo	An	Korea Research Institute of Standards and Science	Korea
HOB	Femtosecond Excitation of Magnetism	Gregory	Malinowski	Institut Jean Lamour, Université de Lorraine	France
HOC	Applications of Magnetization Dynamics	Kornel	Richter	University P.J. Safarik	Slovakia
HOD	DMI, Skyrmions and other Topological Objects	Stanislas	Rohart	Université Paris-Saclay Faculte des Sciences d'Orsay	France
HOE	Magnetic Skyrmions	Olivier	Boulle	SPINTEC	France
HOF	Dynamics in AF-coupled Materials	Jean-Yves	Chauleau	CEA-SPEC	France
HOG	New Computation Schemes	Daniele	Pinna	Forschungszentrum Jülich	Germany
HOH	Magnetization Dynamics in Soft Materials	Valentine	Novosad	Argonne National Laboratory	USA
HOI	Magnonic Crystals and Magnons	Axel	Hoffmann	University of Illinois at Urbana-Champaign	USA
HOJ	Magnons and Spin Waves	Yi	Li	Argonne National Laboratory	USA
HOK	Spin Waves and Magnetization Dynamics I	Jaroslaw	Klos	Uniwersytet im Adama Mickiewicza w Poznaniu	Poland
HOL	Spin Waves and Magnetization Dynamics II	Oleksii	Volkov	Helmholtz-Zentrum Dresden-Rossendorf	Germany
HOM	Micromagnetic and Hysteresis Modeling	Yasushi	Kanai	Niigata Institute of Technology	Japan
IOA	Magnetic Recording Technology I	Chris	Rea	Seagate	USA
IOA	Magnetic Recording Technology I	Wei-Heng	Hsu	Seagate	USA
IOB	Microwave and Millimeter Wave Materials and Devices	Hanae	Kijima-Aoki	Tohoku University	Japan
IOC	Sensors: Materials, Devices and Applications I	Shuichiro	Hashi	Tohoku Gakuin University	Japan
IOD	Power Devices, Induction	Guijun	Li	Hong Kong University of Science and Technology	Hong Kong
IOE	Sensors, Levitation	Xu	Li	Xiamen University	China
IOF	Microscopy, Imaging and Characterization I	Amit	Chanda	University of South Florida	USA

IOG	Microscopy, Imaging and Characterization II	Koji	Sekiguchi	Yokohama National University	Japan
IOH	Magnetic Biodetection and Therapy I	Yuko	Ichiyanagi	Yokohama National University	Japan
IOH	Magnetic Biodetection and Therapy I	César	de Julián Fernández	Institute of Materials for Electronics and Magnetism (IMEM-CNR	Italy
IOH	Magnetic Biodetection and Therapy I	Javier	Alonso	Universidad de Cantabria	Spain
IOI	Magnetic Fluids, Antibacterial Applications, and Other Emerging Topics	Manh-Huong	Phan	University of South Florida	USA
IOI	Magnetic Fluids, Antibacterial Applications, and Other Emerging Topics	Jungjin	Park	University of Maryland at College Park	USA
JOA	Induction Machine and Special Machine I	Mohammad Sedigh	Toulabi	Windsor University	Canada
JOB	High Speed and Special Rotating Electrical Machines I	Wenlong	Li	Nanjing University of Science and Technology	China
JOB	High Speed and Special Rotating Electrical Machines I	Kazuhiro	Muramatsu	Saga University	Japan
JOC	Linear Motors, Energy Harvesting and Vibration Analysis	Amr	Adly	Cairo University	Egypt
JOD	Magnetically Geared, Variable Flux and Reluctance Machines	Siavash	Pakdelian	University of Massachusetts Lowell	USA
JOE	Surface and Interior Mounted Permanent Magnet Electrical Machines I	Ebrahim	Amiri	The University of New Orleans	USA
JOF	(Semi)-Analytical and Numerical Techniques for Design	Pierre-Daniel	Pfister	Zhejiang University	China
JOG	Design Optimization, Loss and Thermal Modellings, Measurement of Electrical Machines	Kyung-Hun	Shin	Chonnam National University	Korea

VIRTUAL POSTER SESSION CHAIRS

APA	Fundamental Properties and Cooperative Phenomena IV	Amilcar	Bedoya Pinto	Max Planck Institute of Microstructure Physics	Germany
BPA	Magnetoelectronic Materials and Phenomena	Luis	Moreno-Ramírez	Universidad de Sevilla	Spain
BPB	Magnetoelectronic Materials and Multiferroic Phenomena	Xiufeng	Han	Institute of Physics, Chinese Academy of Sciences	China
BPB	Magnetoelectronic Materials and Multiferroic Phenomena	Lambert	Alff	TU Darmstadt	Germany
CPA	Soft Magnetic Materials V: Ferrites and Bulk Crystalline	Arcady	Zhukov	University of Basque Country and Ikerbasque	Spain
CPA	Soft Magnetic Materials V: Ferrites and Bulk Crystalline	Samuel	Kernion	CorePower Magnetics	USA
CPB	Soft Magnetic Materials VI: Amorphous and Nanocrystalline	Naoki	Ito	Hitachi Metals, Ltd.	Japan
DPA	Permanent Magnets and Processing II	Xubo	Liu	Ames Laboratory	USA
DPA	Permanent Magnets and Processing II	Jeotikanta	Mohapatra	University of Texas at Arlington	USA
DPB	Non-Rare Earth Permanent Magnet Materials and Nanocomposites II	Emily	Rinko	Iowa State University	USA
DPB	Non-Rare Earth Permanent Magnet Materials and Nanocomposites II	Parashu	Kharel	South Dakota State University	USA
EPA	Structured Materials: Nanoparticles and Nanowires	Paola	Tiberto	INRIM	Italy
EPA	Structured Materials: Nanoparticles and Nanowires	Claudio	Sangregorio	ICCOM - Institute for OrganoMetallic Chemistry	Italy
EPB	Thin Films and Patterned Films	Joao	Ventura	IFIMUP-IN, Universidade do Porto	Portugal
EPB	Thin Films and Patterned Films	Tomoyuki	Ogawa	Tohoku University	Japan
FPA	Magnetocalorics III	R.	Nirmala	Indian Institute of Technology	India
FPA	Magnetocalorics III	Franziska	Scheibel	Technische University Darmstadt	Germany
FPB	Magnetocalorics IV	Feiran	Shen	Institute of Physics, Chinese Academy of Sciences	China
FPC	Magnetoelastics II	Wei	He	Institute of Physics, Chinese Academy of Sciences	China
FPD	Magnetooptics II	Shawn	Pollard	The University of Memphis	USA
GPA	Skyrmions and Spins in Topological Insulator and 2D Materials	Elton	Santos	The University of Edinburgh	United Kingdom
GPB	Fundamental Spintronics I	Yuta	Yamane	Tohoku University	Japan
GPC	Fundamental Spintronics II	Jorge	Puebla	RIKEN	Japan
GPD	MRAM, Magnetic Logic and Related Devices III	Manfred	Albrecht	University of Augsburg	Germany
GPD	MRAM, Magnetic Logic and Related Devices III	Michal	Krupinski	Polish Academy of Sciences	Poland
GPE	Magnetoresistance and Voltage-Controlled Magnetic Properties	Stephane	Mangin	Université de Lorraine	France
HPA	Magnetization Dynamics	Liliana	Buda-Prejbeanu	SPINtronique et Technologie des Composants	France
HPA	Magnetization Dynamics	Yoshinobu	Nakatani	The University of Electro-Communications	Japan

HPB	Magnons, Spin Dynamics and Micromagnetic Modeling	Matthias Benjamin	Jungfleisch	University of Delaware	USA
IPA	Magnetic Recording Technology II	Ganping	Ju	Seagate	USA
IPA	Magnetic Recording Technology II	Yingguo	Peng	Seagate	USA
IPB	Sensors: Materials, Devices and Applications II	Sho	Muroga	Akita University	Japan
IPC	Sensors, Power System, Machines	Ke	Zhu	HK Electric	Hong Kong
IPD	Microscopy, Imaging and Characterization III	Spyridon	Angelopoulos	National Technical University of Athens	Greece
IPD	Microscopy, Imaging and Characterization III	Dario	Arena	University of South Florida	USA
IPE	Magnetic Biodetection and Therapy II	Anirudh	Sharma	Johns Hopkins University School of Medicine	USA
IPE	Magnetic Biodetection and Therapy II	Ravi	Hadimani	Virginia Commonwealth University	USA
IPE	Magnetic Biodetection and Therapy II	Anna	Guller	Macquarie University	Australia
IPF	Geomagnetism, Biomagnetism, Magnetic Fluids, and Other Emerging Topics	Tomoyuki	Ogawa	Tohoku University	Japan
IPF	Geomagnetism, Biomagnetism, Magnetic Fluids, and Other Emerging Topics	Mariana	Proenca	IFIMUP (Portugal) and ISOM-UPM (Spain)	Portugal
JPA	Induction Machine and Special Machine II	Po-Wei	Huang	National Cheng Kung University	Taiwan
JPA	Induction Machine and Special Machine II	Thanh Anh	Huynh	National Cheng Kung University	Taiwan
JPB	High Speed and Special Rotating Electrical Machines II	Hui	Yang	Southeast University	China
JPB	High Speed and Special Rotating Electrical Machines II	Qian	Chen	Jiangsu University	China
JPC	Linear Machines and Linear Actuators	Mi-Ching	Tsai	National Cheng Kung University	Taiwan
JPC	Linear Machines and Linear Actuators	Chinweze	Ubadigha	National Cheng Kung University	Taiwan
JPD	Vibration Analysis and Energy Harvesting Magnetic Devices	Jonathan	Bird	Portland State University	USA
JPD	Vibration Analysis and Energy Harvesting Magnetic Devices	Xuerong	Li	Aalborg University	Denmark
JPE	Magnetically Geared Machines and Reluctance Machines	Kais	Atallah	University of Sheffield	United Kingdom
JPE	Magnetically Geared Machines and Reluctance Machines	Siavash	Pakdelian	University of Massachusetts Lowell	USA
JPF	Vernier Machines	Shuangxia	Niu	The Hong Kong Polytechnic University	Hong Kong
JPG	Variable Flux Machines	Xing	Zhao	The Hong Kong Polytechnic University	Hong Kong
JPH	Surface and Interior Mounted Permanent Magnet Electrical Machines II	Metin	Aydin	Kocaeli University	Turkey
JPH	Surface and Interior Mounted Permanent Magnet Electrical Machines II	Chunhua	Liu	City University of Hong Kong	Hong Kong

JPH	Surface and Interior Mounted Permanent Magnet Electrical Machines II	Kenji	Nakamura	Tohoku Daigaku Daigakuin Kogaku Kenkyuka Kogakubu	Japan
JPI	Surface and Interior Mounted Permanent Magnet Electrical Machines III	Oleksandr	Dobzhanskyi	Point Park University	USA
JPI	Surface and Interior Mounted Permanent Magnet Electrical Machines III	Narayan	Kar	University of Windsor	Canada
JPJ	(Semi)-Analytical and Numerical Techniques for the Optimal Design of Electromagnetic Devices	Jean-Philippe	Lecointe	Laboratoire Systémes Électrotechniques et Environnement	France
JPK	(Semi)-Analytical and Numerical Techniques for the Modeling of Electromagnetic Devices	Yacine	Amara	University of Le Havre	France
JPL	Loss and Thermal Modelling of Electrical Machines, Magnetic Bearing	Yanhui	Gao	Oita University	Japan
JPM	Design Optimization of Electrical Machines	Weimin	Guan	Wuhan University	China

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FUTURE CONFERENCES

67th Annual Conference on Magnetism and Magnetic Materials
October 31 – November 4, 2022, Minneapolis, MN

2023 Intermag Conference
May 15-19, 2023, Sendai, Japan

68th Annual Conference on Magnetism and Magnetic Materials
October 30 – November 3, 2023, Dallas, TX

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January 13-17, 2025, New Orleans, LA

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TECHNICAL PROGRAM

Session TU
TUTORIAL: QUANTUM MAGNONICS

Sara Majetich, Chair
Carnegie Mellon University, Pittsburgh, PA, United States

TU-01. **Quantum Magnonics with a Superconducting Qubit.** ***(Invited)*** *Y. Nakamura[1,2] 1. RIKEN Center for Quantum Computing, Saitama, Japan; 2. Research Center for Advanced Science and Technology, The University of Tokyo, Tokyo, Japan*

TU-02. **Cavity Magnoncs.** ***(Invited)*** *S. Viola Kusminskiy[1] 1. Max Planck Institute for the Science of Light, Erlangen, Germany*

TU-03. **Emerging Opportunities for Coherent Information Processing at the Intersection of Superconductivity and Magnetism.** ***(Invited)*** *Y. Li[1] 1. Materials Science Division, Argonne National Laboratory, Argonne, IL, United States*

Session PL
PLENARY AND IEEE AWARDS CEREMONY

Juergen Fassbender, Co-Chair
HZDR, Dresden, Germany
Victorino Franco, Co-Chair
University of Seville, Sevilla, Spain

IEEE Awards Ceremony

PL-01. **Nanoscale Magnetoelasticity, An Overlooked Opportunity.** ***(Invited)*** *G. Carman[1,2] 1. Mechanical & Aerospace Engineering, UCLA, Los Angeles, CA, United States; 2. Translational Applications of Nanoscale Multiferroic Systems TANMS, Los Angeles, CA, United States*

Session SA
APPLICATION OF SYMMETRY BREAKING IN CORRELATED AND QUANTUM MAGNETIC MATERIALS

Thomas Ward, Chair
Oak Ridge National Laboratory, Oak Ridge, TN, United States

SA-01. **Tuning Spin Excitations in Magnetic Films by Confinement.** ***(Invited)*** *V. Bisogni[1] 1. NSLS II, Brookhaven National Laboratory, Upton, NY, United States*

SA-02. **Controlling the Stripe Order in a Diluted Frustrated Magnet.** ***(Invited)*** *T. Vojta*[1], X. Ye[1] and R. Narayanan[2]
1. Physics, Missouri University of Science and Technology, Rolla, MO, United States; 2. Physics, Indian Institute of Technology Madras, Chennai, India

SA-03. **Compositional disorder in the extreme limit: A novel route to the design and manipulation of dynamic and frustrated magnetic systems.** ***(Invited)*** *A.R. Mazza*[1] and T.Z. Ward[1]
1. Oak Ridge National Laboratory, Oak Ridge, TN, United States

SA-04. **Emergent magnetic states in transition metal nitride heterostructures.** ***(Invited)*** *E. Guo*[1] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China*

SA-05. **Designing Spin Textures through Local Control of Magnetocrystalline Anisotropy.** ***(Invited)*** *Y. Takamura*[1], M.S. Lee[1], R.V. Chopdekar[2], P. Lyu[1], T. Wynn[5], E. Folven[6], J. Grepstad[6], S.T. Retterer[3], P. Shafer[2] and E. Arenholz[4]
1. Materials Science and Engineering, University of California, Davis, Davis, CA, United States; 2. Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 3. Center for Nanophase Materials Sciences, Oak Ridge National Laboratory, Oak Ridge, TN, United States; 4. Oak Ridge National Laboratory, Oak Ridge, TN, United States; 5. Stanford Synchrotron Radiation Lightsource, SLAC National Accelerator Laboratory, Menlo Park, CA, United States; 6. Norwegian Institute of Science and Technology, Trondheim, Norway

SYMPOSIUM SESSION

Session SB
SPINTRONIC DIODES: CHALLENGES AND NEW DIRECTIONS

Riccardo Tomasello, Co-Chair
Politecnico di Bari, Bari, Italy
Mario Carpentieri, Co-Chair
Politecnico of Bari, Bari, Italy

SB-01. **Challenges in microwave and THz spintronic diodes.** ***(Invited)*** *G. Finocchio*[1] *1. University of Messina, Messina, Italy*

SB-02. **WiFi Band Energy Harvesting using Spin-Torque Diode and Nonlinear Hall Effects.** ***(Invited)*** *H. Yang*[1] *1. National University of Singapore, Singapore*

SB-03. **Radio-Frequency Spintronic Neural Networks.** ***(Invited)***
N. Leroux[1], A. Ross[1], D. Markovic[1], D. Sanz Hernandez[1], J. Trastoy[1], P. Bortolotti[1], D. Querlioz[2], L. Martins[3], A. Jenkins[3], R. Ferreira[3], A. Mizrahi[1] and *J. Grollier*[1] *1. CNRS/ Thales, Palaiseau, France; 2. C2N, Université Paris Saclay, Palaiseau, France; 3. INL, Braga, Portugal*

SB-04. **Antiferromagnetic Spin-torque Oscillators: Ultrafast Dynamics and Possible Applications.** ***(Invited)*** *O. Gomonay*[1]
1. Institute of Physics, Johanes Gutenberg University, Mainz, Germany

SB-05. **Signal Detector and RF Energy Harvester Based On A Spintronic Diode With Perpendicular Anisotropy.** ***(Invited)***
P. Artemchuk[1,2], O. Prokopenko[2], V. Tyberkevych[1] and *A.N. Slavin*[1]
1. Physics, Oakland University, Rochester, MI, United States; 2. Radio Physics, Electronics and Computer Systems, Taras Shevchenko National University of Kyiv, Kyiv, Ukraine

SYMPOSIUM SESSION

Session SC
EXPLORING MAGNETISM AT THE NANOSCALE WITH SCANNING NV MAGNETOMETRY

Patrick Maletinsky, Chair
University of Basel, Basel, Switzerland

SC-01. **Magnetic Domains and Moire Magnetism in atomically thin $CrBr_3$ and CrI_3.** ***(Invited)*** *J. Wrachtrup*[1,2] *1. Physics, University of Stuttgart, Stuttgart, Germany; 2. Max Planck Institute for Solid State Science, Stuttgart, Germany*

SC-02. **Exploring antiferromagnetic order at the nanoscale with a single spin microscope.** ***(Invited)*** *V. Jacques*[1] *1. Laboratoire Charles Coulomb, CNRS and Université de Montpellier, Montpellier, France*

SC-03. **Optimizing color center-based nano-sensing.** ***(Invited)***
N. Oshnik[1], L. Mehmel[1], O. Opaluch[1], A. Damm[1], S. Shradha[2], F. Eilenberger[2] and *E. Neu*[1] *1. University of Kaiserslautern, Kaiserslautern, Germany; 2. University of Jena, Jena, Germany*

SC-04. **Imaging hydrodynamic flow in WTe2 with cryogenic quantum magnetometry.** ***(Invited)*** *U. Vool*[1] *1. Harvard University, Cambridge, MA, United States*

SC-05. **Extending Quantum Coherence of Quantum Sensors.** ***(Invited)***
A. Bleszynski Jayich[1], S. Meynell[1], D. Yang[1] and M. Joos[1]
1. Physics, UC Santa Barbara, Santa Barbara, CA, United States

SYMPOSIUM SESSION

Session SD
FRONTIERS OF ORBITAL PHYSICS: STATICS, DYNAMICS, AND TRANSPORT OF ORBITAL ANGULAR MOMENTUM

Olena Gomonay, Chair
Johannes Gutenberg University Mainz, Mainz, Germany

SD-01. **Theory of Orbital Hall Effect and Current-Induced Torques by Orbital Current.** ***(Invited)*** *D. Go*[1,4], D. Jo[2], K. Kim[3], H. Lee[2] and Y. Mokrousov[1,4] *1. Forschungszentrum Jülich, Jülich, Germany; 2. Pohang University of Science and Technology, Pohang, The Republic of Korea; 3. Korea Institute of Science and Technology, Seoul, The Republic of Korea; 4. Johannes Gutenberg University Mainz, Mainz, Germany*

SD-02. **Ferroelectric control of Rashba states: towards non-volatile spintronics driven by ferroelectricity.** ***(Invited)*** *M. Bibes*[1]
1. Unité Mixte de Physique CNRS/Thales, Palaiseau, France

SD-03. **Ultra-efficient spin manipulation by orbital currents.** ***(Invited)*** *M. Kläui*[1] *1. Physics, Johannes Gutenberg University Mainz, Mainz, Germany*

SD-04. **Competition between orbital and spin angular momenta of the THz beams at the antiferromagnetic resonances and Landau level transitions.** ***(Invited)*** *A. Sirenko*[1] *1. Physics, NJIT, Newark, NJ, United States*

SD-05. **Theory of Spin and Orbital Edelstein Effects.** ***(Invited)***
A. Johansson[1,2], B. Göbel[2,1], J. Henk[2], M. Bibes[3] and I. Mertig[2]
1. Max Planck Institute of Microstructure Physics, Halle (Saale), Germany; 2. Martin Luther University Halle-Wittenberg, Halle (Saale), Germany; 3. Unité Mixte de Physique, CNRS, Thales, Université Paris-Saclay, Palaiseau, France

SYMPOSIUM SESSION

Session SE
FREESTANDING COMPLEX OXIDE FILMS: A NEW PARADIGM FOR MAGNETIC HETEROSTRUCTURES

Alexander Grutter, Chair
National Institute of Standards and Technology, Gaithersburg, MD, United States

SE-01. **Extreme Tensile Strain States in $La_{0.7}Ca_{0.3}MnO_3$ Membranes.** ***(Invited)*** *H. Hwang*[1,2] *1. Stanford University, Stanford, CA, United States; 2. SLAC National Accelerator Laboratory, Menlo Park, CA, United States*

SE-02. **Multiferroic Membranes in the Ultrathin Limit.** ***(Invited)***
Y. Nie[1] *1. Nanjing University, Nanjing, China*

SE-03. **Freestanding Single-Crystalline Complex-Oxide Membranes by Remote Epitaxy.** ***(Invited)*** *H.S. Kum*[1] *1. Electrical and Electronics Engineering, Yonsei University, Seoul, The Republic of Korea*

SE-04. **Magnetic Depth Profiling of Freestanding Oxide Films.** ***(Invited)*** *P.P. Balakrishnan*[1] *1. NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, United States*

SE-05. **Free-standing Ferroelectric and Magnetoelectric single crystal Membranes with super-elasticity.** ***(Invited)*** *M. Liu*[1]
1. School of Electrical Engineering, Xi'an Jiaotong University, Xian, China

Session SF
SOFT MAGNETIC COMPONENTS AND MATERIALS FOR EMERGING POWER CONVERSION APPLICATIONS

Paul Ohodnicki, Co-Chair
University of Pittsburgh, Pittsburgh, PA, United States
Kiyonori Suzuki, Co-Chair
Monash University, Clayton, VIC, Australia

SF-01. **Power Dense Inductors Based Upon Co-Based Nanocrystalline Alloys.** ***(Invited)*** *P. Ohodnicki*[1], A. Talaat[1], S. Kernion[2], K. Byerly[2] and A. Leary[3] *1. University of Pitsburgh, Pittsburgh, PA, United States; 2. CorePower Magnetics, Pittsburgh, PA, United States; 3. NASA Glenn Research Center, Cleveland, OH, United States*

SF-02. **Application of FeNi-based Metal Amorphous Nanocomposites (MANCs) in Axial High Speed Motors.** ***(Invited)*** *M. McHenry*[1], K. Byerly[1], Y. Krimer[1], J. Egbu[1] and S. Simizu[1] *1. Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, PA, United States*

SF-03. **Soft magnetic composites for intracellular pulse electric field tumor treatment using DSRD-based nanosecond high power pulse generators.** ***(Invited)*** P. Andalib[1], C. Yu[1], A. Kaltashov[2] and *V.G. Harris*[1] *1. Department of Electrical and Computer Engineering, Northeastern University, Boston, MA, United States; 2. Department of Chemical Engineering, Northeastern University, Boston, MA, United States*

SF-04. **Solid State Transformer Technology Based on Advanced Materials and Design Concepts.** ***(Invited)*** *S. Bhattacharya*[1] and R.B. Beddingfield[1] *1. ECE, NC State University, Raleigh, NC, United States*

SF-05. **Recent Advances and Remaining Challenges in Manufacturing of Amorphous and Nanocrystalline Alloys.** ***(Invited)*** *E. Theisen*[1] *1. Metglas Inc., Conway, SC, United States*

Session SG
NEXT GENERATION ELECTRICAL MACHINES

Jonathan Bird, Co-Chair
Portland State University, Portland, OR, United States
Yacine Amara, Co-Chair
University of Le Havre, Le Havre, France

SG-01. **Energy Conversion for a Sustainable Future: Role of Advanced Magnetic Materials and Advanced Manufacturing.** ***(Invited)*** *A. El-Refaie*[1] *1. Electrical and Computer Engineering, Marquette University, Milwaukee, WI, United States*

SG-02. **Flux Modulation Machines – Innovation & Beyond.** ***(Invited)*** *R. Qu*[1,2] and D. Li[1,2] *1. State Key Laboratory of Advanced Electromagnetic Engineering and Technology, Huazhong University of Science and Technology, Wuhan, China; 2. School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, Wuhan, China*

SG-03. **About High Temperature Electrical Machines, from materials behavior to special design.** ***(Invited)*** *N. Takorabet*[2], S. Duchesne[1] and D. Roger[1] *1. LSEE, Université d'Artois, Béthune, France; 2. GREEN, Université de Lorraine, Vandoeuvre lès Nancy, France*

SG-04. **Formula E: Electric Machines and Drives Strategy.** ***(Invited)*** *J. Paulides*[1] and L. Encica[1] *1. R&D, AE Group, Waalwijk, Netherlands*

SG-05. **Analyse of the flux density and iron loss distributions in segmented magnetic circuits made with mixed electrical steel grades.** ***(Invited)*** A. Rebhaoui[1,2], S. Randi[3,2], *J. Lecointe*[1] and C. Demian[1] *1. Université Artois, Laboratoire Systèmes Electrotechniques et Environnement (LSEE), Béthune, France; 2. VEDECOM, Versailles, France; 3. Renault Technocenter, Guyancourt, France*

ORAL SESSION

Session AOA
FUNDAMENTAL PROPERTIES AND COOPERATIVE PHENOMENA I

Durga Paudyal, Chair
Ames Laboratory, Ames, IA, United States

AOA-01. **Topological Boundary Constraints in Artificial Colloidal Ice.** C. Rodríguez-Gallo[1], A. Ortiz[1] and *P. Tierno*[1] *1. Condensed Matter Physics Department, University of Barcelona, Barcelona, Spain*

AOA-02. **Artificial Out-of-Plane Ising Antiferromagnet on the Kagome Lattice with Very Small Further-Neighbour Couplings.** *J. Colbois*[1], K. Hofhuis[2,3], Z. Luo[2,3], X. Wang[2,3], A. Hrabec[2,3], L. Heyderman[2,3] and F. Mila[1] *1. Institute of Physics, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland; 2. Laboratory for Mesoscopic Systems, Department of Materials, ETH Zurich, Zurich, Switzerland; 3. Laboratory for Multiscale Materials Experiments, Paul Scherrer Institute, Villigen PSI, Switzerland*

AOA-03. **Order and disorder : The magnetic and crystalline electric field skyline of $NdCu_2$ nanoparticles.** *E.M. Jefremovas*[1], M. De la Fuente Rodríguez[1], F. Damay[4], D. Alba-Venero[6], B. Fåk[3], P. Bender[7], A. Michels[2], J.A. Blanco[5] and L. Fernández Barquín[1] *1. Ciencias de la Tierra y Física de la Materia Condensada, Universidad de Cantabria, Santander, Spain; 2. Department of Physics and Material Science, Université du Luxembourg, Luxembourg, Luxembourg; 3. Institut Laue-Langevin, Grenoble, France; 4. Laboratoire Léon Brillouin, Gif sur Yvette, France; 5. Física, Universidad de Oviedo, Oviedo, Spain; 6. ISIS, STFC, Rutherford Appleton Lab, Didcot, United Kingdom; 7. Heinz Maier-Leibnitz Zentrum (MLZ), Technische Universität München, Garching, Germany*

AOA-04. **Long-range Magnetic Ordering in Artificial Kagome Spin Ice.** *K. Hofhuis*[1,2], A. Hrabec[1,2], H. Arava[1,2], N. Leo[3], S.H. Skjærvø[1,2], Y. Huang[4], R.V. Chopdekar[4], S. Parchenko[1,2], A. Kleibert[5], S. Koraltan[6], C. Abert[6], C. Vogler[6], D. Suess[6], P.M. Derlet[7,1] and L. Heyderman[1,2] *1. Laboratory for Mesoscopic Systems, ETH Zurich, Zurich, Switzerland; 2. Laboratory for Multiscale Materials Experiments, Paul Scherrer Institute, Villigen PSI, Switzerland; 3. CIC nanoGune, Donostia-San Sebastian, Spain; 4. Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 5. Swiss Light Source, Paul Scherrer Institute, Villigen PSI, Switzerland; 6. Physics of Functional Materials, University of Vienna, Vienna, Austria; 7. Condensed Matter Theory Group, Paul Scherrer Institute, Villigen PSI, Switzerland*

AOA-05. **Properties of 3 Dimensional Co and Py Bi-Material Artificial Spin Ice.** *B. Myint*[1] and V. Ng[1] *1. Electrical and Computer Engineering, National University of Singapore, Singapore*

AOA-06. **Dipolar Artificial Spin Ice on a Cairo Lattice.** *K.V. Nefedev*[1,2], V. Strongin[1,2], A. Farhan[3,4] and A. Makarov[1] *1. Theoretical Physics and Intelligent Technologies, Far Eastern Federal University, Vladivostok, Russian Federation; 2. Applied Mathematics, Far East Branch of Academia of Science of Russia, Vladivostok, Russian Federation; 3. Laboratory for Multiscale Materials Experiments, Paul Scherrer Institute, Villigen, Switzerland; 4. Physics Department, University of California, Santa Cruz, CA, United States*

AOA-07. **Magnetization Plateau of the Distorted Diamond Spin Chain with Anisotropic Ferromagnetic Interactions.** *T. Sakai*[1,2], K. Okamoto[1], R. Furuuchi[1] and H. Nakano[1] *1. Graduate School of Science, University of Hyogo, Kamigori, Japan; 2. SPring-8, National Institutes for Quantum and Radiological Science and Technology, Sayo, Japan*

AOA-08. **Tension-free Dirac Strings and Steered Magnetic Charges in 3D Artificial Spin Ice.** *S. Koraltan*[1], F. Slanovc[1], F. Bruckner[1], C. Nisoli[2], A. Chumak[3], O. Dobrovolskiy[3], C. Abert[1] and D. Suess[1] *1. Physics of Functional Materials, Faculty of Physics, University of Vienna, Vienna, Austria; 2. Theoretical Division, Los Alamos National Laboratory, Los Alamos, NM, United States; 3. Nanomagnetism and Magnonics, Faculty of Physics, University of Vienna, Vienna, Austria*

AOA-09. **Coexistence of geometric frustration-driven ferromagnetic and glassy states in the ferromagnetic kagome-lattice semimetal compound $Co_3Sn_2S_2$.** *R. Pokharel Madhogaria*[1], C. Hung[1], A. Chanda[1], R. Xue[2], D. Mandrus[2], H. Srikanth[1] and M. Phan[1] *1. University of South Florida, Tampa, FL, United States; 2. University of Tennessee, Knoxville, TN, United States*

AOA-10. **Correlated Disorder in a Molecular Assembly: A New Artificial Spin System.** *M. Alfonso Moro*[1], J. Coraux[1], B. Canals[1] and N. Rougemaille[1] *1. Néel Institute, CNRS, Grenoble, France*

AOA-11. **Arctic Circle Phenomenon and magnetic fragmentation in a square lattice based frustrated spin system.** *L. Reneuve*[1,2], B. Canals[3] and N. Rougemaille[3] *1. Université Grenoble Alpes, Grenoble, France; 2. Institut Néel, Grenoble, France; 3. Institut Néel, CNRS, Grenoble, France*

AOA-12. **Is a field demagnetization protocol applied to an a priori athermal, artificial square ice magnet, a stochastic process?** *O. Brunn*[1,2], B. Canals[1] and N. Rougemaille[1] *1. CNRS - Institut NEEL, Grenoble, France; 2. Institute of Scientific Instruments of the Czech Academy of Sciences, Brno, Czechia*

AOA-13. **Approximates of the Square Ice and F-model Using Two-dimensional Artificial Lattices of Nanomagnets.** *V. Schánilec*[1,2], O. Brunn[1,3], B. Canals[1], M. Horáček[3], S. Krátký[3], P. Meluzín[3], T. Šikola[4,2] and N. Rougemaille[1] *1. Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut NEEL, Grenoble, France; 2. Central European Institute of Technology, CEITEC BUT, Brno University of Technology, Brno, Czechia; 3. Institute of Scientific Instruments of the Czech Academy of Sciences, Brno, Czechia; 4. Institute of Physical Engieneeering, Faculty of Mechanical Engieneering, Brno University of Technology, Brno, Czechia*

AOA-14. **Magnetic and thermoelectric properties of Bi, Cu double-substituted $La_{1-x}Sr_xCoO_3$.** *D.P. Dubey*[1] and R. Chatterjee[1] *1. Physics Department, Indian Institute of Technology- Delhi, New Delhi, India*

AOA-15. **Static and Dynamic Magnetic Properties of Cu-Based Organic-Inorganic Hybrid Perovskite Single Crystals.** E. Vetter[1], H. Lu[2], R. Song[3], *A. Comstock*[1], V. Blum[3], W. Zhang[4], M. Beard[2] and D. Sun[1] *1. Department of Physics, North Carolina State University, Raleigh, NC, United States; 2. Chemistry and Nanoscience Center, National Renewable Energy Laboratory, Golden, CO, United States; 3. Department of Mechanical Engineering and Material Science, Duke University, Durham, NC, United States; 4. Department of Physics, Oakland University, Rochester, MI, United States*

AOA-16. **Self-induced spin glass phase in dhcp Nd.** ***(Invited)*** *A. Bergman*[1] *1. Dept. of Physics and Astronomy, Uppsala University, Uppsala, Sweden*

Session AOB
FUNDAMENTAL PROPERTIES AND COOPERATIVE PHENOMENA II

Eleanor Clements, Co-Chair
National Institute of Standards and Technology, Gaithersburg, MD, United States
Roberto Zivieri, Co-Chair
University of Ferrara, Ferrara, Italy

AOB-01. **Recent developments of magnetism in flatland: Discovery of Intrinsic 2D-XY Ferromagnetism in a van der Waals Monolayer.** ***(Invited)*** *A. Bedoya Pinto*[1], J. Ji[1], A. Pandeya[1], P. Gargiani[2], M. Valvidares[2], P. Sessi[1], J. Taylor[3], F. Radu[3], K. Chang[1] and S. Parkin[1] *1. Max-Planck Institute of Microstructure Physics, Halle, Germany; 2. ALBA Sincrotro, Barcelona, Spain; 3. Helmholtz Zentrum für Materialien und Energie, Berlin, Germany*

AOB-02. **Failure of the mean-field description of magnetic fluctuations in the superconducting quantum dot.** *V. Janiš*[1] and J. Yan[1] *1. Institute of Physics, The Czech Academy of Sciences, Praha, Czechia*

AOB-03. **Spin Reorientation in Antiferromagnet-ferromagnet Phase Transitions.** *A. Buzdakov*[1,2], K. Zvezdin[3], A. Kimel[4] and A.K. Zvezdin[3] *1. Moscow Institute of Physics and Technology, Moscow, Russian Federation; 2. I-FEVS, Torino, Italy; 3. Prokhorov General Physics Institute, Moscow, Russian Federation; 4. Radboud Universiteit, Nijmegen, Netherlands*

AOB-04. **Depinning transition of domain walls with internal degrees of freedom.** A. Skaugen[1] and *L. Laurson*[1] *1. Computational Physics Laboratory, Tampere University, Tampere, Finland*

AOB-05. **N-th Root Topological Lattices.** *H. Sahin*[1,2], S. Rafi-Ul-Islam[1], Z. Siu[1], J. Kong[2], C. Lee[3] and M.B. Jalil[1] *1. Electrical and Computer Engineering, National University of Singapore, Singapore; 2. Institute of High Performance Computing, A*STAR, Singapore, Singapore; 3. Department of Physics, National University of Singapore, Singapore*

AOB-06. **Critical Behavior of the Classical Spin-1 Ising Model for Magnetic Systems.** *R. Zivieri*[1,2] *1. National Institute of High Matematics, Rome, Italy; 2. Department of Physics and Earth Sciences, University of Ferrara, Ferrara, Italy*

AOB-07. **Thermodynamically stable skyrmion lattices in centrosymmetric frustrated helimagnets with dipolar interaction.** *O.I. Utesov*[1,2] *1. Theory Division, National Research Center "Kurchatov Institute" B.P. Konstantinov Petersburg Nuclear Physics Institute, Gatchina, Russian Federation; 2. St. Petersburg School of Physics, Mathematics, and Computer Science, HSE University, St. Petersburg, Russian Federation*

AOB-08. **AC Frequency Modulated Phase Transitions in Topolectrical Circuits.** S. Rafi-Ul-Islam[1], *H. Sahin*[1,2], C. Sun[1], Z. Siu[1] and M.B. Jalil[1] *1. Electrical and Computer Engineering, National University of Singapore, Singapore; 2. Institute of High Performance Computing, A*STAR, Singapore, Singapore*

AOB-09. **Effect of Calcium Doping on Magnetocaloric Properties and Critical Behaviour of $La_{0.55}Ca_xSr_{0.45-x}MnO_3$ around FM-PM Phase Transition.** *M.A. Bally*[1] and D.A. Khan[1] *1. Physics, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh*

AOB-10. **Effects of Random Fields on the Phase Transition of a Two-Dimensional Ferromagnet.** *E. Ibrahim*[1], P. Tang[2] and S. Zhang[1] *1. Physics, University of Arizona, Tucson, AZ, United States; 2. Institute of Physics, Beijing National Laboratory for Condensed Matter Physics, Beijing, China*

AOB-11. **Large Entropy Peaks and Magnetizations Plateaus in the Diluted Pyrochlore Lattice.** *K. Soldatov*[1] *1. Far Eastern Federal University, Vladivostok, Russian Federation*

AOB-12. **Multiple magnetic transitions, anomalous Hall effect and tunable surface states in $Mn(Bi_{1-x}Sb_x)_4Te_7$ (x=0, 0.26, 0.37, 0.48).** *C. De*[1] *1. IBS Centre for Artificial Low Dimensional Electronic System, POSTECH, Pohang, The Republic of Korea*

AOB-13. **Exchange Interactions in Mixed-Rare-Earth Transition-Metal Compounds.** *R. Skomski*[1], D. Paudyal[3], B. Balasubramanian[1], A. Ullah[1], A. Laraoui[2] and D. Sellmyer[1] *1. Physics and Astronomy & NCMN, University of Nebraska, Lincoln, NE, United States; 2. Electrical Engineering, University of Nebraska, Lincoln, NE, United States; 3. Ames Laboratory, Ames, IA, United States*

ORAL SESSION

Session AOC
FUNDAMENTAL PROPERTIES AND COOPERATIVE PHENOMENA III

Amilcar Bedoya Pinto, Co-Chair
Max Planck Institute of Microstructure Physics, Halle, Germany
Aurelian Rotaru, Co-Chair
Stefan cel Mare University, Suceava, Romania

AOC-01. **Weyl-Kondo Semimetal – How Strong Correlations Intersect with Electronic Topology. *(Invited)*** *Q. Si*[1] *1. Department of Physics and Astronomy, Rice Center for Quantum Materials, Rice University, Houston, TX, United States*

AOC-02. **Magnetoelectric effect in Dipolar Clusters. *(Invited)*** *P. Mellado*[1], S. Rica[1] and A. Concha[1] *1. Engineering and Sciences, Universidad Adolfo Ibanez, Santiago, Chile*

AOC-03. **Quantum-confined charge transfer that enhances magnetic anisotropy in lanthanum M-type hexaferrites.** C. Bhandari[1], M.E. Flatté[2] and *D. Paudyal*[1] *1. Ames Laboratory, Ames, IA, United States; 2. University of Iowa, Iowa City, IA, United States*

AOC-04. **A J_1-J_3 Heisenberg kagome lattice with an order by disorder induced Potts order.** V. Grison[1], B. Bernu[1], L. Pierre[2] and *L. Messio*[1,3] *1. LPTMC, Sorbonne Université, Paris, France; 2. Université Nanterre, Nanterre, France; 3. Institut Universitaire de France, Paris, France*

AOC-05. **$Ba_3Co_2O_6(CO_3)_{0.7}$: Candidate Spin-Liquid on the Honeycomb-Lattice.** *A.S. Padgett*[1,2] and Y. Takano[2] *1. High Voltage Sciences, Sandia National Laboratories, Albuquerque, NM, United States; 2. Physics, University of Florida, Gainesville, FL, United States*

AOC-06. **Effect of manganese doping and magneto-photocurrent in organo-metal halide perovskites.** T.A. Fasasi[1], S.W. Tsang[1] and *A. Ruotolo*[2] *1. City University of Hong Kong, Kowloon, Hong Kong; 2. Florida Polytechnic University, Lakeland, FL, United States*

AOC-07. **Magnetic properties of S = 1 spin chain in $Sr_2Ni(SeO_3)_2Cl_2$: XY-antiferromagnet at Sakai-Takahashi phase diagram.** *E. Kozlyakova*[1,2], A. Moskin[2], P. Berdonosov[2], V. Gapontsev[3,4], S. Streltsov[3,4], M. Uhlarz[5], S. Spachmann[6], A. ElGhandour[6], R. Klingeler[6,7] and A. Vasiliev[2,1] *1. National University of Science and Technology "MISIS", Moscow, Russian Federation; 2. Lomonosov Moscow State University, Moscow, Russian Federation; 3. Ural Federal University, Ekaterinburg, Russian Federation; 4. Institute of Metal Physics RAS, Ekaterinburg, Russian Federation; 5. Hochfeld-Magnetlabor Dresden (HLD-EMFL), Dresden, Germany; 6. Kirchhoff Institute of Physics, Heidelberg University, Heidelberg, Germany; 7. Centre for Advanced Materials, Heidelberg University, Heidelberg, Germany*

AOC-08. **Pressure effect on spin-crossover materials: Experiment vs theory.** *A. Rotaru*[1] *1. Electrical Engineering and Computer Science, Stefan cel Mare University, Suceava, Romania*

AOC-09. **Chiral edge conduction induced by large anisotropic exchange interactions.** *S. Sayed*[1,2], P. Brahma[1], C. Hsu[1] and S. Salahuddin[1,2] *1. Electrical Engineering and Computer Sciences, University of California, Berkeley, Berkeley, CA, United States; 2. Materials Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA, United States*

AOC-10. **Magneto-Raman study of magnon and spin-orbit exciton in $CoTiO_3$.** *T.T. Mai*[1], K. Garrity[2], J.R. Simpson[3], R. Valdes Aguilar[4], K. Ross[5] and A.R. Hight Walker[1] *1. Physical Measurement Laboratory, NIST, Gaithersburg, MD, United States; 2. Material Measurement Laboratory, NIST, Gaithersburg, MD, United States; 3. Physics, Astronomy, and Geosciences, Towson University, Towson, MD, United States; 4. Physics, Ohio State University, Columbus, OH, United States; 5. Physics, Colorado State University, Fort Collins, CO, United States*

Session APA
FUNDAMENTAL PROPERTIES AND COOPERATIVE PHENOMENA IV (Poster Session)

Amilcar Bedoya Pinto, Chair
Max Planck Institute of Microstructure Physics, Halle, Germany

APA-01. **Quasi-one dimensional magnetism in $Mn_xCo_{1-x}Nb_2O_6$ compounds.** *M.L. Hneda*[1,2], J.M. da Cunha[3] and O. Isnard[4,5] *1. Instituto Latino-Americano de Ciências da Vida e da Natureza, Universidade Federal da Integração Latino-Americana, Foz do Iguaçu, Brazil; 2. Instituto de Engenharia, Ciência e Tecnologia, Universidade Federal dos Vales do Jequitinhonha e Mucuri, Janaúba, Brazil; 3. Instituto de Física, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil; 4. Institut Néel, CNRS, Grenoble, France; 5. Université Grenoble Alpes, Saint-Martin-d'Hères, France*

APA-02. **Withdrawn**

APA-03. **Phase transitions in lightly doped Mott insulators in the presence of magnetic field.** *L.B. Dubovskiy*[1] *1. Theoretical Division, NRC "Kurchatov Institute", Moscow, Russian Federation*

APA-04. **A Circuit Lattice Representation of a Second-Order Dirac Semimetal.** S. Rafi-Ul-Islam[1], *H. Sahin*[1,2], Z. Siu[1] and M.B. Jalil[1] *1. Electrical and Computer Engineering, National University of Singapore, Singapore; 2. Institute of High Performance Computing, A*STAR, Singapore, Singapore*

APA-05. **Experimental Study of Emergent Ground State Behaviour in $Gd_{1-x}Ce_xNi_5$ (x=0; 0.2; 0.5; 0.8 and 1) Melt-Spun Ribbons.** *A. Dzubinska*[1], J.R. Fernandez[2], M. Reiffers[3], J. Espeso[2], R. Varga[1], K. Arun[4] and J.G. Sal[2] *1. CPM TIP, University of Pavol Jozef Safarik, Kosice, Slovakia; 2. CITIMAC, University of Cantabria, Santander, Spain; 3. Faculty of Humanities and Natural Sciences, Presov University, Presov, Slovakia; 4. Intermetallics and Non-linear Optics Laboratory, Department of Physics, National Institute of Technology, Tiruchirappalli, India*

APA-06. **Inducing Fe moment in LaFeSi with p-block elements substitution.** *R.K. Chouhan*[1], T. Del Rose[1,2], Y. Mudryk[1] and V. Pecharsky[1,2] *1. Ames Laboratory, Ames, IA, United States; 2. Department of Materials Science and Engineering, Iowa State University, Ames, IA, United States*

APA-07. **Neutron diffraction study of incommensurate magnetism in square-lattice magnet $EuGa_2Al_2$.** *E.M. Clements*[1], J.W. Lynn[1], S. Chi[3], J. Moya[2], S. Lei[2], K. Allen[2] and E. Morosan[2] *1. NIST Center for Neutron Research, Gaithersburg, MD, United States; 2. Physics and Astronomy, Rice University, Houston, TX, United States; 3. Neutron Scattering Division, Oak Ridge National Laboratory, Oak Ridge, TN, United States*

APA-08. **Magnetic Interplay Between Gd and Pr in the CeScSi-type Layered Structure.** *T. Del Rose*[1,2], D. Haskel[3], R. Choudhary[1], A. Pathak[4], Y. Mudryk[1], D. Johnson[1,2] and V. Pecharsky[1,2] *1. Ames Lab, U.S. Department of Energy, Ames, IA, United States; 2. Materials Science and Engineering, Iowa State University, Ames, IA, United States; 3. Advanced Photon Source, Argonne National Laboratory, Argonne, IL, United States; 4. Department of Physics, SUNY Buffalo State, Buffalo, NY, United States*

APA-09. **Ferromagnetic Spin Glass State Behaviour in Pr_2AgSi_3.** *R. Djoumessi*[1], B. Sahu[1] and A. Strydom[1] *1. Highly Correlated Matter Research Group, Physics Department, University of Johannesburg, Johannesburg, South Africa*

APA-10. **Anomalous Behaviour in the Seebeck Coefficient of $Cr_{100-z}Os_z$ Alloy System.** P.R. Fernando[1,2], A.R. Prinsloo[1] and *C.J. Sheppard*[1] *1. Physics, University of Johannesburg, Johannesburg, South Africa; 2. Eastern University, Vantharumoolai, Sri Lanka*

APA-11. **Strategies for monopole current control in Artificial Spin Ice Systems.** E. Berganza Eguiarte[1], *G. López-Polín*[2] and R.M. Corona[3] *1. Karlsruhe Institute of Technology, Karlsruhe, Germany; 2. Consejo Superior de Investigaciones Cientificas, Madrid, Spain; 3. Universidad de Santiago de Chile, Santiago de Chile, Chile*

APA-12. **Static and dynamic critical behaviour of spin glass transition in ordered h-$DyMnO_3$ system.** *P. Singh*[1] and D. Pandey[1] *1. School of Materials Science and Technology, Indian Institute of Technology (Banaras Hindu University), Varanasi, India*

APA-13. **Magnetic susceptibility of spin crossover monodisperse particles.** *A. Diaconu*[1] *1. Electrical Engineering and Computer Science, "Stefan cel Mare" University of Suceava, Suceava, Romania*

APA-14. **Single crystal growth and low temperature physical properties of triangular lattice antiferromagnet - $Ca_3NiNb_2O_9$.** *D. Rout*[1], S. Singh[3,2], M. Jonak[3,4] and R. Klingeler[3,4] *1. Physics, Indian Institute of Science Education and Research Pune, Pune, India; 2. Centre for Energy Science, Indian Institute of Science Education and Research Pune, Pune, India; 3. Physics, Kirchhoff Institute of Physics, Heidelberg, Germany; 4. Centre for Advanced Materials, Kirchhoff Institute of Physics, Heidelberg, Germany*

APA-15. **Magnetization process of cubic Fe_3O_4 submicron particles studied by small-angle polarized neutron scattering.** *E. Nomura*[1], M. Chiba[1], S. Matsuo[1], S. Kobayashi[1], J. Manjanna[2], Y. Kawamura[3], J. Suzuki[3], K. Ohishi[3] and K. Hiroi[4] *1. Iwate Univ., Iwate, Japan; 2. Rani Channamma Univ., Belagavi, India; 3. CROSS, Tokai, Japan; 4. JAEA, Tokai, Japan*

Session BOA
MAGNETOELECTRONIC MATERIALS AND PHENOMENA: HEUSLERS AND RELATED MATERIALS

Atsufumi Hirohata, Chair
University of York, York, United Kingdom

BOA-01. **Electronic transport and optical properties of Mn_2*Me*Al (*Me* = Ti, V, Cr, Mn, Fe, Co, Ni) Heusler compounds.** *A. Semiannikova*[1], Y.A. Perevozchikova[1], E.I. Shreder[1], A.A. Makhnev[1], A.V. Lukoyanov[1,2], E.B. Marchenkova[1], P.S. Korenistov[1], V.Y. Irkhin[1] and V.V. Marchenkov[1,2] *1. M.N. Mikheev Institute of Metal Physics, UB RAS, Ekaterinburg, Russian Federation; 2. Ural Federal University, Ekaterinburg, Russian Federation*

BOA-02. **Experimental and theoretical investigation of FeCrVAl and related compounds.** *P. Kharel*[1], G. Baker[1], M. Flesche[1], L. Stuelke[2], P. Shand[2] and P. Lukashev[2] *1. Physics, South Dakota State University, Brookings, SD, United States; 2. Physics, University of Northern Iowa, Cedar Falls, IA, United States*

BOA-03. **Growth and Electronic Properties of Heusler Alloys Predicted to be Topological Insulator: Toward Spin/ Charge Conversion Devices.** *V. Palin*[1,2], Y. Fagot-Revurat[1], C. de Melo[1], C. Guillemard[1,2], A. Anadon[1], S. Petit-Watelot[1], J. Rojas-Sanchez[1], P. Le Fèvre[2], F. Bertran[2] and S. Andrieu[1] *1. Institut Jean Lamour, Université de Lorraine, Nancy, France; 2. Synchrotron SOLEIL, Gif-sur-Yvette, France*

BOA-04. **Perpendicular Anisotropy Controlled by Seed and Capping Layers of Heusler Alloy Films.** W. Frost[1], M. Samiepour[1] and *A. Hirohata*[1] *1. Department of Electronic Engineering, University of York, York, United Kingdom*

BOA-05. **Thickness dependent study of magnetization dynamics and transport properties of half-metallic Co_2MnSi Heusler epitaxial thin films.** *A. Friedel*[1,2], C. de Melo[1,3], C. Guillemard[1,4], V. Palin[1,4], J. Rojas-Sanchez[1], P. Pirro[2], S. Petit-Watelot[1] and S. Andrieu[1] *1. Institut Jean Lamour, Université de Lorraine, Nancy, France; 2. Fachbereich Physik and Landesforschungszentrum OPTIMAS, Technische Universität Kaiserslautern, Kaiserslautern, Germany; 3. LMOPS EA 4423 Laboratory, CentraleSupélec, Université de Lorraine, Metz, France; 4. Synchrotron SOLEIL-CNRS, L'Orme des Merisiers, Gif-sur-Yvette, France*

BOA-06. **Weak ferromagnetism and electronic properties of half-metallic Co_2HfSn and Co_2ZrSn Heusler alloys.** *P. Tiberto*[1], G. Barrera[1], P. Allia[1], A. Difalco[2], A. Castellero[2], M. Palumbo[2] and M. Baricco[2] *1. Advanced Materials and Life sciences, INRIM, Torino, Italy; 2. Chemistry Dept., Università di Torino, Torino, Italy*

BOA-07. **Stabilizing an hexagonal phase of a ternary full Heusler alloy $Fe_2MnSi_{1-x}Ge_x$.** B.M. Pimentel[1], *V.M. Andrade*[2], V.G. de Paula[1], K. Pirota[3], F. Beron[3], M. Cardoso[4], J.N. Gonçalves[4], J.S. Amaral[4], A.M. dos Santos[5] and M.S. Reis[1] *1. Institute of Physics, Federal Fluminense University, Niterói, Brazil; 2. IFIMUP - Institute of Physics for Advanced Materials, Nanotechnology and Photonics, University of Porto, Porto, Portugal; 3. 'Gleb Wataghin' Physics Institute, University of Campinas (UNICAMP), Campinas, Brazil; 4. Department of Physics and CICECO, University of Aveiro, Aveiro, Portugal; 5. Neutron Scattering Division, Oak Ridge National Laboratory, Oak Ridge, TN, United States*

BOA-08. **Possible half-metallic and spin-gapless semiconducting behavior in quaternary Heusler compounds $Co_{2-x}Y_xFeGa$ (Y = Ti, V, Cr, Mn, Fe, and Co, x = 0.50).** *R. Mahat*[1], K. Shambhu[1], U. Karki[1], S. Regmi[1], J. Law[3], V. Franco[3], I. Galanakis[2], A. Gupta[4] and P. LeClair[1] *1. Physics and Astronomy, University of Alabama, Tuscaloosa, AL, United States; 2. Department of Materials Science, School of Natural Sciences, University of Patras, Patras, Greece; 3. Departmento de Fisica de la Materia Condensada ICMSE-CSIC, Universidad de Sevilla, Sevilla, Spain; 4. Department of Chemistry and Biochemistry, University of Alabama, Tuscaloosa, AL, United States*

BOA-09. **Effect of Si substitution on phase transformation, Exchange bias and Magnetoresistance in Ni-Mn-In ribbon alloys.** *M. Kannan*[1], P. Sivaprakash[1], S. Esakkimuthu[1], S. Rajkumar[1], J. Jerries Infanta[1] and S. Arumugam[1] *1. Physics, Bharathidasan University, Madurai, India*

BOA-10. **High Moment and Curie Temperature in Co_2FeZ Heusler alloys.** K. Shambhu[1], R. Mahat[1], J. Law[2], V. Franco[2], W. Butler[1], A. Gupta[3] and *P. LeClair*[1] *1. Physics and Astronomy, The University of Alabama, Tuscaloosa, AL, United States; 2. Departmento de Fisica de la Materia Condensada, Universidad de Sevilla, Sevilla, Spain; 3. Chemistry, The University of Alabama, Tuscaloosa, AL, United States*

BOA-11. **Synthesis, Structural and magnetic properties of Ni-Mn-Ga nanowires.** *K. Javed*[1,2], S. Parajuli[2], S. Ali[2], N. Ahmad[2], S.A. Shah[1] and X. Han[2] *1. Physics, Forman Christian College University, Lahore, Pakistan; 2. Institute of Physics, University of Chinese Academy of Sciences, Beijing, China*

Session BOB
MAGNETOELECTRONIC MATERIALS AND PHENOMENA: 2D AND TOPOLOGICAL MATERIALS

Yu-hang Li, Co-Chair
University of California, Riverside, Riverside, CA, United States
Jiawei Jiang, Co-Chair
Tianjin University, Tianjin, China

BOB-01. **Features of the Electronic Properties of Topological Semimetal $PtSn_4$ and WTe_2 Single Crystals.** *A. Perevalova*[1], S. Naumov[1], A.A. Makhnev[1], E.I. Shreder[1], S.M. Podgornykh[1], E.B. Marchenkova[1], V. Chistyakov[1], J. Huang[2] and V.V. Marchenkov[1,3] *1. M.N. Mikheev Institute of Metal Physics, UB RAS, Yekaterinburg, Russian Federation; 2. National Cheng Kung University, Tainan, Taiwan; 3. Ural Federal University, Yekaterinburg, Russian Federation*

BOB-02. **Spin Fluctuations in Quantized Transport of Magnetic Topological Insulators.** *Y. Li*[1] and R. Cheng[1] *1. UC, Riverside, Riverside, CA, United States*

BOB-03. **Sign Reversal and Large Anisotropy in the Magnetoresistance of Oriented Thin Films of $Ag_{2+\delta}Te$.** *Z. Hua*[1] and P. Xiong[1] *1. Physics, Florida State University, Tallahassee, FL, United States*

BOB-04. **Ab initio study on the possible magnetic topological semimetallic state in $MnMg_2O_4$.** *S. Tomita*[1], D. Yao[2], H. Tsuchiura[1,4] and K. Nmura[3] *1. Department of Applied Physics, Tohoku University, Sendai, Japan; 2. Department of Physics, Tokyo Institute of Technology, Meguro-ku, Tokyo, Japan; 3. Institute for Materials Research, Tohoku University, Sendai, Japan; 4. Center for Spintronics Research Network, Tohoku University, Sendai, Japan*

BOB-05. **Threshold behaviors of direct and Hall currents in topological spin-Hall effect.** *A. Zadorozhnyi*[1] and Y. Dahnovsky[1] *1. Physics and Astronomy, University of Wyoming, Laramie, WY, United States*

BOB-06. **Charge Carrier Mass Discrepancy in $In_{1-x}Mn_xAs/GaSb$ Quantum Wells by Shubnikov de Haas Oscillations and Cyclotron Resonance.** *L. Riney*[1], X. Liu[1], J. Ortiz[4], R. Winkler[2,3], S. Bac[1], J. Wang[1], L. DeVaulchier[4], Y. Guldner[4], T. Orlova[5], M. Zhukovskyi[5], M. Dobrowolska[1], J.K. Furdyna[1] and B. Assaf[1] *1. University of Notre Dame, Notre Dame, IN, United States; 2. Northern Illinois University, DeKalb, IL, United States; 3. Materials Science Division, Argonne National Laboratory, Argonne, IL, United States; 4. Laboratoire de Physique, Ecole Normale Supérieure, Paris, France; 5. Notre Dame Integrated Imaging Facility, University of Notre Dame, Notre Dame, IN, United States*

BOB-07. **Electric-Field Switching of Dzyaloshinskii-Moriya Interaction and Skyrmionic Chirality in Two-Dimensional Multiferroics.** *J. Jiang*[1] and W. Mi[1] *1. Department of Applied Physics, Tianjin University, Tianjin, China*

BOB-08. **Structural and Electronic Properties of Mn Implanted MoS_2.** H. Bana[1], P. Lin[1], R. Villarreal[1], Z. Zarkua[1], M. Auge[2], H. Hofsäss[2], A. Tajeda[3], G. Di Santo[4], L. Petaccia[4], E. Tosi[4], P. Lacovig[4], S. Lizzit[4], M. Nissen[5], I. Baev[5], M. Martins[5], F. Tumino[6], A. Li Bassi[6] and *L.M. Pereira*[1] *1. Quantum Solid-State Physics, KU Leuven, Heverlee, Belgium; 2. Institute of Physics, University of Göttingen, Göttingen, Germany; 3. Laboratoire de Physique des Solides, CNRS, Univ. Paris-Sud, Orsay, France; 4. Elettra Sincrotrone Trieste, Trieste, Italy; 5. Universität Hamburg, Institut für Experimentalphysik, Hamburg, Germany; 6. Department of Energy, Politecnico di Milano, Milan, Italy*

BOB-09. **$ZrTe_2/CrTe_2$: an epitaxial van der Waals platform for spintronics.** *Y. Ou*[1], W. Yanez[1], R. Xiao[1], M. Stanley[1], S. Ghosh[2], B. Zheng[1], Y. Huang[1], T. Pillsbury[1], A. Richardella[1], C. Liu[1], V. Crespi[1], K. Mkhoyan[2] and N. Samarth[1] *1. Physics, The Pennsylvania State University, State College, PA, United States; 2. Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, United States*

BOB-10. **Room-temperature Ferromagnetism in 0D/2D Hybrid Systems.** *N.A. Kapuruge*[1], T. Alba[1], K. Lasek[1], F. Nugera[1], V.O. Jimenez[1], M. Phan[1] and H. Gutierrez[1] *1. Physics, University of South Florida, Tampa, FL, United States*

BOB-11. **Electronic, magnetic, and structural properties of Ni/MoS_2 and Ni/WSe_2 interfaces.** *T.E. Kidd*[1], A. Stollenwerk[1], C. Gorgen[1], L. Stuelke[1], Y. Moua[1], P. Shand[1] and P. Lukashev[1] *1. Physics, University of Northern Iowa, Cedar Falls, IA, United States*

BOB-12. **Magnetization evolution in room-temperature van der Waals magnet $CrTe_2$.** C. Tang[1], Q. Lu[2], L. Alahmed[1], *M. Mahdi*[1], A. Shah[1], V. Gupta[1], R. Cheng[8], N. Rush[1], S. Ambhire[3], P. Khanal[6], Y. Xiong[7], T. Liu[4,9], P. Li[1], S. Urazhdin[5], W. Wang[6], W. Zhang[7], M. Hamilton[1], S. Zhang[3] and G. Bian[2] *1. Electrical and Computer Engineering, Auburn University, Auburn, AL, United States; 2. Physics and Astronomy, University of Missouri, Columbia, MO, United States; 3. Physics, Case Western Reserve University, Cleveland, OH, United States; 4. Materials Science & Engineering, University of California, Los Angeles, Los Angeles, CA, United States; 5. Physics, Emory University, Atlanta, GA, United States; 6. Physics, University of Arizona, Tucson, AZ, United States; 7. Physics, Oakland University, Rochester, MI, United States; 8. Electrical and Computer Engineering, University of California, Riverside, Riverside, CA, United States; 9. Physics, Florida State Unversity, Tallahassee, FL, United States*

BOB-13. **Large-Scale Epitaxy of the van der Waals Room Temperature Ferromagnet Fe_5GeTe_2.** M. Ribeiro[1], G. Gentile[1], A. Marty[1], D. Dosenovic[2], H. Okuno[2], C. Vergnaud[1], J. Jacquot[3], D. Jalabert[2], D. Longo[4], P. Ohresser[4], A. Hallal[1], M. Chshiev[1,5], O. Boulle[1], *F. Bonell*[1] and M. Jamet[1] *1. University Grenoble Alpes, CNRS, CEA, IRIG-Spintec, Grenoble, France; 2. University Grenoble Alpes, CEA, IRIG-MEM, Grenoble, France; 3. University Grenoble Alpes, CEA, IRIG-SYMMES, Grenoble, France; 4. Synchrotron SOLEIL, L'Orme des Merisiers, Saint-Aubin, Gif-sur-Yvette, France; 5. Institut Universitaire de France (IUF), Paris, France*

BOB-14. **Efficient Control of 2D Magnetism.** *C. Gong*[1] *1. University of Maryland, College Park, College Park, MD, United States*

BOB-15. **Magneto-Raman Spectroscopy of Antiferromagntic $FePS_3$ and Ferromagnetic V-Doped WS_2.** *J.R. Simpson*[1,2], T.T. Mai[2], R. Valdes Aguilar[4], A.R. Hight Walker[2], M. Liu[3], D. Zhou[3] and M. Terrones[3] *1. Dept. of Physics, Astronomy, and Geosciences, Towson University, Towson, MD, United States; 2. Physical Measurement Laboratory, National Institute of Standards & Technology, Gaithersburg, MD, United States; 3. Dept. of Materials Science and Engineering, The Pennsylvania State University, University Park, PA, United States; 4. Physics, The Ohio State University, Columbus, OH, United States*

ORAL SESSION

Session BOC
MAGNETOELECTRONIC MATERIALS AND PHENOMENA: COMPLEX OXIDES

Jing Wang, Chair
The Institute of Physics, Chinese Academy of Sciences, Beijing, China

BOC-01. **Superconductivity at $LaAlO_3/KTaO_3$ interfaces.** ***(Invited)*** *Y. Xie*[1] *1. Physics, Zhejiang University, Hangzhou, China*

BOC-02. **Anomalous Nernst effect in perovskite $La_{0.5}Ca_{0.5}CoO_3$.** *A. Ghosh*[1], M. Manikandan[1] and R. Mahendiran[1] *1. Physics, National University of Singapore, Singapore*

BOC-03. **Post synthesis control of Berry phase driven magnetotransport in $SrRuO_3$ films.** *E. Skoropata*[1,2], A. Mazza[1], A. Herklotz[1,3], J. Ok[1], G. Eres[1], M. Brahlek[1], T. Charlton[1], H. Lee[1] and T.Z. Ward[1] *1. Oak Ridge National Laboratory, Oak Ridge, TN, United States; 2. Paul Scherrer Institut, Villigen, Switzerland; 3. Martin-Luther-University Halle-Wittenberg, Halle, Germany*

BOC-04. **Oxygen ion migration regulates magnetism in $La_{0.5}Sr_{0.5}CoO_3$ film.** *Z. Yin*[1,2], C. Zhang[1,2], H. Zhou[1,2], Z. Yu[1,2], Y. Wang[1,2], Y. Gao[1,2], J. Wang[1,2], F. Hu[1,2], S. Jirong[1,2] and B. Shen[1,2] *1. Beijing National Laboratory for Condensed Matter Physics & State Key Laboratory of Magnetism, Institute of Physics, Chinese Academy of Sciences, Beijing, China; 2. School of Physical Sciences, University of Chinese Academy of Sciences, Beijing, China*

BOC-05. **Tunnel magnetoresistance effect of $NiCo_2O_4$/MgO/Fe magnetic tunnel junctions.** *T. Nagahama*[1], Y. Hara[2], A. Ysujie[2] and T. Shimada[1] *1. Graduate School of Engineering, Hokkaido University, Sapporo, Japan; 2. CSE, Hokkaido University, Sapporo, Japan*

BOC-06. **Hysteresis Across the Voltage-Driven Perovskite-Brownmillerite Topotactic Phase Transformation in Epitaxial $La_{0.5}Sr_{0.5}CoO_{3-\delta}$.** *W.M. Postiglione*[1], V. Chaturvedi[1], R. Chakraborty[1], B. Yu[2], W. Tabis[2,3], S. Hameed[2], N. Biniskos[2], A. Jacobson[1], Z. Zhang[4], H. Zhou[4], M. Greven[2], V.E. Ferry[1] and C. Leighton[1] *1. Chemical Engineering & Materials Science, University of Minnesota, Minneapolis, MN, United States; 2. Physics and Astronomy, University of Minnesota, Minneapolis, MN, United States; 3. Faculty of Physics and Applied Computer Science, AGH University of Science and Technology, Krakow, Poland; 4. Advanced Photon Source, Argonne National Laboratory, Lemont, IL, United States*

BOC-07. **Incommensurate Magnetic Phases of the Multiferroic Compound $MnCr_2O_4$ Described with the Superspace Formalism.** *M. Pardo-Sainz*[1,2], A. Toshima[3], G. André[4], J. Basbus[5], G. Cuello[6], T. Honda[7], T. Otomo[7], K. Inoue[3], Y. Kousaka[2] and J. Campo[1] *1. Instituto de Nanociencia y Materiales de Aragón (INMA), CSIC, Zaragoza, Spain; 2. Osaka Prefecture University, Osaka, Japan; 3. Chirality Research Center and Institute for Advanced Materials Research, Hiroshima University, Hiroshima, Japan; 4. Laboratoire Léon Brillouin (LLB), Saclay, France; 5. Centro Atómico Bariloche, INN - CNEA - CONICET, S. C. de Bariloche, Argentina; 6. Institut Laue-Langevin (ILL), Grenoble, France; 7. Institute of Materials Structure Science, High Energy Accelerator Research Organization (KEK), Tsukuba, Japan*

BOC-08. **Dynamic Electric-Field-Induced Magnetic Effects in Cobalt Oxide Thin Films: towards Magneto-Ionic Synapses.** *S. Martins*[1], J. de Rojas[1], Z. Tan[1], M. Cialone[2], A. Lopeandia[1,3], J.H. Martín[4], J. Costa-Kramer[5], E. Menéndez[1] and J. Sort[1,6] *1. Physics Department, Autonomous University of Barcelona, Cerdanyola del Vallès, Spain; 2. CNR-SPIN Genova, Genova, Italy; 3. Catalan Institute of Nanoscience and Nanotechnology (ICN2), Barcelona, Spain; 4. ALBA Synchrotron Light Source, Cerdanyola del Vallès, Spain; 5. IMN-Instituto de Micro y Nanotecnología (CNM-CSIC), Tres Cantos, Spain; 6. Institució Catalana de Recerca i Estudis Avançats (ICREA), Barcelona, Spain*

BOC-09. **Magnetic and transport properties of $SrRuO_3$/$La_{0.85}Ca_{0.15}MnO_3$ epitaxial bilayer thin films.** D. Kumar[1], A.A. Tulapurkar[2] and *C.V. Tomy*[1] *1. Physics, Indian Institute of Technology Bombay, Mumbai, India; 2. Electrical Engineering, Indian Institute of Technology Bombay, Mumbai, India*

BOC-10. **A DFT+*U* study of point defects in spinel ferrites.** *K. Sharma*[1,2], D. Li[1,2], L. Calmels[1,2] and R. Arras[1,2] *1. CEMES-CNRS, Toulouse, France; 2. University of Toulouse, Toulouse, France*

BOC-11. **Defect mechanism for ferroelectricity in orthoferrites.** *S. Ning*[1,2], A. Kumar[1], K. Klyukin[1], J. LeBeau[1], B. Yildiz[1,3] and C. Ross[1] *1. Department of Materials Science and Engineering, MIT, Cambridge, MA, United States; 2. School of Materials Science and Engineering, Nankai University, Tianjin, China; 3. Department of Nuclear Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States*

BOC-12. **Magnetic Characterization of Ru-doped $BaSnO_3$ Thin Films.** *E.R. Lindgren*[1,2] and Y. Suzuki[2,3] *1. Materials Science & Engineering, Stanford University, Stanford, CA, United States; 2. Geballe Laboratory for Advanced Materials, Stanford University, Stanford, CA, United States; 3. Applied Physics, Stanford University, Stanford, CA, United States*

BOC-13. **Withdrawn**

BOC-14. **Universal magnetic domain wall creep driven by magnetoelectric effect.** *J. Shen*[1], K. Toyoki[1], Y. Kotani[2], T. Tada[1], R. Nakatani[1,3] and Y. Shiratsuchi[1,3] *1. Department of Materials Science and Engineering, Graduate School of Engineering, Osaka University, Osaka, Japan; 2. JASRI/ SPring-8, Hyogo, Japan; 3. Center of Spintronics Research Network, Graduate School of Engineering Science, Osaka University, Osaka, Japan*

BOC-15. **First Principles Calculation of Oxygen Vacancy Effects on the Magnetic Properties of the Perovskite $SrNiO_3$.** *E. Cho*[1], K. Klyukin[1], S. Ning[1,2], J. Li[3], R. Comin[3], R. Green[5,6], B. Yildiz[4] and C. Ross[1] *1. Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States; 2. School of Materials Science and Engineering, Nankai University, Tianjin, China; 3. Department of Physics, Massachusetts Institute of Technology, Cambridge, MA, United States; 4. Department of Nuclear Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States; 5. Department of Physics and Engineering Physics, University of Saskatchewan, Saskatoon, SK, Canada; 6. Stewart Blusson Quantum Matter Institute, University of British Columbia, Vancouver, BC, Canada*

ORAL SESSION

Session BOD
MAGNETOELECTRONIC MATERIALS AND PHENOMENA: MAGNETIC SEMICONDUCTORS AND MULTIFERROICS

Karin Leistner, Chair
IFW Dresden, Dresden, Germany

BOD-01. **Converse magnetoelectric effect in Co_2MnSi/ $Pb(Mg_{1/3}Nb_{2/3})O_3$-$PbTiO_3$ interfacial multiferroic heterostructures.** *T. Usami*[1], S. Fujii[2], S. Yamada[1,2], Y. Shiratsuchi[3,1], R. Nakatani[3,1] and K. Hamaya[1,2] *1. Center for Spintronics Research Network, Osaka University, Toyonaka, Japan; 2. Graduate School of Engineering Science, Osaka University, Toyonaka, Japan; 3. Graduate School of Engineering, Osaka University, Suita, Japan*

BOD-02. **Magnetic Constitution of PbTe:Cr - Experimental Aspects.** *K. Gas*[1], A. Królicka[1], S. Kret[1], K. Dybko[1,2], T. Story[1,2] and M. Sawicki[1] *1. Institute of Physics, Polish Academy of Sciences, Warsaw, Poland; 2. International Research Centre MagTop, Institute of Physics, Polish Academy of Sciences, Warsaw, Poland*

BOD-03. **Multiferroic Behavior in $NH_4Al(SO_4)_2$-12H_2O: Magnetism and Ferroelectricity Based on Proton Orbital Degeneracies.** *L. Meng*[1], C. Peng[1], C. He[1] and F. Yen[1] *1. Harbin Institute of Technology, Shenzhen, Shenzhen, China*

BOD-04. **Voltage control of thin films with in-plane and perpendicular exchange bias.** *J. Zehner*[1,3], R. Huhnstock[2], D. Wolf[3], M. Hasan[4], M. Huang[4], D. Bono[4], K. Nielsch[3], A. Ehresmann[2], G.S. Beach[4] and K. Leistner[1] *1. Faculty of Natural Sciences, Chemnitz University of Technology, Chemnitz, Germany; 2. Institute of Physics, Kassel University, Kassel, Germany; 3. Leibniz Institute for Solid State and Materials Research, Dresden, Germany; 4. Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States*

BOD-05. **Noncollinear antiferromagnetic textures in confined geometries.** *O. Pylypovskyi*[1,2], N. Hedrich[3], K. Wagner[3], A.V. Tomilo[4], B.J. Shields[3], T. Kosub[1], D.D. Sheka[4], J. Fassbender[1], P. Maletinsky[3] and D. Makarov[1] *1. Helmholtz-Zentrum Dresden-Rossendorf e.V., Dresden, Germany; 2. Kyiv Academic University, Kyiv, Ukraine; 3. Universitat Basel, Basel, Switzerland; 4. Taras Shevchenko National University of Kyiv, Kyiv, Ukraine*

BOD-06. **Acoustically Actuated Antennas Induced by Magnon-Phonon Coupling.** *Y. Ji*[1] and T. Nan[1] *1. School of Integrated Circuits, Tsinghua University, Beijing, China*

BOD-07. **Proton switching molecular magnetoelectricity.** *Y. Hu*[1]* and S. Ren[1] *1. The State University of New York, Buffalo, Buffalo, NY, United States*

BOD-08. **Effect of Exchange Coupled Magnetic Structures on Magnetization Switching of Strain-Mediated Magnetoelectric Heterostructures.** *P. Pathak*[1] and D. Mallick[1] *1. Electrical Engineering, Indian Institute of Technology Delhi, New Delhi, India*

BOD-09. **Voltage Controlled Superparamagnetic Ensembles for Low Power Reservoir Computing.** *A. Welbourne*[1], A.L. Levy[2], M.O. Ellis[1], H. Chen[1], M.J. Thompson[1], E. Vasilaki[1], D. Allwood[1] and T. Hayward[1] *1. University of Sheffield, Sheffield, United Kingdom; 2. École Polytechnique, Paris, France*

BOD-10. **Laser-Controlled Real and Reciprocal Space Topology in Multiferroic Insulators.** T. Hirosawa[1], J. Klinovaja[1], D. Loss[1] and *S.A. Diaz*[2] *1. University of Basel, Basel, Switzerland; 2. University of Duisburg-Essen, Duisburg, Germany*

BOD-11. **Lattice dynamics and trimeron order of the Verwey transition in magnetite - theory vs. experiment.** *D. Legut*[1] and P. Piekarz[2] *1. IT4Innovations, VSB Technical University of Ostrava, Ostrava, Czechia; 2. Institute of Nuclear Physics, Polish Academy of Sciences, Cracow, Poland*

BOD-12. **Ferromagnetic $Cd_{(1-x)}Cu_xCr_2S_4$ thin films: Synthesis, characterization and first-principles calculations.** *J. Abbasi*[1], S. Regmi[2] and A. Gupta[1] *1. Chemistry&Biochemistry, The University of Alabama, Tuscaloosa, AL, United States; 2. Physics and Astronomy, The University of Alabama, Tuscaloosa, AL, United States*

BOD-13. **Cross-linking and charging molecular magnetoelectronics.** *Y. Huang*[1], Y. Chen[2], Y. Hu[1], T. Mitchell[1], L. An[1], Z. Li[1], J. Benedict[1], H. Li[2] and S. Ren[1] *1. University at Buffalo, Buffalo, NY, United States; 2. Sun Yat-Sen University, Guangzhou, China*

POSTER SESSION

Session BPA
MAGNETOELECTRONIC MATERIALS AND PHENOMENA
(Poster Session)

Luis Moreno-Ramírez, Chair
Universidad de Sevilla, Seville, Spain

BPA-01. **Electronic band structure and magnetism of $CoFeV_{0.5}Mn_{0.5}Si$.** *G. Baker*[1], M. Flesche[1], A. Ramker[2], P. Shand[2], P. Lukashev[2] and P. Kharel[1] *1. Physics, South Dakota State University, Brookings, SD, United States; 2. Physics, University of Northern Iowa, Cedar Falls, IA, United States*

BPA-02. **Antiferromagnetic Phase in Sputtered Topological Insulator/Ferromagnetic Heterostructure Interface.** *N. Bhattacharjee*[1], A. Fedorko[1], V. Lauter[2], M. Matzelle[1], B. Singh[3], A.J. Grutter[4], A.R. Will-Cole[1], R. Markiewicz[1], A. Bansil[1], D. Heiman[1] and N.X. Sun[1] *1. Northeastern University, Boston, MA, United States; 2. Oak Ridge National Laboratory, Oak Ridge, TN, United States; 3. Tata Institute of Fundamental Research, Mumbai, India; 4. National Institute of Standards and Technology, Gaithersburg, MD, United States*

BPA-03. **Determining critical and Curie temperature of Heusler superconducting ferromagnets *Ni_2NbSnZ* (*Z = Ga*, *Ge,* and *Sb*).** *S. Nalevanko*[1,2], L. Galdun[2,3], M. Varga[2], A. Dzubinska[2], M. Reiffers[4], J. Kacmarcik[5] and R. Varga[2,3] *1. Institute of Physics, Univerzita Pavla Jozefa Safarika v Kosiciach, Kosice, Slovakia; 2. CPM - TIP, Univerzita Pavla Jozefa Safarika v Kosiciach, Kosice, Slovakia; 3. RVmagnetics, a. s., Kosice, Slovakia; 4. Fac. Hum. and Nat. Sci., Presovska Univerzita v Presove, Presov, Slovakia; 5. Centre of Low Temperature Physics, Ustav experimentalnej fyziky Slovenskej akademie vied, Kosice, Slovakia*

BPA-04. **Growth of ferromagnetic Kagome metal Fe_3Sn_2 using Pt buffer layer.** *K. Khan*[1], H. Bangar[1], R.S. Yadav[1] and P.K. Muduli[1] *1. Physics, Indian Institute of Technology Delhi, New Delhi, India*

BPA-05. **Spin-gapless semiconducting behavior and sublattice spin cross-over in magnetically compensated half-Heusler compound $(Co_{0.5}Mn_{0.5})MnAl$.** *R. Harikrishnan*[1] and N. Harish Kumar[1] *1. Advanced Magnetic Materials Laboratory, Department of Physics, Indian Institute of Technology, Madras, Chennai, India*

BPA-06. **Enhancement of Anomalous Hall Effect in Magnetic Weyl Semimetal Co_2TiSi Heusler Alloy Thin Films with V doping.** *M. Liu*[1], M. Oogane[1,2], M. Tsunoda[1,3] and Y. Ando[1,2] *1. Tohoku University, Sendai, Japan; 2. Center for Science and Innovation in Spintronics (Core Research Cluster) Organization for Advanced Studies, Sendai, Japan; 3. Center for Spintronics Research Network, Sendai, Japan*

BPA-07. **Quantum Phase Transition in Partially Cu-Doped $ZrNi_{2-x}Cu_xGa$ Heusler Alloys.** *K.M. Stillwell*[1], M. Khan[1], S. Bhatt[1] and A. Pathak[2] *1. Physics, Miami University, Oxford, OH, United States; 2. Physics, SUNY Buffalo State College, Buffalo, NY, United States*

BPA-08. **A comparative study of the martensitic phase transitions in Fe doped $Ni_2Mn_{0.4-x}Fe_xCr_{0.6}Ga$ and $Ni_2Mn_{0.4}Fe_xCr_{0.6-x}Ga$ Heusler alloy systems.** *A. Schaeffer*[1], C. Kerr[1], A. Pathak[2] and M. Khan[1] *1. Physics, Miami University, Oxford, OH, United States; 2. Physics, SUNY Buffalo State College, Buffalo, NY, United States*

BPA-09. **Observation of Topological Superconductivity and SdH Oscillation in $Y_{0.5}Er_{0.5}PdBi$ Thin Film.** *S. Srivastava*[1], V. Bhardwaj[1] and R. Chatterjee[1] *1. Physics, Indian Institute of Technology, Delhi, New Delhi, India*

POSTER SESSION

Session BPB
MAGNETOELECTRONIC MATERIALS AND MULTIFERROIC PHENOMENA
(Poster Session)

Xiufeng Han, Co-Chair
Institute of Physics, Chinese Academy of Sciences, Beijing, China
Lambert Alff, Co-Chair
TU Darmstadt, Darmstadt, Germany

BPB-01. **Magnetostriction in microwave synthesized $La_{0.5}Ba_{0.5}CoO_3$.** M. Manikandan[1], *A. Ghosh*[1] and R. Mahendiran[1] *1. Physics, National University of Singapore, Singapore*

BPB-02. **Enhanced performance of magnetoelectric laminated composites by geometry engineering for high frequency applications.** *A. Lasheras*[1], P. G. Saiz[2], J. Porro[2,3], I. Quintana[4], C. Polak[5] and A. Lopes[6,3] *1. University of the Basque Country, Leioa, Spain; 2. BCMaterials, Basque Center for Materials, Applications and Nanostructures, Leioa, Spain; 3. KERBASQUE, Basque Foundation for Science, Bilbao, Spain; 4. Tekniker, Basque Research and Technology Alliance (BRTA), Eibar, Spain; 5. Vacuumschmelze GmbH & Co. KG, Hanau, Germany; 6. Centre for Cooperative Research on Alternative Energies (CIC energiGUNE), Basque Research and Technology Alliance (BRTA), Vitoria-Gasteiz, Spain*

BPB-03. **Investigation of Room Temperature Multiferroicity in Chemical Vapor Deposited Aurivillius Phase Thin Films for Next Generation Data Storage Technologies.** *L. Colfer*[1], M. Bansal[2], B. Shaw[3], J. Halpin[1], T.S. Maity[2] and L. Keeney[1] *1. Tyndall National Institute, Cork, Ireland; 2. Indian Institute of Science Education and Research, Thiruvananthapuram, Trivandrum, India; 3. University of Cambridge, Cambridge, United Kingdom*

BPB-04. **Structural, dielectric and electrocaloric properties of $Ba(Ti,Zr)O_3$-$(La,Sr)MnO_3$ composite multiferroic.** *A. Gaur*[1] and S. Srinath[1] *1. School of Physics, University of Hyderabad, Hyderabad, India*

BPB-05. **Detection of antiferromagnetic order parameter based on Hall measurements for Pt/Cr_2O_3/Pt trilayer.** *X. Wang*[1], K. Toyoki[1], R. Nakatani[1,2] and Y. Shiratsuchi[1,2] *1. Department of Materials Science and Engineering, Osaka University, Suita, Japan; 2. Center of Spintronics Research Network, Osaka University, Toyonaka, Japan*

BPB-06. **Anomalous Nernst effect in Fe-Si alloy films.** *Y. Hamada*[1], Y. Kurokawa[1], T. Yamauchi[1] and H. Yuasa[1] *1. Information Science and Electrical Engineering, Kyushu University, Fukuoka, Japan*

BPB-07. **Electromagnetic evaluation method for both air-gap distance of non-contact sensor and cementite content inside spheroidal graphite cast iron.** *K. Kawada*[1], M. Kuromizu[2], Y. Ono[2] and Y. Gotoh[1] *1. Innovative Engineering, Oita University, Oita, Japan; 2. Graduate School of Engneering, Oita University, Oita, Japan*

BPB-08. **Giant Ferroelectric Modulation of Barrier Height and Width in Multiferroic Tunnel Junctions.** *L. Jiang*[1], Y. Wang[2], W. Chen[1] and X. Han[1] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China; 2. Central South University, Changsha, China*

BPB-09. **Mapping the Local Structure Around the Néel Temperature of $BiFeO_3$ by Measuring Hyperfine Interactions at Dilute Cd Impurity.** *A.A. Miranda-Filho*[4], T.S. Sales[4], W.L. Ferreira[4], G.A. Cabrera-Pasca[1], J. Schell[2,3] and A.W. Carbonari[4] *1. Programa de Pós-Graduação em Ciência e Engenharia de Materiais , PPGCEM, Universidade Federal do Pará, Ananindeua, Brazil; 2. European Organization for Nuclear Research CERN, Geneva, Switzerland; 3. Institute for Materials Science and Center for Nanointegration Duisburg-Essen (CENIDE), University of Duisburg-Essen, Essen, Germany; 4. Instituto de Pesquisas Energéticas e Nucleares, IPEN/CNEN, São Paulo, Brazil*

BPB-10. **Withdrawn**

BPB-11. **Nonlinear magnetoelectric effects excited by magnetic field pulses.** *D.V. Savelev*[1], D.V. Chashin[1], Y.K. Fetisov[1], D.A. Burdin[1], L.Y. Fetisov[1] and V.O. Belan[1] *1. MIREA - Russian Technological University, Moscow, Russian Federation*

BPB-12. **Low-temperature crystal and magnetic structure of the multiferroic material $Fe_4Ta_2O_9$.** *M. Sen*[1], S. Panja[1], L. Harnagea[1], A. Cervellino[2], V. Pomjakushin[3] and S. Nair[1] *1. Department of Physics, Indian Institute of Science Education and Research (IISER), Pune, India; 2. Materials Science, Paul Scherrer Institute, Forschungsstrasse, Switzerland; 3. Laboratory for Neutron Scattering and imaging, Paul Scherrer Institute, Villigen PSI, Switzerland*

BPB-13. **The effect of high pressure on the electrical and transport properties of the InSb-MnSb magnetic eutectic composition.** *A. Kochura*[3], R.G. Dzhamamedov[2], A.B. Davydov[1], T.R. Arslanov[2], V.V. Rodionov[3], M. Alam[4], A.P. Kuzmenko[3] and B.A. Aronzon[1] *1. P.N. Lebedev Physical Institute, Russian Academy of Sciences, Moscow, Russian Federation; 2. Daghestan Scientific Center, Amirkhanov Institute of Physics, Russian Academy of Sciences, Makhachkala, Russian Federation; 3. Regional Centre of Nanotechnology, South-West State University, Kursk, Russian Federation; 4. Bangamata Sheikh Fojilatunnesa Mujib Science and Technology University, Jamalpur, Bangladesh*

BPB-14. **Oxygen Defect Engineered Magnetism of La_2NiMnO_6 Thin Films.** *J.P. Palakkal*[1], T. Schneider[1] and L. Alff[1] *1. Institute of Materials Science, Technische Universität Darmstadt, Darmstadt, Germany*

BPB-15. **Synthesis, characterization and experimental investigation of hyperfine interactions in $HoMnO_3$.** *N.P. Lima*[1], A.P. Souza[1], A. Burimova[1] and A.W. Carbonari[1] *1. CERPQ, Nuclear and Energy Research Institute, São Paulo, Brazil*

Session COA
SOFT MAGNETIC MATERIALS I: AMORPHOUS AND NANOCRYSTALLINE

Ahmed Talaat, Chair
University of Pittsburgh, Pittsburgh, PA, United States

COA-01. **On the modelling of the anhysteretic magnetization of soft magnetic materials.** *J.M. Silveyra*[1] and J.M. Conde Garrido[1] *1. Laboratorio de Sólidos Amorfos, Instituto de Tecnologías y Ciencias de la Ingeniería (INTECIN), Universidad de Buenos Aires – CONICET, Buenos Aires, Argentina*

COA-02. **Fabrication of soft magnetic composite containing amorphous Fe-Co-B-Si magnetic flakes with good magnetic and mechanical properties.** *N. Sanada*[1], T. Suetsuna[1] and H. Kinouchi[1] *1. Functional Materials Laboratory, Nano Materials & Frontier Research Laboratories, Corporate Research & Development Center, Toshiba Corporation, Kawasaki, Japan*

COA-03. **Evaluation of three-dimensional electromagnetic properties of the soft magnetic composite containing amorphous Fe-Co-B-Si magnetic flakes with magnetic anisotropy.** *H. Kinouchi*[1], N. Sanada[1] and T. Suetsuna[1] *1. Toshiba Corporation, Kawasaki, Japan*

COA-04. **Scalable Synthesis of CoFe and NiFe Nanoparticles from Ferrite Precursors with Tailored Magneto-Thermal Properties by a Combined Co-precipitation, Milling and Reduction Process.** *D. Casaleiz*[1], M. Villanueva[1], A.J. Campos[1], J. Castillo[2], J. Camarero[1,3], E.M. Palmero[1], A. Espinosa[1,2], G. Salas[1] and A. Bollero[1] *1. IMDEA Nanociencia, Madrid, Spain; 2. Nanobiotecnología (IMDEA Nanociencia), Unidad Asociada al Centro Nacional de Biotecnología (CSIC), Madrid, Spain; 3. Dept. de Física de la Materia Condensada and Instituto Nicolás Cabrera, Universidad Autónoma de Madrid, Madrid, Spain*

COA-05. **Structural and magnetic characterization of Co-based soft magnetic amorphous nanocomposite films.** *P. Nakarmi*[1], D. Tweddle[2], A. Koenig[2], K. Cole-Piepke[2], A. Leary[3], R. Noebe[3], G. Thompson[2], C. Mewes[1] and T. Mewes[1] *1. Department of Physics and Astronomy, The University of Alabama, Tuscaloosa, AL, United States; 2. Metallurgical and Materials Engineering, The University of Alabama, Tuscaloosa, AL, United States; 3. NASA Glenn Research Center, Cleveland, OH, United States*

COA-06. **Graded magnetic anisotropy in Co-rich microwires.** *P. Corte-Leon*[1,2], V. Zhukova[1,2], J. Blanco[2], A. Irigaray[2], M. Ipatov[1,2] and A. Zhukov[1,2] *1. Advanced Polymers and Materials: Physics, Chemistry and Technology, University of the Basque Country, San Sebastián, Spain; 2. Applied Physics I, University of the Basque Country, San Sebastián, Spain*

COA-07. **Effects of magnetostriction on excess loss in nanocrystalline soft magnetic materials.** ***(Invited)***
H. Tsukahara[1,2], H. Imamura[2], C. Mitsumata[3], K. Suzuki[4] and K. Ono[5,1] *1. KEK, Tsukuba, Japan; 2. AIST, Tsukuba, Japan; 3. NIMS, Tsukuba, Japan; 4. Monash University, Melbourne, VIC, Australia; 5. Osaka University, Suita, Japan*

COA-08. **Epoxy Wetting of FeNi-based Metal Amorphous Nanocomposite.** *J. Egbu*[1], O. Burnett[2], K. Byerly[1], P. Ohodnicki[3] and M. McHenry[1] *1. Materials Science & Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Physics, Carnegie Mellon University, Pittsburgh, PA, United States; 3. Mechanical Engineering and Materials Science, University of Pittsburgh, Pittsburgh, PA, United States*

COA-09. **Influence of wet and dry milling conditions on the evolution of microstructure and T_C of Fe-Cr-Nb-B glassy powders.** M. Lostun[1], M. Grigoras[1], G. Stoian[1], G. Ababei[1], H. Chiriac[1] and *N. Lupu*[1] *1. Magnetic Materials and Devices Department, National Institute of Research and Development for Technical Physics, Iasi, Romania*

ORAL SESSION

Session COB
SOFT MAGNETIC MATERIALS II: AMORPHOUS AND NANOCRYSTALLINE

Ivan Skorvanek, Chair
Institute of Experimental Physics SAS, Košice, Slovakia

COB-01. **Stress-engineering of Structural and Magnetic Properties in Fe-Si-B Amorphous Microwires and Ribbons.**
X. Zhang[1], E. Rinko[2,3], A. Valeriano Inchausti[4], I. Anderson[2,3], M. Vázquez[4] and L. Lewis[1,5] *1. Mechanical and Industrial Engineering, Northeastern University, Boston, MA, United States; 2. Materials Science and Engineering, Iowa State University, Ames, IA, United States; 3. Ames Laboratory, Ames, IA, United States; 4. Instituto de Ciencia de Materiales de Madrid, CSIC, Madrid, Spain; 5. Chemical Engineering, Northeastern University, Boston, MA, United States*

COB-02. **Development of Novel Fe Based Nanocrystalline FeBNbPSi Alloy Powder with High B_s of 1.41T.**
H. Matsumoto[1], *Y. Kajiura*[1], M. Hosono[1], A. Hasegawa[1], H. Kumaoka[1], K. Yoshidome[1] and S. Mori[1] *1. Material Research Center, TDK Corporation, Narita, Japan*

COB-03. **Effect of Joule Heating on GMI and Magnetic Properties of Fe-rich Glass-Coated Microwires.** A. Gonzalez Villegas[1,2], V. Zhukova[1,2], M. Ipatov[1,2], P. Corte-Leon[1,2], *A. Zhukov*[1,2] and J. Blanco[2] *1. Advanced Polymers and Materials: Physics, Chemistry and Technology, Universidad del País Vasco, San Sebastian, Spain; 2. Dpto. de Fisica Aplicada, EIG, Universidad del País Vasco, San Sebastian, Spain*

COB-04. **Revealing defect-induced spin disorder in nanocrystalline.** *M. Bersweiler*[1], E. Pratami Sinaga[1], I. Peral[1], N. Adachi[2], P. Bender[3], N. Steinke[4], E. Gilbert[5], Y. Todaka[2], Y. Oba[6] and A. Michels[1] *1. Department of Physics and Materials Science, University of Luxembourg, Luxembourg, Luxembourg; 2. Department of Mechanical Engineering, Toyohashi University of Technology, Toyohashi, Japan; 3. Heinz Maier-Leibnitz Zentrum, Technische Universität München, Garching, Germany; 4. Institut Laue-Langevin, Grenoble, France; 5. Australian Centre for Neutron Scattering, Technology Australian Nuclear Science and Organization, Kirrawee DC, NSW, Australia; 6. Materials Sciences Research Center, Japan Atomic Energy Agency, Tokai, Japan*

COB-05. **Magnetostructural Phase Transition in $Fe_{60}V_{40}$ Alloy Thin Films.** *M.S. Anwar*[1,8], H. Cansever[1], B. Böhm[2], R. Gallardo[3], R. Hübner[4], U. kentsch[4], S. Zhou[5], B. Eggert[6], H. Wende[6], K. Potzger[1], J. Fassbender[7], K. Lenz[1], J. Lindner[1], O. Hellwig[1,2] and R. Bali[1] *1. Magnetism, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 2. Physics, Technische Universität Chemnitz, Chemnitz, Germany; 3. Physics, Universidad Técnica Federico Santa María, Santa Maria, Chile; 4. Ion Beam Center, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 5. Semiconductor Materials, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 6. Faculty of Physics and Center for Nanointegration Duisburg-Essen (CENIDE), Universität Duisburg-Essen, Duisburg, Germany; 7. Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 8. Physics, Technische Universität Dresden, Dresden, Germany*

COB-06. **Domain wall propagation in Fe-rich magnetic microwires with graded magnetic anisotropy.** *P. Corte-Leon*[1,3], V. Zhukova[1,3], J. Blanco[3], M. Ipatov[1,3] and A. Zhukov[1,2] *1. Dept. Advanced Polymers and Materials: Physics, Chemistry and Technology, Faculty of Chemistry, University of Basque Country, San Sebastian, Spain; 2. Ikerbasque, Bilbao, Spain; 3. Department Applied Physics, University of Basque Country, San Sebastian, Spain*

COB-07. **Development of an (Fe, Sn)-based Nanocrystalline Soft Magnetic Alloy.** *P. Wang*[1] and M. Willard[1] *1. Materials Science and Engineering, Case Western Reserve University, Cleveland, OH, United States*

COB-08. **Nanocrystalline soft magnetic materials produced by Continuous Ultra-Rapid Annealing (CURA).** *R. Parsons*[1] and K. Suzuki[1] *1. Materials Science and Engineering, Monash University, Clayton, VIC, Australia*

COB-09. **Laser Patterning Assisted Devitrification and Induced Anisotropies in Soft Magnetic Nanocrystalline Alloys.** *A. Talaat*[1], A. Leary[2], D. Greve[3,4], Y. Liu[1], J. Wiezorek[1] and P. Ohodnicki[1,5] *1. Mechanical Engineering & Materials Science, University of Pittsburgh, Pittsburgh, PA, United States; 2. NASA Glenn Research Center, Cleveland, OH, United States; 3. DWGreve Consulting, Sedona, AZ, United States; 4. Electrical & Computer Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 5. Electrical & Computer Engineering, University of Pittsburgh, Pittsburgh, PA, United States*

Session COC
SOFT MAGNETIC MATERIALS III: FERRITES

Paul Ohodnicki, Chair
University of Pittsburgh, Pittsburgh, PA, United States

COC-01. **Growth-Induced Perpendicular Magnetic Anisotropy in Thin Film Rare Earth Iron Garnets.** *A. Kaczmarek*[1], E.R. Rosenberg[1], S. Ngo[1], G.S. Beach[1] and C. Ross[1] *1. Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States*

COC-02. **Gadolinium and Thulium Iron Garnet Thin Films with Perpendicular Magnetic Anisotropy.** *C. Holzmann*[1], O. Ciubotariu[1] and M. Albrecht[1] *1. Institute of Physics, University of Augsburg, Augsburg, Germany*

COC-03. **Magnetic Coupling in Ferrimagnetic Bilayers.** S. Becker[1], Z. Ren[1,2], *F. Fuhrmann*[1], A. Ross[1,3], S. Lord[1,2], S. Ding[1,2], R. Wu[1,4], J. Yang[5], J. Miao[6], M. Kläui[1,2] and G. Jakob[1,2] *1. Institute of Physics, Johannes Gutenberg-University Mainz, Mainz, Germany; 2. Graduate School of Excellence "Materials Science in Mainz" (MAINZ), Mainz, Germany; 3. Unité Mixte de Physique CNRS, Thales, Université Paris-Saclay, Palaiseau, France; 4. Center for Quantum Spintronics, Norwegian University of Science and Technology, Trondheim, Norway; 5. State Key Laboratory for Mesoscopic Physics, Peking University, Beijing, China; 6. School of Materials and Engineering, University of Science and Technology, Beijing, China*

COC-04. **Role of Magnetic Inhomogeneities and Interdiffusion in Compensated Gadolinium Iron Garnet Thin Films.** *K. Srinivasan*[1], P. Quarterman[2], T. Gage[3], C.J. Kinane[4], A.J. Caruana[4], J.G. Barriocanal[5] and B. Stadler[1] *1. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States; 2. NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, United States; 3. Center for Nanoscale Materials, Argonne National Laboratory, Lemont, IL, United States; 4. ISIS-Neutron and Muon Source, STFC Rutherford Appleton Laboratory, Didcot, United Kingdom; 5. Characterization Facility, College of Science and Engineering, University of Minnesota, Minneapolis, MN, United States*

COC-05. **Spin and Orbital Moments in Strained $NiFe_2O_4$ Thin Films.** S. Saha[1], R. Knut[1], F. Sorgenfrei[1], C. Luo[2], Y. Kvashnin[1], P. Thunström[1], J. Jönsson[1], F. Radu[2], A. Gupta[3], O. Eriksson[1], O. Karis[1] and *D. Arena*[4] *1. Uppsala University, Uppsala, Sweden; 2. Helmholtz-Zentrum Berlin fur Materialien und Energie, Berlin, Germany; 3. University of Alabama, Tuscaloosa, AL, United States; 4. University of South Florida, Tampa, FL, United States*

COC-06. **Low Damping Bismuth Substituted Iron Garnet Thin Films for Spintronics.** *T. Fakhrul*[1], B. Khurana[1], H. Nembach[2], J.M. Shaw[2], Y. Fan[3], S. Huang[1], B. Lee[1], G.A. Riley[2], Z. Chen[4], D. A. Muller[4], G.S. Beach[1], L. Liu[3] and C. Ross[1] *1. Materials Science and Engineering, MIT, Cambridge, MA, United States; 2. NIST, BOULDER, CO, United States; 3. EECS, MIT, Cambridge, MA, United States; 4. Cornell, Ithaca, NY, United States*

COC-07. **Designing Magnetic Metal Oxide Colloidal Nanoparticles for Spatially Resolved Thermometry.** A.J. Biacchi[1], F. Abel[1], T.Q. Bui[1], E.L. Correa[1], C. Dennis[1], S. Woods[1] and *A.R. Hight Walker*[1] *1. National Institute of Standards and Technology (NIST), Gaithersburg, MD, United States*

COC-08. **Withdrawn**

COC-09. **Magnetic characterization of self-assembled nanostructures in cobalt ferrites using first order reversal curves.** *S.V. Mullurkara*[1], A. Talaat[1], B.C. Dodrill[2] and P. Ohodnicki[1,3] *1. Mechanical Engineering and Material Science, University of Pittsburgh, Pittsburgh, PA, United States; 2. Lake Shore Cryotronics, Westerville, OH, United States; 3. Electrical Engineering and Computer Science, University of Pittsburgh, Pittsburgh, PA, United States*

COC-10. **Effect of Particle Size and Insulation Coating Technique on the Core Loss, Relative Magnetic Permeability, and Saturation Magnetization of Insulated Powder Cores.** *W. Burgess*[1,2], J. Devkota[1,2] and B. Howard[1] *1. National Energy Technology Laboratory, Pittsburgh, PA, United States; 2. NETL Support Contractor, Pittsburgh, PA, United States*

COC-11. **Enhancement of electromagnetic wave absorption in ferrite hetero-hollow spheres.** *D. Mandal*[1] and K. Mandal[1] *1. Dept. Condensed Matter Physics and Material Sciences, SN Bose National Centre for Basic Sciences, Burdwan, India*

COC-12. **Surface spin mediated negative remanent magnetisation in ultra-fine nickel ferrite nanoparticles at low temperature.** R.R. Kahmei[1], *S. Arackal*[1], S. Shivashankar[1], N. Bhat[1] and R. Sai[1] *1. Center for Nanoscience and Engineering, Indian Institute of Science, Bangalore, India*

COC-13. **Evidence for Temperature Independent Ferromagnetic Resonance Frequency in Bismuth Substituted Iron Garnets.** *D. Gouéré*[1], H. Merbouche[1], C. Carrétéro[1], J. Ben Youssef[2], R. Lebrun[1], P. Bortolotti[1], V. Cros[1] and A. Anane[1] *1. Unité Mixte de Physique CNRS, Thales, Université Paris-Saclay, Palaiseau, France; 2. LabSTICC, Université de Bretagne Occidentale, Brest, France*

Session COD
SOFT MAGNETIC MATERIALS IV: BULK CRYSTALLINE

Natan Aronhime, Chair
Carpenter Technology Corporation, Reading, PA, United States

COD-01. **Magnetization Reversal Behavior in Electrodeposited FeCoNi Thin Films.** *K. Dev*[1], R. Kaur[1], G. Vashisht[1] and S. Annapoorni[1] *1. Department of Physics and Astrophysics, University of Delhi, Delhi, India*

COD-02. **Modelling of magnetic anisotropy in electrical steel sheet by means of cumulative distribution functions of Gaussians.** *G.C. Tolentino*[1], J.V. Leite[2], M. Rossi[1], O. Ninet[1], G. Parent[1] and J. Blaszkowski[3] *1. Université Artois, Laboratoire Systèmes Electrotechniques et Environnement (LSEE), Béthune, France; 2. Universidade Federal de Santa Catarina, GRUCAD, Santa Catarina, Florianòpolis, Brazil; 3. Thyssenkrupp Electrical Steel, Isbergues, France*

COD-03. **Loss Parameter Identification after Cutting for different non-oriented Electrical Steel Grades.** *N. Leuning*[1], B. Schauerte[1], S. Schweren[1] and K. Hameyer[1] *1. Institute of Electrical Machines (IEM), RWTH Aachen University, Aachen, Germany*

COD-04. **Investigation and development of a power loss separation model in Grain-Oriented Electrical Steels combining 1-D alternating and rotational behaviors.** *P. Dupont*[1,2], T. Etifier[3,2], O. Maloberti[3,2], M. Ployard[1], D. Laloy[1] and J. Fortin[3,2] *1. Jeumont Electric, Jeumont, France; 2. Laboratoire des Technologies Innovantes (LTI), Amiens, France; 3. UniLaSalle Campus d'Amiens, Amiens, France*

COD-05. **Manufacturing and Characterization of Soft Magnetic Composite Filaments for Additive Manufacturing.** *Á. Díaz-García*[1], J. Law[1], M. Félix[2], A. Guerrero[2] and V. Franco[1] *1. Condensed Matter Physics, University of Seville, Seville, Spain; 2. Chemical Engineering, University of Seville, Seville, Spain*

COD-06. **Enhancement of magnetostriction in Fe-Co alloy single-crystal film by group-13 element addition.** *Y. Nakamura*[1], M. Ohtake[1], T. Kawai[1], M. Futamoto[1], F. Kirino[2] and N. Inaba[3] *1. Faculty of Engineering, Yokohama National University, Yokohama, Japan; 2. Graduate School of Fine Arts, Tokyo University of the Arts, Tokyo, Japan; 3. Graduate School of Science and Engineering, Yamagata University, Yonezawa, Japan*

COD-07. **High throughput methods to uncover new soft magnetic compositions in the CoFeNiMn-A (A= Al, Si, Cu, V or Ti) high entropy alloy system.** *R. Rowan-Robinson*[1], Z. Leong[1] and N. Morley[1] *1. Department of Material Science and Engineering, University of Sheffield, Sheffield, United Kingdom*

COD-08. **Experimental identification and physical interpretations of 2D tensor magnetic properties of a grain-oriented electrical steel magnetized between the rolling and the transverse directions.** T. Etifier[2,1], P. Dupont[3,1], *O. Maloberti*[2,1], E. Salloum[2], P. Dassonvalle[2,1], S. Panier[4,1] and J. Fortin[2,1] *1. LTI, Amiens, France; 2. UniLaSalle, Amiens, France; 3. Jeumont Electric, Jeumont, France; 4. Université Picardie Jules Vernes, Amiens, France*

COD-09. **Large Magnetostriction in γ′-Fe_4N Single-Crystal Thin Film.** *Y. Maeda*[1], K. Imamura[1], M. Ohtake[1], T. Kawai[1], M. Futamoto[1], F. Kirino[2] and N. Inaba[3] *1. Faculty of Engineering, Yokohama National University, Yokohama, Japan; 2. Graduate School of Fine Arts, Tokyo University of the Arts, Tokyo, Japan; 3. Graduate School of Science and Engineering, Yamagata University, Yonezawa, Japan*

COD-10. **Impact of Ultra-Short Pulsed Laser (USPL) Ablation Process on Separated Loss Coefficients of Grain Oriented Electrical Steels (GOES).** M. Nesser[1], *O. Maloberti*[2], E. Salloum[2], J. Dupuy[3], M. Lamblin[3], S. Panier[1], P. Dassonvalle[2], J. Fortin[2], C. Pineau[4] and J. Birat[4] *1. Laboratoire des technologies Innovantes, Amiens, France; 2. ESIEE-Amiens UniLaSalle, Amiens, France; 3. Multitel, Mons, Belgium; 4. IRT M2P, Metz, France*

COD-11. **Additively manufactured Fe-3Si stator for high performance electrical motor.** *T. Lamichhane*[1], C. Chinnasamy[2], B. Andrew[1], J. Yan[3], Z. Gai[4] and M. Paranthaman[1] *1. Chemical Sciences Division, Oak Ridge National Lab, Oak Ridge, TN, United States; 2. Carpenter Technology, Philadelphia, PA, United States; 3. Materials Science and Engineering, Oak Ridge National Lab, Oak Ridge, TN, United States; 4. CNMS, Oak Ridge National Lab, Oak Ridge, TN, United States*

COD-12. **Mixed magnetic phases in $FeCoCrNiAl_x$ high entropy alloys.** *C.S. Jorgensen*[1], L. Santodonato[1], N. Tang[1], N.C. Liyanage[2], L.J. Quigley[1], P. Liaw[1], D.A. Gilbert[1] and L. Debeer-Schmitt[3] *1. Material Science and Engineering, University of Tennessee, Knoxville, TN, United States; 2. Physics, University of Tennessee, Knoxville, TN, United States; 3. Neutron Scattering Division, Oak Ridge National Laboratory, Oak Ridge, TN, United States*

POSTER SESSION

Session CPA
SOFT MAGNETIC MATERIALS V: FERRITES AND BULK CRYSTALLINE (Poster Session)

Arcady Zhukov, Co-Chair
University of Basque Country and Ikerbasque, San Sebastian, Spain
Samuel Kernion, Co-Chair
CorePower Magnetics, Pittsburgh, PA, United States

CPA-01. **Investigation of Mg doped Y-type Barium hexaferrite using Mössbauer spectroscopy.** *J. Baik*[1] and C. Kim[1] *1. Department of Physics, Kookmin University, Seoul, The Republic of Korea*

CPA-02. **Fe-site Dopant Tailored Microwave Magnetodielectric Effect in $Y_3Fe_{5-x}Si_xO_{12}$ Garnet.** *F. Chen*[1], S. Zhang[1], H. Luo[1] and Y. Cheng[1] *1. Wuhan University of Science and Technology, Wuhan, China*

CPA-03. **Magnetic and electrical properties of epitaxial magnetite (Fe_3O_4) across the Verwey Transition.** *S. Regmi*[1], R. Mahat[1], A. Rai[1], T. Mewes[1] and A. Gupta[2] *1. Department of Physics & Astronomy, The University of Alabama, Tuscaloosa, AL, United States; 2. Department of Chemistry & Biochemistry, The University of Alabama, Tuscaloosa, AL, United States*

CPA-04. **Finite size effect on Structural, optical, elastic and spin resonance properties of oleic acid coated $Zn_xFe_{3-x}O_4$ ($0.4 \leq x \leq 0$) ferrite nanofluids.** *P. Kumar*[1,3], S. Pathak[2], K. Jain[1], K. Deep[1,3], H. Khanduri[1], G. Basheed[1,3] and R. Pant[1,3] *1. Indian Reference Materials Division, CSIR-NPL, New Delhi, India; 2. Department of Mechanical Engineering, University of Melbourne, Parkville, VIC, Australia, Melbourne, VIC, Australia; 3. Academy of Scientific and Innovative Research,Ghaziabad, CSIR-NPL Campus, New Delhi, New Delhi, India*

CPA-05. **The Effect of Rosensweig Instability of a Ferrofluid Droplet on the Electromagnetic Wave Scattering.** *Y. Li*[1,2] and K. Huang[1] *1. Mechanical and Aerospace Engineering, National Defense University, Taoyuan, Taiwan; 2. Mechanical Engineering, National Yan Ming Chiao Tung University, Hsinchu, Taiwan*

CPA-06. **Effect of Sr-doping on Structural and Magnetic Properties of LSMO nanoparticles Prepared by Sol-Gel Auto Combustion Method.** *Y. Kaur*[1] and B. Chudasama[1] *1. School of Physics and Materials Science, Thapar Institute of Engineering and Technology, Patiala, India, Patiala, India*

CPA-07. **Effect of Ga-substitution on magnetic and dielectric properties of nanosized yttrium iron garnet ferrites.** P. Tsai[1], *J. Zou*[1] and T. Han[1] *1. Department of Applied Physics, National University of Kaohsiung, Kaohsiung, Taiwan*

CPA-08. **Analysis of the Influence of Grain-Oriented Silicon Steel Splicing Mode of Stator on the Motor Performance.** *X. Zhang*[1], H. Zhang[1] and R. Pei[1] *1. Electrical Engineering, Shenyang University of Technology, Shenyang, China*

CPA-09. **Investigation of the Influence of the Anisotropic Magnetic Performance of the Grain-Oriented Silicon Steel on the Motor Design.** H. Zhang[1], *A. Hu*[1] and R. Pei[1] *1. Electrical Engineering, Shenyang University of Technology, Shenyang, China*

CPA-10. **The effect of particle size on core-losses of Fe-Si-Cr soft magnetic composites.** *Y. Choi*[1], J. Ahn[1], S. Kim[1], D. Kim[1] and B. Lee[1] *1. Department of Physics and Oxide Research Center, Hankuk University of Foreign Studies, Yongin, The Republic of Korea*

CPA-11. **Proposal of noble co-addition method for α''-$Fe_{16}(N, C)_2$ particles by gas-solid reactions.** *M. Tobise*[1], Y. Nomura[2], M. Kodama[2], T. Murakami[1] and S. Saito[1] *1. Electronic Engineering, Tohoku University, Sendai, Japan; 2. Taiyo Nippon Sanso Corporation., Hokuto, Japan*

CPA-12. **Synthesis and printing of $Fe_{50}Rh_{50}$ nanoparticle inks– a laser-based route to generate magnetocaloric structures.** *S. Tahir*[1], C. Donate-Buendia[1], R. Nadarajah[2] and B. Gökce[1] *1. Materials Science and Additive Manufacturing, Bergische University Wuppertal, Wuppertal, Germany; 2. Technical Chemistry 1, University of Duisburg-Essen, Essen, Germany*

CPA-13. **Morphological evolution of Fe_xCo_{100-x} alloy nanoparticles and their correlation to magnetic behaviour.** .. *Moditma*[1], R. Malik[2], V.R. Reddy[3] and S. Annapoorni[1] *1. Department of Physics and Astrophysics, University of Delhi, Delhi, India; 2. ARSD College, University of Delhi, Delhi, India; 3. UGC-DAE Consortium for Scientific Research, University Campus, Khandwa Road, Indore, India*

CPA-14. **Fe-Ni-Mn alloy produced by mechanical alloying and spark plasma sintering.** K. Zaara[1], M. Chemingui[3], *J. Suñol*[1], Y. Gallard[4] and V. Optasanu[2] *1. University of Girona, Girona, Spain; 2. Université Bourgogne, Dijon, France; 3. Université Sfax, Sfax, Tunisia; 4. Université de Bourgogne, Besançon, France*

CPA-15. **Research and Application of the Fe-Co-V Soft Magnetic Alloy to The High Torque Density Electric Machine.** H. Zhang[1], *L. Wang*[1] and R. Pei[1] *1. Electrical Engineering, Shenyang University of Technology, Shenyang, China*

POSTER SESSION

Session CPB
SOFT MAGNETIC MATERIALS VI: AMORPHOUS AND NANOCRYSTALLINE (Poster Session)

Naoki Ito, Chair
Hitachi Metals, Ltd., Yasugi, Japan

CPB-01. **Relationship between morphology and soft-magnetic properties of Co-Sr-F nano-granular films.** *C. Wang*[1], Y. Endo[2], Y. Cao[1], H. Aoki Kijima[1], N. Kobayashi[3], S. Ohnuma[1,3] and H. Masumoto[1] *1. Frontier Research Institute for Interdisciplinary Sciences, Tohoku University, Sendai, Japan; 2. Department of Electrical Engineering, Graduate School of Engineering, Tohoku University, Sendai, Japan; 3. Research Institute for Electromagnetic Materials, Sendai, Japan*

CPB-02. **Micromagnetic study of anisotropy in cylindrical amorphous nanowires.** *C. Rotarescu*[1], H. Chiriac[1], N. Lupu[1] and T. Óvári[1] *1. National Institute of Research and Development for Technical Physics, Iasi, Romania*

CPB-03. **Withdrawn**

CPB-04. **Application of Bayesian Optimization and Regression Analysis to Ferromagnetic Materials Development.** *A.R. Will-Cole*[3], G. Kusne[1,2], P. Tonner[1], C. Dong[3], X. Liang[3], H. Chen[3] and N.X. Sun[3] *1. National Institute of Standards and Technology, Gaithersburg, MD, United States; 2. University of Maryland, College Park, MD, United States; 3. Electrical Engineering, Northeastern University, Boston, MA, United States*

CPB-05. **Study of the magnetic properties of nano-thin permalloy films depending on the grain size.** N.A. Djuzhev[1], *G.D. Demin*[1], R.N. Andrushin[1], E.V. Novikov[1], B.K. Medvedev[1] and D.D. Noskova[1,2] *1. R&D Center "MEMSEC", National Research University of Electronic Technology (MIET), Moscow, Zelenograd, Russian Federation; 2. Lebedev Physical Institute of the Russian Academy of Sciences (LPI RAS), Moscow, Russian Federation*

CPB-06. **Study on Structural Characteristics and Magnetic Properties of Fe-B Particles with Submicron Sizes Synthesized by A Liquid-phase Reduction Method.** *Y. Endo*[1], K. Murata[1], H. Aoki Kijima[1], T. Miyazaki[1] and H. Masumoto[1] *1. Tohoku University, Sendai, Japan*

CPB-07. **Magnetic Property Measurement and Analysis of High-Frequency Soft Magnetic Materials Under Non-sinusoidal Excitation Considering Temperature Effect.** Y. Li[1], *C. Jin*[1], M. Yang[1], S. Mu[1] and C. Zhang[1] *1. Hebei University of Technology, Tianjin, China*

CPB-08. **Measurement and Analysis of Vibration and Noise Characteristics of Medium-Frequency Transformer Core Under Non-Sinusoidal Voltage Excitation.** Y. Li[1], *Z. Yang*[1], C. Zhang[1] and S. Mu[1] *1. Hebei University of Technology, Tianjin, China*

CPB-09. **Nonlinear Effects in the Magnetization Switching of Nearly Zero Magnetostrictive Amorphous Submicron Wires.** S. Corodeanu[1], C. Hlenschi[1], C. Rotarescu[1], H. Chiriac[1], N. Lupu[1] and *T.A. Ovari*[1] *1. Dept. of Magnetic Materials & Devices, National Institute of R&D for Technical Physics, Iasi, Romania*

CPB-10. **Thickness-dependent Structural and Magnetic Properties of Fe_4N Thin Films.** *S. Seema*[1], A. Tayal[2], P. Gupta[3,4], S. Chakravarty[5] and M. Gupta[1] *1. Physics, UGC-DAE Consortium for Scientific Research, University Campus, Khandwa Road, Indore, Indore, India; 2. Deutsches Elektronen-Synchrotron DESY, Notkestrasse 85, D-22607 Hamburg, Germany, Hamburg, Germany; 3. Raja Ramanna Centre for Advanced Technology, Indore, India, Indore, India; 4. Homi Bhabha National Institute, Training School Complex, Anushakti Nagar, Mumbai, India, Mumbai, India; 5. UGC-DAE Consortium for Scientific Research, Kalpakkam Node, India, Kalpakkam Node, India*

CPB-11. **Transformation of the magnetostriction constant of amorphous microwires by heat treatment.** *J. Alam*[1], M.G. Nematov[2] and L. Panina[1,2] *1. Technology of Electronic Materials, National University of Science and Technology, MISIS, Moscow, Russian Federation; 2. Institute of Physics, Immanuel Kant Baltic Federal University, Kaliningrad, Russian Federation*

CPB-12. **Comprehensive Investigation of Rotational Magnetic Properties for Nanocrystalline Alloy and Ultra-thin Grain-oriented Silicon Steel.** *M. Yang*[1], Q. Yang[1], Y. Li[1], Z. Lin[1], S. Yue[1] and C. Zhang[1] *1. Hebei University of Technology, State Key Laboratory of Reliability and Intelligence of Electical Equipment, Tianjin, China*

ORAL SESSION

Session DOA
RARE-EARTH HARD MAGNETIC MATERIALS

Hossein Sepehri-Amin, Chair
National Institute for Materials Science, Tsukuba, Japan

DOA-01. **High-field magnetization studies and their analysis in $RFe_{11}Ti$ and $RFe_{11}TiH_1$ rare-earth intermetallics.** *N. Kostyuchenko*[1], I.S. Tereshina[2], E.A. Tereshina-Chitrova[3], Y. Skourski[4], M. Doerr[5], A.K. Zvezdin[1,6], M. Paukov[7,8] and H. Drulis[9] *1. Moscow Institute of Physics and Technology (National Research University), Dolgoprudny, Russian Federation; 2. Faculty of Physics, Lomonosov Moscow State University, Moscow, Russian Federation; 3. Institute of Physics CAS, Prague, Czechia; 4. Hochfeld-Magnetlabor Dresden (HLD-EMFL), Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 5. Institut für Festkörper- und Materialphysik, Technische Universität Dresden, Dresden, Germany; 6. Prokhorov General Physics Institute RAS, Moscow, Russian Federation; 7. Faculty of Mathematics and Physics, Charles University, Prague, Czechia; 8. Nuclear Fuel Cycle Department, Centrum Výzkumu Rez, Husinec-Rez, Czechia; 9. Institute of Low Temperature and Structure Research, Polish Academy of Sciences, Wroclaw, Poland*

DOA-02. **New potential materials for rare earth lean permanent magnets from computational design and the challenge of the 4f electrons.** *H.C. Herper*[1] and O. Eriksson[1,2] *1. Physics and Astronomy, Uppsala University, Uppsala, Sweden; 2. School of Science and Technology, Örebro University, Örebro, Sweden*

DOA-03. **Energy based model for Twin boundary prediction in the Sm-Fe-Co 1:12 phase.** *G. Hrkac*[1], C. Skelland[1], J. Fischbacher[2], S. Ener[3], O. Gutfleisch[3] and T. Schrefl[2] *1. EMPS, University of Exeter, Exeyer, United Kingdom; 2. Center for Integrated Sensor Systems, Danube University, Krems, Austria; 3. TU Darmstadt, Darmstadt, Germany*

DOA-04. **Cost effective modification of $SmCo_5$-type alloys.** C. Sarafidis[1], G. Sempros[1], S. Giaremis[1], J. Kioseoglou[1] and *M. Gjoka*[2] *1. Department of Physics, Aristotle University of Thessaloniki, Thessaloniki, Greece; 2. Institute of Nanoscience and Nanotechnology, N.C.S.R. Demokritos, Agia Paraskevi, Athens, Greece*

DOA-05. **Epitaxy Induced Highly Ordered Sm_2Co_{17}–$SmCo_5$ Nanoscale Thin Film Magnets.** S. Sharma[1,2], G. Gkouzia[1], A. Zintler[1], D. Günzing[3], J. Lill[3], D. Motta Meira[4], R. Eilhardt[1], H. Singh[1], R. Xie[1], M. Major[1], I. Radulov[1], P. Komissinskiy[1], H. Zhang[1], K. Skokov[1], H. Wende[3], K. Ollefs[3], L. Molina-Luna[1] and *L. Alff*[1] *1. Materials Science, TU Darmstadt, Darmstadt, Germany; 2. NIMS, Tsukuba, Japan; 3. Physics, Universität Duisburg-Essen, Duisburg, Germany; 4. Argonne National labs, Argonne, IL, United States*

DOA-06. **New coatings for permanent magnets for easy recyclability.** *B. Podmiljsak*[1] and S. Kobe[1] *1. Jozef Stefan Institute, Ljubljana, Slovenia*

DOA-07. **Challenges of reaching high coercivity in coarse grained $ThMn_{12}$ magnets.** *S. Ener*[1], K. Skokov[1], F. Maccari[1], D. Palanisamy[2], L. Schäfer[1], I. Radulov[1], B. Gault[2], D. Raabe[2] and O. Gutfleisch[1] *1. Functional Materials, Materials Science, Technical University of Darmstadt, Darmstadt, Germany; 2. Max-Planck-Institut für Eisenforschung (MPIE) Düsseldorf, Düsseldorf, Germany*

DOA-08. **Magnetic property effects in highly grain-refined Dy-free Nd-Fe-B sintered magnets.** *I. Anderson*[1], W. Tang[1], K. Dennis[1], M.J. Kramer[1] and J. Cui[1] *1. Ames Laboratory, Ames, IA, United States*

DOA-09. **Giant Coercivity and Magnetic Blocking in Molecular Radical-Bridged Lanthanide Compounds.** *S. Demir*[1] *1. Chemistry, Michigan State University, East Lansing, MI, United States*

DOA-10. **Criteria for Permanent-Magnet Materials.** *R. Skomski*[1], J. Cui[2], B. Balasubramanian[1], A. Ullah[1] and D. Sellmyer[1] *1. Physics and Astronomy & NCMN, University of Nebraska, Lincoln, NE, United States; 2. Ames Laboratory & Iowa State University, Ames, IA, United States*

DOA-11. **Synthesis of Sm-Fe binary phases at unexplored low temperature by low-temperature reduction-diffusion process with LiCl-KCl molten salts.** *J. Kim*[1], S. Okada[1] and K. Takagi[1] *1. Magnetic Powder Metallurgy Research Center, National Institute of Advanced Industrial Science and Technology, Nagoya, Japan*

DOA-12. **Effects of Ce–Mn Substitutions on Magnetic Properties of *M*-type Strontium Hexaferrites.** *Z. Zi*[1] and Y. Sun[1] *1. Key Laboratory of Materials Physics, Institute of Solid State Physics, Chinese Academy of Sciences, Hefei, China*

Session DOB
PERMANENT MAGNETS AND PROCESSING I

Wei Tang, Chair
Ames Laboratory, Ames, IA, United States

DOB-01. **Selective Laser Melting of Partially Anisotropic Rare Earth-based Permanent Magnets. *(Invited)*** *D. Goll*[1], F. Trauter[1], R. Loeffler[1] and G. Schneider[1] *1. Materials Research Institute, Aalen University, Aalen, Germany*

DOB-02. **Additive Manufacturing of Anisotropic Sm-Fe-N Bonded Permanent Magnets.** *K. Gandha*[1], M. Paranthaman[2], B.C. Sales[2], H. Wang[2,3], A. Dalagan[2], T. Lamichhane[2], D.S. Parker[2] and C.I. Nlebedim[1] *1. Critical Materials Institute, Ames Laboratory, Ames, IA, United States; 2. Oak Ridge National Laboratory, Oak Ridge, TN, United States; 3. The Bredesen Center, The University of Tennessee, Knoxville, Knoxville, TN, United States*

DOB-03. **Fe-Ni-Al Heusler Alloys: Phase Stability and Magnetocrystalline Anisotropy.** *O.N. Miroshkina*[1,2], M.E. Gruner[1], V. Buchelnikov[2] and V. Sokolovskiy[2] *1. Faculty of Physics, University of Duisburg-Essen, Duisburg, Germany; 2. Condensed Matter Physics Department, Chelyabinsk State University, Chelyabinsk, Russian Federation*

DOB-04. **Effects of deformation ratio and temperature on microstructure and properties of NdFeB magnets by one-step hot deformation.** *K. Xu*[1], W. Fan[1], B. Zhou[1], J. He[1], H. Yu[1] and Z. Liu[1] *1. School of Materials Science and Engineering, South China University of Technology, Guangzhou City, China*

DOB-05. **A strategy to enhance magnetic and service performance of Nd-Fe-B magnets by HRE-free grain boundary diffusion.** *J. He*[1], H. Zeng[1], W. Song[1], B. Zhou[1], H. Yu[1], X. Zhong[1] and Z. Liu[1] *1. South China University of Technology, Guangzhou, China*

DOB-06. **Crystallinity improvement of finely pulverized Sm_2Fe_{17} powder by post-milling annealing and its side-effects.** *A. Hosokawa*[1], W. Yamaguchi[1] and K. Takagi[1] *1. Magnetic Powder Metallurgy Research Center, National Institute of Advanced Industrial Science and Technology, Nagoya, Japan*

DOB-07. **Understanding Grain Morphology Close to the Superparamagnetic Limit.** *C. Skelland*[1], T. Schrefl[2] and G. Hrkac[1] *1. College of Engineering, Mathematics, and Physical Sciences, University of Exeter, Exeter, United Kingdom; 2. Center for Modelling and Simulation, Danube University Krems, Wiener Neustadt, Austria*

DOB-08. **Origin of large unidirectional magnetic anisotropy in NiMn and PdMn.** *N. Josten*[1], S. Noorzayee[1], M. Acet[1], F. Scheibel[2], A. Çakir[3] and M. Farle[1] *1. Faculty of Physics and Center for Nanointegration (CENIDE), University Duisburg-Essen, Duisburg, Germany; 2. Institute of Material Science, Technische Universität Darmstadt, Darmstadt, Germany; 3. Department of Metallurgical and Materials Engineering, Mugla University, Mugla, Turkey*

DOB-09. **Tuning Magnetocrystalline Anisotroy of LTP MnBi with Sn.** *M. Choi*[1], Y. Hong[1], H. Won[1], J. Lee[2], T. Lee[2], T. Lim[2], F. Yan[3] and X. Han[3] *1. Electrical and Computer Engineering, The University of Alabama, Tuscaloosa, AL, United States; 2. Institute of Fundamental and Advanced Technology (IFAT), Hyundai Motor Company, Uiwang-si, The Republic of Korea; 3. Metallurgical and Materials Engineering, The University of Alabama, Tuscaloosa, AL, United States*

DOB-10. **Synthesis of single-crystalline $TbCu_7$-type Sm-Fe powders by reducing reduction-diffusion temperature using molten salt.** *S. Okada*[1] and K. Takagi[1] *1. Magnetic Powder Metallurgy Research Center, Advanced Industrial Science and Technology (AIST), Nagoya, Japan*

ORAL SESSION

Session DOC
NON-RARE EARTH PERMANENT MAGNET MATERIALS AND NANOCOMPOSITES I

Adrian Quesada, Co-Chair
Institute of Ceramics and Glass (CSIC), Madrid, Spain
Alberto Bollero, Co-Chair
IMDEA Nanociencia, Madrid, Spain

DOC-01. **Remanence Improvement in Exchange-Decoupled Composites Owing to Dipolar Interactions.** *A. Quesada*[1], C. Granados[1], J. Guzmán-Mínguez[1], P. Kuntschke[2], C. de Julian Fernandez[3], C. Munuera[4], S. Erohkin[5], D. Berkov[5], T. Schliesch[2] and J. Fernandez[1] *1. Institute of Ceramics and Glass (CSIC), Madrid, Spain; 2. Max Baermann GmbH, Cologne, Germany; 3. IMEM (CNR), Parma, Italy; 4. Institute of Materials Science of Madrid (CSIC, Madrid, Spain; 5. General Numerics Research Lab, Jena, Germany*

DOC-02. **Optimizing magnetic properties and coupling of hard $SrFe_{12}O_{19}$ based nanocomposites.** *P. Maltoni*[1], G. Barucca[2], T. Sarkar[1], G. Varvaro[4], D. Peddis[3,4] and R. Mathieu[1] *1. of Materials Science and Engineering, Solid State Physics, Uppsala University, Uppsala, Sweden; 2. SIMAU, Università Politecnica delle Marche, Ancona, Italy; 3. DCCI, Universita di Genova, Genova, Italy; 4. CNR-ISM, Roma, Italy*

DOC-03. **Hybrid FeCo Nanowires– Strontium Ferrite Composites for Rare-Earth-free Magnets.** J. Guzmán-Mínguez[1], S. Ruiz Gómez[2], L. Vicente-Arche[1], C. Granados[1], C. Fernandez Gonzalez[3], F. Mompean[4], M. Garcia Hernandez[4], D. Mishra[5,6], J. Fernandez[1], L. Perez[7,3], A. Quesada[1] and *C. de Julian Fernandez*[6] *1. Institute of Ceramics and Glass CSIC, Madrid, Spain; 2. University Complutense of Madrid, Madrid, Spain; 3. IMDEA Nanoscience, Madrid, Spain; 4. Institute of Materials Science - CSIC, Madrid, Spain; 5. Institute of Technology Jodhpur, Jodhpur, India; 6. Institute of Materials for Electronics and Magnetism - CNR, Parma, Italy; 7. Unité Mixte de Physique CNRS Thales Univ. Paris-Saclay, Palaiseau, France*

DOC-04. **Fe-Si and its Nanocrystallization as Soft Phase in SmCo-based Nanocomposites.** *Y. Zhang*[1], Y. Li[1], W. Liu[1], M. Yue[1] and D. Zhang[1] *1. Beijing University of Technology, Beijing, China*

DOC-05. **Magnetization reversal in nanofabricated soft-in-hard exchange-spring magnets.** *I.G. de Moraes*[1], Y. Hong[1], F.O. Keller[1], C. Naud[1], S. Le Denmat[1], L. Ranno[1], T. Devillers[1] and N. Dempsey[1] *1. Institut Néel, Université Grenoble-Alpes, CNRS, Grenoble, France*

DOC-06. **High-throughput and Data-mining Search for Novel Rare-Earth-Free Permanent Magnets.** *A. Vishina*[1], H.C. Herper[1] and O. Eriksson[1,2] *1. Physics and Astronomy, Uppsala University, Uppsala, Sweden; 2. School of Science and Technology, Örebro University, Örebro, Sweden*

DOC-07. **Effect of Dopants (Mo, Cr, V) on the Magnetic Properties of Mn-Al-C nanostructured by Flash-Milling.** *C. Muñoz Rodriguez*[1], J. Soler Morala[1], E.M. Palmero[1], B. Skårman[2], H. Vidarsson[2], P. Larsson[2] and A. Bollero[1] *1. Group of Permanent Magnets and Applications, IMDEA Nanoscience, Madrid, Spain; 2. Höganäs AB., Höganäs, Sweden*

DOC-08. **$Fe_{16}N_2$ Permanent Magnet Production by High-Pressure Consolidation.** *O. Zirhli*[2,1], N. Gunduz Akdogan[3,4], D. Le Roy[5], S. Le Floch[5] and O. Akdogan[1,4] *1. Mechatronics Engineering, Bahcesehir University, Istanbul, Turkey; 2. Materials Science and Nano Technology, Sabanci University, Istanbul, Turkey; 3. Piri Reis University, Istanbul, Turkey; 4. Nanoterial Technology Corporation, Istanbul, Turkey; 5. Univ Lyon, Université Claude Bernard Lyon 1, CNRS, Institut Lumière Matière, Lyon, France*

DOC-09. **Effects of Tensile Stress during Annealing of Alnico Melt Spun Ribbons.** *E. Rinko*[1,2], X. Zhang[3], A. Valeriano Inchausti[4], L. Lewis[3], M. Vázquez[4], W. Tang[2], M.J. Kramer[1,2] and I. Anderson[1,2] *1. Materials Science and Engineering, Iowa State University, Ames, IA, United States; 2. Ames Laboratory, Ames, IA, United States; 3. Mechanical and Industrial Engineering, Northeastern University, Boston, MA, United States; 4. Instituto de Ciencia de Materiales de Madrid (CSIC), Madrid, Spain*

DOC-10. **Indications for Novel L1' Ordering in Fe-Pt Alloys Near the Fe-rich Eutectoid Composition.** *A. Savovici*[1], W.A. Soffa[1] and J.A. Floro[1] *1. Materials Science, University of Virginia, Charlottesville, VA, United States*

DOC-11. **The Formation of a Nanoscale Hard Magnetic Ferrite from Prussian Blue Nanocrystals.** *J.G. MacDougall*[1], A. Namai[1], M. Yoshikiyo[1] and S. Ohkoshi[1] *1. School of Science, Chemistry, The University of Tokyo, Tokyo, Japan*

DOC-12. **Submicron particles of Ga-substituted strontium hexaferrite obtained by citrate auto-combustion method.** *E. Gorbachev*[1], L. Trusov[1] and P. Kazin[2] *1. Department of Materials Science, Lomonosov Moscow State University, Moscow, Russian Federation; 2. Department of Chemistry, Lomonosov Moscow State University, Moscow, Russian Federation*

ORAL SESSION

Session DOD
ADVANCED PROCESSING OF PERMANENT MAGNETS

Isabelle de Moraes, Co-Chair
Institut Jean Lamour, Université de Lorraine, Vandoeuvre-lès-Nancy, France
Jeffrey Shield, Co-Chair
University of Nebraska-Lincoln, Lincoln, NE, United States

DOD-01. **A Sustainable Route for Permanent Magnets Fabrication: Additive Manufacturing Applied to Recycled Ferrite Residues.** *D. Casaleiz*[1]*, E.M. Palmero[1], J. de Vicente[1], A. Seoane[2], R. Altimira[2] and A. Bollero[1] *1. Group of Permanent Magnets and Applications, IMDEA Nanociencia, Madrid, Spain; 2. Ingeniería Magnética Aplicada, IMA S.L.U., Barcelona, Spain*

DOD-02. **Optimizing the Particle Size Distribution in Permanent Magnet Composites to Extrude Flexible Filaments for Additive Manufacturing.** *E.M. Palmero*[1], D. Casaleiz[1], J. de Vicente[1] and A. Bollero[1] *1. Permanent Magnets and Applications, IMDEA Nanociencia, Madrid, Spain*

DOD-03. **In-situ alignment of anisotropic hard magnets of 3D printed magnets.** ***(Invited)*** M. Suppan[1], K. Mathauer[1], C. Huber[1], S. Kobe[5], S. Schuschnigg[2], B. Saje[3], I. Teliban[4], M. Groenefeld[4] and *D. Suess*[1] *1. University of Vienna, Vienna, Austria; 2. Montanuniversitaet Leoben, Leoben, Austria; 3. Kolektor Magnet Technology GmbH, Essen, Germany; 4. Magnetfabrik Bonn GmbH, Bonn, Germany; 5. Jozef Stefan Institute, Ljubljana, Slovenia*

DOD-04. **Modeling in-situ magnetic alignment during magnetic 3D printing.** *A. Sarkar*[1], M. Paranthaman[2] and C.I. Nlebedim[1] *1. Ames Laboratory, Ames, IA, United States; 2. Oak Ridge National Laboratory, Oak Ridge, TN, United States*

DOD-05. **Time Dependence Analysis as a Function of the Temperature of Magnetic Polymer Composite Filaments.** *T. Ahmed*[1], C. Belduque[2], M.Y. Chen[1,4], J.S. Tate[1,2] and W.J. Geerts[1,3] *1. Materials Science, Engineering and Commercialization, Texas State University, San Marcos, TX, United States; 2. Mechanical and Manufacturing Engineering, Texas State University, San Marcos, TX, United States; 3. Department of Physics, Texas State University, San Marcos, TX, United States; 4. Electrical Engineering, Texas State University, San Marcos, TX, United States*

DOD-06. **Magnetic Properties of PDMS Embedded with Strotium Ferrite Particles Cured Under Different Magnetic Field Conditions.** *A. Oliveira*[1], M. Hasan Kashem[2], D. Luna[3], W.J. Geerts[3], W. Li[2] and J. Yang[1] *1. Mechanical Engineering, Texas Tech University, Lubbock, TX, United States; 2. Chemical Engineering, Texas Tech University, Lubbock, TX, United States; 3. Department of Physics, Texas State University, San Marcos, TX, United States*

DOD-07. **Preparation of Fe-Pt thin-sheet magnets using exfoliation behavior.** *M. Nakano*[1], Y. Miyahara[1], A. Tsuruoka[1], A. Yamashita[1], T. Yanai[1], T. Honda[2], T. Shinshi[3] and H. Fukunaga[1] *1. Nagasaki University, Nagasaki, Japan; 2. Kyushu Institute of Technology, Kitakyushu, Japan; 3. Tokyo Institute of Technology, Yokohama, Japan*

POSTER SESSION

Session DPA
PERMANENT MAGNETS AND PROCESSING II (Poster Session)

Xubo Liu, Co-Chair
Ames Laboratory, Ames, IA, United States
Jeotikanta Mohapatra, Co-Chair
University of Texas at Arlington, Arlington, TX, United States

DPA-01. **The effect of C addition on the magnetic properties and microstructures of nanocrystalline $SmFe_{11}Ti$ alloy.** *H. Lee*[1], M. Kang[1] and J. Kim[1] *1. Hanyang University, Ansan, The Republic of Korea*

DPA-02. **Modifying magnetic properties of MnBi with Carbon: An experimental and theoretical study.** *M. Flesche*[1], Z. Mehlgerg[1], B. Lamsal[2], B. Lama[3], S. Valloppilly[4], Y. Zhou[2], T. Paudel[3], D. Sellmyer[5] and P. Kharel[1] *1. Physics, South Dakota State University, Brookings, SD, United States; 2. Electrical Engineering and Computer Science, South Dakota State University, Brookings, SD, United States; 3. Physics, South Dakota School of Mines and Technology, Rapid City, SD, United States; 4. Nebraska Center for Materials and Nanoscience, University of Nebraska-Lincoln, Lincoln, NE, United States; 5. Physics and Astronomy, University of Nebraska-Lincoln, Lincoln, NE, United States*

DPA-03. **First-principles study of rare earth permanent magnets with point defects created by radiation.** *R. Suzuki*[1], T. Yayama[1] and F. Akagi[1] *1. Kogakuin University, Yokohama, Japan*

DPA-04. **Non-contact Magnetic Screw by Additive Manufacturing Fabrication.** T. Chang[1], P. Huang[1], S. Kung[2], C. Shih[1], M. Tsai[3], *C.U. Ubadigha*[3], W. Chang[4] and C. Huang[5] *1. Electrical Motor Technology Research Center, National Cheng Kung University, Tainan, Taiwan; 2. Electrical Engineering, National Cheng Kung University, Tainan, Taiwan; 3. Mechanical Engineering, National Cheng Kung University, Tainan, Taiwan; 4. Physics, National Chung Cheng University, Chia-Yi, Taiwan; 5. Mechanical Engineering, National Kaohsiung University of Science and Technology, Kaohsiung, Taiwan*

DPA-05. **Robustness of magneto-crystalline anisotropy and its effect on coercivity in $(Fe_{0.7}Co_{0.3})_2B$.** *X. Liu*[1] and C.I. Nlebedim[1] *1. Ames Laboratory, Ames, IA, United States*

DPA-06. **Hard magnetic properties of $(Sm,Zr)(Fe,Co)_3$ magnets.** *T. Saito*[1] *1. Chiba Institute of Technology, Narashino, Japan*

DPA-07. **Magnetic properties of $Ce_{85}Al_{15}$ doped NdFeB sintered magnet by grain boundary diffusion of $Tb_{70}Cu_{30}$ powders.** *Y. Wong*[1], H. Chang[1], Y. Lee[1], W. Chang[1], C. Chiu[2] and C. Mo[3] *1. Department of Physics, National Chung Cheng University, Chia-Yi 621, Taiwan; 2. New Materials Research & Development Dept., China Steel Corp., Kaohsiung, Taiwan; 3. R&D Department, Himag Magnetic Corporation, Pingtung, Taiwan*

DPA-08. **Microsturcture and magnetic properties of hot-deformed (Nd,Ce)-Fe-B magnets.** S. Wang[1], P. Liu[1], *J. Chen*[2] and W. Cui[1] *1. Northeastern University, Shenyang, China; 2. State Key Laboratory of Transducer Technology, Aerospace Information Research Institute, CAS, Beijing, China*

DPA-09. **Effect of heat treatment on the properties of NdFeB films grown by sputtering.** *A.C. Krohling*[1], J.D. Ardisson[1] and W.A. Macedo[1] *1. Physics, CDTN, Belo Horizonte, Brazil*

DPA-10. **Substitution effect of light elements on magnetic anisotropy in α''-$Fe_{16}X_2$ (X=B,C,N,O,F).** *Y. Kota*[1] and A. Sakuma[2] *1. National Institute of Technology, Fukushima College, Iwaki, Japan; 2. Department of Applied Physics, Tohoku University, Sendai, Japan*

DPA-11. **Magnetic Domain Structure and Remanence Losses of NdFeB Magnets Under the Influence of Demagnetization Factors.** *Y. Ma*[1], J. Cao[1] and L. Li[1] *1. Harbin Institute of Technology, Harbin, China*

DPA-12. **Magnetic and structural transition in the martensitic transformation of the GdCu compound.** *B. Bosch-Santos*[1,2], G.A. Cabrera-Pasca[3], O. Silveira Leite Neto[1], A.A. Miranda-Filho[1], E.L. Correa[2], C. Dennis[2] and A.W. Carbonari[1] *1. Centro do Reator de Pesquisa, Instituto de Pesquisas Energéticas e Nucleares - IPEN, São Paulo, Brazil; 2. Material Measurement Laboratory, National Institute of Standards and Technology - NIST, Gaithersburg, MD, United States; 3. Universidade Federal do Pará, Abaitetuba, Brazil*

DPA-13. **Deep Learning-based Estimation Method of Magnetization Distribution in Permanent Magnet.** *D. Takasu*[1], H. Sasaki[1], N. Nakamura[1] and Y. Okamoto[1] *1. Department of Electrical and Electronic Engineering, Hosei University, Koganei, Japan*

DPA-14. **The Phase Structure and Properties of Fe-riched 2:17-type Sm-Co Sintered Magnets.** *J. Jia*[1], D. Zhang[1], J. Yang[1,2], Z. Xie[1], Y. Li[1], H. Zhang[1], W. Liu[1] and M. Yue[1] *1. Faculty of Materials and Manufacturing, Key Laboratory of Advanced Functional Materials, Ministry of Education of China, Beijing University of Technology, Beijing, China; 2. School of Mechanical Engineering, Anyang Institute of Technology, Anyang, China*

DPA-15. **Effects of 3D-Seeds on Microstructure and Magnetic Properties of Nd-Fe-B thin films.** *K. Koike*[1], K. Furusawa[1], H. Nakajima[1], N. Inaba[1], H. Kato[1], S. Hara[2], Y. Saito[2], S. Okubo[2], H. Ohta[2] and M. Itakura[3] *1. Yamagata University, Yonezawa, Japan; 2. Kobe University, Kobe, Japan; 3. Kyushu University, Kasuga, Japan*

DPA-16. **Magnetic properties of nanocrystalline $Sm_1Fe_{10.5-x}Co_xMo_{1.5}$ alloys with x =0,1,2.** *Y. Xu*[1] and G. Hadjipanayis[1] *1. University of Delaware, Newark, DE, United States*

POSTER SESSION

Session DPB
NON-RARE EARTH PERMANENT MAGNET MATERIALS AND NANOCOMPOSITES II (Poster Session)

Emily Rinko, Co-Chair
Iowa State University, Ames, IA, United States
Parashu Kharel, Co-Chair
South Dakota State University, Brookings, SD, United States

DPB-01. **Ordering Mechanism of $L1_0$-FePt Nanoparticles Synthesized by Ag Addition.** D. Zhao[1,2], *W. Pei*[1,2], Z. Sun[1,2], L. Chang[3,4], Q. Wang[1,2] and Q. Wang[3,4] *1. School of Materials Science and Engineering, Northeastern University, Shenyang, China; 2. Key Laboratory of Anisotropy and Texture of Materials (Ministry of Education), Northeastern University, Shenyang, China; 3. School of Metallurgy, Northeastern University, Shenyang, China; 4. Key Laboratory of Electromagnetic Processing of Materials (Ministry of Education), Northeastern University, Shenyang, China*

DPB-02. **One-step synthesis of $L1_0$-FePt@$PtBi_2$/Bi core-shell nanoparticles with high structral ordering.** L. Chang[1,2], D. Zhao[3], T. Li[3], C. Wu[4], K. Wang[1,3], *W. Pei*[3] and Q. Wang[1] *1. Key Laboratory of Electromagnetic Processing of Materials (Ministry of Education), Northeastern University, Shenyang, China; 2. School of Metallurgy, Northeastern University, Shenyang, China; 3. School of Materials Science and Engineering, Northeastern University, Shenyang, China; 4. School of Materials Science and Engineering, Liaoning Technical University, Shenyang, China*

DPB-03. **Effect of Structural Transformation (fcc to $L1_0$) on the Magnetic Properties of FePt, CoPt and $PtFe_{0.5}Co_{0.5}$ Nanoparticles.** *V. Deepchand*[1] and G. Hadjipanayis[1] *1. Physics and Astronomy, University of Delaware, Newark, DE, United States*

DPB-04. **Infrared Laser Annealing of Nanocomposite Nd-Fe-B/Mo/FeCo Multilayered Magnet Films.** *K. Koike*[1], T. Uchida[1], K. Sakurai[1], N. Inaba[1], H. Kato[1], S. Hara[2], Y. Saito[2], S. Okubo[2], H. Ohta[2] and M. Itakura[3] *1. Yamagata University, Yonezawa, Japan; 2. Kobe University, Kobe, Japan; 3. Kyushu University, Kasuga, Japan*

DPB-05. **Influence of low sintering temperature of substituted M-type barium hexaferrite on its static and high-frequency magnetic properties.** *K. Rana*[3], S. Thakur[4], M. Tomar[1] and A. Thakur[2] *1. Physics and Astrophysics, University of Delhi, New Delhi, India; 2. Physics, Centre of Nanotechnology, Amity University, Gurugram, India; 3. Electronic Materials Device Laboratory, University of Delhi, New Delhi, India; 4. Instituto de Alta Investigación, Universidad de Tarapacá, Arica, Chile*

DPB-06. **Structural, Magnetic, and Mössbauer Spectroscopic Study of La^{3+} and Cu^{1+} Co-doped M-type Strontium Hexaferrite.** H. Kim[2] and *S. Yoon*[1] *1. Department of Physics, Gunsan National University, Gunsan, The Republic of Korea; 2. Basic Materials & Chemicals R&D Center, LG Chem Research Park, Daejeon, The Republic of Korea*

DPB-07. **Sandwiched $CoFe_2O_4/SrFe_{11.5}Al_{0.5}O_{19}/CoFe_2O_4$ nanoparticles with exchange-coupling effect.** *E. Gorbachev*[1], L. Trusov[1] and P. Kazin[2] *1. Department of Materials Science, Lomonosov Moscow State University, Moscow, Russian Federation; 2. Department of Chemistry, Lomonosov Moscow State University, Moscow, Russian Federation*

DPB-08. **Magnetic properties of Mn-Ga-B melt-spun ribbons.** *T. Saito*[1] and D. Nishio-Hamane[2] *1. Chiba Institute of Technology, Narashino, Japan; 2. Institute for Solid State Physics, The University of Tokyo, Kashiwa, Japan*

DPB-09. **Magnetocrystalline Anisotropy in V– and Cu–doped $Fe_{16}N_2$ under DFT+*U*.** *P. Stoeckl*[1], P. Swatek[2] and J. Wang[2] *1. Physics, University of Minnesota Twin Cities, Minneapolis, MN, United States; 2. Electrical and Computer Engineering, University of Minnesota Twin Cities, Minneapolis, MN, United States*

DPB-10. **Microwave-assisted Development of Nanostructured Cobalt-based Magnetic Materials.** *C.I. Nlebedim*[1] and K. Gandha[1] *1. Critical Materials Institute, Ames Laboratory, Ames, IA, United States*

DPB-11. **Recycling of Alnico Magnets by Ultrasonic Atomization and 3D Printing.** *R. Wroblewski*[1], W. Bojarski[1], L. Zrodowski[1,2], B. Moronczyk[1] and M. Leonowicz[1] *1. Faculty of Materials Science and Engineering, Warsaw University of Technology, Warsaw, Poland; 2. AMAZEMET, Warsaw, Poland*

DPB-12. **Residual stress tuned magnetic properties of thick CoMnP/Cu multilayers.** Y. Chen[1], *C. Lin*[1], T. Chin[1,2], J. Chang[3] and C. Sung[3] *1. Department of Materials Science and Engineering, Feng Chia University, Taichung, Taiwan; 2. High Entropy Materials Center, National Tsing Hua University, Hsinchu, Taiwan; 3. Department of Power Mechanical Engineering, National Tsing Hua University, Hsinchu, Taiwan*

Session EOA
3D NANOMAGNETISM AND NANOWIRE ARRAYS

Pavel Ripka, Chair
Czech Technical University, Prague, Czechia

EOA-01. **3D Nanomagnetism in Interconnected Magnetic Nanowire Networks.** ***(Invited)*** E. Burks[2], D.A. Gilbert[2,3], J. Malloy[1,2], A. Quintana[1], C.J. Jensen[1], P. Murray[2], C. Flores[2], T. Felter[4], S. Charnvanichborikarn[5], S. Kucheyev[5], J. Colvin[5], G. Yin[1] and *K. Liu*[1,2] *1. Georgetown University, Washington, DC, United States; 2. University of California, Davis, Davis, CA, United States; 3. University of Tennessee, Knoxville, TN, United States; 4. Sandia National Laboratories, Livermore, CA, United States; 5. Lawrence Livermore National Laboratory, Livermore, CA, United States*

EOA-02. **Nanostructured magnets prepared by magnetophoresis-assisted capillary assembly of Co nanorods.** *L. Lacroix*[1], G. Viau[1], A. Gonon[1], T. Blon[1], I. Lecerf[1], T. Leichlé[2] and T. Ondarcuhu[3] *1. LPCNO, Université Toulouse, Toulouse, France; 2. LAAS, Toulouse, France; 3. IMFT, Toulouse, France*

EOA-03. **Magnetic Texture Fluctuations in Coupled Mesospin Systems.** *S. Slöetjes*[1], A. Ciuciulkaite[1], B. Hjörvarsson[1] and V. Kapaklis[1] *1. Department of Physics and Astronomy, Uppsala University, Uppsala, Sweden*

EOA-04. **Magnetic charge propagation upon a 3D artificial spin-ice.** ***(Invited)*** A. May[1], M.D. Saccone[2], A. van den Berg[1], J. Askey[1], M. Hunt[1] and *S. Ladak*[1] *1. School of Physics and Astronomy, Cardiff University, Cardiff, United Kingdom; 2. Theoretical Division, Los Alamos National Laboratory, Los Alamos, NM, United States*

EOA-05. **Magnetization reversal in individual core/shell cylindrical nanowires with non-magnetic interlayer.** M. Méndez[1], J. García[1], J. Fernandez-Roldan[1], V. Vega[1], A. Gonzalez[1] and *V.M. Prida*[1] *1. University of Oviedo, Oviedo, Spain*

EOA-06. **Effects of growth kinetics on structural and magnetic properties of Co nanowires.** *J. Mohapatra*[1], J. Elkins[1], M. Xing[1] and J. Liu[1] *1. Department of Physics, The University of Texas at Arlington, Arlington, TX, United States*

EOA-07. **Giant Magnetoresistance and Magneto-Thermopower in 3D Interconnected Multilayer Nanowire Networks.** *N. Marchal*[1], T. da Câmara Santa Clara Gomes[1], F. Abreu Araujo[1] and L. Piraux[1] *1. Institute of Condensed Matter and Nanosciences, Université Catholique de Louvain, Louvain-la-Neuve, Belgium*

EOA-08. **Apparent permeability of ordered magnetically soft nanowire and microwire arrays.** *P. Ripka*[1], D. Hrakova[1], M. Mirzaei[1], V. Grim[1], M. Butta[1] and O. Kaman[2] *1. Fac. of Electrical Engineering, Dept. of Measurement, Czech Technical University, Prague, Czechia; 2. Department of Magnetics and Superconductors, Institute of Physics of the Czech Academy of Sciences, Prague, Czechia*

EOA-09. **Feasibility of Using NiCu/FeCo Coupled Bi-segmented Nanowires as In-line Writing Heads for 3D Racetrack Storage Devices.** V.M. Andrade[1], S. Caspani[1], A. Rivelles[2], S. Bunyaev[1], V.O. Golub[3], J.P. Araujo[1], G.N. Kakazei[1], C. Sousa[1] and *M.P. Proenca*[1,2] *1. IFIMUP - Institute of Physics for Advanced Materials, Nanotechnology and Photonics, Department of Physics and Astronomy, Faculty of Sciences, University of Porto, Porto, Portugal; 2. ISOM, Universidad Politécnica de Madrid, Madrid, Spain; 3. Institute of Magnetism NAS of Ukraine and MES of Ukraine, Kyiv, Ukraine*

EOA-10. **Intersection-Mediated Magnetoresistance in 3D Nanowire Networks.** *D. Bhattacharya*[1], C.J. Jensen[1], Z. Chen[1], L. Debeer-Schmitt[3], A.J. Grutter[2], K. Krycka[2], J.A. Borchers[2], E. Burks[5], D.A. Gilbert[4], G. Yin[1] and K. Liu[1] *1. Physics, Georgetown University, Washington, DC, United States; 2. Center for Neutron Research, NIST, Gaithersburg, MD, United States; 3. Oak Ridge National Laboratory, Oak Ridge, TN, United States; 4. Material Science and Engineering, University Of Tennessee, Knoxville, TN, United States; 5. UC Davis, Davis, CA, United States*

EOA-11. **Reservoir computing in an artificial spin-vortex ice.** *K.D. Stenning*[1], J.C. Gartside[1], A. Vanstone[1] and W.R. Branford[1] *1. Imperial College London, London, United Kingdom*

ORAL SESSION

Session EOB
MAGNETIC NANOSTRUCTURES AND EXCHANGE BIAS

Lise-Marie Lacroix, Chair
Université de Toulouse, Toulouse, France

EOB-01. **Predicting the Crossover from Individual to Collective Magnetism in Dense Nanoparticle Systems: Local Anisotropy *vs* Dipolar Interactions.** *E. H. Sánchez*[1], M. Vasilakaki[2], S. Lee[3], P.S. Normile[1], M. Andersson[4], R. Mathieu[4], A. López-Ortega[5], B. Pichon[6], D. Peddis[7], C. Binns[1], P. Nordblad[4], K.N. Trohidou[2], J. Nogues[8] and J.A. De Toro[1] *1. Applied Physics & IRICA, Universidad de Castilla-La Mancha, Ciudad Real, Spain; 2. Institute of Nanoscience and Nanotechnology, Agia Paraskevi, Greece; 3. Institute of Materials Research and Engineering (IMRE), Singapore, Singapore; 4. Department of Materials Science and Engineering, Uppsala University, Uppsala, Sweden; 5. Universidad Pública de Navarra, Pamplona, Spain; 6. Institut de Physique et Chimie des Matériaux de Strasbourg, Université de Strasbourg - CNRS, Strasbourg, France; 7. Dipartimento di Chimica e Chimica Industriale, Università degli Studi di Genova, Genova, Italy; 8. Catalan Institute of Nanoscience and Nanotechnology, CSIC and BIST, Barcelona, Spain*

EOB-02. **Nanoscale magnetic correlations and fluctuations in assemblies of Fe_3O_4 nanoparticles.** *K. Chesnel*[1], J. Rackham[1], D. McPhearson[1], C. Hawkins[1], D. Griner[1], D. Smith[1], R. Harrison[2], A. Reid[3] and M. Transtrum[1] *1. Physics, BYU, Provo, UT, United States; 2. Chemistry, BYU, Provo, UT, United States; 3. SSRL, SLAC, Stanford, CA, United States*

EOB-03. **Magnetic and Transport Properties of Shell-ferromagnetically Precipitated Spin-Polarized Co_2TiGe in a CoTi matrix.** *A. Çakir*[1], N. Josten[2], S. Noorzayee[2], M. Farle[2] and M. Acet[2] *1. Metallurgical and Materials Engineering, Mugla Sitki Kocman University, Mugla, Turkey; 2. Physics, University of Duisburg-Essen, Duisburg, Germany*

EOB-04. **Investigation of magnetic domain nucleation in exchange-biased nanostructures.** *S. Akhundzada*[1], U. Karki[2], M. Reginka[1], M. Merkel[1], C. Mewes[2], T. Mewes[2], A. Ehresmann[1] and M. Vogel[1] *1. Institute of Physics and Center for Interdisciplinary Nanostructure Science and Technology (CINSaT), University of Kassel, Kassel, Germany; 2. Department of Physics and Astronomy, University of Alabama, Tuscaloosa, AL, United States*

EOB-05. **Nanoscale Spin Helices Stabilised by a Hierarchy of Magnetic Interactions in Exchange-Modulated Heterostructures.** *G. Causer*[1], D. Cortie[2], B.R. McGrath[5], J. Zeng[3], K. Lin[3] and K. Livesey[4] *1. Physics Department, Technical University of Munich, Munich, Germany; 2. Australian Centre for Neutron Scattering, Australian Nuclear Science and Technology Organisation, Lucas Heights, NSW, Australia; 3. Department of Materials Science and Engineering, National Chung Hsing University, Taichung, Taiwan; 4. School of Mathematical and Physical Sciences, The University of Newcastle, Callaghan, NSW, Australia; 5. Department of Physics, University of Colorado, Colorado Springs, Colorado Springs, CO, United States*

EOB-06. **Three-axis torque investigation of exchange bias in a micromagnetic disk.** M. Dunsmore[1], *J.A. Thibault*[1], K. Fast[1], V.T. Sauer[1], J.E. Losby[2], Z. Diao[3], E.J. Luber[4], M. Belov[5] and M.R. Freeman[1] *1. Physics, University of Alberta, Edmonton, AB, Canada; 2. Physics and Astronomy, University of Calgary, Calgary, AB, Canada; 3. Physics, Florida Agricultural and Mechanical University, Tallahassee, FL, United States; 4. Chemistry, University of Alberta, Edmonton, AB, Canada; 5. Nanotechnology Research Centre (NANO), National Research Council (NRC), Edmonton, AB, Canada*

EOB-07. **Unravelling exchange bias phenomena in V_2O_3/Co bilayers.** *J.M. Diez*[1], J.L. Fernandez Cuñado[2], P. Perna[2], P.N. Lapa[3], A. Bollero[2], R. Miranda[1,2], I.K. Schuller[3] and J. Camarero[1,2] *1. Universidad Autónoma de Madrid, Madrid, Spain; 2. IMDEA Nanoscience, Madrid, Spain; 3. University of California San Diego, San Diego, CA, United States*

EOB-08. **Withdrawn**

EOB-09. **Exchange Coupled Magnetic Nanoheterostructures with Enhanced Energy Product.** B. Muzzi[5,2], A. López-Ortega[4], M. Albino[3], M. Petrecca[3], C. Innocenti[1,3], G. Bertoni[1], C. de Julian Fernandez[6] and *C. Sangregorio*[5,3] *1. CNR National Research Council, Nano, Modena, Italy; 2. Dept. of Biotechnology, Chemistry and Pharmacy, Univ. of Siena, Siena, Italy; 3. Dept of Chemistry, INSTM & Univ. of Florence, Sesto Fiorentino, Italy; 4. Departamento de Ciencias, Universidad de Navarra, Pamplona, Spain; 5. CNR National Research Council, ICCOM, Sesto Fiorentino, Italy; 6. CNR National Research Council, IMEM, Parma, Italy*

EOB-10. **The effect of x-ray illumination on magnetic domain memory in [Co/Pd] / IrMn multilayers.** *C.S. Walker*[1], M. Parkes[1], C. Olsson[1], D. Keavney[3], E. Fullerton[2] and K. Chesnel[1] *1. Physics, Brigham Young University, Provo, UT, United States; 2. Center for Memory and Recording research, San Diego, CA, United States; 3. Advanced Photon Source, Argonne National Laboratory, IL, United States*

ORAL SESSION

Session EOC
MAGNETIC NANOSTRUCTURES

Victor Prida, Chair
University of Oviedo, Oviedo, Spain

EOC-01. **Chemically-induced Magnetic Dead Shells in Superparamagnetic Ni Nanoparticles from Polarized Small-Angle Neutron Scattering.** *B. Das*[1], J. Batley[1], C. Korostynski[1], M. Nguyen[1], I. Kamboj[1], K. Krycka[2], P. Quarterman[2], J.A. Borchers[2], E. Aydil[3] and C. Leighton[1] *1. Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, United States; 2. NIST Center for Neutron Research, National Institute for Standards and Technology, Gaithersburg, MD, United States; 3. Chemical and Biomolecular Engineering, New York University Tandon School of Engineering, Brooklyn, NY, United States*

EOC-02. **Decreasing the magnetic anisotropy of Fe_3O_4 by Co-doping?** *D. Serantes*[1], D. Faílde[1], A.O. Fumega[1], V. Pardo Castro[1], D. Baldomir[1], B. Pelaz[2], P. del Pino[2] and R.W. Chantrell[3] *1. Applied Physics, Universidade de Santiago de Compostela, Santiago de Compostela, Spain; 2. CiQUS, Universidade de Santiago de Compostela, Santiago de Compostela, Spain; 3. Physics, University of York, York, United Kingdom*

EOC-03. **Disentangling Atom- and Site- Selective Spin Canting in Co-ferrite Nanoparticles with Tunable Structural Disorder.** *A. Fraile Rodríguez*[1,2], C. Moya[1,3], M. Escoda-Torroella[1,2], M. García del Muro[1,2], C. Piamonteze[4], S.R. Avula[4], X. Batlle[1,2] and A. Labarta[1,2] *1. Física de la Matèria Condensada, Universitat de Barcelona, Barcelona, Spain; 2. Institut de Nanociència i Nanotecnologia (IN2UB), Universitat de Barcelona, Barcelona, Spain; 3. Université Libre de Bruxelles, Brussels, Belgium; 4. Swiss Light Source, Paul Scherrer Institut, Villigen PSI, Switzerland*

EOC-04. **Effect of the Applied Field on the Brown and Neel Relaxation Times for Magnetite Nanoparticles Subjected to High Frequency Fields.** *P. de la Presa*[1] and I. Morales Casero[1] *1. Complutense University of Madrid, Madrid, Spain*

EOC-05. **Exploring the Single Domain Limit of High Magnetization Nanoparticles: A Combined Theoretical and Experimental Study.** *Y. Chen*[1], C. Adebi[2] and A. El-Ghazaly[2] *1. Materials Science and Engineering, Cornell University, Ithaca, NY, United States; 2. Electrical and Computer Engineering, Cornell University, Ithaca, NY, United States*

EOC-06. **Fluorescent detection of dipicolinic acid as a biomarker for anthrax using Tb ion-coordinated Fe_3O_4 nanoparticles.** *T. Koo*[1], M. Ko[1], B. Park[1], M. Kim[1] and Y. Kim[1] *1. Materials Science and Engineering, Korea University, Seoul, The Republic of Korea*

EOC-07. **Withdrawn**

EOC-08. **Intraparticle and interparticle extended magnetic structures in chemically homogeneous manganese ferrite nanoparticle assemblies.** *Y. Ijiri*[1], K. Krycka[3], A. Khelil[1], H. Chen[2], E. Everhart[1], J.A. Borchers[3], J. Rhyne[3] and S. Majetich[2] *1. Department of Physics and Astronomy, Oberlin College, Oberlin, OH, United States; 2. Department of Physics, Carnegie Mellon University, Pittsburgh, PA, United States; 3. NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, United States*

EOC-09. **Magnetic Correlations of Iron Oxide Nanoparticles as Probed by PASANS in Stretched Magnetogel Composites.** *S. Oberdick*[1,2], J.A. Borchers[3] and K. Krycka[3] *1. CU Boulder, Boulder, CO, United States; 2. NIST, Boulder, CO, United States; 3. NCNR/NIST, Gaithersburg, MD, United States*

EOC-10. **Preparation of ε-Fe_2O_3 nanoparticles and ceramics.** *M. Karpov*[2,3], E. Gorbachev[1,2], M. Soshnikov[4], L. Trusov[1,2], L. Alyabyeva[3] and B. Gorshunov[3] *1. Faculty of Materials Science, MSU-BIT University, Shenzhen, China; 2. Department of Chemistry, Lomonosov Moscow State University, Moscow, Russian Federation; 3. Center for Photonics and 2D Materials, Moscow Institute of Physics and Technology, Dolgoprudny, Russian Federation; 4. Department of Materials Science, Lomonosov Moscow State University, Moscow, Russian Federation*

EOC-11. **Substrate Conformal Imprint Lithography Defined Synthetic Antiferromagnetic Nanoplatelets for Torque Related Applications.** *J. Li*[1], W. Sijtsma[1], M.A. Verschuuren[2], B. Koopmans[1] and R. Lavrijsen[1] *1. Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands; 2. SCIL Nanoimprint Solutions, Philips Group Innovation, Eindhoven, Netherlands*

EOC-12. **Inclusion of Field Dependent Magnetic Relaxation Time In Zero-Field-Cooled Magnetization Models Provides Better Characterization of Magnetic Nanoparticles.** *A.R. Chalifour*[1], S.L. FitzGerald[2], T.M. Crawford[2] and K. Livesey[1,3] *1. UCCS Biofrontiers Center and Department of Physics, University of Colorado - Colorado Springs, Colorado Springs, CO, United States; 2. Department of Physics and Astronomy, SmartState Center for Experimental Nanoscale Physics, University of South Carolina, Columbia, SC, United States; 3. School of Mathematical and Physical Sciences, The University of Newcastle, Callaghan, NSW, Australia*

EOC-13. **Modeling magnetic correlations in magnetite nanoparticle assemblines using x-ray magnetic scattering data.** *J. Rackham*[1], K. Chesnel[1], M. Transtrum[1], R. Harrison[2] and A. Reid[3] *1. Physics, Brigham Young University, Provo, UT, United States; 2. Chemistry, Brigham Young University, Provo, UT, United States; 3. SLAC National Accelerator Laboratory, Menlo Park, CA, United States*

ORAL SESSION

Session EOD
THIN FILMS I

Ricardo Ferreira, Co-Chair
INL - International Iberian Nanotechnology Laboratory, Braga, Portugal
Akinobu Yamaguchi, Co-Chair
University of Hyogo, Hyogo, Japan

EOD-01. **Local and Non-local Curvature-induced Chiral Effects in Nanomagnetism.** ***(Invited)*** *O.M. Volkov*[1] *1. Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany*

EOD-02. **Magnetization reversal and domain structure in epitaxial W/Co/Pt multilayers with various basic stack repetition number.** *S.K. Jena*[1,2], R. Islam[3], E. Milinska[1], M.M. Jakubowski[1], R. Roman Minikayev[1], S. Lewinska[1], A. Lynnyk[1], P. Aleszkiewicz[1], A. Pietruczik[1], C. Autieri[3,4] and A. Wawro[1] *1. Institute of Physics, Polish Academy of Sciences, Warsaw, Poland; 2. Jerzy Haber Institute of Catalysis and Surface Chemistry, Polish Academy of Sciences, Kraków, Poland; 3. International Research Centre for Interfacing Magnetism and Superconductivity with Topological Matter, Institute of Physics Polish Academy of Sciences, Warsaw, Poland; 4. Consiglio Nazionale delle Ricerche CNR-SPIN, Fisciano, Italy*

EOD-03. **Study of As-deposited and Annealed Ta/CoFeB/TaO_x Heterostructures Using X-Ray Photoelectron Spectroscopy.** *S. Syamlal*[1], S. Kalal[2], H. Perumal[1], D. Kumar[2], M. Gupta[2] and J. Sinha[1] *1. Department of Physics and Nanotechnology, SRM Institute of Science and Technology, Kattankulathur, Chennai, India; 2. UGC DAE Consortium for Scientific Research, University Campus, Khandwa Road, Indore, India*

EOD-04. **X-ray investigation of long-range antiferromagnetic ordering in FeRh.** *M.T. Grimes*[1,2], N. Gurung[1,3], H. Ueda[1], B.F. Pedrini[1], D. Porter[4], V. Scagnoli[1,3], L. Heyderman[1,3] and T. Thomson[2] *1. Paul Scherrer Institut, Villigen, Switzerland; 2. University of Manchester, Manchester, United Kingdom; 3. ETH Zurich, Zurich, Switzerland; 4. Diamond Light Source, Didcot, United Kingdom*

EOD-05. **Tuning Room Temperature Compensation in Synthetic Co/Gd Ferrimagnetic Quadlayers for Advanced Spintronics Devices.** ***(Invited)*** *T. Kools*[1], B. Koopmans[1] and R. Lavrijsen[1] *1. Department of Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands*

EOD-06. **Anisotropy-Induced Spin Reorientation in Chemically Modulated Amorphous Ferrimagnetic Films.** E. Kirk[1,2], *C. Bull*[3], S. Finizio[2], H. Sepehri-Amin[4], S. Wintz[2], A. Suszka[1,2], N. Bingham[1,2], P. Warnicke[2], K. Hono[4], P.W. Nutter[3], J. Raabe[2], G. Hrkac[5], T. Thomson[3] and L. Heyderman[1,2] *1. Laboratory for Mesoscopic Systems, Department of Materials, ETH Zurich, Zurich, Switzerland; 2. Paul Scherrer Institute, Switzerland, Switzerland; 3. Nano Engineering and Spintronic Technologies Group, Department of Computer Science, University of Manchester, Manchester, United Kingdom; 4. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science, Tsukuba, Japan; 5. College of Engineering, Mathematics and Physical Sciences, University of Exeter, Exeter, United Kingdom*

EOD-07. **Modified Magnetic Interface in Compositionally Modulated Ferrimagnetic $Fe_{1-x}Gd_x$ Multilayers.** *J.E. Shoup*[1], P. Quarterman[2], T. Charlton[3], B. Kirby[2], J.A. Borchers[2] and D. Arena[1] *1. Physics, University of South Florida, Tampa, FL, United States; 2. NIST, National Institute of Standards and Technology, Gaithersburg, MD, United States; 3. Spallation Neutron Source, Oak Ridge National Laboratory, Oak Ridge, TN, United States*

EOD-08. **Adjustable exchange springs in ferrimagnetic multilayers with stripe domain patterns visualized by X-ray vector tomography.** J. Hermosa[1,2], A. Hierro-Rodriguez[1,2], A. Sorrentino[3], J. Martín[1,2], L. Alvarez Prado[1,2], E. Pereiro[3], C. Quiros[1,2], *M. Velez*[1,2] and S. Ferrer[3] *1. Physics Dept., University of Oviedo, Oviedo, Spain; 2. CINN (CSIC-UO), El Entrego, Spain; 3. Alba Synchrotron, Cerdanyola del Vallès, Spain*

EOD-09. **Proximity induced magnetism in Pt layered with rare-earth:transition metal ferrimagnetic alloys.** *C. Swindells*[1,2], B. Nicholson[2], O.A. Inyang[2], Y. Choi[3], T. Hase[4] and D. Atkinson[2] *1. Department of Materials Science and Engineering, University of Sheffield, Sheffield, United Kingdom; 2. Department of Physics, Durham University, Durham, United Kingdom; 3. Advanced Photon Source, Argonne National Laboratory, Argonne, IL, United States; 4. Department of Physics, University of Warwick, Coventry, United Kingdom*

Session EOE
THIN FILMS II

Melissa Loving, Co-Chair
Northrop Grumman Corporation, College Park, MD, United States
Susanna Cardoso de Freitas, Co-Chair
INESC-MN, Lisbon, Portugal

EOE-01. **Controlling the Angle Between Magnetic Moments of Adjacent Ferromagnetic Layers.** ***(Invited)*** *E. Girt*[1], J. Besler[1], P. Omelchenko[1], Z. Nunn[1], S. Farhoosh[1], B. Heinrich[1], C. Abert[2] and D. Seuss[2] *1. Physics, Simon Fraser University, Burnaby, BC, Canada; 2. Physics, University of Vienna, Vienna, Austria*

EOE-02. **First principles study of perpendicular magnetic anisotropy in thin-film Co_2MnSi.** L. Stuelke[1], P. Kharel[2], P. Shand[1] and *P. Lukashev*[1] *1. Physics, University of Northern Iowa, Cedar Falls, IA, United States; 2. Physics, South Dakota State University, Brookings, SD, United States*

EOE-03. **Magnetocrystalline Anisotropy of Fe and FeCo Thin Films.** *J.N. Rychly*[1], H. Glowinski[1], J. Snarski-Adamski[1], P. Kuswik[1] and M. Werwinski[1] *1. Institute of Molecular Physics Polish Academy of Sciences, Poznan, Poland*

EOE-04. **Magnetostrictive properties of Co-Fe alloy epitaxial thin films with Co-rich composition.** *S. Noro*[1], M. Ohtake[1], T. Kawai[1], M. Futamoto[1], F. Kirino[2] and N. Inaba[3] *1. Faculty of Engineering, Yokohama National University, Yokohama, Japan; 2. Graduate School of Fine Arts, Tokyo University of the Arts, Tokyo, Japan; 3. Graduate School of Science and Engineering, Yamagata University, Yonezawa, Japan*

EOE-05. **Effect of site disorder on the resonant microwave absorption in $Co_2Fe_{0.5}Ti_{0.5}Si$ Heusler alloy thin films.** *M. Rahaman*[1], S.K. Sahoo[2], A. Haldar[2], M. Raja[3], S. Kaul[1] and S. Srinath[1] *1. School of Physics, University of Hyderabad, Hyderabad, India; 2. Department of Physics, Indian Institute of Technology Hyderabad, India; 3. Defence Metallurgical Research Laboratory, Hyderabad, India*

EOE-06. **Effect of Fullerence on magnetization relaxation and domain wall dynamics in a perpendicularly magnetized $Pt/Co/C_{60}/Pt$ system.** *P. Sharangi*[1], A. Mukhopadhyaya[2], S. Mallik[1], M. Ali[2] and S. Bedanta[1] *1. Physical Science, National Institute of Science Education and Research, Bhubaneswar, India; 2. Institute of Nano Science and Technology, Mohali, India*

EOE-07. **Drastic enhancement of the magnetic anisotropy of thin Co films by Fullerene overlayers.** *M. Benini*[3,1], A. Sahoo[1], R.K. Rakshit[2], M. Singh[2], A. Riminucci[1], P. Graziosi[1], G. Varvaro[4], S. Sanna[3], V.A. Dediu[1] and I. Bergenti[1] *1. ISMN, CNR, Bologna, Italy; 2. CSIR - National Physical Laboratory, New Delhi, India; 3. Physics and Astronomy, University of Bologna, Bologna, Italy; 4. Consiglio Nazionale delle Ricerche, Institute of Structure of Matter, Rome, Italy*

EOE-08. **Easy-cone magnetic anisotropy in tetragonally distorted $NiCo_2O_4$ epitaxial film.** *H. Koizumi*[1] and H. Yanagihara[1] *1. University of Tsukuba, Tsukuba, Japan*

EOE-09. **Structural and Magnetic Study of Single Nano-Hetero-Structured Co-Rich CoP Magnetic Thin Films.** *A. Samanta*[1,2] and S. Roy[1,2] *1. Micropower Devices/Systems and Nanomagnetics Group, Tyndall National Institute, Cork, Ireland; 2. Department of Physics, University College Cork, Cork, Ireland*

EOE-10. **γ′ phase formation in Fe-N thin films prepared on MgO(001) substrates by reactive sputtering.** *K. Imamura*[1], Y. Maeda[1], M. Ohtake[1], M. Futamoto[1], T. Kawai[1], F. Kirino[2] and N. Inaba[3] *1. Faculty of Engineering, Yokohama National University, Yokohama, Japan; 2. Graduate School of Fine Arts, Tokyo University of the Arts, Tokyo, Japan; 3. Graduate School of Science and Engineering, Yamagata University, Yonezawa, Japan*

EOE-11. **Flexible strain-free $La_{0.7}Sr_{0.3}MnO_3$ membranes.** *C. Zhang*[1], Z. Yin[1], J. Wang[1], F. Hu[1], S. Jirong[1] and B. Shen[1] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China*

EOE-12. **Withdrawn**

EOE-13. **TAFF and vortex state study of superconducting Fe (Te, Se) thin films deposited on YSZ substrates.** R. Kumar[1,2], A. Mitra[1] and *G.D. Varma*[1,3] *1. Physics, I.I.T. Roorkee, Roorkee, India; 2. Physics, I.I.T. Delhi, New Delhi, India; 3. Centre of Nanotechnology, I.I.T. Roorkee, Roorkee, India*

EOE-14. **Theoretical study of Yu-Shiba-Rusinov states and Shiba bands for Fe dimers and chains on Au/Nb(110).** *B. Nyári*[1], A. Lászlóffy[2], L. Szunyogh[1] and B. Ujfalussy[2] *1. Department of Theoretical Physics, Budapest University of Technology and Economics, Budapest, Hungary; 2. Wigner Research Centre for Physics, Budapest, Hungary*

ORAL SESSION

Session EOF
PATTERNED FILMS

Tom Thomson, Co-Chair
University of Manchester, Manchester, United Kingdom
Hikaru Nomura, Co-Chair
Osaka University, Toyonaka, Japan

EOF-01. **Magnetic noise measurements and demonstration of a field-induced magnetic monopole plasma in artificial spin ice.** ***(Invited)*** *M. Goryca*[1,2], X. Zhang[3], J. Li[2], A. Balk[2], J.D. Watts[4], C. Leighton[4], C. Nisoli[2], P. Schiffer[3] and S. Crooker[2] *1. University of Warsaw, Warsaw, Poland; 2. Los Alamos National Laboratory, Los Alamos, NM, United States; 3. Yale University, New Haven, CT, United States; 4. University of Minnesota, Minneapolis, MN, United States*

EOF-02. **Reconfigurable magnetism in a bi-stable nanomagnetic array: Artificial Spin-Vortex Ice.** ***(Invited)*** J.C. Gartside[1], A. Vanstone[1], K. Stenning[1], H.H. Holder[1], T. Dion[2], D.M. Arroo[3], H. Kurebayashi[2] and *W.R. Branford*[1] *1. Physics, Imperial College London, London, United Kingdom; 2. London Centre for Nanotechnology, University College London, London, United Kingdom; 3. Materials, Imperial College London, London, United Kingdom*

EOF-03. **Artificial Spin Ice with Y-shaped Nanomagnets.** *X. Zhang*[1], G. Fitez[1], J. Ramberger[2], C. Leighton[2] and P. Schiffer[1,3] *1. Applied Physics, Yale University, New Haven, CT, United States; 2. Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, United States; 3. Physics, Yale University, New Haven, CT, United States*

EOF-04. **Energetics of complex spin textures in LSMO artificial spin ice structures.** *D.Y. Sasaki*[1], R.V. Chopdekar[2], S.T. Retterer[3], D.Y. Jiang[4], J.K. Mason[1], M.S. Lee[1] and Y. Takamura[1] *1. Department of Materials Science and Engineering, University of California, Davis, Davis, CA, United States; 2. Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 3. Center for Nanophase Materials Science, Oak Ridge National Laboratory, Oak Ridge, TN, United States; 4. Department of Chemical Engineering, University of California, Davis, Davis, CA, United States*

EOF-05. **Role of Chiral Switching Barriers on Relaxation Kinetics in Artificial Square Ice.** *N. Leo*[1], M. Menniti[1], P. Vilalba Gonzales[1], M. Pancaldi[2] and P. Vavassori[1,3] *1. CIC nano GUNE BRTA, Donostia - San Sebastián, Spain; 2. Elettra Sincrotrone, Trieste, Italy; 3. Ikerbasque, Bilbao, Spain*

EOF-06. **Computational Study of Artificial Spin Systems Emulating the Random Bond Ising Model.** *J. Latessa*[1], Z. Huang[2], L. Schwiebert[1] and J. Sklenar[2] *1. Computer Science, Wayne State University, Detroit, MI, United States; 2. Physics, Wayne State University, Detroit, MI, United States*

EOF-07. **Static Magnetic Properties of Bi-component Nanotriangles in Hexagonal Arrangement Fabricated by Stepwise Nanosphere Lithography.** *H. Su*[1] and V. Ng[1] *1. Department of Electrical and Computer Engineering, National University of Singapore, Singapore*

EOF-08. **FORC Analysis of Nanopatterned vs. Unpatterned Films: Coercivity and Switching Mechanisms.** *A.D. Mshar*[1], D.D. Arnold[1], P.B. Visscher[2], R.K. Dumas[3] and S. Gupta[1] *1. Metallurgy and Materials Engineering, University of Alabama, Tuscaloosa, AL, United States; 2. Physics and Astronomy, University of Alabama, Tuscaloosa, AL, United States; 3. Quantum Design, San Diego, CA, United States*

EOF-09. **Development of Dy µ-disks for imaging of helimagnetic domains.** *I. de Moraes*[1], G. Beutier[2], L. Badie[1], D. Wermeille[3,4] and K. Dumesnil[1] *1. Institut Jean Lamour, Université de Lorraine-CNRS, Nancy, France; 2. SIMaP, CNRS-Grenoble INP-Université Grenoble Alpes, Grenoble, France; 3. XMaS, The UK Materials Science CRG, The ESRF, Grenoble, France; 4. Department of Physics, University of Liverpool, Liverpool, United Kingdom*

EOF-10. **Direct observation of a Dynamical Glass Transition in a Nanomagnetic Artificial Hopfield Network.** *M.D. Saccone*[1,2], F. Caravelli[1], K. Hofhuis[4,3], S. Parchenko[4,3], S. Dhuey[5], A. Kleibert[6], C. Nisoli[1] and A. Farhan[3] *1. T4, Los Alamos National Lab, Los Alamos, NM, United States; 2. CNLS, Los Alamos National Lab, Los Alamos, NM, United States; 3. Laboratory for Multiscale Materials Experiments (LMX), Paul Scherrer Institute, Villigen PSI, Switzerland; 4. Laboratory for Mesoscopic Systems, Department of Materials, ETH Zurich, Zurich, Switzerland; 5. Molecular Foundry, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 6. Swiss Light Source, Paul Scherrer Institute, Villigen PSI, Switzerland*

EOF-11. **Control of Macroscopic Properties by Tuning Microscopic Interactions in Artificial Ferroic Crystals.** *J. Lehmann*[1], A. Bortis[1], P.M. Derlet[2], C. Donnelly[3,2], N. Leo[4,2], L. Heyderman[2,1] and M. Fiebig[1] *1. Department of Materials, ETH Zurich, Zurich, Switzerland; 2. Paul Scherrer Institute, Villigen, Switzerland; 3. Cavendish Laboratory, University of Cambridge, Cambridge, United Kingdom; 4. CIC nanoGUNE BRTA, Donostia-San Sebastián, Spain*

EOF-12. **Local magnetization reversal in FeGa magnetic nanostructures.** *G. Pradhan*[1], F. Celegato[1], G. Barrera[1], M. Coisson[1] and P. Tiberto[1] *1. Istituto Nazionale di Ricerca Metrologica, Turin, Italy*

POSTER SESSION

Session EPA
STRUCTURED MATERIALS: NANOPARTICLES AND NANOWIRES
(Poster Session)

Paola Tiberto, Co-Chair
INRIM, Torino, Italy
Claudio Sangregorio, Co-Chair
ICCOM - Institute for OrganoMetallic Chemistry, Sesto Fiorentino, Italy

EPA-01. **Motion Synchronicity of a Micro-magnetic-particle Chain in a Rotating Field.** J. Cheng[1], C. Li[1] and *C. Chen*[1] *1. Mechanical Engineering Department, National Yang Ming Chiao Tung University, Hsin-Chu City, Taiwan*

EPA-02. **Magnetite Nanoparticles: A Detailed Analysis of the Low Temperature Magnetic Transitions.** P. Ortega[1], E.M. Jefremovas[1], R. Das[3,4], Z. Nemati[5], M. Phan[5], H. Srikanth[5], M. Fdez-Gubieda[7], A. Muela[2], C. Grüttner[6], *L. Fernández Barquín*[1] and J. Alonso[1] *1. CITIMAC, Universidad de Cantabria, Santander, Spain; 2. Inmunología, Microbiología y Parasitolgía, Universidad del País Vasco, Leioa, Spain; 3. Phenikaa University, Hanoi, Vietnam; 4. Phenikaa Research and Technology Institute, Hanoi, Vietnam; 5. Physics, University of South Florida, Tampa, FL, United States; 6. Micromod Partikeltechnologie GmbH, Rostock, Germany; 7. Electricidad y Electrónica, Universidad del País Vasco, Leioa, Spain*

EPA-03. **Coexistence of Verwey and Morin transitions and emerging magnetic phenomena in iron oxide core/shell nanorods.** *S.B. Attanayake*[1], A. Chanda[1], R. Das[2], M. Phan[1] and H. Srikanth[1] *1. Physics, University of South Florida, Tampa, FL, United States; 2. Phenikaa Research and Technology Institute, Phenikaa University, Hanoi, Vietnam*

EPA-04. **Magnetocaloric Effect and Ferromagnetic Shape Memory Behavior of Electrodeposited Nanowires Array.** *M. Varga*[1,2], L. Galdun[1], K. Saksl[3] and R. Varga[1] *1. Center for Progressive Materials, Technology and Innovation Park, P.J. Safarik University in Kosice, Košice, Slovakia; 2. Department of Condensed Matter Physics, Institute of Physics, Faculty of Sciences, UPJS, Kosice, Košice, Slovakia; 3. Institute of Materials Research, Slovak Academy of Sciences, Košice, Slovakia*

EPA-05. **Analysis of Exchange Bias training effect in Exchange coupled $LaFeO_3$/NiO nanocomposites.** *P. Sharma*[1] and R. Chatterjee[1] *1. Physics, Indian Institute of Technology Delhi, Hauz Khas, India*

EPA-06. **Bias field mediated tunable vertical hysteresis loop shift in $Ni_{80}Fe_{20}/SrRuO_3$ heterostructure.** *M. Bansal*[1], S. Giri[2], W. Li[2], J. L. Macmanus-Driscoll[2] and T.S. Maity[1,2] *1. Indian Institute of Science Education and Research Thiruvananthapuram (IISER TVM), Trivandrum, India; 2. University of Cambridge, Cambridge, United Kingdom*

EPA-07. **Withdrawn**

EPA-08. **Effect of the random interaction among magnetic moments on the magnetization in cobalt ferrite nanoparticles.** *C.R. Stein*[1], M.J. Stoffes Júnior[2], J. André-Filho[3], T.R. Covas[4] and P.C. Morais[3,5] *1. Physics, Federal Institute of Rondônia – IFRO, Porto Velho, Brazil; 2. Physics, Federal Institute of Paraná, Telêmoco Borba, Brazil; 3. Physics, University of Brasília – UnB, Brasília, Brazil; 4. Chemistry, Federal University of Goiás – UFG, Goiás, Brazil; 5. Catholic University of Brasília – UCB, Brasília, Brazil*

EPA-09. **Topological effect of interface texture on the exchange bias in ferro-antiferromagnetic thin films grown on hybrid seed layers.** *A.D. Talantsev*[1,2], A. Elzwawy[3], M. Bakhmetiev[1] and C. Kim[4] *1. Group of Magnetic and Spin Logical Processes and Devices, Institute of Problems of Chemical Physics, Moscow, Russian Federation; 2. Laboratory of Robotized Sensor Systems, Tyumen State University, Tyumen, Russian Federation; 3. Ceramics Department, Inorganic Chemistry Industries and Mineral Resources Division, National Research Centre, Cairo, Egypt; 4. Department of Emerging Materials Science, Daegu Gyeongbuk Institute of Science and Technology, Daegu, The Republic of Korea*

EPA-10. **Ferromagnetic resonance of superparamagnetic iron-oxide nanoparticles: quantification of dipole-dipole interactions.** *D.W. Slay*[1] and M. Charilaou[1] *1. Physics, University of Louisiana at Lafayette, Lafayette, LA, United States*

EPA-11. **Compositional dependence of magnetic properties of multiferroic $Ga_{2-x}Fe_xO_3$ nanoparticles.** T. Han[1], P. Tsai[1], *J. Wang*[1], J. Zou[1] and T. Chen[1] *1. Department of Applied Physics, National University of Kaohsiung, Kaohsiung, Taiwan*

EPA-12. **The Magnetic and Exchange Bias Properties of Phase Segregated $Mn_{2-x}Fe_xNi_{1.6}Ga_{0.4}$.** *B.L. Reese*[1], X. Liu[1], Y. Zhu[1], A. Pathak[2] and M. Khan[1] *1. Physics, Miami University - Oxford, Oxford, OH, United States; 2. Physics, Buffalo State College, Buffalo, NY, United States*

EPA-13. **Structural and magnetic study of Se-rich VSe_2 and $CrSe_2$ nanorods.** V. Bagga[1], R. Singh[2] and *D. Kaur*[1] *1. Physics, DAV University, Jalandhar, India; 2. Physics, IISER Bhopal, Bhopal, India*

EPA-14. **Self-Assembled Magnetite Nanoparticles above a hard drive: the effect of the Soft Underlayer and Changing the Separation of Reversed Magnetic Regions.** *J. Davidson*[1], A.R. Mohtasebzadeh[2], T. Crawford[2] and K. Livesey[3] *1. Department of Physics, University of Colorado Colorado Springs, Colorado Springs, CO, United States; 2. Smart State Center for Experimental Nanoscale Physics and Department of Physics and Astronomy, University of South Carolina, Columbia, SC, United States; 3. School of Mathematical and Physical Sciences, The University of Newcastle, Callaghan, NSW, Australia*

POSTER SESSION

Session EPB
THIN FILMS AND PATTERNED FILMS (Poster Session)

Joao Ventura, Co-Chair
IFIMUP-IN, Universidade do Porto, Porto, Portugal
Tomoyuki Ogawa, Co-Chair
Tohoku University, Sendai, Japan

EPB-01. **Investigation of the dynamics of twisted bilayer artificial spin ice structure.** *R.B. Popy*[1], J. Frank[1], G. Macauley[2] and R. Stamps[1] *1. Physics and Astronomy, University of Manitoba, Winnipeg, MB, Canada; 2. ETH Zurich-Paul Scherrer Institute, Villigen, Switzerland*

EPB-02. **Magnetic properties of high (110)-oriented Co-Fe-Ga alloy films prepared by chemical co-precipitatiton.** *Y. Ohno*[1], K. Yamada[1] and M. Shima[1] *1. Department of Materials Science and Processing, Graduate School of Natural Science and Technology, Gifu University, Gifu, Japan*

EPB-03. **Formation of Nickel Silicide and Appearance of Anomalous behavior of Magnetic Anisotropy in Nickel thin films.** *Z. Hussain*[1] *1. Department of Physics, Indian Institute of Technology, Bombay, Mumbai, India*

EPB-04. **Influence of growth conditions and ion bombardment on the perpendicular magnetic anisotropy in Co/Pd multilayered systems.** E. Sebastiani[1], *A. Parente*[1,2], G. Caballero[1], E. González[1,2], O. Rodriguez[1], M. Menghini[2] and A. Muñoz[1,2] *1. Universidad Complutense de Madrid, Madrid, Spain; 2. IMDEA Nanoscience, Madrid, Spain*

EPB-05. **Perpendicular Magnetic Anisotropy, Interlayer Exchange Coupling and Annealing Stability in Krypton-sputtered Pt/Co/Ir Synthetic Antiferromagnets.** *C. Taylor*[1,2], J. Eckert[1], M. Savadkoohi[3,2] and D.B. Gopman[2] *1. Physics, Harvey Mudd College, Claremont, CA, United States; 2. Materials Science and Engineering Division, National Institute of Standards and Technology, Gaithersburg, MD, United States; 3. Mechanical Engineering, University of the District of Columbia, Washington, DC, United States*

EPB-06. **Shape effect of cobalt nano-particles on magnetic properties of Co-SiO_2 nano-granular films.** *H. Aoki Kijima*[1], Y. Endo[1], T. Miyazaki[1], T. Nojima[1], K. Ikeda[2], N. Kobayashi[2], S. Ohnuma[1,2] and H. Masumoto[1] *1. Tohoku University, Sendai, Japan; 2. Research Institute for Electromagnetic Materials, Sendai, Japan*

EPB-07. **Identifying the Origin of Reduced Magnetization in Buried Thin Layers.** *S.E. Ilse*[1], G. Schütz[1] and E. Goering[1] *1. Modern Magnetic Systems, Max Planck Institute for Intelligent Systems, Stuttgart, Germany*

EPB-08. **Asymmetric modification of the magnetic proximity effect in Pt/Co/Pt trilayers by the insertion of a Ta buffer layer and a Cu spacer layer.** *A. Mukhopadhyay*[1], S.K. Vayalil[1], D. Graulich[2], I. Ahamed[3], S. Francoual[4], A. Kashyap[3], T. Kuschel[2] and P. Kumar[1] *1. Department of Physics, Indian Institute of Science, Bangalore, Bangalore, India; 2. Center for Spinelectronic Materials and Devices, Bielefeld University, Bielefeld, Germany; 3. School of Basic Sciences & School of Computing and Electrical Engineering, Indian Institute of Technology, Mandi, Mandi, India; 4. Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany*

EPB-09. **Magnetotransport of $SrIrO_3$ based symmetric heterostructure.** *A. Jaiswal*[1], R. Schneider[1], M. Le Tacon[1] and D. Fuchs[1] *1. Institute for Quantum Materials and Technologies, Karlsruhe Institute of Technology, Karlsruhe, Germany*

EPB-10. **Dzyaloshinskii-Moriya Interaction and exchange bias in epitaxial Pd/Co/CoO films.** *A. Kozlov*[1], G.S. Suslin[1], V. Shatilov[1], E. Tarasov[1,2], A. Davydenko[1] and I. Tkachenko[2] *1. Institute of Science-Intensive Technologies and Advanced Materials, Far Eastern Federal University, Vladivostok, Russian Federation; 2. Institute of Chemistry, Far Eastern Branch Russian Academy of Sciences, Vladivostok, Russian Federation*

EPB-11. **Interface dependence of NMR spectra of ^{59}Co with different molecular overlayers.** *M. Benini*[1,3], R.K. Rakshit[2], M. Singh[2], G. Allodi[4], S. Sanna[1], V.A. Dediu[3] and I. Bergenti[3] *1. Physics and Astronomy, University of Bologna, Bologna, Italy; 2. CSIR - National Physical Laboratory, New Delhi, India; 3. ISMN, CNR, Bologna, Italy; 4. Physics and Earth Sciences, University of Parma, Parma, Italy*

EPB-12. **Anisotropy Enhancement in Co / C_{60} Fullerene Bi-Layers Determined by Ferromagnetic Resonance.** J.E. Shoup[1], M.D. Rogers[2], O. Cespedes[2] and *D. Arena*[1] *1. Physics, University of South Florida, Tampa, FL, United States; 2. Condensed Matter, Universtiy of Leeds, Leeds, United Kingdom*

ORAL SESSION

Session FOA
MAGNETOCALORICS I

Tino Gottschall, Co-Chair
Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany
Jiazheng Hao, Co-Chair
Institute of High Energy Physics, Dongguan, China

FOA-01. **Developments in magnetocaloric devices.** ***(Invited)*** *N.J. Wilson*[1], P. Burdett[1], E. Lovell[1], R. Bettles[1] and D. Sanderson[1] *1. Camfridge Ltd., Cambridge, United Kingdom*

FOA-02. **Giant Magnetocaloric Effect in the $(Mn,Fe)_2(P,Si)$ System: From Bulk to Nano.** *F. Zhang*[1], C. Taake[2], l. Dugulan[1], l. Caron[2], N. Van Dijk[1] and E. Brück[1] *1. Faculty of Applied Sciences, Delft University of Technology, Delft, Netherlands; 2. Department of Physics, Bielefeld University, Bielefeld, Germany*

FOA-03. **Giant Magnetocaloric effect near room temperature in low-cost $(MnNiSi)_{1-x}(FeCoGa)_x$ alloys.** *S. Ghosh*[1], A. Ghosh[2], P. Sen[3] and K. Mandal[1] *1. S. N. Bose National Centre for Basic Sciences, Kolkata, India; 2. Saha Institute of Nuclear Physics, Kolkata, India; 3. Variable Energy Cyclotron Centre, Kolkata, India*

FOA-04. **The variation of Fe/Ni concentration and its effect on the magnetic and magnetocaloric properties of $Mn_{0.5}Fe_{0.5-x}Ni_{1+x}Si_{0.94}Al_{0.06}$.** *J.F. Casey*[1], B. Akintunde[2], R.C. Das[2], M. Khan[2] and A. Pathak[1] *1. Department of Physics, State University of New York, Buffalo State, Buffalo, NY, United States; 2. Department of Physics, Miami University, Oxford, OH, United States*

FOA-05. **Magnetocaloric Properties of a New Type of Magnetocaloric Materials - M_5XB_2 System.** *H. Ojiyed*[1] and E. Brück[1] *1. Applied Sciences, Delft University of Technology, Delft, Netherlands*

FOA-06. **Nonlinear influence of excess Mn on the magnetoelastic transition in $(Mn,Cr)_2Sb$.** *Q. Shen*[1], N. Van Dijk[1] and E. Brück[1] *1. Fundamental Aspects of Materials and Energy, TU Delft, Delft, Netherlands*

FOA-07. **Observing variations of the local iron moment and charge symmetries in $La(Fe,Si)_{13}$ for Mn- and rare earth doping through nuclear resonant spectroscopy.** *J. Lill*[1], B. Eggert[1], B. Beckmann[2], O.N. Miroshkina[1], I. Radulov[2], K. Skokov[2], R. Brand[1], K. Ollefs[1], M.E. Gruner[1], O. Gutfleisch[2] and H. Wende[1] *1. Faculty of Physics and Center for Nanointegration Duisburg-Essen (CENIDE), University of Duisburg-Essen, Duisburg, Germany; 2. Materials Science, TU Darmstadt, Darmstadt, Germany*

FOA-08. **Compositionally graded La-Fe-Si films.** *E. Fontana*[1], T. Devillers[1] and N. Dempsey[1] *1. Université Grenoble Alpes, CNRS, Grenoble INP, Institut Néel, Grenoble, France*

FOA-09. **Zero thermal expansion over a wide temperature interval in $LaFe_{10.4}Co_{1.0}Si_{1.4}$compound.** *H. Zhou*[1,2], F. Shen[3], J. Hao[3], F. Hu[1,2] and B. Shen[1,2] *1. Beijing National Laboratory for Condensed Matter Physics & State Key Laboratory of Magnetism, Institute of Physics, Beijing, China; 2. School of Physical Sciences, University of Chinese Academy of Sciences, Beijing, China; 3. Spallation Neutron Source Science Center, Dongguan, China*

FOA-10. **Unusual magnetic, magnetocaloric, and transport properties in phase-separated $LaFe_2Si$.** *A. Pathak*[1], J.F. Casey[1], T. Del Rose[4,5], Y. Mudryk[5], D.H. Ryan[2], N.A. Zarkevich[3], D. Johnson[4,5] and V. Pecharsky[4,5] *1. Department of Physics, State University of New York, Buffalo State, Buffalo, NY, United States; 2. Department of Physics, McGill University, Montreal, QC, Canada; 3. NASA Ames Research Center, Moffett Field, CA, United States; 4. Department of Materials Science and Engineering, Iowa State University, Ames, IA, United States; 5. Ames Laboratory, U. S. Department of Energy, Ames, IA, United States*

FOA-11. **Tuning conventional alloys towards the high-entropy space: thermomagnetic and magnetocaloric behavior.** *J. Law*[1], Á. Díaz-García[1], L.M. Moreno-Ramírez[1] and V. Franco[1] *1. Department of Condensed Matter Physics, ICMS-CSIC, University of Seville, Seville, Spain*

FOA-12. **Giant magnetocaloric effect in 2D cobalt hydroxide nanosheets.** *J. Mohapatra*[1], J. Elkins[1], M. Xing[1], H. Zeng[2] and J. Liu[1] *1. Department of Physics, The University of Texas at Arlington, Arlington, TX, United States; 2. Department of Physics, University at Buffalo, The State University of New York, Buffalo, NY, United States*

FOA-13. **A high-throughput search of magnetocaloric materials using first-principles calculations.** *R. Vieira*[1,2], O. Eriksson[1,3], T. Björkman[2] and H.C. Herper[1] *1. Uppsala University, Uppsala, Sweden; 2. Åbo Akademi, Turku, Finland; 3. Örebro University, Örebro, Sweden*

Session FOB
MAGNETOCALORICS II

Fengxia Hu, Co-Chair
Institute of Physics, Chinese Academy of Sciences, Beijing, China
Jia-Yan Law, Co-Chair
University of Seville, Seville, Spain

FOB-01. **All-d-metal full Heusler alloys for caloric and spintronic applications.** *V.G. de Paula*[1] and M.S. Reis[1] *1. Physics, UFF, Niterói, Brazil*

FOB-02. **The local magnetic moment and vibrational properties of Sn in NiMnSn-Heusler alloys during magnetostructural phase transition.** *B. Eggert*[1], B. Beckmann[2], J. Lill[1], T. Lojewski[1], S. Rauls[1], F. Scheibel[2], A. Taubel[2], O.N. Miroshkina[1], K. Ollefs[1], R. Brand[1], M. Hu[3], M.E. Gruner[1], O. Gutfleisch[2] and H. Wende[2] *1. Faculty of Physics and Center for Nanointegration Duisburg-Essen (CENIDE), University of Duisburg-Essen, Duisburg, Germany; 2. Materials Science, TU Darmstadt, Darmstadt, Germany; 3. Advanced Photon Source, Argonne National Laboratory, Lemont, IL, United States*

FOB-03. **Designing multicaloric materials for a novel multi-stimuli cooling cycle utilizing thermal hysteresis.** *A. Taubel*[1], F. Scheibel[1], L. Pfeuffer[1], B. Beckmann[1], W. Liu[1], J. Lemke[1], M. Töllner[1], T. Gottschall[2], S. Ener[1], K. Skokov[1] and O. Gutfleisch[1] *1. Materials Science, Technical University of Darmstadt, Darmstadt, Germany; 2. Dresden High Magnetic Field Lab, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany*

FOB-04. **Micromagnetic phase-field model for magnetostructural transitions in Heusler alloys.** *D. Ohmer*[1], M. Yi[2], O. Gutfleisch[1] and B. Xu[1] *1. Materials Science, TU Darmstadt, Darmstadt, Germany; 2. State Key Lab of Mechanics and Control of Mechanical Structures & Key Lab for Intelligent Nano Materials and Devices of Ministry of Education & College of Aerospace Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing, China*

FOB-05. **On the impact of additive manufacturing processes on the microstructure and magnetic properties of Co-Ni-Ga shape memory Heusler alloys.** *F. Scheibel*[1], C. Lauhoff[2], S. Riegg[1], P. Krooß[2], E. Bruder[1], E. Adabifiroozjaei[1], L. Molina-Luna[1], S. Böhm[3], T. Niendorf[2] and O. Gutfleisch[1] *1. Material Science, Technical University of Darmstadt, Darmstadt, Germany; 2. Institute of Materials Engineering, University of Kassel, Kassel, Germany; 3. Institute for Production Technologies and Logistics, University of Kassel, Kassel, Germany*

FOB-06. **Extrusion-Based 3D Printing of Magnetocaloric Structures.** *V. Sharma*[1], L. Balderson[2], R. Heo[3], C. Hunt[2], H. Zhao[1], R.L. Hadimani[1] and R. Barua[1] *1. Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 2. Department of Chemistry, Viriginia Commonwealth University, Richmond, VA, United States; 3. Department of Biomedical Engineering, Virginia Commonwealth University, Richmond, VA, United States*

FOB-07. **Multifunctional magnetic composites based in meta-magnetic shape memory alloys for 3D printing applications.** *D. Khanna*[1,2], V.S. Alarcos[1,2], V.R. Callardo[1,2] and J. Pérez-Landazábal[1,2] *1. Sciences, Public University Of Navarra, Pamplona, Spain; 2. Institute for Advanced Materials and Mathematics INAMAT2, Pamplona, Spain*

FOB-08. **Magnetocaloric Heusler Alloy Composites for Fused Deposition Modeling.** *Á. Díaz-García*[1], J. Law[1], L. Zrodowski[2], B. Moronczyk[3], R. Wroblewski[3] and V. Franco[1] *1. Condensed Matter Physics, University of Seville, Seville, Spain; 2. AMAZEMET, Warsaw, Poland; 3. Faculty of Materials Science and Engineering, Warsaw University of Technology, Warsaw, Poland*

FOB-09. **Temperature First Order Reversal Curves (TFORC) distributions and their relation to magnetocaloric performance.** *L.M. Moreno-Ramírez*[1] and V. Franco[1] *1. University of Seville, Seville, Spain*

FOB-10. **Enhanced Magnetocaloric Response of High-Entropy Alloy Microwires due to Induced Nanocrystals by Current Annealing.** *H. Yin*[1,2], J. Law[2], Y. Huang[1], H. Shen[1], S. Jiang[3], S. Guo[1] and V. Franco[2] *1. School of Materials Science and Engineering, Harbin Institute of Technology, Harbin, China; 2. Condensed Matter Physics, University of Seville, Sevilla, Spain; 3. Space Environment Simulation Research Infrastructure, Harbin Institute of Technology, Harbin, China*

FOB-11. **Shape Memory Effect in Ni_2FeGa Heusler Glass-Coating Microwire.** L. Frolova[1], M. Hennel[1], P. Sarkar[1], L. Nulandaya[1,3], L. Galdun[1,2], T. Ryba[2] and *R. Varga*[1,2] *1. Center of Progressive Materials, TIP UPJS, Kosice, Slovakia; 2. RVmagnetics, Kosice, Slovakia; 3. Inst. Exp. Phys., Slovak Academy of Sciences, Kosice, Slovakia*

FOB-12. **Microstructure and Properties of Melt-Spun Ni-Mn-Ga-Si Heusler Alloys for Magnetocaloric Application.** *P. Ari-Gur*[1], P. Bhale[1], R. Devaraj[1], Y. Ren[2], R. Noebe[3], A.S. Madiligama[4] and D. Qian[5] *1. Mechanical & Aerospace Engineering, Western Michigan University, Kalamazoo, MI, United States; 2. Argonne National Lab, Argonne, IL, United States; 3. NASA Glenn Research Center, Cleveland, OH, United States; 4. Penn State DuBois, DuBois, PA, United States; 5. University of Kentucky, Lexington, KY, United States*

Session FOC
MAGNETOELASTICS AND MAGNETOOPTICS

SN Piramanayagam, Co-Chair
Nanyang Technological University, Singapore, Singapore
Radhika Barua, Co-Chair
Virginia Commonwealth University, Richmond, VA, United States

FOC-01. **Conditions for effective coupling between surface acoustic waves and spin waves.** ***(Invited)*** N.K. Babu[1], A. Trzaskowska[1], P. Graczyk[2], G. Centala[1], S. Mieszczak[1], H. Glowinski[2], M. Zdunek[1], S. Mielcarek[1] and *J.W. Klos*[1] *1. ISQI, Faculty of Physics, Adam Mickiewicz University in Poznan, Poznan, Poland; 2. Institute of Molecular Physics, Polish Academy of Sciences, Poznan, Poland*

FOC-02. **Enhanced Magnetic Actuation of Magnetorheological Elastomers Using Nano-Magnetic Particles.** *L. Cestarollo*[1], S. Smolenski[3] and A. El-Ghazaly[2] *1. Materials Science and Engineering, Cornell University, Ithaca, NY, United States; 2. Electrical and Computer Engineering, Cornell University, Ithaca, NY, United States; 3. Physics, Bowdoin College, Brunswick, ME, United States*

FOC-03. **Enhanced Magnetostriction in Galfenol Through Dilute Ce-Doping.** *A. Baker*[1], H. Henderson[1], E.E. Moore[1], M. Islam[2], Y. Ijiri[3], M. Willard[2] and S.K. McCall[1] *1. LLNL, Livermore, CA, United States; 2. Case Western Reserve University, Cleveland, OH, United States; 3. Oberlin College and Conservatory, Oberlin, OH, United States*

FOC-04. **Evolution of magnetic order under high fields and external pressure in metallic Fe_3Ga_4.** *B. Wilfong*[1], V. Sharma[2], A. Fedorko[3], O. Bishop[2], X. Zhou[5], G.M. Stephen[4], A.L. Friedman[4], D. Heiman[3], R. Barua[2] and M.E. Jamer[1] *1. Physics, United States Naval Academy, Annapolis, MD, United States; 2. Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 3. Physics, Northeastern University, Boston, MA, United States; 4. Laboratory for Physical Science, College Park, MD, United States; 5. Argonne National Laboratory, Lemont, IL, United States*

FOC-05. **Large room-temperature reversible barocaloric effect in $MnCoGe_{0.99}In_{0.01}$ alloys at low pressure.** *Z. Yu*[1,2], F. Hu[1,2], J. Wang[1,2], S. Jirong[1,2] and B. Shen[1,2] *1. Beijing National Laboratory for Condensed Matter Physics & State Key Laboratory of Magnetism, Institute of Physics, Chinese Academy of Sciences, Beijing, China; 2. School of Physical Sciences, University of Chinese Academy of Sciences, Beijing, China*

FOC-06. **Hydrostatic Pressure Induced Giant Enhancement of the Solid-state Caloric Effect in the Rare-earth-based Giant Magnetocaloric Materials.** *J. Hao*[1], F. Hu[2], J. Wang[2], F. Shen[2], Z. Yu[2], H. Zhou[2], H. Wu[3], Q. Huang[3], J. Wang[2], J. He[4], L. He[2], S. Jirong[2] and B. Shen[2] *1. Spallation Neutron Source Science Center, Institute of High Energy Physics,Chinese Academy of Sciences, Dongguan, China; 2. Institute of Physics, Chinese Academy of Sciences, Beijing, China; 3. NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, United States; 4. Division of Functional Material Research, Central Iron and Steel Research Institute, Beijing, China*

FOC-07. **Magneto-mechanical properties of thin films on stretchable substrate measured by in situ MOKE.** *H. Ben Mahmoud*[1], D. Faurie[1], P. Renault[2] and F. Zighem[1] *1. LSPM-CNRS, Villetaneuse, France; 2. Pprime Institute, Poitiers, France*

FOC-08. **Wavelength-dependent magneto-optical Kerr effect in ferrimagnetic Mn_4N films.** *Y. He*[1], G. Atcheson[1], Z. Gercsi[1], J. Besbas[1], Z. Hu[1], K. Rode[1], P.S. Stamenov[1] and M. Coey[1] *1. Trinity College Dublin, Dublin, Ireland*

FOC-09. **Withdrawn**

FOC-10. **Observation of optical gyromagnetic properties in a magneto-plasmonic metamaterial.** *W. Yang*[1], H. Duan[2] and L. Bi[1] *1. National Engineering Center of Electromagnetic Radiation Control Materials, University of Electronic Science and Technology of China, Chengdu, China; 2. College of Mechanical and Vehicle Engineering, Hunan University, Changsha, China*

FOC-11. **Strain-controlled ferromagnetic domains induced by interfacial proximity to Mott insulator V_2O_3.** *A. Fraile Rodríguez*[1,2], I. Valmianski[3], J. Rodríguez-Álvarez[1,2], M. García del Muro[1,2], J. Ramirez[4], C. Wolowiec[3], F. Kronast[5], I.K. Schuller[3], A. Labarta[1,2] and X. Batlle[1,2] *1. Física de la Matèria Condensada, Universitat de Barcelona, Barcelona, Spain; 2. Institut de Nanociència i Nanotecnologia (IN2UB), Universitat de Barcelona, Barcelona, Spain; 3. Physics, University of California San Diego (UCSD), La Jolla, CA, United States; 4. Physics, Universidad de Los Andes, Bogotá, Colombia; 5. Helmholtz Zentrum Berlin, Berlin, Germany*

FOC-12. **Maximizing Strong Magnon-Phonon Coupling in a Single CoFe Nanomagnet.** *S. Kim*[1]*, W. Yang[1], C. Berk[2], S. Dhuey[3], S. Cabrini[3] and H. Schmidt[1] *1. School of Engineering, University of California Santa Cruz, Santa Cruz, CA, United States; 2. Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 3. Molecular Foundry, University of California Berkeley, Berkeley, CA, United States*

FOC-13. **Optimizing Magnetostriction in Fe-Ga-Zr Nanocrystalline Alloys.** *M. Islam*[1], R. Nandwana[1], J. Healy[1], J.K. Jaklich[1], B. Dong[1], M. Willard[1], A. Yu[2], Y. Ijiri[2], E.E. Moore[3] and S.K. McCall[3] *1. Department of Materials Science and Engineering, Case Western Reserve University, Cleveland, OH, United States; 2. Department of Physics and Astronomy, Oberlin College, Oberlin, OH, United States; 3. Materials Science Division, Lawrence Livermore Laboratory, Livermore, CA, United States*

FOC-14. **Harnessing Magnetic and Optical Properties in Atomically Thin Alloy Mo-WS_2/W-MoS_2 Semiconductors.** *M. Trinh*[1], Y.T. Pham[1], D. Zhou[2], M. Liu[2], V.O. Jimenez[1], S. Ambardar[1], D. Voronine[1], M. Terrones[2] and M. Phan[1] *1. Physics, University of South Florida, Tampa, FL, United States; 2. Materials Science and Engineering, Pennsylvania State University, University Park, PA, United States*

FOC-15. **Low-cost Processing of $AlFe_2B_2$ Feedstock Powders for Additive Manufacturing of Magnetocaloric Structures.** *A.R. Duong*[1], V. Sharma[1], M. Dey[2], S. Javaid[2], S. Gupta[2] and R. Barua[1] *1. Mechanical & Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 2. Mechanical Engineering, University of North Dakota, Grand Forks, ND, United States*

ORAL SESSION

Session FOD
THERMOELECTRICS AND MAGNETOCALORICS

Ramanathan Mahendiran, Co-Chair
National University of Singapore, Singapore
Sunil Nair, Co-Chair
IISER, Pune, India

FOD-01. **Exploring Transverse Thermoelectric Generation in Magnetic Systems Toward Applications.** ***(Invited)*** *W. Zhou*[1], K. Uchida[1] and Y. Sakuraba[1] *1. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science, Tsukuba, Japan*

FOD-02. **Flexible Thermoelectric Magnetic Switches based on Interconnected Nanowire Networks.** *T. da Câmara Santa Clara Gomes*[1], N. Marchal[1], F. Abreu Araujo[1] and L. Piraux[1] *1. Université Catholique de Louvain, Louvain-La-neuve, Belgium*

FOD-03. **Large magnetic entropy change in Nd_2In near the boiling temperature of natural gas.** *W. Liu*[1], F. Scheibel[1], T. Gottschall[2], E. Bykov[2], I. Dirba[1], K. Skokov[1] and O. Gutfleisch[1] *1. Materials Science, Technische Universität Darmstadt, Darmstadt, Germany; 2. High Magnetic Field Laboratory, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany*

FOD-04. **Tuning the magnetic and magnetocaloric properties in $Dy_6(Fe,Mn)X_2$ intermetallics (X=Sb, Te, Bi).** A. Herrero[1], *A. Oleaga*[1], I.R. Aseguinolaza[1], A.J. Garcia-Adeva[1], E. Apiñaniz[1], A.V. Garshev[2], V.O. Yapaskurt[3] and A.V. Morozkin[2] *1. Department of Applied Physics, University of the Basque Country, Bilbao, Spain; 2. Department of Chemistry, Moscow State University, Moscow, Russian Federation; 3. Geological Faculty, Moscow State University, Moscow, Russian Federation*

FOD-05. **Magnetocaloric properties of rare earths in pulsed magnetic fields.** *T. Gottschall*[1], E. Bykov[1], M. Kuz'min[2], A. Amirov[3,4], A. Aliev[3,4], A.M. Tishin[6], D. Schlagel[5], Y. Mudryk[5], V. Pecharsky[5], C. Salazar-Mejia[1], Y. Skourski[1] and J. Wosnitza[1] *1. Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 2. Aix-Marseille Université, Marseille, France; 3. Immanuel Kant Baltic Federal University, Kaliningrad, Russian Federation; 4. Amirkhanov Institute of Physics of Dagestan Federal Research Center, Makhachkala, Russian Federation; 5. Ames Laboratory, U.S. Department of Energy, Ames, IA, United States; 6. M.V. Lomonosov Moscow State University, Moscow, Russian Federation*

FOD-06. **Cryogenic magnetocaloric effect and thermomagnetic transitions in RE_6Co_2Ga (*RE* = Ho, Dy or Gd) compounds.** *D. Guo*[1,2], L.M. Moreno-Ramírez[2], C. Romero-Muñiz[3,4], Y. Zhang[1], J. Law[2], V. Franco[2], J. Wang[1] and Z. Ren[1] *1. School of Materials Science and Engineering, Shanghai University, Shanghai, China; 2. Departamento de Física de la Materia Condensada, Universidad de Sevilla, Sevilla, Spain; 3. Department of Physical, Chemical and Natural Systems, Universidad Pablo de Olavide, Sevilla, Spain; 4. Departamento de Física Aplicada I, Universidad de Sevilla, Sevilla, Spain*

FOD-07. **Large cryogenic magnetocaloric effect in $GdNi_{1-x}Co_x$ ($0 \le x \le 0.15$).** A. Biswas[1], T. Del Rose[1,2], *Y. Mudryk*[1] and V. Pecharsky[1,2] *1. Ames Laboratory of US DOE, Iowa State University, Ames, IA, United States; 2. Department of Materials Science and Engineering, Iowa State University, Ames, IA, United States*

POSTER SESSION

Session FPA
MAGNETOCALORICS III
(Poster Session)

R. Nirmala, Co-Chair
Indian Institute of Technology, Chennai, India
Franziska Scheibel, Co-Chair
Technische University Darmstadt, Darmstadt, Germany

FPA-01. **Enhanced refrigerant capacity in Mn_5Ge_3 melt spun ribbon near room temperature.** *L. Bachhraj*[1,3], Y. Bitla[2], A. Patra[2], R. Pant[1,3] and G. Basheed[1,3] *1. CSIR - National Physical Laboratory (NPL), Dr. K. S. Krishnan Marg, New Delhi, India; 2. Department of Physics, Central University of Rajasthan, Ajmer, India; 3. Academy of Scientific and Innovative Research (AcSIR), Ghaziabad, India*

FPA-02. **Improving the Magnetocaloric Response of Fe-rich $(Mn,Fe)_2(P,Si)$ Alloys.** *A. Kiecana*[1], I. Batashev[1], K. Kwakernaak[2], N. Van Dijk[1] and E. Brück[1] *1. Radiation, Science and Technology, TU Delft, Delft, Netherlands; 2. Materials Science and Engineering, TU Delft, Delft, Netherlands*

FPA-03. **Structural, magnetic and mechanical properties of Gd films.** *E. Fontana*[1], T. Devillers[1], M. Salaün[1], J. Motte[1], A. Bosseboeuf[2], M. Verdier[3] and N. Dempsey[1] *1. Université Grenoble Alpes, CNRS, Grenoble INP, Institut Néel, Grenoble, France; 2. C2N, CNRS, University Paris Saclay, Palaiseau, France; 3. University Grenoble Alpes, CNRS, Grenoble INP, SIMaP, Grenoble, France*

FPA-04. **Substitution effects on the magnetic phase transition and magnetocaloric effects in nanolaminated $AlFe_2B_2$ alloys.** S. Wang[1], P. Liu[1], *J. Chen*[2] and W. Cui[1] *1. Northeastern University, Shenyang, China; 2. State Key Laboratory of Transducer Technology, Aerospace Information Research Institute, CAS, Beijing, China*

FPA-05. **Study the magnetocaloric properties of shape-dependent nanostructured Gd_2O_3: Nanoplates, Nanorods, and Nanospheres.** *D. Neupane*[1], J.F. Casey[2], A. Pathak[2] and S. Mishra[1] *1. Physics and Materials Science, The University of Memphis, Memphis, TN, United States; 2. Physics, SUNY, Buffalo State, Buffalo, NY, United States*

FPA-06. **An Efficient Strategy for the Discovery of Novel Magnetocaloric Materials.** *I. Batashev*[1,2], G. de Wijs[2], E. Brück[1], N. Van Dijk[1] and M. Maschek[1] *1. TU Delft, Delft, Netherlands; 2. Radboud University, Nijmegen, Netherlands*

FPA-07. **Large plateau-like Magnetic entropy change in Sn doped Ni-Co-Mn-Ti all *d* metal Heusler alloy.** *S. Samanta*[1], S. Ghosh[1] and K. Mandal[1] *1. Magnetism Laboratory, Department of Condensed Matter Physics and Material Sciences, S. N. Bose National Centre for Basic Sciences, Kolkata, India*

FPA-08. **Magnetocaloric Effect in Fe-Mn based High Entropy Alloys.** *M. Ghahremani*[1] and A. Aslani[2] *1. Computer Science, Mathematics and Engineering, Shepherd University, Shepherdstown, WV, United States; 2. Electrical and Computer Engineering, George Washington University, Washington, DC, United States*

FPA-09. **Producing gadolinium free-standing and flexible films, with high quality surface for energy applications: the role of thickness and growth temperature.** *D. Nguyen Ba*[1,2], L. Becerra[2], M. Marangolo[2], M. Almanza[1] and M. LoBue[1] *1. Université Paris-Saclay, ENS Paris-Saclay, CNRS, SATIE, Gif-sur-Yvette, France; 2. Sorbonne Université, CNRS, Institut des NanoSciences de Paris, Paris, France*

FPA-10. **Magneto-structural phase transition in the *B*-site disordered $Sr(Fe_{1/2}Nb_{1/2})O_3$ perovskite: A combined dc magnetization and x-ray diffraction study.** *A. Kumar*[1,2], S. Nair[1] and D. Pandey[2] *1. Department of Physics, Indian Institute of Science Education and Research (IISER), Pune, India; 2. School of Materials Science and Technology, Indian Institute of Technology (BHU), Varanasi, India*

FPA-11. **Magnetocaloric Effect Study on Heusler Based Glass-Coated Microwires.** *M. Hennel*[1,2], L. Galdun[1] and R. Varga[1] *1. CPM-TIP, UPJS, Kosice, Slovakia; 2. UFV, PF UPJS, Kosice, Slovakia*

FPA-12. **Near room temperature magnetocaloric properties in Ni deficient $Mn_{0.525}Fe_{0.5}Ni_{0.975}Si_{0.95}Al_{0.05}$.** *M. Khan*[1], R.C. Das[1], B. Akintunde[1], J.F. Casey[2] and A. Pathak[2] *1. Physics, Miami University, Oxford, OH, United States; 2. Physics, SUNY Buffalo State College, Buffalo, OH, United States*

FPA-13. **Observation of large magnetocaloric effect in rare-earth substituted Gd_2O_3 nanorods.** *S. Hazarika*[1], A.V. Morozkin[2], G. Karanam[3], R. Nama[3], K. Pradeep[3] and R. Nirmala[1] *1. Physics, Indian Institute of Technology Madras, Chennai, India; 2. Chemistry, Moscow Lomonosov State University, Moscow, Russian Federation; 3. Department of Metallurgical and Materials Engineering, Indian Institute of Technology Madras, Chennai, India*

FPA-14. **Anomalous Magnetic Properties of $GdCrTiO_5$ Nanoparticles.** *B. Bharati*[1,2], P. Mohanty[2], C.J. Sheppard[2] and A.R. Prinsloo[2] *1. Spectrum Analytical Facility, University of Johannesburg, Johannesburg, South Africa; 2. Chromium Research Group, Department of Physics, University of Johannesburg, Johannesburg, South Africa*

FPA-15. **The Effect of Thickness Induced 3D Strain on Magnetocaloric Properties of Epitaxial $La_{0.8}Ca_{0.2}MnO_3$.** *W. Akram*[1], S. Giri[2], M. Bansal[1] and T.S. Maity[1] *1. School of Physics, Indian Institute of Science Education and Research Thiruvananthapuram, Thiruvananthapuram, India; 2. Physics Department, Kharagpur College, Kharagpur, Paschim Medinipur, India*

POSTER SESSION

Session FPB
MAGNETOCALORICS IV
(Poster Session)

Feiran Shen, Chair
Institute of Physics, Chinese Academy of Sciences, Beijing, China

FPB-01. **Modifications in the magnetocaloric effect owing to composition changes in $Gd_2In_{1-x}Ge_x$ ($0 \le x \le 0.2$) system of compounds.** *S. Sharma*[1] and P. Kumar[1] *1. Department of Applied Sciences, Indian Institute of Information Technology Allahabad, Prayagraj, India*

FPB-02. **Magnetocaloric effect in melt-spun rare earth intermetallic compound $ErAl_2$.** *M.M. Prusty*[1], C. Arout[4], A.V. Morozkin[5], G. Karanam[2], K. Pradeep[2], P. Paulose[3] and R. Nirmala[1] *1. Physics, Indian Institute of Technology Madras, Chennai, India; 2. Department of Metallurgical and Materials Engineering, Indian Institute of Technology Madras, Chennai, India; 3. Tata Institute of Fundamental Research, Mumbai, India; 4. Defence Metallurgical Research Laboratory, Hyderabad, India; 5. Chemistry, Moscow State University, Moscow, Russian Federation*

FPB-03. **Rare-earth chromite $DyCrO_3$: Structural and magnetic properties.** *E.T. Sibanda*[1], A.R. Prinsloo[1], C.J. Sheppard[1] and P. Mohanty[1] *1. Department of Physics, University of Johannesburg, Johannesburg, South Africa*

FPB-04. **Peculiar magnetic phase transition and large magnetocaloric effect in Nd_2In.** *A. Biswas*[1], A. Thayer[1,2], Y. Mudryk[1], I. Hlova[1], O. Dolotko[1] and V. Pecharsky[1,2] *1. Ames Laboratory, Ames, IA, United States; 2. Department of Materials Science and Engineering, Iowa State University, Ames, IA, United States*

FPB-05. **Magnetic and magnetocaloric properties of $Tm_xDy_{1-x}Al_2$ (x = 0.25, 0.50 and 0.75).** *P.D. Ribeiro*[1], B.D. Alho[1], R. Soares[1], E. Nobrega[1], V. de Sousa[1], P. von Ranke[1], Y. Mudryk[2] and V. Pecharsky[2,3] *1. Rio de Janeiro State University, Rio de Janeiro, Brazil; 2. Ames Laboratory, Ames, IA, United States; 3. Department of Materials Science and Engineering, Iowa State University, Ames, IA, United States*

FPB-06. **Investigating the structural and magnetic properties of $CoFeNi_{0.5}AlCr_x$.** M. Anis[1], R. Osman[1], J. Harris[1], A. Quinata-Nedelcos[2], Y. Azakli[1] and *N. Morley*[1] *1. University of Sheffield, Sheffield, United Kingdom; 2. New Model Institute for Technology and Engineering, Hereford, United Kingdom*

FPB-07. **A new spin structure and giant baromagnetic effect in $Mn_{0.87}Fe_{0.13}NiGe$ alloy.** *F. Shen*[1], H. Zhou[2], J. Hao[1], L. He[1], F. Hu[2], H. Wu[3], Q. Huang[3], S. Deng[1], T. Liang[1] and B. Shen[2] *1. Spallation Neutron Source Science Center, Dongguan, China; 2. Chinese Academy of Sciences, Institute of Physics, Beijing, China; 3. National Institute of Standards and Technology, NIST Center for Neutron Research, Gaithersburg, MD, United States*

POSTER SESSION

Session FPC
MAGNETOELASTICS II
(Poster Session)

Wei He, Chair
Institute of Physics, Chinese Academy of Sciences, Beijing, China

FPC-01. **Magnetostriction and heat-capacity study on the metamagnetic phase transition of $Dy_2In_{1-x}Al_x$ alloys.** S. Wang[1], P. Liu[1], *J. Chen*[2] and W. Cui[1] *1. Northeastern University, Shenyang, China; 2. State Key Laboratory of Transducer Technology, Aerospace Information Research Institute, CAS, Beijing, China*

FPC-02. **Analysis and Experimental Research on High Frequency Magnetic Properties of Different Magnetostrictive Materials Considering Temperature Effect.** *W. Huang*[1], Z. Xia[1] and P. Guo[1] *1. Hebei University of Technology, Tianjin, China*

FPC-03. **Controlling Piezoelectric Love Waves in Magnetoacoustic Devices.** *O. Latcham*[1], Y. Au[1], A. Shytov[1], S. Horsley[1] and V. Kruglyak[1] *1. University of Exeter, Exeter, United Kingdom*

FPC-04. **Theoretical investigation of the nonhysteretic first-order phase transition of Eu_2In through free-energy analysis.** *B.D. Alho*[1], P.D. Ribeiro[1], P. von Ranke[1], F. Guillou[2], Y. Mudryk[3] and V. Pecharsky[3,4] *1. DEQ, UERJ, Rio de Janeiro, Brazil; 2. Inner Mongolia Key Laboratory for Physics and Chemistry of Functional Materials, Inner Mongolia Normal University, Hohhot, China; 3. Ames Laboratory, Ames, IA, United States; 4. Iowa State University, Ames, IA, United States*

FPC-05. **Static and dynamic magneto-elastic sensing properties of Fe-Al alloy powder-epoxy composite patches.** *S. Na*[1], B. Yoo[2], D.J. Pines[2], J. Yoo[1] and N.J. Jones[1] *1. Physical Metallurgy and Fire Performance Branch, Naval Surface Warfare Center Carderock Division, Bethesda, MD, United States; 2. Aerospace Engineering, University of Maryland, College Park, MD, United States*

FPC-06. **Study of Effective Particle Shape-Dependent Magnetization Behavior of Soft Magnetic Polymeric Composites.** W.M. Kiarie[1], *D. Sitarski*[2] and D. Jiles[3,1] *1. Materials Science and Engineering, Iowa State University, Ames, IA, United States; 2. Aerospace Engineering, Iowa State University, Ames, IA, United States; 3. Electrical and Computer Engineering, Iowa State University, Ames, IA, United States*

POSTER SESSION

Session FPD
MAGNETOOPTICS II
(Poster Session)

Shawn Pollard, Chair
The University of Memphis, Memphis, TN, United States

FPD-01. **Circular Displacement Current induced Novel Magneto-Optical Effects in All-dielectric Metasurfaces.** *S. Xia*[1], D. Ignatyeva[2], Q. Liu[3], Y. Chen[3], J. Qin[1], V.I. Belotelov[2], M. Veis[4] and L. Bi[1] *1. University of Electronic Science and Technology of China, Chengdu, Chile; 2. Lomonosov Moscow State University, Leninskie Gory, Moscow, Russian Federation; 3. College of Mechanical and Vehicle Engineering National Engineering Research Center for High Efficiency Grinding, Hunan University Changsha, Hunan, China; 4. Charles University of Prague, Faculty of Mathematics and Physics, Prague, Czechia*

FPD-02. **Light diffraction in rotating magnetic emulsions in a magnetic field.** *C.V. Yerin*[1] and S.S. Belykh[1] *1. Physical and Technical Faculty, North-Caucasian Federal University, Stavropol, Russian Federation*

FPD-03. **Crystallization of magneto-optical bismuth terbium iron garnet films.** *K. Hayashi*[1], Q. Du[1], T. Fakhrul[1], J. Hu[1] and C. Ross[1] *1. Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States*

FPD-04. ***d*-zero Magnetism induced by Optical Excitation in Single Crystal $SrTiO_3$.** *L. Prendeville*[1], M. Coey[1], E. Roy[1] and J. Besbas[1] *1. School of Physics and CRANN, Trinity College Dublin, Dublin, Ireland*

FPD-05. **Proximity and Charge-Transfer Mediated Magnetism at Nickel Ferrite Interfaces with Graphene and Hexagonal Boron Nitride Monolayers.** *N. Schulz*[1], A. Chanda[1], G. Dutt[2], T. Sarkar[2], M. Kamalakar[3], M. Phan[1] and H. Srikanth[1] *1. Physics, University of South Florida, Tampa, FL, United States; 2. Department of Materials Science and Engineering, Uppsala University, Uppsala, Sweden; 3. Department of Physics and Astronomy, Uppsala University, Uppsala, Sweden*

FPD-06. **Magnetic proximity effect on the helimagnetic state of highly crystalline manganese phosphide films.** *N.W. Mudiyanselage*[1], D. DeTellem[1], R. Pokharel Madhogaria[1], A. Chanda[1], J.E. Shoup[1], A.T. Duong[2], M. Trinh[1], D. Arena[1], H. Srikanth[1], S. Witanachchi[1] and M. Phan[1] *1. Physics, University of South Florida, Tampa, FL, United States; 2. Phenikaa University, Hanoi, Vietnam*

FPD-07. **Ultra-short Pulsed Laser Ablation Process on a GO FeSi Electrical Single Sheet: Impact on the Static/Dynamic Magneto-mechanical Behavior and Optimization.** *E. Salloum*[1,2], O. Maloberti[1,2], S. Panier[2], M. Nesser[2], J. Dupuy[3], M. Lamblin[3] and J. Fortin[1,2] *1. R&D, Unilasalle, Amiens, France; 2. LTI, UPJV, Amiens, France; 3. Multitel, Mons, Belgium*

ORAL SESSION

Session GOA
SPINS IN 2D MATERIALS AND GRAPHENE

Josep Ingla-Aynés, Chair
Delft University of Technology, Delft, Netherlands

GOA-01. **Magnetic Ordering in 2D van der Waals Halide VI_3.** *K. Carva*[1], A. Koriki[1], J. Pospisil[1] and M. Kratochvílová[1] *1. DCMP, Charles University, Prague, Czechia*

GOA-02. **FeClBr: A Two-dimensional Intrinsic Magnetic Material with Spontaneous Valley Polarization at Room Temperature.** *R. Li*[1] and W. Mi[1] *1. Department of Applied Physics, Tianjin University, Tianjin, China*

GOA-03. **Two-dimensional Magnetic Order in Cr-based Transition Metal Chalcogenides.** *J. Phillips*[1] and V. Pardo Castro[1] *1. Física Aplicada, Universidade de Santiago de Compostela, Santiago de Compostela, Spain*

GOA-04. **Towards Large Scale Quantum Engineering of band structure Spin-Filtering in TMDC-based Magnetic Tunnel Junctions.** *V. Zatko*[1], S. Dubois[2], J. Peiro[1], M. Galbiati[1], M. Och[3], C. Mattevii[3], P. Brus[4], B. Servet[4], F. Godel[1], F. Petroff[1], A. Fert[1], J. Charlier[2], M. Martin[1], B. Dlubak[1] and P. Seneor[1] *1. Unité Mixte de Physique CNRS Thales Université Paris Saclay, Palaiseau, France; 2. Institute of Condensed Matter and Nanosciences (IMCN), Université Catholique de Louvain, Louvain-la-Neuve, Belgium; 3. Department of Materials, Imperial College, London, United Kingdom; 4. Thales Research and Technology, Palaiseau, France*

GOA-05. **Intrinsic spin-orbit torque in van der Waals magnetic materials.** *F. Xue*[1,2] and P.M. Haney[1] *1. Physical Measurement Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, United States; 2. Institute for Research in Electronics and Applied Physics, University of Maryland College Park, College Park, MD, United States*

GOA-06. **Emergent Ferromagnetism in Fe-doped WS_2 Monolayers at Room Temperature: Experimental and First-Principles Studies.** *Y.T. Pham*[1], K.C. Nguyen[1], T. Zhang[2], M. Liu[2], V.O. Jimenez[1], V. Kalappattil[1], F. Zhang[2], K. Fujisawa[2], A. Elias[2], M. Trinh[1], I.I. Oleynik[1], M. Terrones[2] and M. Phan[1] *1. Physics, University of South Florida, Tampa, FL, United States; 2. The Pennsylvania State University, University Park, PA, United States*

GOA-07. **Magnetic proximity effects induced in MoS_2 by Fe(001)/MgO(*n*MLs) bilayers: A first-principles study.** *P. Marcon*[1,2], D. Li[1,2], Y. Lu[3,4], R. Arras[1,2] and L. Calmels[1,2] *1. CEMES-CNRS, Toulouse, France; 2. Université de Toulouse, Toulouse, France; 3. Institut Jean Lamour, Nancy, France; 4. Université de Lorraine, Nancy, France*

GOA-08. **Large Exchange Splitting in Monolayer Graphene Magnetized by an Antiferromagnet.** ***(Invited)*** Y. Wu[6], *G. Yin*[1,6], L. Pan[6], A.J. Grutter[2], Q. Pan[6], A. Lee[6], D.A. Gilbert[3], J.A. Borchers[2], W. Ratcliff II[2], A. Li[4], X. Han[4] and K.L. Wang[6,5] *1. Department of Physics, Georgetown University, Washington, DC, United States; 2. NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, United States; 3. Department of Materials Science and Engineering, University of Tennessee, Knoxville, TN, United States; 4. Department of Physics and Astronomy, Beijing University of Technology, Beijing, China; 5. Department of Physics and Astronomy, University of California, Los Angeles, CA, United States; 6. Department of Electrical and Computer Engineering, University of California, Los Angeles, CA, United States*

GOA-09. **Electrical control of spin-orbit coupling-induced spin precession and spin-to-charge conversion in graphene proximitized by WSe_2.** *F. Herling*[1], J. Ingla-Aynes[1], S. Chenattukuzhiyil[1], N. Ontoso[1], J. Fabian[2], L.E. Hueso[1,3] and F. Casanova[1,3] *1. Nanodevices, CIC nanoGUNE BRTA, San Sebastian-Donostia, Spain; 2. Institute for Theoretical Physics, University of Regensburg, Regensburg, Germany; 3. IKERBASQUE, Basque Foundation for Science, Bilbao, Spain*

GOA-10. **Tuning Spin-Orbit Coupling in Graphene-based Heterostructure with Cobalt Dusting Effects.** *T. Do*[1,2], S. Lee[3], Y. Jang[4], C. Hwang[3] and T. Kim[1,2] *1. IBS Center for Quantum Nanoscience, Ewha Womans University, Seoul, The Republic of Korea; 2. Department of Physics, Ewha Womans University, Seoul, The Republic of Korea; 3. Korea Research Institute of Standards and Science, Daejeon, The Republic of Korea; 4. Department of Physics, Incheon National University, Incheon, The Republic of Korea*

GOA-11. **Engineering functional graphene-based systems by thermally assisted metal intercalation.** *I. Arnay*[1], A. Gudín[1], A. Guedeja-Marron Gil[1,2], J.M. Diez[1,3], A. Anadón[1], R. Guerrero[1], M. Varela[2], J. Camarero[1,3], R. Miranda[1,3] and P. Perna[1] *1. IMDEA Nanociencia, Madrid, Spain; 2. Departamento de Física de Materiales & Instituto Pluridisciplinar, Universidad Complutense de Madrid, Madrid, Spain; 3. Departamento de Física de la Materia Condensada, Instituto Nicolás Cabrera, and Condensed Matter Physics Center (IFIMAC), Universidad Autónoma de Madrid, Madrid, Spain*

GOA-12. **Substitutional Magnetic Dopants in Graphene: Kondo Screening or RKKY Interactions.** *R. Villarreal*[1], P. Lin[1], H. Bana[1], Z. Zarkua[1], V. Hendriks[1], M. Nair[2], K. Verguts[1,3], S. Brems[3], S. de Gendt[1,3], S. Achilli[4], G. Fratesi[4], M. Auge[5], F. Junge[5], H. Hofsäss[5], S. De Feyter[1], G. Di Santo[6], L. Petaccia[6], M. Nissen[7], I. Baev[7], M. Martins[7] and L.M. Pereira[1] *1. KU Leuven, Leuven, Belgium; 2. CUNY Advanced Science Research Centre, New York, NY, United States; 3. imec vzw, Leuven, Belgium; 4. Università degli Studi di Milano, Milano, Italy; 5. University of Göttingen, Göttingen, Germany; 6. Elettra Sincrotrone Trieste, Trieste, Italy; 7. Universität Hamburg, Hamburg, Germany*

ORAL SESSION

Session GOB
SPINS AND SPIN ORBIT TORQUE IN TOPOLOGICAL INSULATORS

Olaf Van't Erve, Chair
Naval Research Laboratory, Washington, DC, United States

GOB-01. **Room-temperature ferromagnetism in 2D vdW Fe_3GeTe_2 and its potential application.** H. Wang[1] and *T. Nie*[1] *1. Beihang University, Beijing, China*

GOB-02. **Large bulk spin-orbit torques in van der Waals ferromagnet Fe_3GeTe_2.** *K. Lee*[1,2], F. Martin[2], M. Schmitt[2], A. Liedtke[2], A. Shahee[2], H.T. Simensen[3], T. Scholz[4], T. Saunderson[2], D. Go[5], M. Gradhand[6], Y. Mokrousov[5], T. Denneulin[7], A. Kovacs[7], B. Lotsch[4], A. Brataas[3] and M. Kläui[2] *1. Division of Display and Semiconductor Physics, Korea University, Sejong, The Republic of Korea; 2. Institute of Physics, Johannes Gutenberg University Mainz, Mainz, Germany; 3. Centre for quantum spintronics, Norwegian University of Science and Technology, Trondheim, Norway; 4. Max Planck Institute for Solid State Research, Stuttgart, Germany; 5. Peter Grünberg Institut and Institute for Advanced Simulation, Forschungszentrum Jülich and JARA, Juelich, Germany; 6. University of Bristol, Bristol, United Kingdom; 7. Ernst Ruska-Centre for Microscopy and Spectroscopy with Electrons and Peter Grünberg Institute, Forschungszentrum Jülich, Juelich, Germany*

GOB-03. **Spin-orbit torques in topological insulator - two-dimensional ferromagnet heterostructures.** *T. Guillet*[1], G. Gentile[2], R. Galceran[1], J.F. Sierra[1], M. Costache[1], M. Jamet[2], F. Bonell[2] and S.O. Valenzuela[1] *1. Catalan Institute of Nanoscience and Nanotechnology (ICN2), Bellaterra, Barcelona, Spain; 2. IRIG-SPINTEC, CEA Grenoble, Grenoble, France*

GOB-04. **Spin-Orbit Torques in Topological-Insulator/2D-Ferromagnet Heterostructures.** *N. Figueiredo Prestes*[1], P. Tsipas[2], P. Pappas[2], J. Peiro[1], V. Zatko[1], S. Krishnia[1], N. Reyren[1], H. Jaffrès[1], A. Dimoulas[2] and J. George[1] *1. Unité Mixte de Physique, CNRS, Thales, Université Paris-Saclay, Palaiseau, France; 2. NCSR DEMOKRITOS, Athens, Greece*

GOB-05. **Bilinear magnetoresistance in HgTe topological insulator: opposite signs at opposite surfaces demonstrated by gate control.** F. Yu[1], J. Li[1], P. Noël[1], M. Cosset-Chéneau[1], P. Ballet[1], T. Meunier[1], J. Attané[1], A. Fert[2] and *L. Vila*[1] *1. Spintec, Université Grenoble Alpes, Grenoble, France; 2. UMphy, Palsaiseau, France*

GOB-06. **Topological and trivial gaps in graphene-based van der Waals heterostructures under strain and disorder.** *L. Oroszlany*[1,2] *1. Department of Physics of Complex Systems, Eötvös Loránd University, Budapest, Hungary; 2. Lendulet Topology and Correlation Research Grou, MTA-BME, Budapest, Hungary*

GOB-07. **Observation of a superconducting state of possible Ising-type topological superconductor $FeTe_{0.6}Se_{0.4}$, equipping ferromagnetic electrodes with perpendicular magnetic anisotropy.** *K. Ohnishi*[1], S. Gupta[2], S. Kasahara[3], Y. Kasahara[4], Y. Matsuda[4], E. Shigematsu[1], R. Ohshima[1], Y. Ando[1] and M. Shiraishi[1] *1. Electronic Science and Engineering, Kyoto Univ., Kyoto City, Japan; 2. School of Physics and Astronomy, Univ. Leeds, Leeds, United Kingdom; 3. Research Institute for Interdisciplinary Science, Okayama Univ., Okayama City, Japan; 4. Physics, Kyoto Univ., Kyoto city, Japan*

GOB-08. **Laser induced spin injection to [GeTe / Sb_2Te_3] supperlattice through a TbFeCo film.** *S. Sumi*[1], H. Awano[1] and J. Tominaga[2] *1. Toyota Technological Institute, Nagoya, Japan; 2. National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan*

GOB-09. **Large Spin to Charge Conversion Efficiency in Polycrystalline Topological Insulator.** *B.B. Singh*[1], S.K. Jena[1], M. Samanta[2], K. Biswas[2] and S. Bedanta[1] *1. Physics, NISER, Bhubaneswar, India; 2. JNCASR, Bangalore, India*

GOB-10. **Elemental Topological Dirac Semimetal α-Sn with High Quantum Mobility.** *L. Anh*[1,2], K. Takase[1], T. Chiba[3], Y. Kota[3], K. Takiguchi[1] and M. Tanaka[1,4] *1. Department of Electrical Engineering and Information Systems, The university of Tokyo, Tokyo, Japan; 2. PRESTO, Japan Science and Technology Agency, Saitama, Japan; 3. National Institute of Technology, Fukushima College, Fukushima, Japan; 4. Center for Spintronics Research Network, The University of Tokyo, Tokyo, Japan*

GOB-11. **Room Temperature Spin Transport in Cd_3As_2.** *G.M. Stephen*[1], A.T. Hanbicki[1], T. Schumann[2], J.T. Robinson[3], M. Goyal[2], S. Stemmer[2] and A.L. Friedman[1] *1. Laboratory for Physical Sciences, College Park, MD, United States; 2. Materials Department, University of California, Santa Barbara, Santa Babara, CA, United States; 3. Electronics Science and Technology, Naval Research Laboratory, Washington, DC, United States*

ORAL SESSION

Session GOC
SKYRMION DYNAMICS

Sadamichi Maekawa, Chair
RIKEN, Wako, Japan

GOC-01. **Electrical manipulation of skyrmioninc textures in chiral magnets.** ***(Invited)*** *H. Du*[1], J. Tang[1], W. Wang[2], D. Song[2], J. Zang[3] and M. Tian[1] *1. High Magnetic Field Laboratory, Chinese Academy of Sciences, Hefei, China; 2. Institutes of Physical Science and Information Technology, Anhui University, Hefei, China; 3. Department of Physics and Astronomy, University of New Hampshire, Durham, Durham, NH, United States*

GOC-02. **Current-driven single-skyrmion motion in a room-temperature chiral-lattice magnet.** *L. Peng*[1], K. Karube[1], Y. Taguchi[1], N. Nagaosa[1,2], Y. Tokura[1,2] and X. Yu[1] *1. RIKEN Center for Emergent Matter Science (CEMS), Wako, Japan; 2. Department of Applied Physics, University of Tokyo, Tokyo, Japan*

GOC-03. **Current-driven deformation of isolated magnetic skyrmions.** *F.S. Yasin*[1], K. Karube[1], A. Kikkawa[1], Y. Taguchi[1], Y. Tokura[1,2] and X. Yu[1] *1. Center for Emergent Matter Science (CEMS), RIKEN, Wako, Japan; 2. Applied Physics, University of Tokyo, Bunkyo, Japan*

GOC-04. **Deterministic Bloch Chirality in Interfacial DMI Systems: An Astroid for DW Switching.** *M.D. Kitcher*[1], N. Pandey[1], M.D. Graef[1] and V.M. Sokalski[1] *1. Materials Science & Engineering, Carnegie Mellon University, Pittsburgh, PA, United States*

GOC-05. **Scaling law of current-driven magnetic skyrmion creep.** *M. Song*[1], M. Yoo[1], S. Yang[2], M. Park[1] and K. Kim[1] *1. Korea Advanced Institute of Science and Technology, Daejeon, The Republic of Korea; 2. Korea Research Institute of Standards and Science, Daejeon, The Republic of Korea*

GOC-06. **Helitronics: Electrical Manipulation of Helimagnetic Phases.** *J. Masell*[1,2] and N. Nagaosa[1,3] *1. CEMS, RIKEN, Wako, Japan; 2. TFP, Karlsruhe Institute of Technology, Karlsruhe, Germany; 3. Department of Applied Physics, University of Tokyo, Tokyo, Japan*

GOC-07. **Withdrawn**

GOC-08. **Evolution of Novel Chiral Spin Textures in Fe/Gd Based Multilayers.** *W. Parker*[1], S. Montoya[2], E. Fullerton[3], R. Moraski[1] and B. McMorran[1] *1. Physics, University of Oregon, Eugene, OR, United States; 2. Naval Information Warfare Systems Command, San Diego, CA, United States; 3. Center for Memory and Recording Research, University of California San Diego, La Jolla, CA, United States*

GOC-09. **Angle-dependent Magnetotransport Properties of Skyrmions in Amorphous Fe/Gd Multilayers.** *S. Montoya*[1], M. Lubarda[3], V. Lomakin[2,1] and E. Fullerton[1,2] *1. Center for Memory and Recording Research, University of California San Diego, La Jolla, CA, United States; 2. Electrical and Computer Engineering, University of California San Diego, La Jolla, CA, United States; 3. Mechanical and Aerospace Engineering, University of California San Diego, La Jolla, CA, United States*

GOC-10. **Sub-monolayer capping induced switching of magnetic chirality.** *G. Chen*[1], C. Ophus[2], R. Lo Conte[3,4], R. Wiesendanger[3], A. Schmid[2] and K. Liu[1] *1. Georgetown University, Washington, DC, United States; 2. Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 3. University of Hamburg, Hamburg, Germany; 4. University of California, Berkeley, Berkeley, CA, United States*

GOC-11. **Frustration of coupled helices in weakly perpendicular magnetic thin films.** *S.A. Morley*[1], J. Li[2], R. Tumbleson[1,3], S. Montoya[4], E. Fullerton[4], D. Lederman[3], S.D. Kevan[1] and S. Roy[1] *1. Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 2. Department of Materials Science and Engineering, University of California Davis, Davis, CA, United States; 3. Department of Physics, University of California Santa Cruz, Santa Cruz, CA, United States; 4. Center for Memory and Recording Research, University of California San Diego, La Jolla, CA, United States*

GOC-12. **Electrical discrimination of magnetic-skyrmion chirality via spin-orbit and -transfer torques in a branched nanowire.** *K. Yamada*[1], A. Hirohata[2] and Y. Nakatani[3] *1. Chemistry and Biomolecular Science, Gifu University, Gifu City, Japan; 2. Department of Electronic Engineering, University of York, York, United Kingdom; 3. Graduate School of Informatics and Engineering, University of Electro-Communications, Chofu, Japan*

GOC-13. **Gauge Theory Applied to Chiral Magnets.** *P. Ansalone*[1], E.S. Olivetti[1], A. Magni[1], A. Sola[1] and V. Basso[1] *1. Istituto Nazionale di Ricerca Metrologica, Torino, Italy*

ORAL SESSION

Session GOD
SKYRMION STABILIZATION, VOLTAGE CONTROL, AND NEUROMORPHIC APPLICATIONS

Jan Masell, Chair
RIKEN, Wako, Japan

GOD-01. **Skyrmion Creation and Annihilation by Electric Current Vorticity.** ***(Invited)*** *J. Fujimoto*[1], H. Funaki[2], W. Koshibae[2], M. Matsuo[3,2] and S. Maekawa[2,3] *1. University of Tokyo, Hongo, Japan; 2. RIKEN Center for Emergent Matter Science, Wako, Japan; 3. Kavli Institute for Theoretical Sciences, University of Chinese Academy of Sciences, Beijing, China*

GOD-02. **Fast current-induced domain wall and skyrmion motion in a nearly compensated amorphous ferrimagnetic alloy.** *Y. Quessab*[1], J. Xu[1] and A. Kent[1] *1. Department of Physics, New York University, New York, NY, United States*

GOD-03. **Stabilizing skyrmions in ferri/ferromagnet heterostructure towards efficient motion.** *S. Mallick*[1], H. Damas[2], M. Hehn[2], N. Reyren[1], K. Bouzehouane[1], J. Rojas-Sanchez[2], V. Cros[1] and A. Fert[1] *1. Unité Mixte de Physique, CNRS, Thales, Université Paris-Saclay, Palaiseau, France; 2. Université de Lorraine, CNRS, Institute Jean Lamour, Nancy, France*

GOD-04. **Controlling generation position and motion path of magnetic skyrmions.** M. Im[1], S. Je[2], *H. Han*[1], D. Jung[3], S. Jeong[3], A. Soumyanarayanan4[4], D. Vasudevan[1] and K. Lee[3] *1. Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 2. Chonnam National University, Chonnam, The Republic of Korea; 3. UNIST, Ulsan, The Republic of Korea; 4. Institute of Materials Research and Engineering, Singapore, Singapore*

GOD-05. **Confinement and Protection of Magnetic Skyrmions.** *K. Ohara*[1], X. Zhang[1], Y. Chen[1], Z. Wei[3], Y. Ma[4], J. Xia[2], Y. Zhou[2] and X. Liu[1] *1. Department of Electrical and Computer Engineering, Shinshu University, Nagano, Japan; 2. School of Science and Engineering, The Chinese University of Hong Kong, Shenzhen, China; 3. School of Mechanics and Engineering Science, Zhengzhou University, Zhengzhou, China; 4. College of Optical Science and Engineering, Zhejiang University, Hangzhou, China*

GOD-06. **Creation and Annihilation of Magnetic Skyrmions in Confined Geometry using Voltage Control of Magnetic Anisotropy.** M. Rajib[1], D. Bhattacharya[1], B. Dai[2], S.A. Razavi[2], H. Wu[2], K.L. Wang[2] and *J. Atulasimha*[1] *1. Mechanical and Nuclear Engineering Department, Virginia Commonwealth University, Richmond, VA, United States; 2. Electrical and Computer Engineering, University of California, Los Angeles, CA, United States*

GOD-07. **Get skyrmions back on track : Suppressing skyrmion Hall angle by material engineering or gate voltage.** *C. Fillion*[1], R. Kumar[1,2], J. Fischer[1], L. Monnier[1], M. Belmeguenai[4], A. Fassatoui[3], S. Pizzini[3], L. Ranno[3], S. Auffret[1], I. Joumard[1], O. Boulle[1], G. Gaudin[1], L.D. Buda-Prejbeanu[1], C. Baraduc[1] and H. Béa[1] *1. SPINTEC, Grenoble, France; 2. Antaios, Meylan, France; 3. Institut NEEL, Grenoble, France; 4. Université Sorbonne Paris Nord, LSPM, CNRS, Villetaneuse, France*

GOD-08. **Nucleating Magnetic Skyrmions in Gr/Co/Pt Patterned Nanodots via the Voltage Controlled Magnetic Anisotropy.** *P. Olleros-Rodríguez*[1], O. Chubykalo-Fesenko[2] and P. Perna[1] *1. IMDEA Nanoscience Institute, Madrid, Spain; 2. Materials Science Institute of Madrid (ICMM), Madrid, Spain*

GOD-09. **Creation and Annihilation of Skyrmions for Neuromorphic Computing Applications.** A.H. Lone[1], A. Ganguly[2], D. Divyanshu[1], *S. Amara*[1] and H. Fariborzi[1] *1. CEMSE, King Abdullah University of Science and Technology, Jeddah, Saudi Arabia; 2. Khalifa University of Science and Technology, Abu Dhabi, United Arab Emirates*

GOD-10. **Nanoscale room-temperature skyrmionic synapse for deep spiking neural networks.** *R. Chen*[1], C. Li[1], Y. Li[1], J.J. Miles[1], G. Indiveri[2], S. Furber[1], V.F. Pavlidis[1] and C. Moutafis[1] *1. The University of Manchester, Manchester, United Kingdom; 2. University of Zurich and ETH Zurich, Zurich, Switzerland*

GOD-11. **Topology-Driven Spin-Diode Reversal Effect: a New Degree of Freedom Towards Vortex-Based Spin-Torque Oscillators in Neuromorphic Computing.** *C. Chopin*[1], L. Martins[2], L. Benetti[2], S. de Wergifosse[1], A. Jenkins[2], R. Ferreira[2] and F. Abreu Araujo[1] *1. IMCN / BSMA, Université Catholique de Louvain, Louvain-la-Neuve, Belgium; 2. International Iberian Nanotechnology Laboratory, Braga, Portugal*

GOD-12. **Skyrmionic Interconnect Device.** *R. Chen*[1], Y. Li[1], V.F. Pavlidis[1] and C. Moutafis[1] *1. The University of Manchester, Manchester, United Kingdom*

Session GOE
SKYRMIONS IN ANTIFERROMAGNETS AND FERRIMAGNETS

Steven Bennett, Chair
U.S. Naval Research Laboratory, Washington, DC, United States

GOE-01. **Phase Coexistence and Transitions between Anti- and Ferromagnetic States in a Synthetic Antiferromagnet.** *C.E. Barker*[1], C. Barton[2], E. Haltz[1], O. Kazakova[2], T. Moore[1] and C. Marrows[1] *1. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom; 2. Quantum Technologies, National Physical Laboratory, Teddington, United Kingdom*

GOE-02. **Observation of skyrmion and stripe domain phases in synthetic antiferromagnetic coupled multilayer systems using Lorentz transmission electron microscopy.** *K. Fallon*[1], D. McGrouther[1], A. Silinga[1], E. Haltz[2], C.E. Barker[2], T. Moore[2], G. Burnell[2], C. Marrows[2] and S. McVitie[1] *1. SUPA, School of Physics and Astronomy, University of Glasgow, Glasgow, United Kingdom; 2. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom*

GOE-03. **Synthetic antiferromagnet with built-in planar asymmetry.** *K. Wang*[1] and G. Xiao[1] *1. Department of Physics, Brown University, Providence, RI, United States*

GOE-04. **Skyrmions in synthetic antiferromagnets and their nucleation using electrical current and ultrafast laser illumination.** R. Juge[1], N. Sisodia[1], J. Urrestarazu Larrañaga[1], Q. Zhang[1], V. Pham[1], R. Belkhou[2], N. Mille[2], N. Novakovic[3], F. Kronast[3], S. Wintz[6], M. Weigand[3], J. Gräfe[6], M. Belmeguenai[4], L.D. Buda-Prejbeanu[1], L. Ranno[5], G. Gaudin[1] and *O. Boulle*[1] *1. Spintec, Grenoble, France; 2. Soleil Synchrotron, Saint-Aubin, France; 3. Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany; 4. Laboratoire des Sciences des Procedés et des Matériaux, Université Paris 13, Villetaneuse, France; 5. Institut Néel, Grenoble, France; 6. Max Planck Institute for Intelligent Systems, Stuttgart, Germany*

GOE-05. **Magnetic states in a triangular antiferromagnet – a model for $CoNb_3S_6$.** *O. Heinonen*[1], R.A. Heinonen[2], I. Martin[1] and H. Park[1] *1. Argonne National Laboratory, Lemont, IL, United States; 2. University of Rome Tor Vergata, Rome, Italy*

GOE-06. **Direct imaging of chiral domain walls in ferrimagnetic alloys.** *B. Seng*[1,2], D. Schönke[1], J. Yeste[1], R.M. Reeve[1], N. Kerber[1], J. Bello[2], F. Kammerbauer[1], M. Bhukta[1], N. Bergeard[3], T. Ferté[3], C. Boeglin[3], F. Radu[4], R. Abrudan[4], T. Kachel[4], D. Lacour[2], S. Mangin[2], M. Hehn[2] and M. Kläui[1] *1. Institut für Physik, Johannes Gutenberg Universität, Mainz, Germany; 2. Institut Jean Lamour, Nancy, France; 3. Institut de Physique et Chimie des Matériaux de Strasbourg, Strasbourg, France; 4. Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany*

GOE-07. **Role of rare-earth element on the Dzyaloshinskii-Moriya Interaction in amorphous ferrimagnets.** *D.H. Suzuki*[1] and G.S. Beach[1] *1. Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States*

GOE-08. **Robust and tunable rare-earth ferrimagnetic systems for dense, small and high-mobility skyrmions at room temperature.** T. Dutta[2], A. Mandru[2], O. Yildirim[2] and *H.J. Hug*[2,1] *1. University of Basel, Basel, Switzerland; 2. Empa, Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland*

ORAL SESSION

Session GOF
SKYRMIONS, ANTISKYRMIONS AND TOPOLOGY

Max Hirschberger, Chair
The University of Tokyo, Tokyo, Japan

GOF-01. **Dipolar-Stabilized First and Second-Order Antiskyrmions in Ferrimagnetic Multilayers.** *M. Heigl*[1], S. Koraltan[2], M. Vanatka[3], C. Abert[2,4], M. Urbanek[3], D. Suess[2,4] and M. Albrecht[1] *1. Institute of Physics, University of Augsburg, Augsburg, Germany; 2. Faculty of Physics, University of Vienna, Vienna, Austria; 3. CEITEC BUT, Brno University of Technology, Brno, Czechia; 4. Research Platform MMM Mathematics - Magnetism - Materials, University of Vienna, Vienna, Austria*

GOF-02. **Real-space imaging of topological skyrmions/ antiskyrmions and their transformation.** *L. Peng*[1], R. Takagi[1,2], K. Karube[1], W. Koshibae[1], J. Masell[1], K. Shibata[1,3], F. Kagawa[1,4], S. Seki[1,2], N. Nagaosa[1,4], Y. Tokura[1,4], Y. Taguchi[1] and X. Yu[1] *1. RIKEN Center for Emergent Matter Science (CEMS), Wako, Japan; 2. Department of Applied Physics and Institute of Engineering Innovation, University of Tokyo, Tokyo, Japan; 3. Institute of Industrial Science, University of Tokyo, Tokyo, Japan; 4. Department of Applied Physics, University of Tokyo, Tokyo, Japan*

GOF-03. **Coexistence of topologically distinct spin textures.** *B. Göbel*[1], J. Jena[2], I. Mertig[1] and S. Parkin[2] *1. Martin-Luther-Universität Halle-Wittenberg, Halle, Germany; 2. Max-Planck-Institut für Mikrostrukturphysik, Halle, Germany*

GOF-04. **Observation of Increasing Topological Hall Resistivity with Temperature in Skyrmion Hosting Magnetic Multilayers with $[Pt|CoB|Ir]_{xN}$ Structure.** *A.J. Huxtable*[1], J. Gretton[1], M. Ali[1], G. Burnell[1], C. Marrows[1] and K. Zeissler[1] *1. University of Leeds, Leeds, United Kingdom*

GOF-05. **Study on the topology-relevant stability of vortex-antivortex pair in a permalloy element.** *H. Han*[1,2], S. Lee[2], M. Jung[3], N. Kim[2], W. Chao[1], Y. Yu[4], J. Hong[3], K. Lee[2] and M. Im[1] *1. Center for X-ray Optics, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 2. Department of Materials Science and Engineering, Ulsan National Institute of Science and Engineering (UNIST), Ulsan, The Republic of Korea; 3. Department of Emerging Materials Science, Daegu Gyeongbuk Institute of Science and Technology (DGIST), Daegu, The Republic of Korea; 4. Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, United States*

GOF-06. **Interplay of Weyl electronic structure with long-range magnetic structure in Co_xFe_{1-x} Ge alloy.** *B. Sabir*[1] and J.D. Gayles[1] *1. Physics, University of South Florida, Tampa, FL, United States*

GOF-07. **Hall Effect and Topological Phase Transition in Exchange-Coupled Nanomagnets.** *A. Ullah*[1,2], B. Balasubramanian[1,2], R. Pahari[1,2], D. Sellmyer[1,2] and R. Skomski[1,2] *1. Physics and Astronomy, University of Nebraska Lincoln, Lincoln, NE, United States; 2. Nebraska Center for Materials and Nanoscience, Lincoln, NE, United States*

GOF-08. **Topological Hall effect in epitaxial thin films of tetragonal Heusler compounds.** *A. Markou*[1], P. Swekis[1], J.D. Gayles[2], S. Parkin[3] and C. Felser[1] *1. Solid State Chemistry, Max Planck Institute for Chemical Physics of Solids, Dresden, Germany; 2. Physics, University of South Florida, Tampa, FL, United States; 3. NISE, Max Planck Institute for Microstructure Physics, Halle, Germany*

GOF-09. **Withdrawn**

GOF-10. **Direct control of antiferromagnetic topological textures at room temperature.** *H. Jani*[1] *1. Physics, National University of Singapore, Singapore*

GOF-11. **Magnetic Skyrmions Probed by Spin-polarized Scanning Tunneling Microscopy: Topology Imprinted on the Charge Current and Spin Transfer Torque.** *K. Palotas*[1,2], L. Rozsa[3] and L. Szunyogh[2] *1. Wigner Research Center for Physics, Budapest, Hungary; 2. Budapest University of Technology and Economics, Budapest, Hungary; 3. University of Konstanz, Konstanz, Germany*

GOF-12. **Reversible writing/deleting of magnetic skyrmions through hydrogen adsorption/desorption.** *G. Chen*[1,3], C. Ophus[2], A. Quintana[1], H. Kwon[4], C. Won[5], H. Ding[7], Y. Wu[6], A. Schmid[2] and K. Liu[1,3] *1. Georgetown University, Washington, DC, United States; 2. Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 3. University of California, Davis, Davis, CA, United States; 4. Korea Institute of Science and Technology, Seoul, The Republic of Korea; 5. Kyung Hee University, Seoul, The Republic of Korea; 6. Fudan University, Shanghai, China; 7. Nanjing University, Nanjing, China*

Session GOG
FUNDAMENTAL INTERACTIONS IN SKYRMIONS AND NOVEL PHASES

Aisha Aqeel, Chair
University of Munich, Munich, Germany

GOG-01. **First-principles study of exchange interactions at the atomic scale.** *S. Haldar*[1] and S. Heinze[1] *1. Institute of Theoretical Physics and Astrophysics, University of Kiel, Kiel, Germany*

GOG-02. **Ruderman-Kittel-Kasuya-Yosida-type interfacial Dzyaloshinskii-Moriya interaction in heavy metal/ ferromagnet heterostructures.** *T. Kim*[1], I. Cha[1], Y. Kim[1], G. Kim[1], A. Stashkevich[2], Y. Roussigné[2], M. Belmeguenai[2], S.M. Chérif[2], A.S. Samardak[3] and Y. Kim[1] *1. Korea University, Seoul, The Republic of Korea; 2. Université Sorbonne Paris Nord, Villetaneuse, France; 3. Far Eastern Federal University, Vladivostok, Russian Federation*

GOG-03. **Phase transitions of skyrmion lattices.** J. Zazvorka[2], F. Dittrich[3], Y. Ge[3], N. Kerber[3], K. Raab[3], T.B. Winkler[3], K. Litzius[1], M. Veis[2], *P. Virnau*[3] and M. Kläui[3] *1. MPI for Intelligent Systems, Stuttgart, Germany; 2. Physics, Charles University, Prague, Czechia; 3. Physics, University of Mainz, Mainz, Germany*

GOG-04. **Theory of Néel-Bloch transition for compact magnetic skyrmions.** *A. Bernand-Mantel*[1], C. Muratov[2] and T. Simon[3] *1. Laboratoire de Physique et Chimie des Nano-Objets, Université de Toulouse-CNRS, Toulouse, France; 2. Department of Mathematical Sciences, NJIT, Newark, NJ, United States; 3. Institute for Applied Mathematics, University of Bonn, Bonn, Germany*

GOG-05. **Resonant tender x-ray scattering from Ru-4d conduction electrons in the skyrmion host $Gd_3Ru_4Al_{12}$.** *M. Hirschberger*[6,5], L. Spitz[1,5], J. Bertinshaw[2], S. Francoual[3], B. Keimer[2], T. Arima[4,5] and Y. Tokura[6,5] *1. Paul-Scherrer-Insitut, Villigen, Switzerland; 2. Max-Planck-Institute for Solid State Research, Stuttgart, Germany; 3. Deutsches Elektronen-Synchrotron (DESY), Hamburg, Germany; 4. Department of Advanced Materials Science, The University of Tokyo, Kashiwa, Japan; 5. Center for Emergent Matter Science, RIKEN, Wako, Japan; 6. Quantum-Phase Electronics Center and Department of Applied Physics, The University of Tokyo, Bunkyo, Japan*

GOG-06. **A New Magnetic Intermediate State, "*B-Phase*", in MnSi Probed by Small-Angle Neutron Scattering and Muon Spin Rotation.** M. Pardo-Sainz[3], M. Ohkuma[2], S. Iwasaki[4], K. Ohishi[1], M. Mito[2], J. Akimitsu[4], Y. Cai[5,6], K. Kojima[5,6], Y. Kousaka[4,7], K. Inoue[8], V. Laliena[9] and *J. Campo*[3,8] *1. Neutron Science and Technology Center, Comprehensive Research Organization for Science and Society (CROSS), Ibaraki, Japan; 2. Graduate School of Engineering, Kyushu Institute of Technology, Kitakyushu, Japan; 3. Aragonese Nanoscience and Materials Institute, Spanish National Research Council (CSIC), Zaragoza, Spain; 4. Research Institute for Interdisciplinary Science, Okayama University, Okayama, Japan; 5. TRIUMF, Vancouver, BC, Canada; 6. University of British Columbia, Vancouver, BC, Canada; 7. Department of Physics and Electronics, Osaka Prefecture University, Osaka, Japan; 8. Chirality Research Center, Hiroshima University, Higashihiroshima, Japan; 9. Applied Mathematics Department, University of Zaragoza, Zaragoza, Spain*

GOG-07. **Non-Collinear Three-Dimensional Textures In Magnetic Multilayers: Hatching of Skyrmionic Cocoons.** *M. Grelier*[1], F. Ajejas[1], Y. Sassi[1], K. Bouzehouane[1], A. Vecchiola[1], S. Collin[1], A. Fert[1], V. Cros[1] and N. Reyren[1] *1. Unité Mixte de Physique CNRS/Thales, Palaiseau, France*

GOG-08. **Brillouin Light Scattering from Quantized Spin Waves in Nanowires with Antisymmetric Exchange Interactions.** J. Xu[1], G.A. Riley[2,3], J.M. Shaw[2], H. Nembach[2,4] and *A. Kent*[1] *1. Department of Physics, New York University, New York, NY, United States; 2. Quantum Electromagnetics Division, NIST, Boulder, CO, United States; 3. Center for Memory and Recording Research, University of California – San Diego, La Jolla, CA, United States; 4. Department of Physics, University of Colorado, Boulder, CO, United States*

GOG-09. **The 3-dimensional depth profile of magnetic skyrmion tubes.** *N.C. Liyanage*[1], L.J. Quigley[2], S. Montoya[5], N. Tang[2], T. Liu[6], M.R. Fitzsimmons[1,7], S.K. Sinha[3], R. Kawakami[6], J.A. Borchers[4], E. Fullerton[5], B.B. Maranville[4], L. Debeer-Schmitt[7], A.J. Grutter[4] and D.A. Gilbert[2,1] *1. Department of Physics and Astronomy, University of Tennessee, Knoxville, TN, United States; 2. Materials Science Department, University of Tennessee, Knoxville, TN, United States; 3. Physics Department, University of California, San Diego, CA, United States; 4. NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, United States; 5. CMRR, University of California, San Diego, CA, United States; 6. The Department of Physics, The Ohio State University, Columbus, OH, United States; 7. Neutron Scattering Division, Oak Ridge National Laboratory, Oak Ridge, TN, United States*

GOG-10. **Unravelling the details of the magnetic texture of skyrmion tubes in three dimensions.** S. Schneider[1], D. Wolf[2], A. Lubk[2] and *B.F. Rellinghaus*[1] *1. Dresden Center for Nanoanalysis, TU Dresden, Dresden, Germany; 2. IFW Dresden, Dresden, Germany*

GOG-11. **Tuning of the Dzyaloshinskii-Moriya interaction by He^+ ion irradiation.** *H. Nembach*[1,2], E. Jué[1,2], K. Potzger[3], J. Fassbender[3], T. Silva[1] and J.M. Shaw[1] *1. NIST, Boulder, CO, United States; 2. Department of Physics, University of Colorado, Boulder, CO, United States; 3. Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden - Rossendorf, Dresden, Germany*

GOG-12. **Influence of Ga+ Ion Irradiation on Skyrmion Motion.** *V. Ahrens*[1], L. Gnoli[2], D. Giuliano[2], S. Mendisch[1,3], M. Kiechle[1], F. Riente[2] and M. Becherer[1] *1. Department of Electrical and Computer Engineering, Technical University of Munich, Munich, Germany; 2. Department of Electronics and Telecommunications, Politecnico di Torino, Torino, Italy; 3. Infineon Technologies AG, Neubiberg, Germany*

GOG-13. **Facilitating Skyrmion Nucleation in Ir/Co/Pt Multilayers With Ga^+ Ion Irradiation.** *M.C. de Jong*[1], B.H. Smit[1], M.J. Meijer[1], J. Lucassen[1], J. van Liempt[1], H. Swagten[1], B. Koopmans[1] and R. Lavrijsen[1] *1. Department of Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands*

ORAL SESSION

Session GOH
SPIN DYNAMICS
Jun'ichi Ieda, Chair
Japan Atomic Energy Agency, Tokai, Japan

GOH-01. **Latest Strides on Magnon-Phonon Coupling (acoustic): Spin current, Nonreciprocity and Nonlinearity.** ***(Invited)*** *J. Puebla*[1], M. Xu[2,1], Y. Hwang[2,1], K. Yamamoto[3,1], S. Maekawa[1,4] and Y. Otani[2,1] *1. Center for Emergent Matter Science, RIKEN, Wako, Japan; 2. Institute for Solid State Physics, University of Tokyo, Kashiwa, Japan; 3. Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan; 4. Kavli Institute for Theoretical Sciences, University of Chinese Academy of Sciences, Beijing, China*

GOH-02. **Broadband terahertz spectroscopy of anisotropic magnetoresistance reveals intrinsic contributions.** *L. Nadvornik*[1,2], M. Borchert[2,3], L. Brandt[4], R. Schlitz[5], K. de Mare[6,7], K. Výborný[6], I. Mertig[4], G. Jakob[8], M. Kläui[8], S.T. Goennenwein[5], M. Wolf[3], G. Woltersdorf[4] and T. Kampfrath[2,3] *1. Faculty of Mathematics and Physics, Charles University, Prague, Czechia; 2. Department of Physics, Freie Universität Berlin, Berlin, Germany; 3. Department of Physical Chemistry, Fritz Haber Institute of the Max Planck Society, Berlin, Germany; 4. Institut für Physik, Martin-Luther-Universität, Halle, Germany; 5. Institut für Festkörper- und Materialphysik, Technische Universität Dresden, Dresden, Germany; 6. Institute of Physics, Academy of Sciences of the Czech Republic, v.v.i., Prague, Czechia; 7. Department of Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands; 8. Institut für Physik, Johannes Gutenberg-Universität Mainz, Mainz, Germany*

GOH-03. **Magnetically switchable ultrafast spintronic THz emitters.** *M. Fix*[1], R. Schneider[2], J. Bensmann[2], S. Michaelis de Vasconcellos[2], R. Bratschitsch[2] and M. Albrecht[1] *1. Institute of Physics, University of Augsburg, Augsburg, Germany; 2. Institute of Physics and Center for Nanotechnology, University of Münster, Münster, Germany*

GOH-04. **Ferromagnetic resonance as a spectroscopic tool for investigating topological surface states.** *L. Pietanesi*[1], R. Diaz-Pardo[1], T. Mayer[2], D. Bougeard[2], M. Kronseder[2] and C.H. Back[1] *1. Technical University Munich, Munich, Germany; 2. University of Regensburg, Regensburg, Germany*

GOH-05. **Simultaneous electrical and optical detections of spin-torque ferromagnetic resonance.** *Y. Shiota*[1], R. Hisatomi[1], T. Moriyama[1] and T. Ono[1] *1. Institute for Chemical Research, Kyoto University, Uji, Japan*

GOH-06. **DC voltage generated by the unidirectional spin Hall magnetoresistance in the spin torque ferromagnetic resonance spectrum.** *M. Aoki*[1], Y. Ando[1], E. Shigematsu[1], R. Ohshima[1], T. Shinjo[1] and M. Shiraishi[1] *1. Electronic Science and Engineering, Kyoto University, Kyoto, Japan*

GOH-07. **Alloying effect on auto-oscillation properties of $W_{100-x}Ta_x$/CoFeB/MgO spin Hall nano-oscillators.** *N. Behera*[1], H. Fulara[1], M. Zahedinejad[1], A. Houshang[1] and J. Åkerman[1] *1. Physics, University of Gothenburg, Gothenburg, Sweden*

GOH-08. **Study of Spin-Orbit Interactions and Multilevel Switching in Co/Pt/Co trilayer.** *K. Grochot*[1,2], P. Ogrodnik[1,3], L. Karwacki[4,5], P. Mazalski[6,7], J. Kanak[1], J. Checinski[1], W. Skowronski[1], S. Zietek[1] and T. Stobiecki[1,2] *1. Institute of Electronics, AGH University of Science and Technology, Cracow, Poland; 2. Faculty of Physics and Applied Computer Science, AGH University of Science and Technology, Cracow, Poland; 3. Faculty of Physics, Warsaw University of Technology, Warsaw, Poland; 4. Institute for Theoretical Physics, Utrecht University, Utrecht, Netherlands; 5. Institute of Molecular Physics, Polish Academy of Sciences, Poznan, Poland; 6. Jerzy Haber Institute of Catalysis and Surface Chemistry of the Polish Academy of Sciences, Cracow, Poland; 7. Faculty of Physics, University of Bialystok, Bialystok, Poland*

GOH-09. **Field-free Spin-orbit Torque-driven Multistate Switching of Canted GdCo Moments.** *C. Hsu*[1], M. Alawein[1], S. Sayed[1,2] and S. Salahuddin[1,2] *1. Electrical Engineering and Computer Science, University of California, Berkeley, Berkeley, CA, United States; 2. Materials Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA, United States*

GOH-10. **Low power spin-orbit torque magnetization switching in all-sputtered BiSb topological insulator / perpendicularly magnetized CoPt / MgO multilayers on Si substrate.** *F. Tuo*[1], N.H. Khang[1] and P. Nam Hai[1,2] *1. Tokyo Institute of Technology, Tokyo, Japan; 2. The University of Tokyo, Tokyo, Japan*

GOH-11. **Development of an Optically-Gated Fe/*n*-GaAs Spin-Polarised Transistor.** J. Kim[1], M. Samiepour[2], E. Jackson[2], J. Ryu[3], D. Iizasa[3], T. Saito[3], M. Kohda[3,4], J. Nitta[3,4], H. Beere[5], D. Ritchie[5] and *A. Hirohata*[2] *1. Physics, University of York, York, United Kingdom; 2. Electronic Engineering, University of York, York, United Kingdom; 3. Materials Science, Tohoku University, Sendai, Japan; 4. Spintronics Research Network, Tohoku University, Sendai, Japan; 5. Physics, University of Cambridge, Cambridge, United Kingdom*

GOH-12. **Terahertz Emission from CoFeB/Pt Spintronic Structures Controlled by In-Plane Uniaxial Anisotropy.** *S.M. Hewett*[1], C. Bull[1,2], P.W. Nutter[2], T. Thomson[2] and D.M. Graham[1,3] *1. Department of Physics and Astronomy, The University of Manchester, Manchester, United Kingdom; 2. Department of Computer Science, The University of Manchester, Manchester, United Kingdom; 3. The Cockcroft Institute, Daresbury, Warrington, United Kingdom*

GOH-13. **Magnonic Contribution to Unidirectional Spin Hall Magnetoresistance in Epitaxial Cr/Fe Bilayer.** *T.T. Nguyen*[1], V. Nguyen[2], S. Jeong[2], E. Park[2], H. Jang[2], N. Lee[2], S. Lee[3], B. Park[3], S. Cho[2], H. Lee[4], J. Hong[1] and S. Kim[2] *1. Emerging Materials Science, Daegu Gyeongbuk Institute of Science and Technology, Daegu, The Republic of Korea; 2. Department of Physics, University of Ulsan, Ulsan, The Republic of Korea; 3. Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology, Daejeon, The Republic of Korea; 4. Department of Physics, Pohang University of Science and Technology, Pohang, The Republic of Korea*

GOH-14. **Interface driven spin pumping and inverse Rashba–Edelstein effect in FeGaB/Ag/BiSb multilayers.** *V. Sharma*[1], P. Bajracharya[1], A. Johnson[1] and R. Budhani[1] *1. Department of Physics, Morgan State University, Baltimore, MD, United States*

GOH-15. **Nonlinear planar Hall effect from spin-momentum locking inhomogeneities in topological insulator Bi_2Se_3.** *Y. Wang*[1], V. Mambakkam[2], Y. Wang[2], S.A. Law[2] and J.Q. Xiao[1] *1. Department of Physics and Astronomy, University of Delaware, Newark, DE, United States; 2. Department of Materials Science and Engineering, University of Delaware, Newark, DE, United States*

Session GOI
MAGNETIZATION CONTROL

Chuanpu Liu, Chair
Colorado State University, Fort Collins, CO, United States

GOI-01. **Control of Magnetism Using Surface States in Topological Dirac Semimetal α-Sn.** ***(Invited)*** J. Ding[1], C. Liu[1], V. Kalappattil[4], Y. Zhang[1,2], O. Mosendz[3], U. Erugu[4], R. Yu[1,5], J. Tian[4], A. DeMann[1], S.B. Field[1], X. Yang[2], H. Ding[5], J. Tang[4], B. Terris[3], A. Fert[6], H. Chen[1] and *M. Wu*[1]
1. Department of Physics, Colorado State University, Fort Collins, CO, United States; 2. School of Optical and Electronic Information, Huazhong University of Science and Technology, Wuhan, China; 3. Western Digital Research Center, Western Digital Corporation, San Jose, CA, United States; 4. Department of Physics and Astronomy, University of Wyoming, Laramie, WY, United States; 5. National Laboratory of Solid State Microstructures and Department of Physics, Nanjing University, Nanjing, China; 6. Unité Mixte de Physique, CNRS, Thales, Université Paris-Saclay, Palaiseau, France

GOI-02. **Magnetization-Dependent Spin Hall Effect in a Perpendicularly Magnetized Film.** *D. Qu*[1,2], T. Chuang[3], S. Lee[1] and S. Huang[3] *1. Institute of Physics, Academia Sinica, Taipei, Taiwan; 2. Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan; 3. Department of Physics, National Taiwan University, Taipei, Taiwan*

GOI-03. **Spin diode effect in magnetic garnets.** *R. Kohno*[1], K. An[1], N. Thiery[1], V. Naletov[1,2], L. Vila[1], J. Ben Youssef[3], H. Merbouche[4], V. Cros[4], A. Anane[4], T. Hauet[5], V.E. Demidov[6], S. Demokritov[6], G. de Loubens[7] and O. Klein[1] *1. Université Grenoble Alpes, CEA, CNRS, Grenoble INP, Spintec, Grenoble, France; 2. Institute of Physics, Kazan Federal University, Kazan, Russian Federation; 3. LabSTICC, CNRS, Université de Bretagne Occidentale, Brest, France; 4. Unité Mixte de Physique, CNRS, Thales, Université Paris-Sud, Université Paris Saclay, Palaiseau, France; 5. Institut Jean Lamour, CNRS, Université de Lorraine, Nancy, France; 6. Department of Physics, University of Muenster, Muenster, Germany; 7. SPEC, CEA-Saclay, CNRS, Université Paris-Saclay, Gif-sur-Yvette, France*

GOI-04. **Giant spin-charge conversion in an all-epitaxial $LaTiO_{3+\delta}$/$SrTiO_3$ heterostructure.** *S. Kaneta-Takada*[1], M. Kitamura[2], S. Arai[1], R. Okano[1], L. Anh[1,3], T. Endo[1], K. Horiba[2], H. Kumigashira[2,4], M. Kobayashi[1,5], M. Seki[1,5], H. Tabata[1,5], M. Tanaka[1,5] and S. Ohya[3,5] *1. Department of Electrical Engineering and Information Systems, The University of Tokyo, Bunkyo-ku, Japan; 2. Photon Factory, High Energy Accelerator Research Organization (KEK), Tsukuba, Japan; 3. Institute of Engineering Innovation, The University of Tokyo, Bunkyo-ku, Japan; 4. Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University, Sendai, Japan; 5. Center for Spintronics Research Network (CSRN), The University of Tokyo, Bunkyo-ku, Japan*

GOI-05. **Universal scaling of the temperature dependence of longitudinal spin Seebeck effect in compensated ferrimagnets.** *A. Chanda*[1], N. Schulz[1], C. Holzmann[2], J. Seyd[2], M. Albrecht[2], M. Phan[1] and H. Srikanth[1] *1. Physics, University of South Florida, Tampa, FL, United States; 2. Institute of Physics, University of Augsburg, Augsburg, Germany*

GOI-06. **Coherent ac spin current transmission across an antiferromagnetic CoO insulator.** *Q. Li*[1,2], M. Yang[3,2], C. Klewe[4], P. Shafer[4], A.T. N'Diaye[4], D. Hou[5], T. Wang[2], N. Gao[2], E. Saitoh[6], C. Hwang[7], R.J. Hicken[8], J. Li[9], E. Arenholz[4] and Z.Q. Qiu[2] *1. National Synchrotron Radiation Laboratory, University of Science and Technology of China, Hefei, China; 2. Physics department, UC Berkeley, Berkeley, CA, United States; 3. Anhui University, Hefei, China; 4. Advanced Light Source, Lawerence Berkeley National Laboratory, Berkeley, CA, United States; 5. University of Science and Technology of China, Hefei, China; 6. University of Tokyo, Tokyo, Japan; 7. Korea Research Institute of Standards and Science, Yuseong, The Republic of Korea; 8. Department of Physics and Astronomy, University of Exeter, Exter, United Kingdom; 9. International Center for Quantum Materials, Peking University, Beijing, China*

GOI-07. **Auto-oscillations in Two-magnet Heterostructures Driven by Thermal Spin Currents in Perpendicular Geometry.** *S. Regmi*[1], B. Arkook[1], C. Safranski[2], R. Rodriguez[1], J. Shi[1] and I. Barsukov[1] *1. Physics and Astronomy, University of California Riverside, Riverside, CA, United States; 2. IBM T.J. Watson Research Center, Yorktown, NY, United States*

GOI-08. **Spin superfluidity in noncollinear antiferromagnets.** A.A. Kovalev[1] and *B. Li*[1] *1. University of Nebraska - Lincoln, Lincoln, NE, United States*

GOI-09. **Thermal spin current generation in the multifunctional ferrimagnet $Ga_{0.6}Fe_{1.4}O_3$.** *A. Anadón*[1], S. Homkar[2], E. Martin[1], B. Meunier[2], C. Dubs[3], D. Preziosi[2], S. Petit-Watelot[1], N. Viart[2] and J. Rojas-Sanchez[1] *1. Institut Jean Lamour, Nancy, France, France; 2. IPCMS, Strasbourg, France; 3. INNOVENT e.V. Technologieentwicklung, Jena, Germany*

GOI-10. **Towards the development of $Tm_3Fe_5O_{12}$ magnetic insulator and Bi_2Se_3 topological insulator for charge-spin interconversion.** *S. Husain*[1], M. Ribeiro[2], S. Krishnia[1], N. Figueiredo Prestes[1], A. Marty[2], F. Bonell[2], N. Reyren[1], O. Boulle[2], M. Jamet[2], V. Cros[1] and J. George[1] *1. Unité Mixte de Physique, CNRS, Thales, Université Paris-Saclay, Palaiseu, France; 2. CEA, CNRS, Grenoble INP, IRIG-SPINTEC, Univ. Grenoble Alpes, Grenoble, France*

GOI-11. **Spin Current Rectifier Based on the Kitaev Spin Model.** *O. Kanehira*[1], H. Tsuchiura[1,2] and A. Koga[3] *1. Department of Applied Physics, Tohoku University, Sendai, Japan; 2. Center for Spintronics Research Network, Tohoku University, Sendai, Japan; 3. Department of Physics, Tokyo Institute of Technology, Meguro-ku, Japan*

GOI-12. **The damage analysis for irradiation tolerant spin-driven thermoelectric device based on $Y_3Fe_5O_{12}$/Pt heterostructures.** *J. Ieda*[1], S. Okayasu[1], K. Harii[2], M. Kobata[3], K. Yoshii[3], T. Fukuda[3], M. Ishida[4] and E. Saitoh[5,1] *1. Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan; 2. Department of Functional Materials Research, National Institutes for Quantum and Radiological Science and Technology, Takasaki, Japan; 3. Materials Sciences Research Center, Japan Atomic Energy Agency, Hyogo, Japan; 4. System Platform Research Laboratories, NEC, Kawasaki, Japan; 5. Department of Applied Physics, University of Tokyo, Tokyo, Japan*

GOI-13. **Interface and bulk induced spin-to-charge conversion at TbCo/Pt/YIG spin valve structure.** *A. Yagmur*[1], S. Sumi[1], H. Awano[1] and K. Tanabe[1] *1. Toyota Technological Institute, Nagoya, Japan*

ORAL SESSION

Session GOJ
METAL SPINTRONICS

Mingzhong Wu, Chair
Colorado State University, Fort Collins, CO, United States

GOJ-01. **Theory of emergent inductance with spin-orbit effects.** ***(Invited)*** *Y. Yamane*[1,2] and J. Ieda[3] *1. Frontier Research Institute for Interdisciplinary Sciences, Tohoku Universirty, Sendai, Japan; 2. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 3. Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan*

GOJ-02. **Bulk spin-orbit torques in centrosymmetric magnetic single layers.** *L. Zhu*[1], D.C. Ralph[2] and R.A. Buhrman[2] *1. Institute of Semiconductors, Chinese Academy of Sciences, Beijing, China; 2. Cornell University, Ithaca, NY, United States*

GOJ-03. **Spin-Orbit Torques beyond the Spin-Diffusion Model in Ferromagnet/Normal-Metal/Ferromagnet Trilayers.** *K. Belashchenko*[1], G.G. Baez Flores[1], A.A. Kovalev[1] and V. Amin[2] *1. Department of Physics and Astronomy and Nebraska Center for Materials and Nanoscience, University of Nebraska-Lincoln, Lincoln, NE, United States; 2. Department of Physics, Indiana University-Purdue University, Indianapolis, Indianapolis, IN, United States*

GOJ-04. **Direct X-ray detection of the spin Hall effect in CuBi.** S. Ruiz Gómez[1], R. Guerrero[3], W. Khaliq[1], C. Fernandez-Gonzalez[2,3], S. Finizio[4], P. Perna[3], J. Camarero[3], L. Perez[2,3], L. Aballe[1] and *M. Foerster*[1] *1. ALBA synchrotron, Barcelona, Spain; 2. Fisica de Materiales, Universidad Complutense de Madrid, Madrid, Spain; 3. IMDEA Nanoscience, Madrid, Spain; 4. Swiss Light Source, Zurich, Switzerland*

GOJ-05. **Large Exotic Spin Torques in Antiferromagnetic Iron Rhodium.** *J. Gibbons*[1,2], T. Dohi[3], V. Amin[4], F. Xue[5,6], H. Ren[7,8], J. Xu[7], H. Arava[2,9], S. Shim[10,11], H. Saglam[12,2], Y. Liu[13], J.E. Pearson[2], N. Mason[10,11], A.K. Petford-Long[2,9], P.M. Haney[5], M. Stiles[14], E. Fullerton[8], A. Kent[7], S. Fukami[3] and A. Hoffmann[1,11] *1. Materials Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, United States; 2. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States; 3. Laboratory for Nanoelectronics and Spintronics, Research Institute of Electrical Communications, Tohoku University, Sendai, Japan; 4. Physics, Indiana University - Purdue University Indianapolis, Indianapolis, IN, United States; 5. Nanoscale Processes and Measurements Group, National Institute of Standards and Technology, Gaithersburg, MD, United States; 6. Institute for Research in Electronics and Applied Physics & Maryland Nanocenter, University of Maryland, College Park, MD, United States; 7. Center for Quantum Phenomena, New York University, New York, NY, United States; 8. Center for Memory and Recording Research, University of California San Diego, La Jolla, CA, United States; 9. Materials Science and Engineering, Northwestern University, Evanston, IL, United States; 10. Physics, University of Illinois at Urbana-Champaign, Urbana, IL, United States; 11. Materials Research Laboratory, University of Illinois at Urbana-Champaign, Urbana, IL, United States; 12. Applied Physics, Yale University, New Haven, CT, United States; 13. Center for Nanoscale Materials, Argonne National Laboratory, Lemont, IL, United States; 14. Alternative Computing Group, National Institute of Standards and Technology, Gaithersburg, MD, United States*

GOJ-06. **Spin absorption anisotropy in lateral spin valves.** *M. Cosset-Cheneau*[1], V. Pham[1], D. Gusakova[1], G. Zahnd[1], C. Grezes[1], X. Waintal[2], A. Marty[1], H. Jaffrès[3], L. Vila[1] and J. Attané[1] *1. Spintec, Grenoble, France; 2. Pheliqs, Grenoble, France; 3. CNRS-THALES, Palaiseau, France*

GOJ-07. **Chirality-dependent Edelstein effect in elemental Tellurium nanowires.** ***(Invited)*** *F. Calavalle*[1], M. Suaréz Rodríguez[1], A. Johansson[2], D.C. Vaz[1], h. yang[1], B. Martin Garcia[1], A. Chuvilin[1,3], I. Mertig[2], M. Gobbi[1,3], L.E. Hueso[1,3] and F. Casanova[1,3] *1. CIC nanoGUNE BRTA, Donostia-San Sebastián, Spain; 2. Max Planck Institute of Microstructure Physics, Halle, Germany; 3. IKERBASQUE, Bilbao, Spain*

GOJ-08. **Spin-Reflective Metallic Cu/Cr Interface.** *Y. Lim*[1], B. Nepal[2], D.A. Smith[1], S. Wu[1], A. Srivastava[2], P. Nakarmi[2], C. Mewes[2], Z. Jiang[1], A. Gupta[1], D. Viehland[1], C. Klewe[3], P. Shafer[3], J. Heremans[1], T. Mewes[2] and S. Emori[1] *1. Virginia Tech, Blacksburg, VA, United States; 2. University of Alabama, Tuscaloosa, AL, United States; 3. Advanced Light Source, Berkeley, CA, United States*

GOJ-09. **Superimposed contributions to two-terminal and nonlocal spin signals in lateral spin-transport devices.** *A.M. Spiesser*[1], R. Jansen[1], Y. Fujita[1,2], H. Saito[1], S. Yamada[2], K. Hamaya[2] and S. Yuasa[1] *1. Research Center for Emerging Computing Technologies, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan; 2. Center for Spintronics Research Network, Graduate School of Engineering Science, Osaka University, Toyonaka, Japan*

GOJ-10. **Nonreciprocal transport of pure spin current at the Au/Pt interface.** *P. Omelchenko*[1], E.A. Montoya[2], E. Girt[1] and B. Heinrich[1] *1. Simon Fraser University, Burnaby, BC, Canada; 2. Dep. of Physics and Astronomy, University of California, Irvine, CA, United States*

GOJ-11. **Surface states mediated spin-to-charge conversion in $Bi_{1-x}Sb_x$/Co and Bi_2SnTe_4/Co topological insulators probed by THz emission spectroscopy.** *E. Rongione*[1,2], L. Baringthon[1,3], S. Fragkos[4], P. Tsipas[4], J. Hawecker[2], T. Dang[1], E. Xenogiannopoulou[4], P. Le Fèvre[3], N. Reyren[1], G. Patriarche[5], A. Lemaître[5], A. Dimoulas[4], R. Lebrun[1], J. George[1], S. Dhillon[2] and H. Jaffrès[1] *1. Unité Mixte de Physique CNRS/Thales, Palaiseau, France; 2. Laboratoire de Physique de l'Ecole Normale Supérieure, Paris, France; 3. Synchrotron SOLEIL, Saint-Aubin, France; 4. Institute of Nanoscience and Nanotechnology, Athens, Greece; 5. Centre de Nanosciences et Nanotechnologies, Palaiseau, France*

GOJ-12. **Field-free spin-orbit torque switching driven by facet-induced out-of-plane spin polarization.** *T. Chen*[1], W. Liao[1], T. Tsai[1], Y. Huang[1], H. Yen[1] and C. Pai[1] *1. National Taiwan University, Taipei, Taiwan*

GOJ-13. **Observation of Large Spin Torques-Related Unidirectional Magnetoresistance in Metallic Heterostructures.** T. Zhang[1], C. Cheng[1], C. Huang[1], C. Peng[1], Y. Huang[1], T. Chen[1], *Y. Liu*[1] and C. Pai[1,2] *1. Department of Materials Science and Engineering, National Taiwan University, Taipei, Taiwan; 2. Center of Atomic Initiative for New Materials, National Taiwan University, Taipei, Taiwan*

GOJ-14. **Hard magnet topological semimetals in XPt_3 compounds with the harmony of Berry curvature.** *J.D. Gayles*[1], A. Markou[2] and C. Felser[2] *1. Applied Physics, University of South Florida, Tampa, FL, United States; 2. Solid State Phyiscs, Max Planck Institute for Chemical Physics of Solids, Dresden, Germany*

ORAL SESSION

Session GOK
MRAM, MAGNETIC LOGIC AND RELATED DEVICES I

Stephane Mangin, Chair
Université de Lorraine, Vandoeuvre-lès-Nancy, France

GOK-01. **The Impact of the Buhrman Group on MRAM over the Past 25 Years.** ***(Invited)*** *J. Katine*[1] *1. Western Digital, San Jose, CA, United States*

GOK-02. **Nanosecond Stochastic Magnetic Tunnel Junctions for Probabilistic Computing - Experiment and Theory.** ***(Invited)*** *S. Kanai*[1,2], K. Hayakawa[1,3], K. Kobayashi[1,3], T. Funatsu[1,3], W. Borders[1], J. Igarashi[1], B. Jinnai[4], H. Ohno[1,5] and S. Fukami[1,6] *1. Laboratory for Nanoelectronics and Spintronics, RIEC, Tohoku University, Sendai, Japan; 2. Division for the Establishment of Frontier Sciences, Organization for Advanced Studies, Tohoku University, Sendai, Japan; 3. Graduate School of Engineering, Tohoku University, Sendai, Japan; 4. WPI-Advanced Institute for Materials Research, Tohoku University, Sendai, Japan; 5. Center for Spintronics Research Network, Tohoku University, Sendai, Japan; 6. Center for Innovative Integrated Electronic Systems, Tohoku University, Sendai, Japan*

GOK-03. **A spin Hall Ising machine.** *A. Houshang*[1], M. Zahedinejad[1], S. Muralidhar[1], J. Checinski[2], M. Dvornik[1], R. Khymyn[1], H. Fulara[1], A. Awad[1] and J. Åkerman[1] *1. Physics, University of Gothenburg, Gothenburg, Sweden; 2. AGH University of Science and Technology, Krakow, Poland*

GOK-04. **Multifunctional Design of Domain Wall-Magnetic Tunnel Junction Artificial Synapses for Accurate Training of Neural Networks.** *S. Liu*[1], T.P. Xiao[2], C. Cui[1], J.C. Incorvia[1], C. Bennett[2] and M. Marinella[2] *1. Electrical and Computer Engineering, University of Texas at Austin, Austin, TX, United States; 2. Sandia National Laboratories, Albuquerque, NM, United States*

GOK-05. **Experimental Demonstration of Reservoir Computation using Emergent Domain Wall Dynamics in a Patterned Magnetic Substrate.** *I.T. Vidamour*[1]*, C. Swindells[1], G. Venkat[1], P.W. Fry[3], N. Morley[1], E. Vasilaki[2], D. Allwood[1] and T. Hayward[1] *1. Department of Materials Science and Engineering, The University of Sheffield, Sheffield, United Kingdom; 2. Department of Computer Science, The University of Sheffield, Sheffield, United Kingdom; 3. Nanoscience and Technology Centre, University of Sheffield, Sheffield, United Kingdom*

GOK-06. **High-Speed CMOS-Free Purely Spintronic Asynchronous Recurrent Neural Network.** *C.B. Duffee*[1], P.O. Mathews[1], A. Thayil[2], T. Stovall[3], C. Bennett[4], F. Garcia-Sanchez[6], M. Marinella[4], J.C. Incorvia[5], N. Hassan[1], X. Hu[1] and J.S. Friedman[1] *1. Department of Electrical and Computer Engineering, University of Texas at Dallas, Richardson, TX, United States; 2. Laboratoire de Physique de la Matière Condensée, Ecole Polytechnique, Villeurbanne, France; 3. School of Behavioral & Brain Sciences, University of Texas at Dallas, Richardson, TX, United States; 4. Sandia National Laboratories, Albuquerque, NM, United States; 5. Electrical and Computer Engineering, University of Texas at Austin, Austin, TX, United States; 6. Departamento de Física Aplicada, Universidad de Salamanca, Salamanca, Spain*

GOK-07. **Superparamagnetic tunnel junctions with a synthetic antiferromagnetic free layer.** *K. Kobayashi*[1,2], K. Hayakawa[1,2], W.A. Borders[1,2], S. Kanai[1,3], J. Igarashi[1,2], H. Ohno[1,4] and S. Fukami[1,5] *1. Laboratory for Nanoelectronics and Spintronics, Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 2. Graduate School of Engineering, Tohoku University, Sendai, Japan; 3. Division for the Establishment of Frontier Sciences, Organization for Advanced Studies, Tohoku University, Sendai, Japan; 4. WPI-Advanced Institute for Materials Research, Tohoku University, Sendai, Japan; 5. Center for Innovative Integrated Electronic Systems, Tohoku University, Sendai, Japan*

GOK-08. **Synchronous Unsupervised STDP Learning with Stochastic STT-MRAM Switching.** *P. Zhou*[1], J. Smith[1], L. Deremo[2], S.K. Heinrich-Barna[2] and J.S. Friedman[1] *1. Department of Electrical and Computer Engineering, The University of Texas at Dallas, Richardson, TX, United States; 2. Texas Instruments Inc., Dallas, TX, United States*

GOK-09. **Frustrated Arrays of Nanomagnets for Efficient Reservoir Computing.** *A.J. Edwards*[1], D. Bhattacharya[2], P. Zhou[1], N.R. McDonald[3], L. Loomis[3], C.D. Thiem[3], J. Atulasimha[2] and J.S. Friedman[1] *1. Electrical and Computer Engineering, The University of Texas at Dallas, Richardson, TX, United States; 2. Department of Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 3. Information Directorate, Air Force Research Laboratory, Rome, NY, United States*

GOK-10. **Multi-Weight Artificial Synapses with Straight Notched Geometry for Neuromorphic Computing.** *M. Alamdar*[1], T. Leonard[1], S. Liu[1], O.G. Akinola[1], L. Xue[2], J.S. Friedman[3], M. Marinella[4], T.P. Xiao[4], C. Bennett[4] and J.C. Incorvia[1] *1. ECE Dept., University of Texas at Austin, Austin, TX, United States; 2. Applied Materials, Santa Clara, CA, United States; 3. ECE Dept., University of Texas at Dallas, Richardson, TX, United States; 4. Sandia National Laboratories, Albuquerque, NM, United States*

GOK-11. **Determination of Attempt Time Using Stochastic Magnetic Tunnel Junctions.** *K. Hayakawa*[1,2], S. Kanai[1,3], K. Kobayashi[1,2], W.A. Borders[1,2], J. Igarashi[1,2], B. Jinnai[4], H. Ohno[1,5] and S. Fukami[1,6] *1. RIEC, Tohoku University, Sendai, Japan; 2. Engineering, Tohoku University, Sendai, Japan; 3. DEFS, Tohoku University, Sendai, Japan; 4. WPI-AIMR, Tohoku University, Sendai, Japan; 5. CIES, Tohoku University, Sendai, Japan; 6. CSRN, Tohoku University, Sendai, Japan*

GOK-12. **Fokker-Planck equation based on normal modes for computing write error rates in magnetic random access memories.** *Z. Lin*[1,2] and V. Lomakin[1,2] *1. Department of Electrical and Computer Engineering, University of California San Diego, La Jolla, CA, United States; 2. Center for Memory and Recording Research, La Jolla, CA, United States*

GOK-13. **High-Speed Switching of FeRh Memristors.**
N. Blumenschein[1], G.M. Stephen[1], C. Cress[2], S.L. LaGasse[2], A.T. Hanbicki[1], S.P. Bennett[3] and A.L. Friedman[1]
1. Laboratory for Physical Sciences, College Park, MD, United States; 2. Electronics Science and Technology Division, United States Naval Research Laboratory, Washington, DC, United States; 3. Materials Science and Technology Division, United States Naval Research Laboratory, Washington, DC, United States

GOK-14. **Multi-Weight Directional Artificial Synapses with Trapezoidal Geometry for Neuromorphic Computing.**
T. Leonard[1], M. Alamdar[1], S. Liu[1], C. Cui[1], O.G. Akinola[1], L. Xue[4], T.P. Xiao[3], J.S. Friedman[2], M. Marinella[3], C. Bennett[3] and J.C. Incorvia[1] *1. ECE, University of Texas at Austin, Austin, TX, United States; 2. ECE, The University of Texas at Dallas, Richardson, TX, United States; 3. Sandia National Laboratories, Albuquerque, NM, United States; 4. Applied Materials, Santa Clara, CA, United States*

ORAL SESSION

Session GOL
MRAM, MAGNETIC LOGIC AND RELATED DEVICES II

Denys Makarov, Chair
Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany

GOL-01. **Magnon Quantum Effect and Magnonic Devices.** ***(Invited)***
X. Han[1] *1. State Key Laboratory of Magnetism, Institute of Physics, Chinese Academy of Sciences, Beijing, China*

GOL-02. **Influence of sputtering conditions on the magnetic properties of Co/Pt-based iridium-synthetic antiferromagnetic coupling reference layer.** *H. Honjo*[1], H. Naganuma[1], K. Nishioka[1], T. Nguyen[1], M. Yasuhira[1], S. Ikeda[1] and T. Endoh[1] *1. Center for Innovative Integrated Electronic Systems, Tohoku University, Sendai, Japan*

GOL-03. **Spin-orbit torque magnetization switching in a perpendicularly magnetized full Heusler alloy Co_2FeSi.**
M. Jiang[1], E. Matsushita[2], Y. Takamura[2], L. Anh[1,3], S. Nakagawa[2], S. Ohya[1,3] and M. Tanaka[1,4] *1. Dept. of Electrical Engineering and Information Systems, The University of Tokyo, Tokyo, Japan; 2. Dept. of Electrical and Electronic Engineering, Tokyo Institute of Technology, Tokyo, Japan; 3. Institute of Engineering Innovation, Graduate School of Engineering, The University of Tokyo, Tokyo, Japan; 4. Center for Spintronics Research Network (CSRN), Graduate School of Engineering, The University of Tokyo, Tokyo, Japan*

GOL-04. **Current Driven Domain Wall Motion in Compensated Ferrimagnets: Fast Domain Wall Velocity in a Wide Temperature Range Without External Magnetic Field.**
S. Ranjbar[1], S. Kambe[1], S. Sumi[1], K. Tanabe[1] and H. Awano[1]
1. Toyota technological institute, Nagoya, Japan

GOL-05. **Complex Hopfield Networks Implemented Using Coupled Spin-Torque Oscillator Arrays.** *N. Prasad*[2,1], A. Madhavan[2,3], P. Mukim[2,1] and M. Stiles[2] *1. Dept. of Chemisty and Biochemistry, University of Maryland at College Park, College Park, MD, United States; 2. Physical Measurements Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, United States; 3. Institute for Research in Electronics and Applied Physics, University of Maryland at College Park, College Park, MD, United States*

GOL-06. **Analog multiplication implemented with spin-torque diodes for neural networks applications.** *L. Mazza*[1], V. Puliafito[1], E. Raimondo[2], A. Giordano[2], Z. Zeng[3], M. Carpentieri[1] and G. Finocchio[2] *1. Department of Electrical and Information Engineering, Politecnico di Bari, Bari, Italy; 2. Department of Mathematical and Computer Sciences, Physical Sciences and Earth Sciences, University of Messina, Messina, Italy; 3. Suzhou Institute of Nano-tech and Nano-bionics, Chinese Academy of Sciences, Suzhou, China*

GOL-07. **Design of a 2-bit Multi-Level Cell with Fully One-Step Writing Mode Based on Spin-Orbit Torque.** *M. Wang*[1], Z. Wang[1], A. Du[1], H. Cheng[1], Y. Zhao[2] and W. Zhao[1] *1. School of Integrated Circuit Science and Engineering, Beihang University, Beijing, China; 2. Beijing Microelectronics Technology Institute, Beijing, China*

GOL-08. **Time-resolved studies of spin-transfer-torque switching in perpendicular magnetic tunnel junction nanopillars at low temperature.** *L. Rehm*[1], G. Wolf[2], B. Kardasz[2], M. Pinarbasi[2] and A. Kent[1] *1. Center for Quantum Phenomena, Department of Physics, New York University, New York, NY, United States; 2. Spin Memory Inc., Fremont, CA, United States*

GOL-09. **Real time investigation of Double magnetic tunnel junction with switchable assistance layer for high efficiency STT-MRAM.** *D. Sanchez Hazen*[1], B. da Silva Teixeira[1], D. Salomoni[1], S. Auffret[1], L. Vila[1], R. Sousa[1], L. Prejbeanu[1], L.D. Buda-Prejbeanu[1] and B. Dieny[1] *1. MRAM, SPINTEC, Grenoble, France*

GOL-10. **Withdrawn**

GOL-11. **Reduction of power consumption and micromagnetic instabilities associated with domain wall dynamics in perpendicular magnetic tunnel junction nanopillars.** *N.N. Statuto*[1], A. Lai[1] and A. Kent[1] *1. Center For Quantum Phenomena, New York University, New York, NY, United States*

GOL-12. **Surface Acoustic Wave Induced Nano-oscillator Based Reservoir Computing.** M.F. Chowdhury[1], W. Misba[1], D. Bhattacharya[2], A.J. Edwards[3], J.S. Friedman[3] and *J. Atulasimha*[1] *1. Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 2. Physics, Georgetown University, District of Columbia, DC, United States; 3. Electrical and Computer Engineering, University of Texas, Dallas, TX, United States*

GOL-13. **Current controlled perpendicular superparamagnetic tunnel junctions operating at zero applied magnetic field.** *A. Sidi El Valli*[1], G. Lezier[1], J. Langer[2], J. Wrona[2], R. Sousa[1], B. Dieny[1], U. Ebels[1] and P. Talatchian[1] *1. IRIG-Spintec, Univ. Grenoble Alpes, CEA, CNRS, Grenoble INP, Grenoble, France; 2. Singulus Technologies AG, Kahl am Main, Germany*

ORAL SESSION

Session GOM
VOLTAGE-CONTROLLED MAGNETIC ANISOTROPY AND SWITCHING

Minori Goto, Chair
Osaka University, Toyonaka, Japan

GOM-01. **Voltage-control of magnetic properties in topological-insulator/magnetic-insulator bilayers.** ***(Invited)*** *T. Chiba*[1], A. Leon[2] and T. Komine[3] *1. National Institute of Technology, Fukushima College, Iwaki, Japan; 2. Universidad Tecnológica Metropolitana, Santiago, Chile; 3. Ibaraki University, Hitachi, Japan*

GOM-02. **A magnetic gain-cell structure for efficient voltage-controlled MRAM.** *S. Sayed*[1,2], C. Hsu[1] and S. Salahuddin[1,2] *1. Electrical Engineering and Computer Sciences, University of California, Berkeley, Berkeley, CA, United States; 2. Materials Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA, United States*

GOM-03. **Voltage Modulated RKKY Interaction through Magneto-Ionic Gating.** *A.E. Kossak*[1], M. Hasan[1], M. Huang[1], P. Reddy[1], S. Sheffels[1] and G.S. Beach[1] *1. Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States*

GOM-04. **Lithium-Ion Battery Technology for Voltage Control of Perpendicular Magnetization.** *M. Ameziane*[1], R. Mansell[1] and S. van Dijken[1] *1. Applied Physics, Aalto University, Espoo, Finland*

GOM-05. **Reversible anisotropy manipulation via gate voltages in ferromagnet/oxide multilayers.** *A. Di Pietro*[1,2], R. Pachat[4], J.W. van der Jagt[3], L. Herrera-Diez[4], D. Ravelosona[3] and G. Durin[1,2] *1. Magnetism, INRIM, Turin, Italy; 2. Politecnico di Torino, Turin, Italy; 3. C2N - Spin Ion, Paris, France; 4. CNRS, Paris, France*

GOM-06. **Gate-controlled giant proximity magnetoresistance and odd-parity magnetoresistance in semiconductor-based nonmagnetic (InAs) / ferromagnetic (GaFeSb) heterostructures.** *K. Takiguchi*[1], L. Anh[1,2], T. Chiba[3], K. Okamura[1], H. Shiratani[1], R. Fukuzawa[1,4], T. Takahashi[4,5] and M. Tanaka[1,6] *1. EEIS, University of Tokyo, Bunkyo-ku, Japan; 2. IEI, University of Tokyo, Bunkyo-ku, Japan; 3. National Institute of Technology, Fukushima College, Iwaki-shi, Japan; 4. IIS, University of Tokyo, Meguro-ku, Japan; 5. NanoQuine, University of Tokyo, Meguro-ku, Japan; 6. CSRN, University of Tokyo, Bunkyo-ku, Japan*

GOM-07. **Magneto-ionic Gating of an Antiferromagnet.** *M. Hasan*[1], M. Huang[1] and G.S. Beach[1] *1. Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States*

GOM-08. **All-electrical magnetization switching and reading in ferromagnetic/multiferroic nanodevices at room temperature.** *D.C. Vaz*[1], C. Lin[2], J. Plombon[2], W. Choi[1], I. Groen[1], I. Arango[1], V. Pham[1], D.E. Nikonov[2], H. Li[2], P. Debashis[2], S.B. Clendenning[2], T.A. Gosavi[2], V. Garcia[3], S. Fusil[3], M. Bibes[3], Y. Huang[4], B. Prasad[4], R. Ramesh[4], F. Casanova[1] and I.A. Young[2] *1. CIC nanoGUNE, Donostia-San Sebastián, Spain; 2. Components Research, Intel Corporation, Hillsboro, OR, United States; 3. Unité Mixte de Physique, CNRS/Thales, Palaiseau, France; 4. Department of Materials Science and Engineering and Department of Physics, University of California, Berkeley, CA, United States*

GOM-09. **Effect of Annealing on Magnetoionics in W/CoFeB/HfO_2.** *R. Pachat*[1], D. Ourdani[4], M.A. Syskaki[6], A. Di Pietro[3], L. Largeau[1], R. Juge[2], C. Balan[5], J.W. van der Jagt[2], Y. Roussigné[4], M. Gabor[8], S.M. Chérif[4], G. Durin[3], S. Pizzini[5], S. Ono[7], J. Langer[6], M. Belmeguenai[4], D. Ravelosona[2,1] and L. Herrera-Diez[1] *1. C2N, Université Paris-Saclay, Palaiseau, France; 2. Spin-Ion technologies, Palaiseau, France; 3. INRIM, Torino, Italy; 4. Laboratoire des Sciences des Procédés et des Matériaux, Université Paris 13, Villetaneuse, France; 5. Institut Néel, Univ. Grenoble Alpes, Grenoble, France; 6. Singulus Technologies, Kahl am Main, Germany; 7. Central Research Institute of Electric Power Industry, Yokosuka, Japan; 8. Physics and Chemistry Department, Technical University of Cluj-Napoca, Cluj-Napoca, Romania*

GOM-10. **Sub-Volt Switching of Nanoscale Voltage-Controlled Perpendicular Magnetic Tunnel Junctions.** *Y. Shao*[1], V. Lopez Dominguez[1], N. Davila[2], N. Kioussis[3], J. Katine[2] and P. Khalili Amiri[1] *1. Department of Electrical and Computer Engineering, Northwestern University, Evanston, IL, United States; 2. Western Digital Corporation, San Jose, CA, United States; 3. Department of Physics and Astronomy, California State University, Northridge, CA, United States*

GOM-11. **Ising Machine Based on Electrically Coupled Spin Hall Nano-Oscillators.** *B.C. McGoldrick*[1], J. Sun[2] and L. Liu[1] *1. Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Cambridge, MA, United States; 2. IBM T. J. Watson Research Center, Yorktown Heights, NY, United States*

GOM-12. **Conservative Skyrmion Logic with Voltage-Controlled Magnetic Anisotropy Synchronization.** *B. Walker*[1], C. Cui[2], F. Garcia-Sanchez[3], J.C. Incorvia[2], X. Hu[1] and J.S. Friedman[1] *1. Electrical and Computer Engineering, University of Texas at Dallas, Richardson, TX, United States; 2. Electrical and Computer Engineering, University of Texas at Austin, Austin, TX, United States; 3. Department of Physics, University of Salamanca, Salamanca, Spain*

GOM-13. **Magneto-ionic Enhancement of Exchange Bias via Electric Fields.** *C.J. Jensen*[1], P. Murray[2], A. Quintana-Puebla[1], J. Zhang[3], X. Zhang[3], B. Kirby[4], P. Quarterman[4], A.J. Grutter[4], H. Zhang[5], A. Davydov[5], M. Sall[6,7], L. Herrera Diez[6], D. Ravelosona[6,7] and K. Liu[1,2] *1. Physics, Georgetown University, Washington, DC, United States; 2. University of California, Davis, Davis, CA, United States; 3. King Abdullah University of Science and Technology, Thuwal, Saudi Arabia; 4. Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, United States; 5. Materials Measurement Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, United States; 6. Centre de Nanosciences et de Nanotechnologies, CNRS, Université Paris-Saclay, Palaiseau, France; 7. Spin-Ion Technologies, Palaiseau, France*

ORAL SESSION

Session GON
MAGNETORESISTANCE IN HETEROSTRUCTURES (GMR, TMR, TAMR)

Gaspare Varvaro, Chair
Consiglio Nazionale delle Ricerche, Monterotondo Scalo (RM), Italy

GON-01. **Computation with Domain Walls and Oscillators in Chirally Coupled Systems.** ***(Invited)*** *A. Hrabec*[1,2] *1. Department of Materials, ETH Zurich, Zurich, Switzerland; 2. Laboratory for Multiscale Materials Experiments, Paul Scherrer Institute, Villigen, Switzerland*

GON-02. **Symmetry Dependent Field-free Switching of Perpendicular Magnetization.** ***(Invited)*** L. Liu[1], C. Zhou[1], A. Manchon[2] and *J. Chen*[1] *1. Materials Science and Engineering, National University of Singapore, Singapore; 2. Physics, Aix-Marseille University, Marseille, France*

GON-03. **Stretchable Printed Magnetic Sensors Based on Giant Magnetoresistive Microflakes for On-Skin Electronic Interfaces.** *E. Oliveros Mata*[1], M. Ha[2], G. Canon Bermudez[1], Y. Zabila[1], J. Fassbender[1] and D. Makarov[1] *1. Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 2. Electronics and Telecomunications Research Institute, Daejeon, The Republic of Korea*

GON-04. **Spin Dependent Transport Properties of Fe_4N/Chiral Methionine/Fe_4N Organic Magnetic Tunnel Junction.** *Y. Zhang*[1] and W. Mi[1] *1. Department of Applied Physics, Tianjin University, Tianjin, China*

GON-05. **Giant tunnel magnetoresistance ratio and oscillation in Fe/MgO/Fe(001) and Fe/MgAlO/Fe(001) magnetic tunnel junctions.** *T. Scheike*[1], H. Sukegawa[1], Q. Xiang[1], Z. Wen[1], T. Ohkubo[1], K. Hono[1] and S. Mitani[1] *1. National Institute for Materials Science (NIMS), Tsukuba, Japan*

GON-06. **Spin-dependent Transport Through Photoswitchable Self Assembled Monolayers.** *L. Jerro*[1], B. Quinard[1], S. Delprat[1], F. Godel[1], S. Colin[1], A. Sander[1], A. Vecchiola[1], K. Bouzehouane[1], P. Yu[2], T. Mallah[2], F. Petroff[1], P. Seneor[1] and R. Mattana[1] *1. Unité Mixte de Physique CNRS/Thales, Palaiseau, France; 2. Insitut de Chimie Moléculaire et des Matériaux d'Orsay, Orsay, France*

GON-07. **High bias TMR in ferrimagnetic MTJs based on Mn_3Ga.** *M.T. Stamenova*[1] and P.S. Stamenov[1] *1. School of Physics and CRANN, Trinity College Dublin, Dublin, Ireland*

GON-08. **Perpendicularly Magnetized Co/Pd-based Magneto-resistive Heterostructures on Large-area Flexible Substrates.** *M. Hassan*[1,2], S. Laureti[2], C. Rinaldi[3], F. Fagiani[3], S. Varotto[3], G. Barucca[4], N. Schmidt[1], G. Varvaro[2] and M. Albrecht[1] *1. Uni. Augsburg, Institute of Pysics, Augsburg, Germany; 2. CNR-ISM-NM2 Lab, Monterotondo Scalo, Italy; 3. Department of Physics, Polytechnico di Milano, Milano, Italy; 4. SIMAU, Marche Polytechnic University, Ancona, Italy*

GON-09. **Flexible magnetoreceptive switch for on-skin touchless human-machine interaction.** *P. Makushko*[1,2], E. Oliveros Mata[1], G. Canon Bermudez[1], M. Hassan[3,4], S. Laureti[4], C. Rinaldi[5], F. Fagiani[5], G. Barucca[6], N. Schmidt[3], Y. Zabila[1,7], T. Kosub[1], R. Illing[1], O.M. Volkov[1], I. Vladymyrskyi[2], J. Fassbender[1], M. Albrecht[3], G. Varvaro[4] and D. Makarov[1] *1. Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 2. National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Kyiv, Ukraine; 3. University of Augsburg, Augsburg, Germany; 4. Consiglio Nazionale delle Ricerche, Roma, Italy; 5. Politecnico di Milano, Milano, Italy; 6. Università Politecnica delle Marche, Ancona, Italy; 7. The H. Niewodniczanski Institute of Nuclear Physics, Krakow, Poland*

GON-10. **Effect of Counter Electrode on Tunneling Anisotropic Magnetoresistance through Iron Quantum Wells.** *M. Al-Mahdawi*[1,2], Q. Xiang[1], Y. Miura[1], M. Belmoubarik[1], K. Masuda[1], S. Kasai[1], H. Sukegawa[1] and S. Mitani[1] *1. National Institute for Materials Science, Tsukuba, Japan; 2. Center for Science and Innovation in Spintronics, Tohoku University, Sendai, Japan*

GON-11. **Large spin-scattering asymmetry at half-metallic Co-based Heusler-alloy/ferromagnet interface.** *Y. Fujita*[1], Y. Miura[1], T. Sasaki[1], T. Nakatani[1], K. Hono[1] and Y. Sakuraba[1] *1. National Institute for Materials Science, Tsukuba, Japan*

Session GOO
ANTIFERROMAGNETIC SPINTRONICS I

Jean Anne Incorvia, Co-Chair
University of Texas at Austin, Austin, TX, United States
Vincent Baltz, Co-Chair
Spintec, Grenoble, France

GOO-01. **Coherent Sub-Terahertz Spin Pumping from an Insulating Antiferromagnet.** ***(Invited)*** *E. del Barco*[1], P. Vaidya[1], J. van Tol[2], Y. Liu[3], R. Cheng[4], A. Brataas[5] and D. Lederman[6] *1. University of Central Florida, Orlando, FL, United States; 2. NHMFL, Tallahassee, FL, United States; 3. Northeastern University, Shenyang, China; 4. University of California, Riverside, Riverside, CA, United States; 5. Norwegian University of Science and Technology, Trondheim, Norway; 6. University of California Santa Cruz, Santa Cruz, CA, United States*

GOO-02. **Out-of-plane spin polarization and antiferromagnetic spin Hall effect.** ***(Invited)*** *C. Song*[1], X. Chen[1], H. Bai[1], Y. You[1], F. Pan[1], H. Yang[2] and X. Fan[3] *1. Tsinghua University, Beijing, China; 2. National University of Singapore, Singapore; 3. Lanzhou University, Lanzhou, China*

GOO-03. **Observation of unidirectional magnetoresistance in collinear-antiferromagnet/heavy-metal bilayers.** *S. Shim*[1,2], M. Mehraeen[3], J. Sklenar[1,4], J. Oh[1,2], J. Gibbons[2,5], H. Saglam[6,7], A. Hoffmann[5,6], S. Zhang[3] and N. Mason[1,2] *1. Physics, University of Illinois at Urbana-Champaign, Urbana, IL, United States; 2. Materials Research Laboratory, University of Illinois at Urbana-Champaign, Urbana, IL, United States; 3. Physics, Case Western Reserve University, Cleveland, OH, United States; 4. Physics and Astronomy, Wayne State University, Detroit, MI, United States; 5. Materials Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, United States; 6. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States; 7. Physics, Yale University, New Haven, CT, United States*

GOO-04. **Suppressing Electrical Switching of Antiferromagnets with High Magnetic Fields.** *C. Schippers*[1], M. Grzybowski[1], M. Bal[2], K. Rubi[2], U. Zeitler[2] and H. Swagten[1] *1. Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands; 2. High Field Magnet Laboratory (HFML - EMFL), Radboud University, Nijmegen, Netherlands*

GOO-05. **Long-range supercurrents through a chiral non-collinear antiferromagnet in lateral Josephson junctions.** *K. Jeon*[1], B.K. Hazra[1], K. Cho[1], A. Chakraborty[1], J. Jeon[1], H. Han[1], H. Meyerheim[1], T. Kontos[2] and S. Parkin[1] *1. NISE, Max Planck Institute of Microstructure Physics, Halle (Saale), Germany; 2. Laboratoire de Physique de l'Ecole normale supérieure, ENS, Université PSL, CNRS, Sorbonne Université, Université de Paris, Paris, France*

GOO-06. **Roles of Destressing and Dzyaloshinskii-Moriya Interaction for Magnetic Reversal in α-Fe_2O_3.** *A. Wittmann*[1], K. Litzius[2,1], A. Churikova[1], L. Scipioni[3], A. Shepard[3], T. Newhouse-Illige[3], J. Greer[3], N.O. Birge[4] and G.S. Beach[1] *1. Massachusetts Institute of Technology, Cambridge, MA, United States; 2. Max Planck Institute for Intelligent Systems, Stuttgart, Germany; 3. PVD Products, Wilmington, MA, United States; 4. Michigan State University, East Lansing, MI, United States*

GOO-07. **Co/Pt/NS/Pt/Co (NS= Ru, Ir) synthetic antiferromagnetic layers for spin-orbit torque switching originating from the spin-Hall effect.** *Y. Saito*[1], S. Ikeda[1,2] and T. Endoh[1,3] *1. Center for Innovative Integrated Electronic Systems, Tohoku University, Sendai, Japan; 2. Center for Science and Innovation in Spintronics, Tohoku University, Sendai, Japan; 3. Department of Electrical Engineering, Tohoku University, Sendai, Japan*

GOO-08. **Anisotropic magnetoresistance reversal driven by spin flops in a helical antiferromagnet.** *H. Shin*[1], J. Kim[1], J. Hong[1], K. Jeong[1], J. Kim[1], N. Lee[1] and Y. Choi[1] *1. Department of Physics, Yonsei University, Seoul, The Republic of Korea*

GOO-09. **Toroidal moments: hallmarks of collinear antiferromagnetic order.** *R. Winkler*[1] and U. Zülicke[2] *1. Physics, Northern Illinois University, DeKalb, IL, United States; 2. School of Chemical and Physical Sciences, Victoria University of Wellington, Wellington, New Zealand*

GOO-10. **Spin transport in a long Josephson junction based on an antiferromagnetic domain wall.** *R. Khymyn*[1], R. Ovcharov[1], B. Ivanov[2] and J. Åkerman[1] *1. Department of Physics, University of Gothenburg, Gothenburg, Sweden; 2. Institute of Magnetism of NASU and MESU, Kyiv, Ukraine*

GOO-11. **Thermal Hall Effect of Magnons in Collinear Antiferromagnetic Insulators: Signatures of Magnetic and Topological Phase Transitions.** *R.R. Neumann*[1], A. Mook[2], J. Henk[1] and I. Mertig[1] *1. Institut of Physics, Martin Luther University Halle-Wittenberg, Halle (Saale), Germany; 2. Department of Physics, University of Basel, Basel, Switzerland*

GOO-12. **Spectroscopic MOKE and other Berry phased boosted properties of ferrimagnetic and antiferromagnetic Mn_3NiN.** *F. Johnson*[1], J. Kimák[2], J. Zazvorka[2], E. Schmoranzerová[2], J. Godinho[2,3], P. Nemec[2], L. Beran[2], M. Veis[2], Z. Soban[3], J. Zemen[4], D. Boldrin[1,5], H. Zhang[6], H. Singh[6], J. Wunderlich[7] and L. Cohen[1] *1. Blackett Laboratory, Imperial College London, London, United Kingdom; 2. Faculty of Mathematics and Physics, Charles University, Prague, Czechia; 3. Institute of Physics, Czech Academy of Sciences, Prague, Czechia; 4. Faculty of Electrical Engineering, Czech Technical University, Prague, Czechia; 5. School of Physics and Astronomy, University of Glasgow, Glasgow, United Kingdom; 6. Institute of Materials Science, TU Darmstadt, Darmstadt, Germany; 7. University of Regensburg, Regensburg, Germany*

GOO-13. **Theory of Unidirectional Magnetoresistance in Collinear-Antiferromagnet/Heavy-Metal Bilayers.** *M. Mehraeen*[1], S. Shim[2,3], J. Sklenar[2,4], J. Oh[2,3], J. Gibbons[2,3], H. Saglam[5,6], A. Hoffmann[5,7], S. Zhang[1] and N. Mason[2,3] *1. Physics, Case Western Reserve University, Cleveland, OH, United States; 2. Physics, University of Illinois at Urbana-Champaign, Urbana, IL, United States; 3. Materials Research Laboratory, University of Illinois at Urbana-Champaign, Urbana, IL, United States; 4. Physics and Astronomy, Wayne State University, Detroit, MI, United States; 5. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States; 6. Physics, Yale University, New Haven, CT, United States; 7. Materials Science and Engineering, University of illinois at Urbana-Champaign, Urbana, IL, United States*

GOO-14. **Electrical manipulation of antiferromagnetic order in PtMn and $PtMn_3$ pillars.** *J. Shi*[1], V. Lopez Dominguez[1], S. Arpaci[1], F. Garesci[2], C. Wang[1], H. Almasi[1], M. Grayson[1], G. Finocchio[2] and P. Khalili Amiri[1] *1. Northwestern University, Evanston, IL, United States; 2. University of Messina, Messina, Italy*

GOO-15. **Anomalous Exchange Resonance Driven by Spin-Orbit Torques in Intrinsic Antiferromagnetic Topological Insulator.** *J. Tang*[1] and R. Cheng[1] *1. Department of Electrical and Computer Engineering, University of California Riverside, Riverside, CA, United States*

ORAL SESSION

Session GOP
ANTIFERROMAGNETIC SPINTRONICS II

Romain Lebrun, Chair
Unité Mixte de Physique CNRS/Thales, Palaiseau, France

GOP-01. **Chiral-spin rotation of non-collinear antiferromagnetic Mn_3Sn by spin-orbit torque.** ***(Invited)*** *Y. Takeuchi*[1], Y. Yamane[2,3], J. Yoon[3,4], R. Itoh[3,4], B. Jinnai[1], S. Kanai[3,5], J. Ieda[3,6], H. Ohno[3,7] and S. Fukami[3,8] *1. WPI-Advanced Institute for Materials Research, Tohoku University, Sendai, Japan; 2. Frontier Research Institute for Interdisciplinary Sciences, Tohoku University, Sendai, Japan; 3. Laboratory for Nanoelectronics and Spintronics, Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 4. Graduate School of Engineering, Tohoku University, Sendai, Japan; 5. Division for the Establishment of Frontier Sciences, Tohoku University, Sendai, Japan; 6. Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan; 7. Center for Innovative Integrated Electronic Systems, Tohoku University, Sendai, Japan; 8. Center for Spintronics Research Network, Tohoku University, Sendai, Japan*

GOP-02. **Accessing superluminal-like magnon velocity in an antiferromagnetic insulator.** ***(Invited)*** *K. Lee*[1], D. Lee[2], D. Yang[1], R. Mishra[1,3], D. Kim[1], S. Kim[4], K. Lee[4] and H. Yang[1] *1. Department of Electrical and Computer Engineering, National University of Singapore, N.A., Singapore; 2. Department of Materials Science and Engineering, Korea University, Seoul, The Republic of Korea; 3. Centre for Applied Research in Electronics, Indian Institute of Technology Delhi, New Delhi, India; 4. Department of Physics, Korea Advanced Institute of Science and Technology, Daejeon, The Republic of Korea*

GOP-03. **Coherent Spin Pumping in Easy-Plane Antiferromagnets.** *M. Guo*[1] and R. Cheng[1,2] *1. Physics and Astronomy, University of California, Riverside, Riverside, CA, United States; 2. Electrical and Computer Engineering, University of California, Riverside, Riverside, CA, United States*

GOP-04. **Antiferromagnetic Magnon Pseudospin Dynamics and the Magnon Hanle Effect in Hematite Thin Films.** J. Gückelhorn[1,2], A. Kamra[3], T. Wimmer[1,2], M. Opel[1], S. Geprägs[1], R. Gross[1,2], H. Huebl[1,2] and *M. Althammer*[1,2] *1. Walther-Meissner-Institut, Garching, Germany; 2. Physik Department, TU Munich, Garching, Germany; 3. IFIMAC - Condensed Matter Physics Center and Department of Theoretical Condensed Matter Physics, Universidad Autónoma de Madrid, Madrid, Spain*

GOP-05. **Observation of current-induced switching in non-collinear antiferromagnetic $IrMn_3$ by differential voltage measurements.** *S. Arpaci*[1,2], V. Lopez Dominguez[1], J. Shi[1], L. Sánchez-Tejerina[3], F. Garesci[4], C. Wang[1], X. Yan[1], V. Sangwan[5], M. Grayson[1,2], M. Hersam[1,5], G. Finocchio[3] and P. Khalili Amiri[1,2] *1. Department of Electrical and Computer Engineering, Northwestern University, Evanston, IL, United States; 2. Graduate Program in Applied Physics, Northwestern University, Evanston, IL, United States; 3. Department of Mathematical and Computer Sciences, Physical Sciences and Earth Sciences, University of Messina, Messina, Italy; 4. Department of Engineering, University of Messina, Messina, Italy; 5. Department of Materials Science and Engineering, Northwestern University, Evanston, IL, United States*

GOP-06. **Spin-Hall Magnetoresistance and Anomalous Hall Effect in Pt/Cr_2O_3 Thin Films.** *M. Al-Mahdawi*[1], T. Nozaki[2], H. Imamura[2], M. Oogane[1], Y. Ando[1] and M. Sahashi[1] *1. Tohoku University, Sendai, Japan; 2. National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan*

GOP-07. **Voltage-Controlled Dynamic Modulation of Electromagnetic Response in Antiferromagnetic Materials at Terahertz Frequencies.** *X. Xu*[1], Y. Semenov[1] and K. Kim[1] *1. North Carolina State University, Raleigh, NC, United States*

GOP-08. **Spin-Hall Diode Based on a Canted Antiferromagnet as a Detector of Microwave Signals.** *A. Safin*[1], S. Nikitov[1], V. Tyberkevych[2] and A.N. Slavin[2] *1. Kotel'nikov Institute of Radioengineering of RAS, Moscow, Russian Federation; 2. Oakland University, Rochester Hills, MI, United States*

GOP-09. **Quantifying Spin-Orbit Torques in AFM/HM Heterostructures.** *E. Cogulu*[1], H. Zhang[2], N.N. Statuto[1], Y. Cheng[3], F. Yang[3], R. Cheng[2,4] and A. Kent[1] *1. Center for Quantum Phenomena, New York University, New York, NY, United States; 2. Department of Electrical and Computer Engineering, University of California Riverside, Riverside, CA, United States; 3. Department of Physics, The Ohio State University, Columbus, OH, United States; 4. Department of Physics, University of California Riverside, Riverside, CA, United States*

GOP-10. **Dynamics of a ferrimagnetic domain wall by a rotating field.** *M. Jin*[1], I. Hong[2], D. Kim[3], K. Lee[1] and S. Kim[1] *1. Department of Physics, KAIST, Daejeon, The Republic of Korea; 2. Korea University, Seoul, The Republic of Korea; 3. KIST, Seoul, The Republic of Korea*

GOP-11. **Spin-pumping and inverse spin-Hall effects in collinear and canted antiferromagnets.** *I. Boventer*[1], H.T. Simensen[2], A. Anane[1], M. Kläui[3], A. Brataas[2] and R. Lebrun[1] *1. Unité Mixte de Physique CNRS/Thales, Palaiseau, France; 2. NTNU, Trondheim, Norway; 3. Johannes Gutenberg Universitat, Mainz, Germany*

GOP-12. **Strong exchange coupling between Mn_2Au and Permalloy thin films for read-out in antiferromagnetic spintronics.** *M. Jourdan*[1], S. Bommanaboyena[1], D. Backes[2], L. Veiga[2], S. Dhesi[2], Y. Niu[3], B. Sarpi[3], T. Denneulin[4], A. Kovacs[4], T. Mashoff[1], O. Gomonay[1], J. Sinova[1], K. Everschor-Sitte[5], D. Schönke[1], R.M. Reeve[1], H. Elmers[1] and M. Kläui[1] *1. Johannes Gutenberg University Mainz, Mainz, Germany; 2. Diamond Light Source, Didcot, United Kingdom; 3. MAX IV Laboratory, Lund, Sweden; 4. Forschungszentrum Jülich, Jülich, Germany; 5. Universität Duisburg Essen, Duisburg, Germany*

GOP-13. **Anomalous Nernst effect in thin films of non-collinear antiferromagnet Mn_3NiN.** F. Johnson[1], *J. Kimak*[2], E. Schmoranzerová[2], H. Reichlova[3], Z. Soban[4], J. Godinho[2,4], K. Olejnik[4], S. Beckert[3], J. Zemen[5], J. Wunderlich[6], P. Nemec[2] and L. Cohen[1] *1. Department of Physics, Imperial College London, London, United Kingdom; 2. Faculty of Mathematics and Physics, Charles University, Prague, Czechia; 3. Institut für Festkörper- und Materialphysik, Technische Universitat Dresden, Dresden, Germany; 4. Institute of Physics of the Czech Academy of Sciences, Prague, Czechia; 5. Faculty of Electrical Engineering, Czech Technical University in Prague, Prague, Czechia; 6. Institute of Experimental and Applied Physics, University of Regensburg, Regensburg, Germany*

GOP-14. **Determination of spin-orbit torque efficiency in non-collinear antiferromagnet / heavy metal heterostructures.**
K. Kishi[1,2], Y. Takeuchi[3], Y. Yamane[2,4], J. Yoon[1,2], R. Takechi[1,2], B. Jinnai[3], S. Kanai[1,5], J. Ieda[6], H. Ohno[1,7] and S. Fukami[1,8] *1. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 2. Graduate School of Engineering, Tohoku University, Sendai, Japan; 3. Advanced Institute for Materials Research, Tohoku University, Sendai, Japan; 4. The Frontier Research Institute for Interdisciplinary Sciences, Tohoku University, Sendai, Japan; 5. Center for Spintronics Research Network, Tohoku University, Sendai, Japan; 6. Advanced Sciences Research Center, Japan Atomic Energy Agency, Tokai, Japan; 7. Center for Science and Innovation in Spintronics, Tohoku University, Sendai, Japan; 8. Center for Innovative Integrated Electronic Systems, Tohoku University, Sendai, Japan*

GOP-15. **Memory of frozen and rotatable antiferromagnetic spins in epitaxial CoO(111)/Fe and NiO(111)/Fe bilayers.**
M. Slezak[1], H. Nayyef[1], P. Drozdz[1], W. Janus[1], A. Koziol-Rachwal[1], M. Szpytma[1], M. Zajac[2], T. Mentes[3], A. Locatelli[3], F. Genuzio[4] and T. Slezak[1] *1. AGH University of Science and Technology, Krakow, Poland; 2. National Synchrotron Radiation Centre SOLARIS, Jagiellonian University, Krakow, Poland; 3. Elettra - Sincrotrone Trieste, Basovizza, Trieste, Italy; 4. CERIC-ERIC, Basovizza, Trieste, Italy*

ORAL SESSION

Session GOQ
SPIN INJECTION AND SPIN TRANSFER TORQUES

Hélène Béa, Co-Chair
Université Grenoble Alpes, Spintec, Grenoble, France
Emilie Jué, Co-Chair
National Institute of Standards and Technology, Boulder, CO, United States

GOQ-01. **Memristor-controlled mutual synchronization of spin Hall nano-oscillator arrays for neuromorphic computing and spintronic Ising machines.** ***(Invited)*** *J. Åkerman*[1] *1. Department of Physics, University of Gothenburg, Gothenburg, Sweden*

GOQ-02. **Theory of Spin Torques Emerging from Band Topology.** ***(Invited)*** *Y. Araki*[1] *1. Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan*

GOQ-03. **Enhancement of heat controlled magnetic anisotropy by improving a thermal design of magnetic tunnel junctions.**
M. Goto[1,2], R. Kobayashi[1], R. Okuno[1], Y. Yamada[1], T. Mizuno[3], T. Yamane[3], N. Degawa[3], T. Suzuki[3], A. Shimura[3], S. Aoki[3], J. Urabe[3], S. Hara[3], H. Nomura[1,2] and Y. Suzuki[1,2] *1. Osaka University, Toyonaka, Japan; 2. CSRN-Osaka, Toyonaka, Japan; 3. TDK corporation, Chuo-ku, Japan*

GOQ-04. **Ohmic contact on n-type Si using an Iron-based alloy.** *N. Yamashita*[1], E. Shigematsu[1], S. Honda[2], R. Ohshima[1], M. Shiraishi[1] and Y. Ando[1] *1. Electronic Science and Engineering, Kyoto University, Kyoto, Japan; 2. Department of Pure and Applied Physics, Kansai University, Suita, Japan*

GOQ-05. **Spin mixing conductance at interfaces of TI/FM and HM/FM heterostructures.** *O. Van't Erve*[1], X. Zhang[1], C.H. Li[1] and B. Jonker[1] *1. Naval Research Lab, Washington, DC, United States*

GOQ-06. **Splitting of the Nonlinear Spin-Torque Vortex Oscillator Dynamics Originating from the Ampère-Oersted Field Induced by the Excitation Current.** *S. de Wergifosse*[1], C. Chopin[1] and F. Abreu Araujo[1] *1. IMCN / BSMA, Université Catholique de Louvain, Louvain-la-Neuve, Belgium*

GOQ-07. **Current driven domain wall dynamics across the angular momentum compensation point in epitaxially grown ferrimagnetic Ni-doped Mn_4N thin films.** *S. Ghosh*[1,2], T. Komori[2], A. Hallal[1], J.A. Peña Garcia[3], T. Gushi[1,2], T. Hirose[2], H. Mitarai[2], H. Okuno[4], J. Vogel[3], M. Chshiev[1,5], J. Attané[1], L. Vila[1], T. Suemasu[2] and S. Pizzini[3] *1. Univ. Grenoble Alpes, CEA, CNRS, Grenoble INP, IRIG-Spintec, Grenoble, France; 2. Institute of Applied Physics, Graduate School of Pure and Applied Sciences, University of Tsukuba, Tsukuba, Japan; 3. Univ. Grenoble Alpes, CNRS, Institut Néel, Grenoble, France; 4. Univ. Grenoble Alpes, CEA, IRIG-MEM, Grenoble, France; 5. Institut Universitaire de France, Paris, France*

GOQ-08. **Injection locking of edge, bullet, and interior spin wave modes in nano-constriction spin Hall nano-oscillators.** *M. Rajabali*[1], A.A. Awad[1,2], J. Yue[1], M. Dvornik[2], R. Khymyn[1], M. Zahedinejad[1], H. Fulara[1], J. Åkerman[1,2] and A. Houshang[1,2] *1. Physics, University of Gothenburg, Gothenburg, Sweden; 2. NanOsc AB, Gothenburg, Sweden*

GOQ-09. **Two-terminal magnetoresistance ratio in Co-based Heusler alloy/germanium lateral spin-valve devices.** *M. Yamada*[1,2], K. Sumi[3], T. Naito[3], K. Sawano[4] and K. Hamaya[2] *1. PRESTO, JST, Kawaguchi, Japan; 2. Center for Spintronics Research Network, Osaka University, Toyonaka, Japan; 3. Graduate School of Engineering Science, Osaka University, Toyonaka, Japan; 4. Advanced Research Laboratories, Tokyo City University, Setagaya, Japan*

GOQ-10. **Electrically connected spin-torque oscillators array for 2.4 GHz WiFi band transmission.** *R. Sharma*[1], R. Mishra[2], T. NgO[1], Y. Guo[1], S. Fukami[3,4], H. Sato[3,4], H. Ohno[3,4] and H. Yang[1] *1. Electrical and Computer Engineering, National University of Singapore, Singapore; 2. Centre for Applied Research in Electronics, Indian Institute of Technology Delhi, New Delhi, India; 3. Center for Science and Innovation in Spintronics, Tohoku University, Sendai, Japan; 4. Center for Spintronics Research Network, Tohoku University, Sendai, Japan*

GOQ-11. **Spin Torque Oscillation Starting-up Time Dependence on the Initial Magnetization Orientation in Orthogonal Magnetization Disks.** *L. Chuhan*[1], Y. Kurokawa[1], N. Hashimoto[1], T. Tanaka[1] and H. Yuasa[1] *1. Graduate School and Faculty of Information Science and Electrical Engineering, Kyushu University, Fukuoka, Japan*

GOQ-12. **All-Optical Spin Injection in Silicon Revealed by Element Specific Time-Resolved Kerr Effect.** *S. Laterza*[1,2], A. Caretta[2], R. Bhardwaj[2], B. Casarin[1], V. Bonanni[2], A. Simoncig[2], M. Zangrando[2,3], P. Rebernik Ribič[2], G. Penco[2], G. De Ninno[2], L. Giannessi[2], R. Flammini[4], P. Moras[5], P. Rajak[3], M. Mahabul Islam[3], R. Ciancio[3], F. Parmigiani[2,6] and M. Malvestuto[2,3] *1. Physics, University of Trieste, Trieste, Italy; 2. Elettra-Sincrotrone Trieste S.C.p.A., Trieste, Italy; 3. CNR-IOM, Trieste, Italy; 4. ISM-CNR, Roma, Italy; 5. ISM-CNR, Trieste, Italy; 6. International Faculty, University of Cologne, Cologne, Germany*

GOQ-13. **Enhanced Torques in Co/Pt Systems via Orbital Current Contribution.** *S. Krishnia*[1], F. Leroy[1], J. George[1], S. Collin[1], V. Cros[1] and H. Jaffrès[1] *1. Unité Mixte de Physique, CNRS, Thales, Université Paris-Saclay, Palaiseau, France*

GOQ-14. **Non-linear classification of radio-frequency signals using spintronic hardware in neural networks with hidden layers.** *A. Ross*[1], A. Mizrahi[1], A. de Riz[1], N. Leroux[1], L. Martins[2], A. Jenkins[2], R. Ferreira[2] and J. Grollier[1] *1. Unite Mixté de Physique CNRS-Thales, Palaiseau, France; 2. International Iberian Nanotechnology Laboratory, Braga, Portugal*

POSTER SESSION

Session GPA
SKYRMIONS AND SPINS IN TOPOLOGICAL INSULATOR AND 2D MATERIALS (Poster Session)

Elton Santos, Chair
The University of Edinburgh, Edinburgh, United Kingdom

GPA-01. **Control of a magnetic skyrmionium on a TbFeCo thin film.** *S. Kato*[1], K. Ohara[1], X. Zhang[1], J. Xia[2] and X. Liu[1] *1. Electrical and Computer Engineering, Shinshu University, Nagano, Japan; 2. Science and Engineering, The Chinese University of Hong Kong, Hong Kong, China*

GPA-02. **Gate-Controlled Skyrmions in Magnetic Trilayer Tracks.** *J. Fischer*[1], C. Fillion[1], R. Kumar[1,2], L. Monnier[1], A. Fassatoui[3], S. Pizzini[3], L. Ranno[3], L. Cagnon[3], S. Auffret[1], I. Joumard[1], O. Boulle[1], G. Gaudin[1], L.D. Buda-Prejbeanu[1], C. Baraduc[1] and H. Béa[1] *1. SPINTEC, Grenoble, France; 2. Antaios, Meylan, France; 3. Institut NEEL, Grenoble, France*

GPA-03. **Tuning the eccentricity of Bloch skyrmions in $Fe_{1.9}Ni_{0.9}Rh_{0.2}P$.** *S. Schneider*[1,2], L. Peng[1], K. Karube[1], Y. Taguchi[1], D. Pohl[2], B.F. Rellinghaus[2], Y. Tokura[1,3] and X. Yu[1] *1. Center for Emergent Matter Science (CEMS), RIKEN, Wako, Japan; 2. Dresden Center for Nanoanalysis, TU Dresden, Dresden, Germany; 3. Department of Applied Physics, University of Tokyo, Bunkyo-ku, Japan*

GPA-04. **Room Temperature Skyrmions at Zero Field in Ir/Fe/Co/Pt-based Systems with Antiferromagnetic Coupling.** *Y. Feng*[1,2], H.J. Hug[1,2] and A. Mandru[1] *1. Empa, Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland; 2. Department of Physics, University of Basel, Basel, Switzerland*

GPA-05. **Skyrmion Hosting Multilayers Based on Synthetic Antiferromagnets.** *E. Darwin*[1], P. Shepley[1], T. Hase[3], J. Cunningham[2] and B.J. Hickey[1] *1. Condensed Matter, University of Leeds, Leeds, United Kingdom; 2. Electrical Engineering, University of Leeds, Leeds, United Kingdom; 3. University of Warwick, Warwick, United Kingdom*

GPA-06. **Chiral Spin Textures and Spin-Orbit Torques in Single Layer Ferrimagnets Without Heavy-Metal Interface.** *S. Krishnia*[1], E. Haltz[1], L. Berges[1], L. Aballe[2], M. Foerster[2], L. Bocher[1], R. Weil[1], A. Thiaville[1], J. Sampaio[1] and A. Mougin[1] *1. Université Paris-Saclay, CNRS, Laboratoire de Physique des Solides, Orsay, France; 2. Alba Synchrotron Light Facility, CELLS, E-08290, Barcelona, Spain*

GPA-07. **Tuning the Density of Incomplete and Tubular Skyrmions in Ferro/ferri/ferromagnetic Trilayers.** *A. Mandru*[1], O. Yildirim[1], R. Tomasello[2], Y. Feng[1], P. Mirzadeh Vaghehfi[1], T. Dutta[1], G. Carlotti[3], S. Tacchi[4], G. Finocchio[5] and H.J. Hug[1,6] *1. Empa, Swiss Federal Laboratories for Materials Science and Technology, Dubendorf, Switzerland; 2. Dipartimento di Ingegneria Elettrica e dell'Informazione, Politecnico di Bari, Bari, Italy; 3. Dipartimento di Fisica e Geologia, Università di Perugia, Perugia, Italy; 4. Istituto Officina dei Materiali - IOM, Perugia, Italy; 5. Department of Mathematical and Computer Sciences, Physical Sciences and Earth Sciences, University of Messina, Messina, Italy; 6. Department of Physics, University of Basel, Basel, Switzerland*

GPA-08. **A Skyrmion-based Robust Racetrack Device and a Programmable Logic Device with Complete Boolean Logic Gates.** *Z. Yan*[1], G. Yu[1] and X. Han[1] *1. Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, Beijing, China*

GPA-09. **Large Magneto-Electric Resistance in the Topological Dirac Semimetal α-Sn.** *V. Kalappattil*[1], Y. Zhang[1], C. Liu[1], S. Zhang[2], J. Ding[1], U. Erugu[3], J. Tian[3], J. Tang[3] and M. Wu[1] *1. Physics, Colorado State University, Fort Collins, CO, United States; 2. Physics, Case Western Reserve University, Cleveland, OH, United States; 3. Physics, University of Wyoming, Laramie, WY, United States*

GPA-10. **Exchange bias and spin-orbit torque in the Fe_3GeTe_2-based heterostructures prepared by vacuum exfoliation approach.** *Y. Zhang*[1], H. Xu[1], C. Yi[1], Y. Shi[1], G. Yu[1] and X. Han[1] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China*

GPA-11. **Change in longitudinal spin Seebeck voltage with microstructure in YIG films prepared by sol-gel method.** *M. Yamamoto*[1], S. Masaki[1], H. Matsui[1], Y. Shiota[2], T. Moriyama[2], T. Kato[3], T. Ono[2], M. Shima[1] and K. Yamada[1] *1. Department of Materials Science and Processing, Graduate School of Natural Science and Technology, Gifu University, Gifu, Japan; 2. Institute for Chemical Research, Kyoto University, Uji, Japan; 3. Institute of Materials and Systems for Sustainability, Nagoya University, Nagoya, Japan*

POSTER SESSION

Session GPB
FUNDAMENTAL SPINTRONICS I (Poster Session)

Yuta Yamane, Chair
Tohoku University, Sendai, Japan

GPB-01. **Non-equilibrium of magnons and phonons in thulium iron garnets.** *G. Lee*[1], T. Lee[1], C. Phuoc[2], D. Kim[1], M. Seo[1], Y. Jo[3] and K. Kim[1] *1. Physics, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea; 2. Material Science and Engineering, Chungnam National University, Daejeon, The Republic of Korea; 3. Division of Scientific Instrumentation, Korea Basic Science Institute, Daejeon, The Republic of Korea*

GPB-02. **Laser-induced charge and spin photocurrents in $BiAg_2$ monolayer from first-principles.** *T. Adamantopoulos*[1], M. Merte[1,2], F. Freimuth[1,3], D. Go[1,3], S. Blügel[1] and Y. Mokrousov[1,3] *1. Peter Grünberg Institut and Institute for Advanced Simulation, Forschungszentrum Jülich GmbH, Jülich, Germany; 2. Department of Physics, RWTH Aachen University, Aachen, Germany; 3. Institute of Physics, Johannes Gutenberg University Mainz, Mainz, Germany*

GPB-03. **Independence of the Inverse Spin Hall Effect with the Magnetic Phase in Thin NiCu Films.** *M. Cosset-Chéneau*[1], S. Varotto[2], C. Grezes[1], P. Warin[1], Y. Fu[1], A. Brenac[1], J. Jacquot[3], S. Gambarelli[3], C. Rinaldi[4], V. Baltz[1], J. Attané[1], L. Vila[1] and P. Noël[1] *1. Spintec, Grenoble, France; 2. CNRS-THALES, Palaiseau, France; 3. Pheliqs, Grenoble, France; 4. Politecnico di Milano, Milan, Italy*

GPB-04. **Magnon Junction Effect in $Y_3Fe_5O_{12}/CoO/Y_3Fe_5O_{12}$ Insulating Heterostructures.** *W. He*[1] and X. Han[1] *1. Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, Beijing, China*

GPB-05. **Spin-Orbit Torques Dependence on the Metal Barrier Thickness in Metal/$SrTiO_3$-based Two-Dimensional Electron Gases Studied by Spin-Torque Ferromagnetic Resonance.** *A. Kandazoglou*[1], C. Grezes[1], M. Cosset-Chéneau[1], P. Sgarro[1], P. Noël[1,2], S. Auffret[1], A. Brenac[1], M. Bibes[3], S. Petit-Watelot[4], J. Rojas-Sanchez[4], J. Attané[1] and L. Vila[1] *1. CEA, SPINTEC, Grenoble, France; 2. DMAT, Eidgenossische Technische Hochschule Zurich, Zurich, Switzerland; 3. Unité mixte de Physique CNRS/Thales, Palaiseau, France; 4. Institut Jean-Lamour, Université Lorraine - CNRS, Nancy, France*

GPB-06. **Direct Detection of Transient Spin Pumping during Phase Transition of FeRh.** *T. Lee*[1], M. Park[2], S. Kim[1], K. Lee[1], M. Jung[2] and K. Kim[1] *1. Physics, Korea Advanced Institute of Science and Technology, Daejeon, The Republic of Korea; 2. Physics, Sogang University, Seoul, The Republic of Korea*

GPB-07. **Magnetization Switching by Spin-Orbit Torque from a Topological Dirac Semimetal.** *C. Liu*[1], J. Ding[1], V. Kalappattil[1], Y. Zhang[1,2], O. Mosendz[3], U. Erugu[4], R. Yu[1,5], J. Tian[4], A. DeMann[1], S.B. Field[1], X. Yang[2], H. Ding[5], J. Tang[4], B. Terris[3], A. Fert[6] and H. Chen[1,7] *1. Physics Department, Colorado State University, Fort Collins, CO, United States; 2. Huazhong University of Science and Technology, Wuhan, China; 3. Western Digital Research Center, Western Digital Corporation, San Jose, CA, United States; 4. Department of Physics and Astronomy, University of Wyoming, Laramie, WY, United States; 5. National Laboratory of Solid State Microstructures and Department of Physics, Nanjing University, Nanjing, China; 6. Unité Mixte de Physique, CNRS, Thales, Université Paris-Saclay, Palaiseau, France; 7. School of Advanced Materials Discovery, Colorado State University, Fort Collins, CO, United States*

GPB-08. **Decoupling anomalous Nernst and longitudinal spin Seebeck effects in Fe_3O_4/Pt thin films around the Verwey transition.** *A. Chanda*[1], D. DeTellem[1], Y.T. Pham[1], J.E. Shoup[1], A.T. Duong[2], R. Das[2], S. Cho[3], D.V. Voronine[1], M. Trinh[1], D. Arena[1], S. Witanachchi[1], H. Srikanth[1] and M. Phan[1] *1. Physics, University of South Florida, Tampa, FL, United States; 2. Phenikaa University, Hanoi, Vietnam; 3. University of Ulsan, Ulsan, The Republic of Korea*

GPB-09. **Efficient Spin-Orbit-Torque Switching Assisted by an Effective Perpendicular Field in a Magnetic Trilayer.** *T. Ma*[1,2], C. Wan[1], J. Dong[1], C. Guo[1], M. Zhao[1], X. Wang[1], Y. Zhang[1], G. Yu[1] and X. Han[1] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China; 2. Center of Materials Science and Optoelectronics Engineering, University of Chinese Academy of Sciences, Beijing, China*

GPB-10. **Manipulation of coercivity in GdFeCo/Hf heterostructures by an electrical current.** *N. Hai*[1], R.C. Bhatt[2], L. Ye[2], T. Wu[2] and J. Wu[1] *1. Department of Physics, National Changhua University of Education, Changhua, Taiwan; 2. Graduate School of Materials Science, National Yunlin University of Science and Technology, Douliu, Taiwan*

GPB-11. **Multi-level resistance switching in high-quality epitaxial FeRh films.** *M. Park*[1], S. Ji[1], W. Yoo[1], H. Bang[1], J. Yang[2], K. Kim[2] and M. Jung[1] *1. Physics, Sogang University, Seoul, The Republic of Korea; 2. Korea Advanced Institute of Science and Technology, Daejeon, The Republic of Korea*

GPB-12. **Magnonic skin effect and magnon valve effect in an antiferromagnetically coupled heterojunction.** *Z. Yan*[1], Y. Xing[1] and X. Han[1] *1. Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Science, Beijing, China*

GPB-13. **Spin currents at the interface and spin Hall torque.** *V. Basso*[1], A. Magni[1], A. Sola[1] and M. Kuepferling[1] *1. INRIM, Torino, Italy*

GPB-14. **Towards 100% Spin-Orbit Torque Efficiency in PtCr Alloy with the High Spin Hall Conductivity.** *C. Hu*[1], Y. Chiu[1], C. Tsai[1], C. Huang[1], K. Chen[1], C. Peng[1], C. Lee[2], Y. Huang[2], S. Lin[2] and C. Pai[1] *1. National Taiwan University, Taipei, Taiwan; 2. Taiwan Semiconductor Manufacturing, Hsinchu, Taiwan*

GPB-15. **Spin-flop driven anisotropic magnetoresistance in antiferromagnetic spin-valve-like structure.** D. Oh[1], *J. Kim*[1], K. Jeong[1], H. Shin[1], J. Hong[1], J. Kim[1], N. Lee[1] and Y. Choi[1] *1. Department of Physics, Yonsei University, Seoul, The Republic of Korea*

POSTER SESSION

Session GPC
FUNDAMENTAL SPINTRONICS II (Poster Session)

Jorge Puebla, Chair
RIKEN, Wako, Japan

GPC-01. **Spin-orbit torque in structures with magnetization-compensated MnGa/Co_2MnSi bilayer.** *T. Hara*[1], K. Jono[1], M. Yamanouchi[1] and T. Uemura[1] *1. Grad. School of Information Science and Technology, Hokkaido University, Sapporo, Japan*

GPC-02. **Composition dependence of in-plane uniaxial magnetic anisotropy and magnetization reversal behavior in Ni-Fe alloy thin films on a single crystal 128° Y-Cut $LiNbO_3$ substrate.** *M. Ito*[1], N. Maki[2], A. Yamaguchi[3], M. Shima[1,2] and K. Yamada[1,2] *1. Materials Science and Processing, Gifu University, Gifu, Japan; 2. Chemistry and Biomolecular Science Faculty of Engineering, Gifu University, Gifu, Japan; 3. Laboratory of Advanced Science and Technology for Industry, University of Hyogo, Kamigori, Japan*

GPC-03. **Probing THz emission from spintronic Fe/Pt-emitters with varied interfaces.** *L. Scheuer*[1], M. Ruhwedel[1], D. Sokoluk[1], G. Torosyan[2], R. Beigang[1], M. Rahm[1] and E. Papaioannou[3] *1. TUK, Kaiserslautern, Germany; 2. Photonic Center Kaiserslautern, Kaiserslautern, Germany; 3. Institute of Physics, MLU, Halle, Germany*

GPC-04. **Rashba Spin-Orbit Torque in Interface Engineered Ultrathin Metallic Multilayers.** *S. Krishnia*[1], Y. Sassi[1], F. Ajejas[1], S. Collin[1], A. Fert[1], J. George[1], N. Reyren[1], V. Cros[1] and H. Jaffrès[1] *1. Unité Mixte de Physique, CNRS, Thales, Université Paris-Saclay, Palaiseau, France*

GPC-05. **The anomalous Nernst effect in Co_2MnSi thin film.** J. Harknett[1], C. Cox[1,2], L. Osborn[1], M.T. Greenaway[1] and *K. Morrison*[1] *1. Physics, Loughborough University, Loughborough, United Kingdom; 2. National Physical Laboratory, Teddington, United Kingdom*

GPC-06. **Investigation of Spin Gapless Semiconducting Behaviour in Quaternary CoFeMnSi Heusler Alloy Thin Films on Si (100).** *V. Mishra*[1], V. Barwal[1], L. Pandey[1], N. Gupta[1], S. Hait[1], A. Kumar[1], N. Sharma[1], N. Kumar[1] and S. Chaudhary[1] *1. Physics, Indian Institute of Technology Delhi, New Delhi, India*

GPC-07. **Observation of out-of-plane spin polarization in amorphous WTe_2.** *W. Liao*[1], C. Peng[1], T. Chen[1] and C. Pai[1] *1. National Taiwan University, Taipei, Taiwan*

GPC-08. **Curie temperature dependence of unidirectional spin Hall magnetoresistance in metallic bilayers.** *K. Yamanoi*[1], H. Semizu[1] and Y. Nozaki[1,2] *1. Department of Physics, Keio University, Yokohama, Japan; 2. Keio University, Center for Spintronics Research Network, Yokohama, Japan*

GPC-09. **Thermal Scanning Probe Lithography as a Technique for Fabrication and Local Modification of Non-Local Spin Valves.** *A.J. Wright*[1], M.J. Erickson[2,3], P.A. Crowell[2], C. Leighton[3] and L. O'Brien[1] *1. Physics, University of Liverpool, Liverpool, United Kingdom; 2. Physics and Astronomy, University of Minnesota, Minneapolis, MN, United States; 3. Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, United States*

GPC-10. **Large Spin-Current Conversion in Tungsten-based Materials.** *R. Xiao*[1], J. Zhang[1,2], H. Zhang[1], A. Du[1], J. Yin[1], S. Lu[3], X. Shang[3], C. Zhang[2], B. Man[2], S. Lyu[3], X. Zhou[3], W. Chen[1,2], D. Zhu[1,2], G. Wang[3], W. Zhao[1,2], K. Cao[1,2] and H. Liu[3] *1. Fert Beijing Institute, School of Integrated Science and Engineering, Beihang University, Beijing, China; 2. Beihang-Geortek Joint Microelectronics Institute, Qingdao Research Institute, Beihang University, Qingdao, China; 3. Truth Memory tech. Corporation, Beijing, China*

GPC-11. **Non-Volatile Electric-Field Control of Spin-Orbit Torques and Anomalous Hall Effect in Perpendicular Ferromagnet - $SrTiO_3$ System.** C. Grezes[1], *A. Kandazoglou*[1], M. Cosset-Chéneau[1], L. Moreno[2], P. Sgarro[1], P. Noël[1,3], S. Auffret[1], K. Garello[1], M. Bibes[2], L. Vila[1] and J. Attané[1] *1. CEA, SPINTEC, Grenoble, France; 2. Unité mixte de Physique CNRS/Thales, Palaiseau, France; 3. DMAT, Eidgenossische Technische Hochschule Zurich, Zurich, Switzerland*

POSTER SESSION

Session GPD
MRAM, MAGNETIC LOGIC AND RELATED DEVICES III (Poster Session)

Manfred Albrecht, Co-Chair
University of Augsburg, Augsburg, Germany
Michal Krupinski, Co-Chair
Polish Academy of Sciences, Kraków, Poland

GPD-01. **Design of LUT-Based LDPC Decoders for Spin-Torque Transfer Magnetic Random Access Memory.** *C. Duangthong*[1], W. Phakphisut[1] and P. Subniti[1] *1. School of Engineering, King Mongkut's Institute of Technology Ladkrabang, Ladkrabang, Thailand*

GPD-02. **Spin Orbit Torque Driven Stochastic MTJ Neuron-based Boltzmann Machine for Pattern Classification Application.** *D. Divyanshu*[1], A.H. Lone[1], S. Amara[1], S. Srinivasan[2] and H. Fariborzi[1] *1. CEMSE, King Abdullah University of Science and Technology, Jeddah, Saudi Arabia; 2. SCEE, Indian Institute of Technology Mandi, Mandi, India*

GPD-03. **Artificial neuron designed using a spin Josephson oscillator based on a synthetic antiferromagnet.** *S. Louis*[1], H. Bradley[2], A.N. Slavin[2] and V. Tyberkevych[2] *1. Electrical and Computer Engineering, Oakland University, Rochester, MI, United States; 2. Physics, Oakland University, Rochester, MI, United States*

GPD-04. **Kuramoto-Model-Based Data Classification Using the Synchronization Dynamics of Uniform-Mode Spin Hall Nano-Oscillators.** *N. Garg*[1], V. Hemadri Bhotla[1], P.K. Muduli[1] and D. Bhowmik[2,3] *1. Physics, Indian Institute of Technology Delhi, New Delhi, India; 2. Electrical Engineering, Indian Institute of Technology Delhi, New Delhi, India; 3. School of Artificial Intelligence, Indian Institute of Technology Delhi, New Delhi, India*

GPD-05. **Examination of Magnetization Switching Behavior by Bi-directional Read of Spin Orbit Torque MRAM.** *A. Yamada*[1], Y. Kishi[1], M. Ke[1] and T. Kawahara[1] *1. Tokyo University of Science, Tokyo, Japan*

GPD-06. **Atomistic Study of the Thermodynamic Properties and Switching Dynamics of Perpendicular Shape Anisotropy MRAM.** *W. Lack*[1], R.F. Evans[1] and S. Jenkins[1] *1. University of York, York, United Kingdom*

GPD-07. **3-Terminal Domain Wall Device Based Synapses for Neuromorphic Computing.** *D. Kumar*[1], S. Srivastava[1], K. Yamane[2], W. Law[2], G. Rajan[2], V. Naik[2], T. Jin[1], S. Li[1], W. Lew[1], X. Wang[1] and S. Piramanayagam[1] *1. Nanyang Technological University, Singapore, Singapore; 2. GLOBALFOUNDRIES Singapore Pte. Ltd., Singapore, Singapore*

GPD-08. **Coercivity control of thin films with perpendicular magnetic anisotropy by surface acoustic waves.** *J. Shuai*[1], M. Ali[1], L. Chen[2], J. Cunningham[2] and T. Moore[1] *1. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom; 2. School of Electronic and Electrical Engineering, University of Leeds, Leeds, United Kingdom*

GPD-09. **Weighted Error Correcting Code (WECC) against Asymmetric Error of STT-MRAM.** *Q. Wang*[1] and Y. Jiang[1] *1. School of Internet of Things Engineering, Jiangnan University, Wuxi, China*

GPD-10. **Nanoscale Thermal Transport Model of Magnetic Tunnel Junction (MTJ) Device for STT-MRAM.** *S. Li*[1] and Y. Jiang[1] *1. Department of Electrical Engineering, Jiangnan University, Wuxi, China*

GPD-11. **Milli volt class spin motive force due to domain wall motion in GdFeCo magnetic wire.** *M. Oikawa*[1], S. Sumi[1], K. Tanabe[1] and H. Awano[1] *1. Toyota Technological Institute, Nagoya, Japan*

GPD-12. **The fast write strategy of STT-MRAM with pipeline architecture.** *G. Zhang*[1] and Y. Jiang[1] *1. Department of Electrical Engineering, Jiangnan University, Wuxi, China*

GPD-13. **A RC Thermal Model of 3D-Stacked Stand-alone MRAM.** *R. Yong*[1] and Y. Jiang[1] *1. School of Internet of Things Engineering, Jiangnan University, Wuxi, China*

GPD-14. **Compact Model of Domain Wall MTJ Device Driven by Spin Orbit Torque and Dzyaloshinskii–Moriya Interaction.** *M. Wang*[1] and Y. Jiang[1] *1. Jiangnan University, Wuxi, China*

GPD-15. **Nontrivial Relationship Between Current Pulse Width and Spin Torque Switching of Perpendicular Magnetic Tunnel Junctions.** J. Beik Mohammadi[1,2], *E. Clay*[1] and J. Andino[1] *1. Loyola University New Orleans, New Orleans, LA, United States; 2. University of New Orleans, New Orleans, LA, United States*

GPD-16. **FeRh Based Metamagnetic Memristors for Neuromorphic Spintronics.** A.L. Friedman[1], N. Blumenschein[1], S.L. LaGasse[2], G.M. Stephen[1], O. Van't Erve[2], M. Currie[2], J. Prestigiacomo[2], S. Qadri[2], A.T. Hanbicki[1], C. Cress[2] and *S.P. Bennett*[2] *1. Laboratory for Physical Sciences, College Park, MD, United States; 2. United States Naval Research Laboratory, Washington, DC, United States*

GPD-17. **Effect of high T_c interface layer in high T_c/ low T_c hybrid memory layer on thermally assisted spin-transfer-torque switching.** *W. Zhao*[1], T. Kato[2], D. Oshima[1] and S. Iwata[3] *1. Department of Electronics, Nagoya University, Nagoya, Japan; 2. Institute of Materials and Systems for Sustainability, Nagoya Univerisity, Nagoya, Japan; 3. Department of Research, Nagoya Industrial Science Research Institute, Nagoya, Japan*

POSTER SESSION

Session GPE
MAGNETORESISTANCE AND VOLTAGE-CONTROLLED MAGNETIC PROPERTIES (Poster Session)

Stephane Mangin, Chair
Université de Lorraine, Vandoeuvre-lès-Nancy, France

GPE-01. **Ionic Liquid Modulation of Exchange Bias in Epitaxial $LaMnO_3$ Films.** *X. Zhao*[1], S. Ng[1], Y. Liu[1,2], H. Wong[1], W. Cheng[1], C. Mak[1] and C. Leung[1] *1. Applied Physics, The Hong Kong Polytechnic University, Hong Kong, China; 2. College of Electronic Information and Mechatronic Engineering, Zhaoqing University, Zhaoqing, China*

GPE-02. **Impact of Magneto-Electric Coupling in Thermally Activated Magnetization Dynamics in Nanomagnets.** *S. Perna*[1], P. Ansalone[2], V. Scalera[3], M. d'Aquino[1], C. Serpico[1] and V. Basso[2] *1. DIETI, Università di Napoli Federico II, Naples, Italy; 2. Instituto Nazionale di Ricerca Metrologica, Turin, Italy; 3. Free University of Bozen-Bolzano, Bolzano, Italy*

GPE-03. **Reconfigurable spin-logic device via laterally modulated Rashba effect in Pt/Co/AlO_x structures.** *M. Kang*[1], J. Choi[1], J. Jeong[1], J. Park[1], H. Park[2], T. Kim[2], T. Lee[1], K. Kim[1], K. Kim[3], J. Oh[2], D. Viet[4], J. Jeong[4], J. Yuk[1], J. Park[2], K. Lee[1] and B. Park[1] *1. Korea Advanced Institute of Science and Technology, Deajeon, The Republic of Korea; 2. Korea University, Seoul, The Republic of Korea; 3. Korea Institute of Science and Technology, Seoul, The Republic of Korea; 4. Chungnam National University, Daejeon, The Republic of Korea*

GPE-04. **Enhancement of Voltage Controlled Magnetic Anisotropy (VCMA) Through Electron Depletion.** *T. Peterson*[1], A. Hurben[1], D. Zhang[1] and J. Wang[1] *1. University of Minnesota, Minneapolis, MN, United States*

GPE-05. **Improving the spin-orbit torque efficiency in Pt/CoFeB/Pt based perpendicularly magnetized system to decrease the critical current density for current-induced magnetization switching.** *S. Kayal*[1], S. Maji[1], A. Mukhopadhyay[1] and P. Kumar[1] *1. Department of Physics, Indian Institute of Science, Bangalore, India*

GPE-06. **Spin-orbit torque assisted switching with voltage controlled exchange coupling.** *B.R. Zink*[1], Y. Lv[1], D. Zhang[1], D. Lyu[1] and J. Wang[1] *1. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

GPE-07. **Toggling of Exchange Bias in GdCo/NiO Thin Film Heterostructures by Hydrogen Gating.** *M. Hasan*[1], J. Zehner[2], M. Huang[1], K. Leistner[2] and G.S. Beach[1] *1. Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States; 2. Leibniz IFW Dresden, Dresden, Germany*

GPE-08. **A Model of Liposomal DDS with Field-Dependent Radical Pair System.** *H. Nakagawa*[1], M. Fujimoto[2] and T. Tadokoro[1] *1. Tokyo Denki University, Tokyo, Japan; 2. CPCC, Tokyo, Japan*

GPE-09. **Detection of proton NMR by highly sensitive TMR sensor.** *M. Oogane*[1], K. Fujiwara[2], H. Wagatsuma[1], S. Kumagai[2] and Y. Ando[1] *1. Tohoku University, Sendai, Japan; 2. Spin Sensing Factory Corp., Sendai, Japan*

GPE-10. **Multi-TMR device with a compact footprint for low magnetic field detection at room temperature.** *M. Silva*[1,2], R. Macedo[1], S. Cardoso de Freitas[1,2] and P.P. Freitas[1] *1. Instituto de Engenharia de Sistemas e Computadores - Microsistemas e Nanotecnologias, Lisbon, Portugal; 2. Instituto Superior Tecnico (IST), Universidade de Lisboa, Lisbon, Portugal*

GPE-11. **Giant tunneling magnetoresistance in van derWaals magnetic tunnel junctions formed by interlayer antiferromagnetic bilayer $CoBr_2$.** *Y. Zhu*[2,1], X. Guo[2], L. Jiang[1], Z. Yan[1], Y. Yan[2] and X. Han[1] *1. Institute of Physics, Beijing, China; 2. Jilin University, Changchun, China*

GPE-12. **Structural and Magnetic Properties of CoIrMnAl Heusler Alloy Epitaxial Films Fabricated with Magnetron Sputtering for Spintronics Applications.** *D.C. Lloyd*[1], K. Elphick[1], R. Monma[2,3], T. Roy[4], K. Suzuki[3,5], T. Tsuchiya[5,6], M. Tsujikawa[4,5], S. Mizukami[3,6], M. Shirai[5,6] and A. Hirohata[1] *1. Department Electronic Engineering, University of York, York, United Kingdom; 2. Department of Applied Physics, Graduate School of Engineering, Tohoku University, Sendai, Japan; 3. WPI Advanced Institute for Materials Research (AIMR), Tohoku University, Sendai, Japan; 4. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 5. Center for Spintronics Research Network (CSRN), Tohoku University, Sendai, Japan; 6. Center for Science and Innovation in Spintronics (CSIS), Core Research Cluster (CRC), Tohoku University, Sendai, Japan*

GPE-13. **Integration of 10 nm thick Dysprosium Iron Garnet Films on Silicon.** *M. Gross*[1], J. Bauer[2] and C. Ross[2] *1. Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Cambridge, MA, United States; 2. Material Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States*

Session HOA
FERROMAGNETIC RESONANCE

Kyongmo An, Chair
Korea Research Institute of Standards and Science, Daejeon, The Republic of Korea

HOA-01. **Magnetoelastic Gilbert Damping in Magnetostrictive $Fe_{0.7}Ga_{0.3}$ Thin Films.** ***(Invited)*** *W. Peria*[1], X. Wang[2], H. Yu[2], S. Lee[2,3], I. Takeuchi[2] and P.A. Crowell[1] *1. School of Physics and Astronomy, University of Minnesota, Minneapolis, MN, United States; 2. Department of Materials Science and Engineering, University of Maryland, College Park, MD, United States; 3. Department of Physics, Pukyong National University, Busan, The Republic of Korea*

HOA-02. **Quantifying spin-mixed states in ferromagnets.** *J.M. Shaw*[1], R. Knut[2], C. Armstrong[3], S. Bhandary[4], Y. Kvashnin[2], D. Thonig[5], E. Delczeg-Czirjak[2], O. Karis[2], T. Silva[1], E. Weschke[6], H. Nembach[1], O. Eriksson[2,5] and D. Arena[3] *1. NIST, Boulder, CO, United States; 2. Uppsala University, Uppsala, Sweden; 3. Univ. South Florida, Tampa, FL, United States; 4. Trinity College, Dublin, Ireland; 5. Örebro University, Örebro, Sweden; 6. Helmholtz Zentrum Berlin Mat & Energie, Berlin, Germany*

HOA-03. **Anomalous Temperature Dependence of Phonon Pumping by Ferromagnetic Resonance in $[Co/Pd]_n$ Multilayers with Perpendicular Anisotropy.** *W. Peria*[1], D. Zhang[2], J. Wang[2] and P.A. Crowell[1] *1. School of Physics and Astronomy, University of Minnesota, Minneapolis, MN, United States; 2. Department of Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

HOA-04. **Intrinsic and Extrinsic Damping in Polycrystalline Fe Thin Films.** *S. Wu*[1], D.A. Smith[1], P. Nakarmi[2], A. Rai[2], M. Clavel[3], M. Hudait[3], J. Zhao[4], F.M. Michel[4], T. Mewes[2] and S. Emori[1] *1. Physics, Virginia Tech, Blacksburg, VA, United States; 2. Physics and Astronomy, The University of Alabama, Tuscaloosa, AL, United States; 3. Electrical and Computer Engineering, Virginia Tech, Blacksburg, VA, United States; 4. Geosciences, Virginia Tech, Blacksburg, VA, United States*

HOA-05. **The role of proximity induced magnetism on spin transport in multilayered systems.** *C. Swindells*[1,2], H. Glowinski[3], Y. Choi[4], D. Haskel[4], P. Michalowski[5], T. Hase[6], P. Kuswik[3] and D. Atkinson[2] *1. Department of Materials Science and Engineering, University of Sheffield, Sheffield, United Kingdom; 2. Department of Physics, Durham University, Durham, United Kingdom; 3. Institute of Molecular Physics, Poznan, Poland; 4. Advanced Photon Source, Argonne National Laboratory, Argonne, IL, United States; 5. Lukasiewicz Research Network, Institute of Microelectronics and Photonics, Warsaw, Poland; 6. Department of Physics, University of Warwick, Coventry, United Kingdom*

HOA-06. **Ultrathin ferrimagnetic GdFeCo films with very low damping.** *L. Bainsla*[1], A.A. Awad[1], M. Zahedinejad[1], A. Kumar[1], N. Behera[1], H. Fulara[1], R. Khymyn[1], A. Houshang[1] and J. Åkerman[1] *1. Physics, University of Gothenburg, Gothenburg, Sweden*

HOA-07. **Increase of Gilbert Damping in Permalloy Thin Films Due to Heat-Induced Structural Changes.** *F. Schulz*[1], R. Lawitzki[2], H. Glowinski[3], F. Lisiecki[3], N. Träger[1], P. Kuswik[3], E. Goering[1], G. Schütz[1] and J. Gräfe[1] *1. Max Planck Institute for Intelligent Systems, Stuttgart, Germany; 2. Department of Materials Science, University of Stuttgart, Stuttgart, Germany; 3. Institute of Molecular Physics, Polish Academy of Sciences, Poznan, Poland*

HOA-08. **New Techniques for Probing the Dynamic Properties of Magnetic Materials.** *S.A. Ryan*[1], P.M. Tengdin[1], W. You[1], P. Johnsen[1], C. Gentry[1], A. Grafov[1], A. Blonsky[1], C. Chen[1], D. Zusin[1], X. Shi[1], M. Murnane[1] and H. Kapteyn[1] *1. Department of Physics and JILA, University of Colorado and NIST, Boulder, CO, United States*

HOA-09. **Low-Damping Vertically Graded Ferromagnetic Films.** *R. Maizel*[1], Y. Lim[1], S. Wu[1], D.A. Smith[1], A. Gupta[1], J. Heremans[1] and S. Emori[1] *1. Physics, Virginia Polytechnic Institute and State University, Blacksburg, VA, United States*

HOA-10. **Dispersion Relation of Nutation Surface Spin Waves in Ferromagnets.** *M. Cherkasskii*[1], M. Farle[1,2] and A. Semisalova[1] *1. Faculty of Physics, University of Duisburg-Essen, Duisburg, Germany; 2. Kirensky Institute of Physics, Federal Research Center KSC SB RAS, Krasnoyarsk, Russian Federation*

HOA-11. **Nonmonotonic temperature dependence of current-induced effective magnetic field exerted on domain wall in $SrRuO_3$.** *M. Yamanouchi*[1], Y. Araki[2], T. Sakai[1], T. Uemura[1], H. Ohta[3] and J. Ieda[2] *1. Graduate School of Information Science and Technology, Hokkaido University, Sapporo, Japan; 2. Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan; 3. Research Institute for Electronic Science, Hokkaido University, Sapporo, Japan*

HOA-12. **Time-resolved Nonlinear Magnetization Dynamics in YIG Thin Films.** *A.S. Hamill*[1], T. Qu[2], R. Victora[2] and P.A. Crowell[1] *1. Physics and Astronomy, University of Minnesota, Minneapolis, MN, United States; 2. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

HOA-13. **Effect of surface treatment on damping constant in Ta-O/Co-Fe-B heterostructures.** *T. Nguyen*[1,2], Y. Saito[2], S. Ikeda[1,2], T. Endoh[1,2] and Y. Endo[1,3] *1. Center for Science and Innovation in Spintronics, Tohoku University, Sendai, Japan; 2. Center for Innovative Integrated Electronic Systems, Tohoku University, Sendai, Japan; 3. Graduate School of Engineering, Tohoku University, Sendai, Japan*

HOA-14. **Dynamic instabilitiy in high power FMR of BiYIG nanodisks.** *I. Ngouagnia Yemeli*[1], D. Gouéré[2], H. Merbouche[3], T. Srivastava[1], H. Hurdequint[1], V. Cros[2], M. Muñoz[4], S. Sangiao[5], J. de Teresa[5], O. Klein[6], A. Anane[2] and G. de Loubens[1] *1. Université Paris-Saclay, CEA, CNRS, SPEC, Gif-Sur-Yvette, France; 2. Unite Mixte de Physique CNRS/Thales, Palaiseau, France; 3. Institut für Angewandte Physik, University of Münster, Münster, Germany; 4. Instituto de Micro y Nanotecnología (CNM-CSIC), Madrid, Spain; 5. Departamento de Física de la Materia Condensada, Universidad de Zaragoza, Zaragoza, Spain; 6. Université Grenoble Alpes, CEA, CNRS, Spintec, Grenoble, France*

HOA-15. **High Order Gyromode Observation in Dome-like Nanoparticles.** *A. Bondarenko*[1], S. Bunyaev[1], A. Shukla[2], A. Apolinario[1], D. Navas[1,4], N. Singh[3], A. Adeyeye[2,5] and G.N. Kakazei[1] *1. IFIMUP/Department of Physics and Astronomy, University of Porto, Porto, Portugal; 2. Department of Electrical and Computer Engineering, National University of Singapore, Singapore; 3. Institute of Microelectronics, A*STAR, Singapore, Singapore; 4. Instituto de Ciencia de Materiales de Madrid, Madrid, Spain; 5. Department of Physics, Durham University, Durham, United Kingdom*

ORAL SESSION

Session HOB
FEMTOSECOND EXCITATION OF MAGNETISM

Gregory Malinowski, Chair
Institut Jean Lamour, Université de Lorraine, Vandœuvre-lès-Nancy, France

HOB-01. **Ultrafast Single Pulse All Optical Magnetization Switching of Ferromagnets.** ***(Invited)*** *Q. Remy*[1], J. Igarashi[1,2], S. Iihama[3,4], G. Malinowski[1], M. Hehn[1], J. Gorchon[1], J. Hohlfeld[1], S. Fukami[2,4], H. Ohno[2,4] and S. Mangin[1] *1. Institut Jean Lamour, UMR CNRS, Université de Lorraine, Nancy, France; 2. Laboratory for Nanoelectronics and Spintronics, Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 3. Frontier Research Institute for Interdisciplinary Sciences, Tohoku University, Sendai, Japan; 4. Center for Spintronics Research Network, Tohoku University, Sendai, Japan*

HOB-02. **Sub-THz spin torque oscillation excited by inverse effective spin torque in ferrimagnetic material at angular momentum compensation composition.** *Y. Kurokawa*[1], N. Hashimoto[1], C. Liu[1], T. Tanaka[1] and H. Yuasa[1] *1. Graduate School and Faculty of Information Science and Electrical Engineering, Kyushu University, Fukuoka, Japan*

HOB-03. **Probing optically induced spin-currents using THz spin-waves in noncollinear magnetic bilayers.** *T. Lichtenberg*[1], M. Beens[1], M.H. Jansen[1], R. Duine[1,2] and B. Koopmans[1] *1. Department of Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands; 2. Institute for Theoretical Physics, Utrecht University, Utrecht, Netherlands*

HOB-04. **Enhancing All-Optical Magnetization Writing with Spin Currents.** *Y. van Hees*[1], M. Peters[1], M. Beens[1], P. van de Meugheuvel[1], B. Koopmans[1] and R. Lavrijsen[1] *1. Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands*

HOB-05. **Laser-Induced THz-Modes of Lattice Vibrations in Yig:Co Thin Films.** *A.I. Frej*[1] and A. Stupakiewicz[1] *1. Physics, University of Bialystok, Bialystok, Poland*

HOB-06. **Correlation between Femtosecond Laser Induced Spin Current and Spin Dynamics at the Single Layer Graphene/CoFeB Thin Films.** *S. Panda*[1], S. Majumder[1], S. Choudhury[1], A. Bhattacharya[1], S. Sinha[1] and A. Barman[1] *1. Department of Condensed Matter Physics and Material Sciences, S. N. Bose National Centre for Basic Sciences, Kolkata, India*

HOB-07. **Laser-Induced Magnetization Precession in YIG/Metal Thin Film Heterostructures.** *E. Schmoranzerová*[1], J. Kimák[1], Z. Soban[2], D. Kriegner[3,2], H. Reichlova[3,2], R. Schlitz[3], M. Munzenberg[5], G. Jakob[4], E. Guo[4], M. Kläui[4] and P. Nemec[1] *1. Faculty of Mathematics and Physics, Charles University, Prague, Czechia; 2. Institute of Physics, Czech Academy of Sciences, Prague, Czechia; 3. Technical University Dresden, Dresden, Germany; 4. Institute of Physics, Johannes Gutenberg University Mainz, Mainz, Germany; 5. Institute of Physics, University of Greifswald, Greifswald, Germany*

HOB-08. **Imprinting chirality in collinear magnet with ultrafast laser.** *S. Ghosh*[1,2], F. Freimuth[1,2], O. Gomonay[2], S. Blügel[1] and Y. Mokrousov[1,2] *1. PGI - 1, Forschungszentrum Jülich, Jülich, Germany; 2. Institute of Physics, Johannes Gutenberg University, Mainz, Germany*

HOB-09. **Using Spin Waves to Probe Ultrafast Spin Current Generation in Rare Earth Ferromagnets.** *Y. van Hees*[1], T. Lichtenberg[1], M. Beens[1], J. Levels[1], B. Koopmans[1] and R. Lavrijsen[1] *1. Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands*

HOB-10. **RKKY exchange coupling mediated ultrafast all-optical switching of a ferromagnet.** *D. Polley*[1,2], J. Chatterjee[1,4], A. Pattabi[1], H. Jang[1,3], S. Salahuddin[1] and J. Bokor[1,2] *1. EECS, University of California Berkeley, Berkeley, CA, United States; 2. Material Science Department, LBNL, Berkeley, CA, United States; 3. Material Science and Engineering, Seoul National University, Seoul, The Republic of Korea; 4. Fraunhofer Institute for Photonic Microsystems, Dresden, Germany*

HOB-11. **Modeling ultrafast demagnetization and spin transport: the interplay of spin-polarized electrons and thermal magnons.** *M. Beens*[1], R. Duine[2,1] and B. Koopmans[1] *1. Eindhoven University of Technology, Eindhoven, Netherlands; 2. Utrecht University, Utrecht, Netherlands*

HOB-12. **Ultrafast magnetization dynamics of strained NFO films using ultra short XUV pulses.** S. Saha[1], *R. Knut*[1], R. Malik[1], K. Jatkar[1,5], R. Stefanuik[1], J. Soderstrom[1], V. Kapaklis[1], C. Luo[2], F. Radu[2], A. Gupta[3], O. Karis[1] and D. Arena[4] *1. Uppsala University, Uppsala, Sweden; 2. Helmholtz-Berlin, Berlin, Germany; 3. University of Alabama, Tuscaloosa, AL, United States; 4. University of South Florida, Tampa, FL, United States; 5. Stockholm University, Stockholm, Sweden*

HOB-13. **Ultrafast magnetization dynamics in half-metallic Co_2FeAl Heusler alloy.** R. Malik[1], E. Delczeg-Czirjak[1], R. Knut[1], I. Vaskivskyi[1,2], D. Phuyal[1,3], S. Jana[1,4], R. Stefanuik[1], Y. Kvashnin[1], J. Soderstrom[1], D. Thonig[5], R. Gupta[1], A. Kumar[1], P. Svedlindh[1], O. Eriksson[1] and *O. Karis*[1] *1. Uppsala University, Uppsala, Sweden; 2. University of Ljubljana, Ljubljana, Slovenia; 3. KTH, Stockholm, Sweden; 4. Helmholtz-Berlin, Berlin, Germany; 5. Örebro University, Örebro, Sweden*

HOB-14. **Tuneable Ni, Pt, Ir and Co Synthetic Ferrimagnets for All Optical Switching.** *J.N. Scott*[1], M. Dabrowski[3], W. Hendren[1], C.M. Forbes[1], A. Frisk[2], D. Burn[2], D.G. Newman[3], P.S. Keatley[3], A.T. N'Diaye[4], T. Hesjedal[5], G. van der Laan[2], R.J. Hicken[3] and R. Bowman[1] *1. Queen's University Belfast, Belfast, United Kingdom; 2. Diamond Light Source, Didcot, United Kingdom; 3. University of Exeter, Exeter, United Kingdom; 4. Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 5. University of Oxford, Oxford, United Kingdom*

HOB-15. **Single pulse all-optical magnetic switching in amorphous $DyCo_x$ and $TbCo_x$.** *Z. Hu*[1], J. Besbas[1], R. Smith[1], N. Teichert[1], G. Atcheson[1], P.S. Stamenov[1], K. Rode[1] and M. Coey[1] *1. CRANN, AMBER and School of Physics, Trinity College Dublin, Dublin, Ireland*

ORAL SESSION

Session HOC
APPLICATIONS OF MAGNETIZATION DYNAMICS

Kornel Richter, Chair
University P.J. Safarik, Košice, Slovakia

HOC-01. **Controlling Magnon Interaction by a Nanoscale Switch.** *A. Etesamirad*[1], R. Rodriguez[1], J. Bocanegra[1], R. Verba[2], J. Katine[3], I. Krivorotov[4], V. Tyberkevych[5], B. Ivanov[2] and I. Barsukov[1] *1. Physics and Astronomy, University of California, Riverside, Riverside, CA, United States; 2. Institute of Magnetism, Kyiv, Ukraine; 3. Western Digital, San Jose, CA, United States; 4. Physics and Astronomy, University of California, Irvine, Irvine, CA, United States; 5. Department of Physics, Oakland University, Rochester, MI, United States*

HOC-02. **Enhancing domain wall motion with He^+ irradiation: the role of microscopic pinning parameters.** *J.W. van der Jagt*[1], M. Sall[1], N. Vernier[2], L. Herrera-Diez[2], M. Belmeguenai[3], Y. Roussigné[3], A. Thiaville[4], V. Jeudy[4], R. Juge[1] and D. Ravelosona[1,2] *1. Spin-Ion Technologies, Palaiseau, France; 2. Centre de Nanosciences et de Nanotechnologies, Palaiseau, France; 3. Laboratoire des Sciences des Procédés et des Matériaux, Villetaneuse, France; 4. Laboratoire de Physique des Solides, Orsay-Cedex, France*

HOC-03. **Tailoring domain wall dynamics and magnetic relaxation in Pd/Co/C_{60}/Pd system at the molecular scale.** *E. Pandey*[1], B. Ojha[1], P. Sharangi[1] and S. Bedanta[1] *1. Physical Sciences, National Institute of Science Education and Research (NISER), Bhubaneswar, Khordha, India*

HOC-04. **Tuning the Magnetic Properties of Ferromagnetic [Pt/Co/Mn]$_n$ Multilayers.** *M. Lonsky*[1], M. Yoo[1], Y. Huang[1] and A. Hoffmann[1] *1. Materials Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, United States*

HOC-05. **Temperature dependence static and dynamic properties of soft magnetic thin film FeGaB/Al_2O_3 for microwave applications.** *Y. Wang*[1], Y. Karampuri[1] and W. Tao[1] *1. School of Information Science and Technology, ShanghaiTech University, Shanghai, China*

HOC-06. **Magnetization Dynamics of Single and Trilayer Permalloy Nanodots.** *M. Kuchibhotla*[1], A. Talapatra[2], A. Haldar[1] and A. Adeyeye[2,3] *1. Physics, Indian Institute of Technology Hyderabad, Hyderabad, India; 2. Department of Electrical and Computer Engineering, National University of Singapore, Singapore; 3. Physics, Durham University, Durham, United Kingdom*

HOC-07. **Ferromagnetic Resonance of Tuneable Low Magnetostrictive Ni_xFe_{100-x} Superlattice Structures for High Frequency Application.** *M.R. McMaster*[1], W. Hendren[1], J. Scott[1] and R. Bowman[1] *1. Mathematics and Physics, Queen's University, Belfast, United Kingdom*

HOC-08. **Coupling-induced bistability in self-oscillating regimes of two coupled identical Spin-Torque nano-oscillators.** *S. Perna*[1], S. Wittrock[2], M. d'Aquino[1], A. Quercia[1], R. Lebrun[3], V. Cros[3] and C. Serpico[1] *1. DIETI, University of Naples Federico II, Naples, Italy; 2. Max Born Institute for Nonlinear Optics and Short Pulse Spectroscopy, Berlin, Germany; 3. Unité Mixte de Physique CNRS/Thales, Paris, France*

HOC-09. **An Improved Eddy Current Loss Model Over Broadband Frequency Range.** *L. Chen*[1,2], Z. Zhang[1] and T. Ben[1] *1. College of Electrical Engineering and New Energy, China Three Gorges University, Yichang, China; 2. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China*

HOC-10. **Magnetic Gilbert Damping at Elevated Temperature: High PMA Ultrathin Film.** *R. Mandal*[1,2], Y. Sasaki[2], I. Kurniawan[2], J. Jung[2], Y. Miura[2], Y. Sakuraba[2], K. Hono[2] and Y. Takahashi[2] *1. Advanced Institute for Materials Research, Tohoku University, Sendai, Japan; 2. National Institute for Materials Science, Tsukuba, Japan*

HOC-11. **Bi-stable magnetization switching in a magnetic tunnel junction with thermal isolation.** *Y. Kaneda*[1,2], M. Goto[1,2], T. Mizuno[3], T. Yamane[3], N. Degawa[3], T. Suzuki[3], A. Shimura[3], S. Aoki[3], J. Urabe[3], S. Hara[3], H. Nomura[1,2] and Y. Suzuki[1,2] *1. Graduate School of Engineering Science, Osaka University, Toyonaka, Japan; 2. Center for Spintronics Research Network, Osaka University, Toyonaka, Japan; 3. TDK Corporation, Chuo-ku, Japan*

HOC-12. **Electrically detected ferromagnetic resonance in polycrystalline YIG covered with a layer of Ag paint.** *Y. Lee*[1] and R. Mahendiran[1] *1. Physics, National University of Singapore, Singapore*

HOC-13. **Magnetization dynamics of magnetic nanoparticles for thermal and magnetic particle imaging.** *T.Q. Bui*[1], A.J. Biacchi[1], K.N. Quelhas[1], M. Henn[1], E.L. Correa[1], W. Tew[1], A.R. Hight Walker[1], C. Dennis[1], M.J. Donahue[1] and S. Woods[1] *1. National Institute of Standards and Technology, Gaithersburg, MD, United States*

ORAL SESSION

Session HOD
DMI, SKYRMIONS AND OTHER TOPOLOGICAL OBJECTS

Stanislas Rohart, Chair
Université Paris-Saclay Faculte des Sciences d'Orsay, Orsay, France

HOD-01. **Exploiting excitations of magnetic topological objects.** ***(Invited)*** *D.R. Rodrigues*[1] *1. Department of Electrical and Information Engineering, Politecnico di Bari, Bari, Italy*

HOD-02. **Engineering of intrinsic chiral torques in magnetic thin films based on the Dzyaloshinskii-Moriya interaction.** *Z. Liu*[1,2], Z. Luo[1,2], S. Rohart[3], L. Heyderman[1,2], P. Gambardella[2] and A. Hrabec[1,2] *1. Laboratory for Multiscale Materials Experiments, Paul Scherrer Institute, Villigen PSI, Switzerland; 2. Department of Materials, ETH Zurich, Zurich, Switzerland; 3. Laboratoire de Physique des Solides, Université Paris-Saclay, Orsay, France*

HOD-03. **Magnetization statics and dynamics in Ir/Co/Pt multilayers with Dzyaloshinskii-Moriya interaction.** *A.K. Dhiman*[1], R. Gieniusz[1], P. Gruszecki[2], J. Kisielewski[1], M. Matczak[1], Z. Kurant[1], I. Sveklo[1], U. Guzowska[1], M. Tekielak[1], F. Stobiecki[3] and A. Maziewski[1] *1. Laboratory of Magnetism, Faculty of Physics, University of Bialystok, Bialystok, Poland; 2. Faculty of Physics, Adam Mickiewicz University, Poznan, Poland; 3. Institute of Molecular Physics, Polish Academy of Sciences, Poznan, Poland*

HOD-04. **Localized and propagating spin-wave modes in thin film multilayers hosting skyrmions.** *T. Srivastava*[1,2], I. Ngouagnia Yemeli[1], Y. Sassi[2], F. Ajejas[2], A. Vecchiola[2], K. Bouzehouane[2], N. Reyren[2], V. Cros[2], T. Devolder[3], J. Kim[3] and G. de Loubens[1] *1. SPEC, CEA-Saclay, CNRS, Université Paris-Saclay, Gif-sur-Yvette, France; 2. Unité Mixte de Physique, CNRS, Thales, Univ. Paris-Sud, Université Paris-Saclay, Palaiseau, France; 3. Centre for Nanoscience and Nanotechnology, CNRS, Université Paris-Saclay, Palaiseau, France*

HOD-05. **The Bloch Point 3D Topological Charge Induced by the Magnetostatic Interaction.** *K. Guslienko*[1,2], F. Tejo[3], R. Hernández Heredero[4] and O. Chubykalo-Fesenko[3] *1. Departamento de Polímeros y Materiales Avanzados, Universidad del País Vasco, UPV/EHU, San Sebastian, Spain; 2. IKERBASQUE, the Basque Foundation for Science, Bilbao, Spain; 3. Instituto de Ciencia de Materiales de Madrid, Madrid, Spain; 4. Departamento de Matemática Aplicada, Universidad Politécnica de Madrid, Madrid, Spain*

HOD-06. **Thermally Activated Transitions in Confined Ferromagnets with Perpendicular Magnetic Anisotropy as Function of the Interfacial Dzialoshinskii-Moriya Interaction Strength.** *G.D. Chaves-O'Flynn*[1], D.L. Stein[2] and P. Kuswik[1] *1. Department of Thin Films, Institute of Molecular Physics, Polish Academy of Sciences, Poznan, Poland; 2. Department of Physics and Courant Institute of Mathematical Sciences, New York University, New York, NY, United States*

HOD-07. **Pinning Behavior of Magnetic Skyrmions in Thin Film.** R. Gruber[1], J. Zazvorka[1,2], *M.A. Brems*[1], D.R. Rodrigues[3], N. Kerber[1], B. Seng[1], K. Everschor-Sitte[3], P. Virnau[1] and M. Kläui[1] *1. Institute of Physics, Johannes Gutenberg-Universität Mainz, Mainz, Germany; 2. Institute of Physics, Faculty of Mathematics and Physics, Charles University, Prague, Czechia; 3. Faculty of Physics, Universität Duisburg-Essen, Duisburg, Germany*

HOD-08. **Orbital angular momentum of a domain wall and geometrically twisted magnons.** *S. Lee*[1] and S. Kim[1] *1. Physics, Korea Advanced Institute of Science and Technology, Daejeon, The Republic of Korea*

HOD-09. **Chiral droplets in ferromagnets, and their current-driven motion.** *S. Komineas*[1,2], N. Sisodia[3,4], P.K. Muduli[4] and N. Papanicolaou[5] *1. Institute of Applied and Computational Mathematics, Foundation for Research and Technology - Hellas, Heraklion, Greece; 2. Department of Mathematics and Applied Mathematics, University of Crete, Heraklion, Greece; 3. SPINTEC, CNRS, Grenoble, France; 4. Department of Physics, Indian Institute of Technology Delhi, New Delhi, India; 5. Department of Physics, University of Crete, Heraklion, Greece*

HOD-10. **Atomistic Simulations of Antiferromagnetic Skyrmions' High-Speed Dynamics and Contrast with Domain Wall Motion.** *E.A. Tremsina*[1,2], A. Wittmann[1] and G.S. Beach[1] *1. Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States; 2. Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Cambridge, MA, United States*

HOD-11. **Withdrawn**

HOD-12. **Spin-Wave Resonances of Magnetic Hopfions.**
D.W. Raftrey[1,2] and P. Fischer[1,2] *1. Physics, University of California Santa Cruz, Santa Cruz, CA, United States; 2. Material Science, Lawrence Berkeley National Laboratory, Berkeley, CA, United States*

HOD-13. **Influence of domain wall anisotropy and dimensionality on the current-induced hysteresis loop shift for quantification of the Dzyaloshinskii-Moriya interaction.**
T. Dohi[1,2], S. Fukami[1,3] and H. Ohno[1,3] *1. RIEC, Tohoku University, Sendai, Japan; 2. Institut für Physik, JGU, Mainz, Germany; 3. CSIS, Tohoku University, Sendai, Japan*

HOD-14. **Chiral Brownian motion of the magnetic skyrmions.**
S. Miki[1,2], Y. Jibiki[1,2], E. Tamura[1,2], M. Goto[1,2], M. Oogane[3], R. Ishikawa[4], H. Nomura[1] and Y. Suzuki[1] *1. Graduate School of Engineering and Science, Osaka University, Toyonaka, Japan; 2. CSRN-Osaka, Osaka University, Toyonaka, Japan; 3. Department of Applied Physics, Tohoku University, Sendai, Japan; 4. ULVAC, Inc., Suita, Japan*

HOD-15. **Anomalous thermal drift of skyrmions in frustrated magnets under spin-orbit torques.** *J. Kim*[1] *1. Centre de Nanosciences et de Nanotechnologies, CNRS, Université Paris-Saclay, Palaiseau, France*

ORAL SESSION

Session HOE
MAGNETIC SKYRMIONS
Olivier Boulle, Chair
SPINTEC, Grenoble, France

HOE-01. **Microwave-assisted excitation of a skyrmion lattice.**
H. Yang[1], M. Hervé[2], L. Desplat[3], T. Balashov[4], P. Buhl[5], P.A. Hervieux[3], B. Dupé[6,7] and W. Wulfhekel[1] *1. Karlsruhe Institute of Technology, Karlsruhe, Germany; 2. Institut des NanoSciences de Paris, Sorbonne University, Paris, France; 3. IPCMS, Universite de Strasbourg, Strasbourg, France; 4. RWTH Aachen University, Aachen, Germany; 5. Johannes Gutenberg University Mainz, Mainz, Germany; 6. Fonds de la Recherche Scientifique, Bruxelles, Belgium; 7. University of Liège, Liège, Belgium*

HOE-02. **Configurable Pixelated Skyrmions on Nanoscale Grids.**
X. Zhang[1], J. Xia[1], K. Shirai[1], H. Fujiwara[1], O. Tretiakov[2], M. Ezawa[3], Y. Zhou[4] and X. Liu[1] *1. Shinshu University, Nagano, Japan; 2. University of New South Wales, Sydney, NSW, Australia; 3. University of Tokyo, Tokyo, Japan; 4. The Chinese University of Hong Kong, Shenzhen, China*

HOE-03. **Influence of Geometry on Domain-Wall Pair to Skyrmion Conversion in Typical Magnetic Nanochannel.**
H. Perumal[1], S. Syamlal[1] and J. Sinha[1] *1. Department of Physics and Nanotechnology, SRM Institute of Science and Technology, Kattankulathur, Chennai, India*

HOE-04. **Current induced skyrmion nucleation at zero field.**
S.K. Panigrahy[1], S. Mallick[1], G. Pradhan[1] and S. Rohart[1]
1. Laboratoire de Physique des Solides, Universite Paris Saclay, Orsay, France

HOE-05. **In-situ GHz Dynamics of Skyrmions Probed with SANS.**
N. Tang[1], S. Montoya[2], N.C. Liyanage[4], S.K. Patel[2,3], L.J. Quigley[1], A.J. Grutter[5], M.R. Fitzsimmons[4,6], S.K. Sinha[3], J.A. Borchers[5], E. Fullerton[2,7], L. Debeer-Schmitt[8] and D.A. Gilbert[1,4] *1. Material Science Engineering, University Tennessee, Knoxville, Knoxville, TN, United States; 2. Center for Memory and Recording Research, University of California, San Diego, San Diego, CA, United States; 3. Physics Department, University of California, San Diego, San Diego, CA, United States; 4. Department of Physics and Astronomy, University of Tennessee, Knoxville, Knox, TN, United States; 5. NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, United States; 6. Neutron Scattering Division, Oak Ridge National Laboratory, Oak Ridge, TN, United States; 7. Department of Electrical and Computer Engineering, University of California, San Diego, San Diego, CA, United States; 8. High Flux Isotope Reactor, Oak Ridge National Laboratory, Knoxville, TN, United States*

HOE-06. **Magnetostatic coupling between the skyrmion state in isolated nanodot with saturated ferromagnetic waveguide.**
M.K. Zelent[1], M. Moalic[1] and M. Krawczyk[1] *1. Institute of Spintronics and Quantum Information, Faculty of Physics, Adam Mickiewicz University, Poznan, Poland*

HOE-07. **Driving skyrmions with low threshold current density in amorphous CoFeB thin film.**
B. Ojha[1], S. Mallick[2], M. Sharma[1], A. Thiaville[2], S. Rohart[2] and S. Bedanta[1]
1. School of Physical Sciences, National Institute of Science Education and Research (NISER), Jatni, India; 2. Laboratoire de Physique des Solides, Universite Paris-Saclay, Orsay Cedex, France

HOE-08. **Concept of current and field-free processing of chiral spin textures in racetrack devices.**
A. Schäffer[1,2], P. Siegl[1], M. Stier[1], J. Berakdar[2], M. Thorwart[1], R. Wiesendanger[1] and E.Y. Vedmedenko[1] *1. University of Hamburg, Hamburg, Germany; 2. Martin-Luther-University, Halle, Germany*

HOE-09. **Engineering of spin-orbit torque in multilayers for efficient skyrmion displacement at zero field.**
Y. Sassi[2], S. Krishnia[1], F. Ajejas[1], D. Sanz Hernandez[1], S. Collin[1], K. Bouzehouane[1], A. Vecchiola[1], A. Fert[1], V. Cros[2] and N. Reyren[2] *1. Université Paris-Saclay, Unité Mixte de Physique, CNRS, Thales, Palaiseau, France; 2. Unité Mixte de Physique, CNRS, Thales, Université Paris-Saclay, Palaiseau, France*

HOE-10. **Creation and Annihilation of Skyrmion Bubbles by Profile-Programmed Alternating Magnetic Field Pulses.**
Y. Chen[1,2], K. Ohara[1], Z. Xichao[1], J. Xia[1], Z. Wei[2], Y. Zhou[3] and X. Liu[1] *1. Shinshu University, Wakasato, Japan; 2. Zhengzhou University, Zhengzhou, China; 3. The Chinese University of Hong Kong, Shenzhen, China*

HOE-11. **Collective Skyrmion Motion Under the Influence of an Additional Interfacial Spin-Transfer Torque.**
C.R. MacKinnon[1], K. Zeissler[2,3], S. Finizio[4], J. Raabe[4], C. Marrows[2,3], T. Mercer[1], P. Bissell[1] and S. Lepadatu[1]
1. Jeremiah Horrocks Institute for Mathematics, Physics and Astronomy, University of Central Lancashire, Preston, United Kingdom; 2. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom; 3. Bragg Centre for Materials Research, University of Leeds, Leeds, United Kingdom; 4. Swiss Light Source, Paul Scherrer Institut, Villigen, Switzerland

HOE-12. **Dynamics of chiral solitons driven by polarized currents.**
V. Laliena[1,3], S. Bustingorry[2] and *J. Campo*[3] *1. Applied Mathematics Department, University of Zaragoza, Zaragoza, Spain; 2. Instituto de Nanociencia y Nanotecnología (CNEA-CONICET), Centro Atómico Bariloche, Bariloche, Argentina; 3. Aragon Nanoscience and Materials Institute, Spanish National Research Council (CSIC), Zaragoza, Spain*

HOE-13. **Higher Order Skyrmionium Nucleation and Propagation in Insulating, 2D and Metallic Interfaces at Room Temperature.**
A.C. Önel[1,2], A. Mousavi Cheghabouri[3], M. Arıkan[2] and M.C. Onbasli[3] *1. Department of Physics, Gebze Technical University, Kocaeli, Turkey; 2. National Metrology Institute, The Scientific and Technological Research Council of Turkey, Kocaeli, Turkey; 3. Electrical and Electronics Engineering, Koç University, Istanbul, Turkey*

ORAL SESSION

Session HOF
DYNAMICS IN AF-COUPLED MATERIALS

Jean-Yves Chauleau, Chair
CEA-SPEC, Gif-sur-Yvette, France

HOF-01. **Fast Current-Induced Domain Wall Motion in Compensated Co/Gd Quadlayers.**
P. Li[1], T. Kools[1], R. Lavrijsen[1] and B. Koopmans[1] *1. Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands*

HOF-02. **Breathing Modes of Skyrmion Strings in a Synthetic Antiferromagnet.**
C.E. Barker[1], E. Haltz[1], T. Moore[1] and C. Marrows[1] *1. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom*

HOF-03. **Macromagnetic Simulation of AFM-FM phase transition in FeRh using a modified Landau-Lifshitz-Bloch Equation.**
M. Menarini[1] and V. Lomakin[1] *1. Electrical and Computer Engineering, University of California San Diego, La jolla, CA, United States*

HOF-04. **DMI and Cavity Magnonics for Antiferromagnetic Domain Walls.**
O.J. Iyaro[1], I. Proskurin[1,2] and R. Stamps[1] *1. Department of Physics and Astronomy, University of Manitoba, Winnipeg, MB, Canada; 2. Institute of Natural Sciences and Mathematics, Ural Federal University, Ekaterinburg, Russian Federation*

HOF-05. **Current-Driven Domain Wall Motion in a Synthetic Antiferromagnet Multilayer.** C.E. Barker[1], E. Haltz[1], S. Finizio[2], G. Burnell[1], J. Raabe[2] and *C. Marrows*[1] *1. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom; 2. Swiss Light Source, Paul Scherrer Institute, Villigen, Switzerland*

HOF-06. **Magnetization Dynamics in Synthetic Antiferromagnets (SAFs) with Perpendicular Magnetic Anisotropy (PMA).** *D. Huang*[1], D. Zhang[2], D. Lyu[2], J. Wang[2] and X. Wang[1] *1. Mechanical Engineering, University of Minnesota, Minneapolis, MN, United States; 2. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

HOF-07. **Making ferrimagnetic Mn_4N ferromagnetic by non-magnetic element doping.** *T. Yasuda*[1], T. Komori[1], H. Mitarai[1], K. Toko[1], S. Honda[4], S. Ghosh[1,3], L. Vila[3], J. Attané[3], K. Amemiya[2] and T. Suemasu[1] *1. Pure and Applied Sciences, University of Tsukuba, Tsukuba, Japan; 2. KEK, Tsukuba, Japan; 3. Spintec, Grenoble, France; 4. Kansai University, Suita, Japan*

HOF-08. **Current-Driven Domain Wall Motion in Curved Ferrimagnetic Strips Above and Below the Angular Momentum Compensation.** *D. Osuna Ruiz*[1], Ó. Alejos[2], V. Raposo[1] and E. Martínez[1] *1. Department of Applied Physics, University of Salamanca, Salamanca, Spain; 2. Department of Electricity and Electronics, University of Valladolid, Valladolid, Spain*

HOF-09. **Domain wall dynamics across magnetic and spin compensation points in ferrimagnets.** *M. Logunov*[4], S. Safonov[4], A. Fedorov[2,4], A. Fedorova[2,4], N. Moiseev[5], A. Safin[1,4], S. Nikitov[2,4] and A. Kirilyuk[3,4] *1. Moscow Power Engineering Institute, Moscow, Russian Federation; 2. Moscow Institute of Physics and Technology, Dolgoprudny, Russian Federation; 3. FELIX Laboratory, Radboud University, Nijmegen, Netherlands; 4. Kotel'nikov Institute of Radio-Engineering and Electronics of RAS, Moscow, Russian Federation; 5. National Research Mordovia State University, Saransk, Russian Federation*

HOF-10. **Nonstationary domain wall dynamics in almost compensated ferrimagnets: a novel scenario.** *R. Ovcharov*[1], R. Khymyn[1], B. Ivanov[2] and J. Åkerman[1] *1. Physics Department, University of Gothenburg, Gothenburg, Sweden; 2. Institute of Magnetism of the National Academy of Sciences of Ukraine and the Ministry of Education and Science of Ukraine, Kyiv, Ukraine*

HOF-11. **Experimental and theoretical approach to magneto-transport properties in $Mn_{4-x}Ni_xN$ with high domain wall mobility.** *T. Komori*[1], H. Mitarai[1], T. Yasuda[1], K. Toko[1], S. Honda[2] and T. Suemasu[1] *1. Institute of Applied Physics, University of Tsukuba, Tsukuba, Japan; 2. Kansai University, Osaka, Japan*

Session HOG
NEW COMPUTATION SCHEMES

Daniele Pinna, Chair
Forschungszentrum Jülich, Jülich, Germany

HOG-01. **Domain Wall Skyrmion Based Artificial Neuron Device.** *B. Nepal*[1], U. Karki[1], T. Komiyama[2], L. Wang[3], Y. Zhang[4], R. Gunawan[5], M.D. Graef[6], V. Sokalski[6], M. Vogel[7], T. Mewes[1] and C. Mewes[1] *1. Department of Physics and Astronomy, The University of Alabama, Tuscaloosa, AL, United States; 2. Department of Neurosciences, University of California San Diego, La Jolla, CA, United States; 3. Department of Civil and Environmental Engineering, Virginia Tech University, Blacksburg, VA, United States; 4. Department of Cell and Molecular Biology, University of Rhode Island, Kingston, RI, United States; 5. Department of Chemical and Biological Engineering, University at Buffalo - SUNY, Buffalo, NY, United States; 6. Department of Material Science and Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 7. Institute of Physics and Center for Interdisciplinary Nanostructure Science and Technology, University of Kassel, Kassel, Germany*

HOG-02. **Reprogrammable skyrmion-based hybrid demultiplexers for complex computations.** *N. Sisodia*[1], L.D. Buda-Prejbeanu[1], G. Gaudin[1] and O. Boulle[1] *1. Univ. Grenoble Alpes, CNRS, CEA, Grenoble INP, Spintec, Grenoble, France*

HOG-03. **Stochastic Computing with Magnetic Domain Wall Devices.** *A. Welbourne*[1], M. Chambard[1], S. Kyle[1], M. Drouhin[1], L.T. Haigh[1], A.M. Keogh[1], A. Mullen[1], P.W. Fry[1], F. Maccherozzi[2], T. Forest[2], L. Aballe[3], M. Foerster[3], E. Vasilaki[1], D. Allwood[1] and T. Hayward[1] *1. University of Sheffield, Sheffield, United Kingdom; 2. Diamond Light Source, Oxford, United Kingdom; 3. ALBA Synchrotron Light Facility, Barcelona, Spain*

HOG-04. **Neuromorphic Learning of a Deep Neural Network with Low Precision and Stochastic Domain Wall Based Memristor.** W. Misba[1], M. Lozano[1], D. Querlioz[2] and *J. Atulasimha*[1] *1. Virginia Commonwealth University, Richmond, VA, United States; 2. Université Paris-Saclay, Paris, France*

HOG-05. **Domain Wall-Gated, Cascaded and Low-Power Skyrmion Logic Gates with Robust Operation.** A. Mousavi Cheghabouri[1] and *M.C. Onbasli*[1] *1. Electrical and Electronics Engineering, Koc University, Istanbul, Turkey*

HOG-06. **Kinematic Domain Wall Model for Large-Scale Neuromorphic Network Simulation.** *K. Doleh*[1], C.M. Linseisen[1], L.M. Humphrey[1], F. Garcia-Sanchez[3], X. Hu[1], W.H. Brigner[1], C. Cui[2], J.M. Martin[1], J.C. Incorvia[2], N. Hassan[1], A.J. Edwards[1] and J.S. Friedman[1] *1. Department of Electrical and Computer Engineering, The University of Texas at Dallas, Richardson, TX, United States; 2. Department of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX, United States; 3. Departamento de Física Aplicida, Universidad de Salamanca, Salamanca, Spain*

HOG-07. **Machine Learning with Stochastic Magnetic Domain Wall Synapses.** *M.O. Ellis*[1], A. Welbourne[2], S. Kyle[2], T. Hayward[2], D. Allwood[2] and E. Vasilaki[1] *1. Department of Computer Science, University of Sheffield, Sheffield, United Kingdom; 2. Department of Materials Science and Engineering, University of Sheffield, Sheffield, United Kingdom*

HOG-08. **Neuromorphic computation with a single magnetic domain wall.** R.V. Ababei[1], *M.O. Ellis*[2], I.T. Vidamour[1], D. Devadasan[1], D. Allwood[1], E. Vasilaki[2] and T. Hayward[1] *1. Department of Materials Science and Engineering, University of Sheffield, Sheffield, United Kingdom; 2. Department of Computer Science, University of Sheffield, Sheffield, United Kingdom*

HOG-09. **Skyrmion Based Logic-In-Memory Architecture using Synthetic Antiferromagnets.** *N. Sisodia*[1], L.D. Buda-Prejbeanu[1], G. Gaudin[1] and O. Boulle[1] *1. Univ. Grenoble Alpes, CNRS, CEA, Grenoble INP, Spintec, Grenoble, France*

HOG-10. **Physical Reservoir Computing Using Spin Torque Oscillator with Loop Circuit.** *S. Tsunegi*[1,2], T. Taniguchi[1], A. Kamimaki[1], K. Yakushiji[1], A. Fukushima[1], S. Yuasa[1] and H. Kubota[1] *1. AIST, Tsukuba, Japan; 2. JST-PRESTO, Kawaguchi, Japan*

HOG-11. **Stochastic Property of Skyrmionic Shuffling Device.** *Z. Khodzhaev*[1] and E. Turgut[1] *1. Physics, Oklahoma State University, Stillwater, OK, United States*

HOG-12. **Magnetic domain wall stability in stepped wire for multistate storage devices.** *R. Sbiaa*[1], S.M. Alrisi[1], T. Jin[2] and S. Piramanayagam[2] *1. Physics, Sultan Qaboos University, Al Khodh, Oman; 2. School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, Singapore*

HOG-13. **Skyrmion Qubits: A New Class of Quantum Logic Elements Based on Nanoscale Magnetization.** *C. Psaroudaki*[1,2] and C. Panagopoulos[3] *1. Institute for Quantum Information and Matter, California Institute of Technology, Pasadena, CA, United States; 2. Department of Physics, California Institute of Technology, Pasadena, CA, United States; 3. Division of Physics and Applied Physics, Nanyang Technological University, Nanyang, Singapore, Singapore*

Session HOH
MAGNETIZATION DYNAMICS IN SOFT MATERIALS

Valentine Novosad, Chair
Argonne National Laboratory, Lemont, IL, United States

HOH-01. **Magnetic Vortices: into the Third Dimension.** ***(Invited)***
S. Gliga[1] *1. Swiss Light Source, Paul Scherrer Institute, Villigen, Switzerland*

HOH-02. **Diffusive and Fluid-like Motion of Homochiral Domain Walls in Easy-Plane Magnetic Strips.** *D.A. Smith*[1], S. Takei[2,3], B. Brann[1], L. Compton[1], F. Ramos-Diaz[1], M. Simmers[4] and S. Emori[1] *1. Physics, Virginia Tech, Blacksburg, VA, United States; 2. Physics, Queens College, Queens, NY, United States; 3. Physics Doctoral Program, The Graduate Center of the City University of New York, New York, NY, United States; 4. Academy of Integrated Science, Virginia Tech, Blacksburg, VA, United States*

HOH-03. **Generation of High Amplitude Microwaves in Nanowires Induced by Domain Wall Motion.** *A. Samanta*[1,2] and S. Roy[1,2] *1. Micropower Devices/Systems and Nanomagnetics Group, Tyndall National Institute, Cork, Ireland; 2. Department of Physics, University College Cork, Cork, Ireland*

HOH-04. **Dynamics of bi-stable Néel domain wall under spin orbit-torque.** K.J. Franke[1], *E. Haltz*[1] and C. Marrows[1] *1. Physics, University of Leeds, Leeds, United Kingdom*

HOH-05. **Reversal modes in perpendicular shape-anisotropy magnetic tunnel junctions: from coherent rotation reversal to vortex formation.** *A. Palomino*[1], S. Lequeux[1], T. Almeida[2], S. Auffret[1], L.D. Buda-Prejbeanu[1], L. Vila[1], R. Sousa[1], L. Prejbeanu[1], D. Cooper[2] and B. Dieny[1] *1. Univ. Grenoble Alpes, CEA, CNRS, Grenoble INP, IRIG-SPINTEC, Grenoble, France; 2. Univ. Grenoble Alpes, CEA, LETI, Grenoble, France*

HOH-06. **Oersted-field- and current- induced Bloch Point domain wall dynamics in cylindrical Ni nanowires.** *J. Fernandez-Roldan*[1], C. Bran[2], R.P. del Real[2], M. Vázquez[2] and O. Chubykalo-Fesenko[2] *1. University of Oviedo, Oviedo, Spain; 2. Institute of Materials Science of Madrid, Madrid, Spain*

HOH-07. **Magnetochiral effect of single domain wall propagation in the Matteucci effect of magnetostrictive microwire.** A. Jimenez[1,2], E. Calle[1], J. Fernandez-Roldan[3,1], R.P. del Real[1], R. Varga[2] and *M. Vázquez*[1] *1. Institute of Materials Science of Madrid, CSIC, Madrid, Spain; 2. Centre for Progressive Materials, TIP, P.V. Safarik University, Kosiçe, Slovakia; 3. Department of Physics, University of Oviedo, Oviedo, Spain*

HOH-08. **Data-Driven Thiele Equation Approach: a New Tool for Vortex Based Spin-Torque Nano Oscillator Dynamics.** *F. Abreu Araujo*[1], C. Chopin[1] and S. de Wergifosse[1] *1. IMCN / BSMA, Université catholique de Louvain, Louvain-la-Neuve, Belgium*

HOH-09. **Switching between Magnetic Bloch and Néel Domain Walls with Anisotropy Modulations.** K.J. Franke[1], C. Ophus[2], A. Schmid[2] and *C. Marrows*[1] *1. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom; 2. National Center for Electron Microscopy, Lawrence Berkeley National Laboratory, Berkeley, CA, United States*

ORAL SESSION

Session HOI
MAGNONIC CRYSTALS AND MAGNONS

Axel Hoffmann, Chair
University of Illinois at Urbana-Champaign, Urbana, IL, United States

HOI-01. **Spin-Wave Induced Spontaneous Symmetry Breaking in Time and Space – Space-Time Magnonic Crystals.** ***(Invited)*** *P. Gruszecki*[1], N. Träger[2], J. Gräfe[2] and M. Krawczyk[1] *1. Institute of Spintronics and Quantum Information, Faculty of Physics, Adam Mickiewicz University, Poznan, Poland; 2. Max Planck Institute for Intelligent Systems, Stuttgart, Germany*

HOI-02. **Spin-wave rejection efficiency of dynamic magnonic crystal.** *M. Iwaba*[1] and K. Sekiguchi[2] *1. Graduate School of Engineering Science, Yokohama National University, Yokohama, Japan; 2. Faculty of Engineering, Yokohama National University, Yokohama, Japan*

HOI-03. **Reconfigurable dynamic states in Heusler based magnonic crystals.** *S. Mantion*[1] and N. Biziere[1] *1. CEMES-CNRS, Université de Toulouse, Toulouse, France*

HOI-04. **Tuning Interactions in Reconfigurable Kagome Artificial Spin Ices for Magnonics.** *V. Bhat*[1] and D. Grundler[2,3] *1. International Research Centre MagTop, Institute of Physics, Polish Academy of Sciences, Warsaw, Poland; 2. Institute of Materials, Laboratory of Nanoscale Magnetic Materials and Magnonics, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland; 3. Institute of Microengineering, Laboratory of Nanoscale Magnetic Materials and Magnonics, School of Engineering, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland*

HOI-05. **Towards observable unidirectional edge modes in topological magnonic crystals.** J. Feilhauer[1], M.K. Zelent[3], Z. Zhang[4], J. Christensen[5] and *M. Mruczkiewicz*[1,2] *1. Institute of Electrical Engineering, Slovak Academy of Sciences, Bratislava, Slovakia; 2. Centre For Advanced Materials Application CEMEA, Slovak Academy of Sciences, Bratislava, Slovakia; 3. Faculty of Physics, Adam Mickiewicz University in Poznan, Poznan, Poland; 4. Department of Physics, MOE Key Laboratory of Modern Acoustics, Collaborative Innovation Center of Advanced Microstructures, Nanjing University, Nanjing, China; 5. Department of Physics, Universidad Carlos III de Madrid, Madrid, Spain*

HOI-06. **Magnonic Frequency Comb Through Nonlinear Magnon-Skyrmion Scattering.** Z. Wang[1], *H. Yuan*[2], Y. Cao[1], Z. Li[1], R. Duine[2] and P. Yan[1] *1. University of Electronic Science and Technology of China, Chengdu, China; 2. Utrecht University, Utrecht, Netherlands*

HOI-07. **Spin-wave frequency combs.** *T. Hula*[1,2], K. Schultheiß[1], F.J. Gonçalves[1], L. Körber[1,3], M. Bejarano[1,4], L. Flacke[5,6], M. Copus[8], A. Kakay[1], M. Weiler[6,7], R. Camley[8], J. Fassbender[1,3] and H. Schultheiss[1] *1. Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 2. Technische Universität Chemnitz, Chemnitz, Germany; 3. Fakultät Physik, Technische Universität Dresden, Dresden, Germany; 4. Fakultät Elektrotechnik und Informationstechnik, Technische Universität Dresden, Dresden, Germany; 5. Walther-Meißner-Institute, Bayerische Akademie der Wissenschaften, Garching, Germany; 6. Physik-Department, Technische Universität München, Munich, Germany; 7. Fachbereich Physik und Landesforschungszentrum OPTIMAS, Technische Universität Kaiserslautern, Kaiserslautern, Germany; 8. Center for Magnetism and Magnetic Nanostructures, University of Colorado, Colorado Springs, CO, United States*

HOI-08. **Magnon straintronics based on the tunable spin-wave propagation in the ensembles of magnonic stripes.** *A.V. Sadovnikov*[1], A. Grachev[1] and S. Nikitov[1] *1. Saratov State University, Saratov, Russian Federation*

HOI-09. **Strong Magnon-Magnon Coupling in Two-Dimensional Diamond Shaped Ferromagnetic Nanodots Array.** *S. Majumder*[1], S. Choudhury[1], S. Barman[2], Y. Otani[3] and A. Barman[1] *1. CMP&MS, S N Bose National Centre for Basic Sciences, Kolkata, India; 2. Institute for Engineering and Management, Kolkata, India; 3. RIKEN-CEMS, Saitama, Japan*

HOI-10. **Influence of the interfacial Dzyaloshinskii-Moriya interaction on the band structure of one-dimensional magnonic crystals.** *S. Tacchi*[1], R. Gallardo[2], D. Petti[3], A. Cattoni[4], J. Flores-Farías[2], E. Albisetti[3], G. Carlotti[5] and P. Landeros[2] *1. CNR- Istituto Officina dei Materiali (CNR-IOM), Perugia, Italy; 2. Departamento de Física, Universidad Técnica Federico Santa María, Valparaíso, Chile; 3. Dipartimento di Fisica, Politecnico di Milano, Milano, Italy; 4. Centre de Nanosciences et de Nanotechnologies (C2N), Paris, France; 5. Dipartimento di Fisica e Geologia, Università di Perugia, Perugia, Italy*

HOI-11. **Heralded parametric single magnon source.** *D.A. Bozhko*[1] and R. R. Peroor[1] *1. Department of Physics and Energy Science, University of Colorado Colorado Springs, Colorado Springs, CO, United States*

HOI-12. **Spin wave dynamics in magnonic coupler with antidote interconnection.** *A.A. Martyshkin*[1], S. Odintsov[1], E.N. Beginin[1] and A.V. Sadovnikov[1] *1. Saratov State University, Saratov, Russian Federation*

HOI-13. **Magnonic signal steering by parity-time symmetry.** *X. Wang*[1], C. Jia[2] and J. Berakdar[3] *1. School of Physics and Electronics, Central South University, Changsha, China; 2. Lanzhou University, Lanzhou, China; 3. Martin Luther University Halle-Wittrenberg, Halle, Germany*

ORAL SESSION

Session HOJ
MAGNONS AND SPIN WAVES

Yi Li, Chair
Argonne National Laboratory, Westmont, IL, United States

HOJ-01. **Chiral Hinge Magnons in Second-Order Topological Magnon Insulators.** *A. Mook*[1], S.A. Díaz[2], J. Klinovaja[1] and D. Loss[1] *1. University of Basel, Basel, Switzerland; 2. University of Duisburg-Essen, Duisburg-Essen, Germany*

HOJ-02. **Generation of Entanglement by Two-Magnon Interference.** *C. Trevillian*[1] and V. Tyberkevych[1] *1. Physics, Oakland University, Rochester, MI, United States*

HOJ-03. **Self-Hybridization of Magnons in Synthetic Antiferromagnetic Tetralayers.** *M.M. Subedi*[1], Y. Xiong[2], P.B. Meisenheimer[3], J.T. Heron[3], W. Zhang[2] and J. Sklenar[1] *1. Wayne State University, Detroit, MI, United States; 2. Oakland University, Rochester, MI, United States; 3. University of Michigan, Ann Arbor, MI, United States*

HOJ-04. **Spectral-fingerprinting: Microstate readout via remanence ferromagnetic resonance in artificial spin systems.** *A. Vanstone*[1,2], J.C. Gartside[1], K. Stenning[1], T. Dion[1,2], D.M. Arroo[1] and W.R. Branford[1] *1. Imperial College London, London, United Kingdom; 2. University College London, London, United Kingdom*

HOJ-05. **Reconfigurable Training, Vortex Writing and Spin-Wave Fingerprinting in an Artificial Spin-Vortex Ice.** *J.C. Gartside*[1], K.D. Stenning[1], A. Vanstone[1], T. Dion[1,2], H.H. Holder[1], D.M. Arroo[1,2], H. Kurebayashi[2] and W.R. Branford[1] *1. Physics, Experimental Solid State, Imperial College London, London, United Kingdom; 2. Physics, University College London, London, United Kingdom*

HOJ-06. **Comparison of Spin-Wave Modes in Connected and Disconnected Artificial Spin Ice Nanostructures using Brillouin Light Scattering.** *A.K. Chaurasiya*[1,5], A.K. Mondal[1], J.C. Gartside[2], K.D. Stenning[2], A. Vanstone[2], S. Barman[3], W.R. Branford[2,4] and A. Barman[1] *1. Condensed Matter Physics and Material Sciences, S N Bose National Centre for Basic Sciences, Kolkata, India; 2. Department of Physics, Imperial College London, London, United Kingdom; 3. Institute of Engineering and Management, Kolkata, India; 4. London Centre for Nanotechnology, Imperial College London, London, United Kingdom; 5. Physics Department, University of Gothenburg, Gothenburg, Sweden*

HOJ-07. **Spin-wave dispersion in magnetic nanotubes: Beyond the thin-shell approximation.** *L. Körber*[1,2], G. Quasebarth[1,2], A. Otto[2] and A. Kakay[1] *1. Institute of Ion Beam Physics and Materials Research, Helmholz-Zentrum Dresden - Rossendorf, Dresden, Germany; 2. Fakultät Physik, Technische Universität Dresden, Dresden, Germany*

HOJ-08. **Spin dynamics in a Honeycomb lattice of Permalloy nano-ellipses.** *W. Bang*[1], M.T. Kaffash[2], A. Hoffmann[3], J.B. Ketterson[4] and M. Jungfleisch[2] *1. School of Liberal Arts, Koera Tech, Cheonan, The Republic of Korea; 2. Department of Physics and Astronomy, University of Delaware, Newark, DE, United States; 3. Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, United States; 4. Department of Physics and Astronomy, Northwestern University, Evanston, IL, United States*

HOJ-09. **Up-conversion of spin wave modes in Y-shaped Permalloy structures.** *J. Liu*[1], A. Guerrero[1], K. Nygren[2], M. Swyt[2] and K. Buchanan[2] *1. Department of Physics and Astronomy, Georgia Southern University, Statesboro, GA, United States; 2. Department of Physics, Colorado State University, Fort Collins, CO, United States*

HOJ-10. **Withdrawn**

HOJ-11. **Resonant Spin Transmission Mediated by Magnons in a Magnetic Insulator Multilayer Structure.** *Y. Fan*[1], J. Finley[2], J. Han[2], M. Holtz[3], P. Quarterman[3], P. Zhang[2], T. Safi[2], J. Hou[2], A.J. Grutter[3] and L. Liu[2] *1. Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States; 2. EECS, Massachusetts Institute of Technology, Cambridge, MA, United States; 3. NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, United States*

HOJ-12. **Electrical Detection of Backward Spin-waves in Epitaxial Fe Films.** *S. Nezu*[1], T. Scheike[2], H. Sukegawa[2] and K. Sekiguchi[3] *1. Graduate School of Engineering Science, Yokohama National University, Yokohama, Japan; 2. National Institute for Materials Science, Tsukuba, Japan; 3. Faculty of Engineering, Yokohama National University, Yokohama, Japan*

HOJ-13. **Nonreciprocal Magnetoacoustic Waves in Dipolar-Coupled Ferromagnetic Bilayers.** *M. Küß*[1], M. Heigl[2], L. Flacke[3,4], A. Hörner[1], M. Weiler[5,3], A. Wixforth[1] and M. Albrecht[2] *1. Experimental Physics I, University of Augsburg, Augsburg, Germany; 2. Experimental Physics IV, University of Augsburg, Augsburg, Germany; 3. Walther-Meißner-Institut, Bayerische Akademie der Wissenschaften, Garching, Germany; 4. Physics-Department, Technical University Munich, Garching, Germany; 5. Fachbereich Physik and Landesforschungszentrum OPTIMAS, Technische Universität Kaiserslautern, Kaiserslautern, Germany*

HOJ-14. **Magnonic Goos-Hänchen Effect Induced by One Dimensional Solitons.** *V. Laliena*[2] and J. Campo[1] *1. Aragonese Nanoscience and Materials Institute, Spanish National Research Council (CSIC), Zaragoza, Spain; 2. Applied Mathmatics Department, University of Zaragoza, Zaragoza, Spain*

HOJ-15. **Measuring the dispersion relations of spin wave bands using time-of-flight spectroscopy.** *T. Devolder*[1], G. Talmelli[2], S. Ngom[1], F. Ciubotaru[2], C. Adelmann[2] and C. Chappert[1] *1. Université Paris-Saclay, Palaiseau, France; 2. imec, Leuven, Belgium*

ORAL SESSION

Session HOK
SPIN WAVES AND MAGNETIZATION DYNAMICS I

Jaroslaw Klos, Chair
Uniwersytet im Adama Mickiewicza w Poznaniu, Poznan, Poland

HOK-01. **First Results on Atomically Resolved Spin-Wave Spectroscopy by Transmission Electron Microscopy.** ***(Invited)*** *B.W. Zingsem*[1,2], V. Migunov[2], T. Feggeler[3], T. Weßels[2], R. Meckenstock[1], T. Denneulin[2], S. Masur[2], M. Winklhofer[4], M. Farle[1] and R. Dunin-Borkowski[2] *1. Physics, University Duisburg-Essen, Duisburg, Germany; 2. Ernst Ruska-Centre, Forschungszentrum Jülich GmbH, Jülich, Germany; 3. Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 4. Research Center Neurosensory Science, University of Oldenburg, Oldenburg, Germany*

HOK-02. **Element-specific imaging of magnons on the sub 50 nm scale.** *T. Feggeler*[1], R. Meckenstock[2], D. Spoddig[2], B. Zingsem[2,3], J. Lill[2], D. Günzing[2], S. Wintz[4], M. Weigand[5], H. Wende[2], M. Farle[2,6], M. Winklhofer[7], K. Ollefs[2] and H. Ohldag[1,8] *1. Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 2. University of Duisburg-Essen, Duisburg, Germany; 3. Ernst Ruska Centre for Microscopy and Spectroscopy with Electrons and Peter Grünberg Institute, Forschungszentrum Jülich GmbH, Jülich, Germany; 4. Max Planck Institute for Intelligent Systems, Stuttgart, Germany; 5. Helmholtz Center Berlin, Berlin, Germany; 6. Kirensky Institute of Physics, Federal Research Center KSC SB RAS, Krasnoyarsk, Russian Federation; 7. School of Mathematics and Science, University of Oldenburg, Oldenburg, Germany; 8. Department of Material Sciences and Engineering, Stanford University, Stanford, CA, United States*

HOK-03. **Direct Imaging of Spin-Wave Dynamics in a Low-Damping Ferrimagnet Close to Antiferromagnetic Compensation.** *S. Mayr*[1,2], S. Finizio[1], M. Weigand[3], J. Gräfe[4], C. Dubs[5], J. Bailey[1], J. Reuteler[6], H. Stoll[4,7], G. Schütz[4], J. Raabe[1] and S. Wintz[1,4] *1. Paul Scherrer Institut, Villigen PSI, Switzerland; 2. Department of Materials, ETH Zurich, Zürich, Switzerland; 3. Helmholtz-Zentrum Berlin, Berlin, Germany; 4. Max Planck Institute for Intelligent Systems, Stuttgart, Germany; 5. INNOVENT e.V. Technologieentwicklung Jena, Jena, Germany; 6. Scientific Center for Optical and Electron Microscopy, ETH Zurich, Zürich, Switzerland; 7. Institute of Physics, Johannes Gutenberg University Mainz, Mainz, Germany*

HOK-04. **Probing Spin Waves Through Transient Reflectance Ultrafast Spectroscopy (TRUS) in PLD Grown $Y_3Fe_5O_{12}$/ $Gd_3Ga_5O_{12}$.** *S. Satapathy*[1,2], M. Kumar[1,2], R. Kumar[3], Z. Hossain[3], G. Basheed[1,2] and K. Maurya[1,2] *1. CSIR-National Physical Laboratory, New Delhi, India; 2. Academy of Scientific and Innovative Research (AcSIR), Ghaziabad, India; 3. Department of Physics, Indian Institute of Technology, Kanpur, India*

HOK-05. **Ferromagnetic resonance driven GHz spin dynamics probed by time-resolved dynamic X-ray magnetic linear dichroism.** *C. Klewe*[1], S. Emori[2], Q. Li[3], M. Yang[4], B.A. Gray[5], H. Jeon[6], B.M. Howe[5], Y. Suzuki[7,8], Z.Q. Qiu[9], P. Shafer[1] and E. Arenholz[10] *1. Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 2. Department of Physics, Virginia Tech, Blacksburg, VA, United States; 3. National Synchrotron Radiation Laboratory, University of Science and Technology of China, Hefei, China; 4. Institute of Physical Science and Information Technology, Anhui University, Hefei, China; 5. Materials and Manufacturing Directorate, Air Force Research Laboratory, Wright-Patterson Air Force Base, Dayton, OH, United States; 6. Sensors Directorate, Air Force Research Laboratory, Wright-Patterson Air Force Base, Dayton, OH, United States; 7. Geballe Laboratory for Advanced Materials, Stanford University, Stanford, CA, United States; 8. Department of Applied Physics, Stanford University, Stanford, CA, United States; 9. Department of Physics, University of California at Berkeley, Berkeley, CA, United States; 10. Cornell High Energy Synchrotron Source, Cornell University, Ithaca, NY, United States*

HOK-06. **Spin-wave optics fabricated by FIB irradiation of YIG films.** *M. Kiechle*[2], A. Papp[1], S. Mendisch[2], V. Ahrens[2], G. Csaba[1] and M. Becherer[2] *1. Faculty of Information Technology and Bionics, Pázmány Péter Catholic University, Budapest, Hungary; 2. Department of Electrical and Computer Engineering, Technical University of Munich, Munich, Germany*

HOK-07. **Investigation of magnon absorption from $Y_3Fe_5O_{12}$ into metals.** *S. Mae*[1], E. Shigematsu[1], R. Ohshima[1], Y. Ando[1], T. Shinjo[1] and M. Shiraishi[1] *1. Electronic Science and Engineering, Kyoto University, Kyoto, Japan*

HOK-08. **Strong magnon-photon coupling with chip-integrated YIG in the zero-temperature limit.** *P.G. Baity*[1], D.A. Bozhko[2], R. Macedo[1], W. Smith[3], R. C. Holland[1], S. Danilin[1], V. Seferai[1], J. Barbosa[1], R. R. Peroor[2], S. Goldman[2], U. Nasti[1], J. Paul[1], R.H. Hadfield[1], S. McVitie[3] and M. Weides[1] *1. James Watt School of Engineering, University of Glasgow, Glasgow, United Kingdom; 2. Center for Magnetism and Magnetic Materials, Department of Physics and Energy Science, University of Colorado Colorado Springs, Colorado Springs, CO, United States; 3. SUPA, School of Physics and Astronomy, University of Glasgow, Glasgow, United Kingdom*

HOK-09. **Coherent coupling of two remote magnonic resonators mediated by superconducting circuits.** *Y. Li*[1], V.G. Yefremenko[2], M. Lisovenko[2], C. Trevillian[3], T. Polakovich[4], T.W. Cecil[2], P. Barry[2], J.E. Pearson[1], R. Divan[5], V. Tyberkevych[3], C.L. Chang[2], U. Welp[1], W. Kwok[1] and V. Novosad[1] *1. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States; 2. High Energy Physics Division, Argonne National Laboratory, Lemont, IL, United States; 3. Physics, Oakland University, Rochester, MI, United States; 4. Physics Division, Argonne National Laboratory, Lemont, IL, United States; 5. Center for Nanoscale Materials, Argonne National Laboratory, Lemont, IL, United States*

HOK-10. **Effects of Spin Wave Dispersion on Surface Acoustic Wave Velocity.** *P. Rovillain*[1], J. Duquesne[1], M. Eddrief[1], M. Pini[2], A. Rettori[4,5], S. Tacchi[3] and M. Marangolo[1] *1. Institut des NanoSciences de Paris, Sorbonne Université, CNRS, Paris, France; 2. Istituto dei Sistemi Complessi del CNR (CNR-ISC), Sede Secondaria di Firenze, Sesto Fiorentino, Italy; 3. Istituto Officina dei Materiali del CNR (CNR-IOM), Sede Secondaria di Perugia, c/o Dipartimento di Fisica e Geologia, Universita di Perugia, Perugia, Italy; 4. Dipartimento di Fisica ed Astronomia, Universit_a degli Studi di Firenze, Sesto Fiorentino, Italy; 5. INFN, Sezione di Firenze, Sesto Fiorentino, Italy*

HOK-11. **Experimental Observation of the Spin-Wave Talbot Effect.** *C. Riedel*[1], T. Taniguchi[1] and C.H. Back[1] *1. Technical University Munich, Garching, Germany*

HOK-12. **Dispersion of Magnetostatic Spin Waves in a System of Dipolar Coupled Ferromagnetic Layers.** *P. Gerevenkov*[1], V. Bessonov[2], A. Telegin[2], A. Kalashnikova[1] and N. Khokhlov[1] *1. Ioffe Institute, St Petersburg, Russian Federation; 2. M.N. Miheev Institute of Metal Physics, Yekaterinburg, Russian Federation*

HOK-13. **Self-imaging Based Programmable Spin-wave Logic Gates.** *M. Golebiewski*[1], P. Gruszecki[1] and M. Krawczyk[1] *1. Faculty of Physics, Adam Mickiewicz University, Poznan, Poland*

ORAL SESSION

Session HOL
SPIN WAVES AND MAGNETIZATION DYNAMICS II

Oleksii Volkov, Chair
Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany

HOL-01. **Mode attraction in Floquet systems with memory: application to cavity magnonics.** *I. Proskurin*[1,2], O.J. Iyaro[1] and R. Stamps[1] *1. Department of Physics and Astronomy, University of Manitoba, Winnipeg, MB, Canada; 2. Department of Theoretical and Mathematical Physics, Ural Federal University, Ekaterinburg, Russian Federation*

HOL-02. **Exchange Constant Determination using Multiple-Mode FMR Perpendicular Standing Spin Waves.** *H.J. Waring*[1], Y. Li[1], N. Johansson[1], C. Moutafis[1], I.J. Vera-Marun[2] and T. Thomson[1] *1. Computer Science, University of Manchester, Manchester, United Kingdom; 2. Physics and Astronomy, University of Manchester, Manchester, United Kingdom*

HOL-03. **Spin-wave spectra of 3D nanovolcanoes fabricated by focused electron beam-induced deposition.** O. Dobrovolskiy[1], S. Bunyaev[2], A. Bondarenko[2], S. Lamb-Camarena[1], K. Guslienko[3,4], A. Chumak[1], M. Huth[5] and *G.N. Kakazei*[2] *1. Faculty of Physics, University of Vienna, Vienna, Austria; 2. IFIMUP/Department of Physics and Astronomy, University of Porto, Porto, Portugal; 3. Division de Fisica de Materiales, Depto. Polimeros y Materiales Avanzados: Fisica, Quimica y Tecnologia, Universidad del Pais Vasco, UPV/EHU, San Sebastian, Spain; 4. IKERBASQUE, the Basque Foundation for Science, Bilbao, Spain; 5. Physikalisches Institut, Goethe University, Frankfurt, Germany*

HOL-04. **Exchange-spring enabled high-frequency microwave emission from a spin-torque nano-oscillator.** *S. Jiang*[1,2], S. Chung[3,2], Q.T. Le[2], P.J. Wong[1], W. Zhang[1] and J. Åkerman[2,4] *1. School of Microelectronics, Northwestern Polytechnical University, Xi'an, China; 2. Department of Physics, University of Gothenburg, Gothenburg, Sweden; 3. Department of Physics Education, Korea National University of Education, Cheongju, The Republic of Korea; 4. Department of Applied Physics, KTH Royal Institute of Technology, Stockholm, Sweden*

HOL-05. **Increase of a Bullet Mode Lifetime due to Interaction with a Hot Magnon Gas.** *P. Artemchuk*[1], V. Tyberkevych[1] and A.N. Slavin[1] *1. Department of Physics, Oakland University, Rochester, MI, United States*

HOL-06. **Evolution of Room-Temperature Magnon Gas toward Coherent Bose–Einstein Condensate.** *A.A. Serga*[1], T.B. Noack[1], V.I. Vasyuchka[1], A. Pomyalov[2], V.S. L'vov[2] and B. Hillebrands[1] *1. Fachbereich Physik and Landesforschungszentrum OPTIMAS, Technische Universität Kaiserslautern, Kaiserslautern, Germany; 2. Department of Chemical and Biological Physics, Weizmann Institute of Science, Rehovot, Israel*

HOL-07. **Double Accumulation and Anisotropic Transport of Magneto-Elastic Bosons in Yttrium Iron Garnet Films.** *A.A. Serga*[1], P. Frey[1], D.A. Bozhko[2], V.S. L'vov[3] and B. Hillebrands[1] *1. Fachbereich Physik and Landesforschungszentrum OPTIMAS, Technische Universität Kaiserslautern, Kaiserslautern, Germany; 2. Department of Physics and Energy Science, University of Colorado Colorado Springs, Colorado Springs, CO, United States; 3. Department of Chemical and Biological Physics, Weizmann Institute of Science, Rehovot, Israel*

HOL-08. **Spin Chirality-Mediated Orbital Angular Momentum in Quasi-Two-Dimensional Topological Magnon Insulator Cu(1,3-bdc).** *L. Alahmed*[1], J. Wen[4], Y. Xiong[2], L. Zhang[3,5], F. Lux[6], F. Freimuth[6], Y. Mokrousov[6], W. Zhang[2], Y.S. Lee[7] and P. Li[1] *1. Electrical and Computer Engineering, Auburn University, Auburn, AL, United States; 2. Department of Physics, Oakland University, Rochester, MI, United States; 3. Peter Grünberg Institut, Forschungszentrum Jülich, Jülich, Germany; 4. Stanford Institute for Materials and Energy Sciences, SLAC National Accelerator Laboratory, Menlo Park, CA, United States; 5. Institute for Advanced Simulation, JARA, Jülich, Germany; 6. Institute of Physics, Johannes Gutenberg University Mainz, Mainz, Germany; 7. Department of Applied Physics, Stanford University, Stanford, CA, United States*

HOL-09. **Spin Wave Amplification using Spin-Orbit-Torques, A Micromagnetic Approach.** *A. El Kanj*[1], H. Merbouche[1], D. Gouéré[1], I. Boventer[1], R. Lebrun[1], P. Bortolotti[1], V. Cros[1] and A. Anane[1] *1. Unité Mixte de Physique CNRS-Thales, Palaiseau, France*

HOL-10. **Inner dynamics in ferrimagnetic system across its compensation points.** *E. Haltz*[1,2], J. Sampaio[1], S. Krishnia[1], L. Berges[1], A. Mougin[1] and A. Thiaville[1] *1. Solid States Physics Laboratory, Orsay, France; 2. Physics, University of Leeds, Leeds, United Kingdom*

HOL-11. **The thermodynamic properties of exchange stiffness.** *S. Stansill*[1,2] and J. Barker[1,2] *1. University of Leeds, Leeds, United Kingdom; 2. Bragg Centre for Materials Research, Leeds, United Kingdom*

HOL-12. **An Effective Hamiltonian Model for Combined Magnon-Phonon Excitations in Ferrimagnets of the Mn_2RuGa Family.** J. O'Brien[1], M.T. Stamenova[1] and *P.S. Stamenov*[1] *1. School of Physics and CRANN, Trinity College Dublin, Dublin, Ireland*

HOL-13. **Adjusting dipolar interactions to control exceptional points in synthetic antiferromagnets.** *T. Jeffrey*[1], W. Zhang[2] and J. Sklenar[1] *1. Physics, Wayne State University, Detroit, MI, United States; 2. Physics, Oakland University, Rochester, MI, United States*

ORAL SESSION

Session HOM
MICROMAGNETIC AND HYSTERESIS MODELING

Yasushi Kanai, Chair
Niigata Institute of Technology, Kashiwazaki, Japan

HOM-01. **Multi-scale simulations of skyrmion annihilation in disk geometries.** *T.B. Winkler*[1], K. Litzius[2], A. De Lucia[1], M. Weißenhofer[3], H. Fangohr[4,5] and M. Kläui[1] *1. Institut für Physik, JGU Mainz, Mainz, Germany; 2. Department of Materials Science and Engineering, MIT, Cambridge, MA, United States; 3. Fachbereich Physik, Universität Konstanz, Konstanz, Germany; 4. Max-Planck Institute for Structure and Dynamics of Matter, Hamburg, Germany; 5. University of Southampton, Southampton, United Kingdom*

HOM-02. **Modelling noncolinear interface coupling in magnetic multilayers.** *C. Abert*[1], E. Girt[2] and D. Suess[1] *1. University of Vienna, Vienna, Austria; 2. Simon Fraser University, Burnaby, BC, Canada*

HOM-03. **Micromagnetic Simulations of Clusters of Nanoparticles: A Coarse-graining Study.** *R. Behbahani*[1,2], M.L. Plumer[1] and I. Saika-Voivod[1] *1. Physics and Physical Oceanography, Memorial University of Newfoundland, St. John's, NL, Canada; 2. Physics, Western University, London, ON, Canada*

HOM-04. **Wave reversal mode: A new magnetization reversal mechanism in magnetic nanotubes.** *J. Escrig*[1,2], N. Bajales[3,4], D.M. Arciniegas Jaimes[3], S. Raviolo[3,4] and J.M. Carballo[5] *1. Department of Physics, Universidad de Santiago de Chile, Santiago, Chile; 2. Center for the Development of Nanoscience and Nanotechnology, Santiago, Chile; 3. CONICET, Córdoba, Argentina; 4. Universidad Nacional de Córdoba, Córdoba, Argentina; 5. Universidad Nacional de Río Cuarto, Río Cuarto, Argentina*

HOM-05. **Micromagnetic simulations with realistically-generated sintered microstructures.** *A.R. Insinga*[1], E.B. Poulsen[1] and R. Bjørk[1] *1. Energy Conversion and Storage, Technical University of Denmark, Copenhagen, Denmark*

HOM-06. **Normal modes description of nonlinear magnetization dynamics in micromagnetic systems.** *S. Perna*[1], F. Bruckner[2], C. Serpico[1], D. Suess[2] and M. d'Aquino[1] *1. DIETI, University of Naples Federico II, Naples, Italy; 2. University of Vienna, Vienna, Austria*

HOM-07. **Physics informed neural networks for computational magnetism.** *T. Schrefl*[1,2], A. Kovacs[1,2], J. Fischbacher[1,2], M. Gusenbauer[1,2], M. Hovorka[1,2] and H. Oezelt[2] *1. Christian Doppler Laboratory for Magnet Design through Physics Informed Machine Learning, Wiener Neustadt, Austria; 2. Department for Integrated Sensor Systems, Danube University Krems, Wiener Neustadt, Austria*

HOM-08. **Berry-Phase Interpretation of Thin-Film Micromagnetism.** R. Skomski[1], B. Balasubramanian[1], *A. Ullah*[1], C. Binek[1] and D. Sellmyer[1] *1. Physics and Astronomy & NCMN, University of Nebraska, Lincoln, NE, United States*

HOM-09. **Parallel Micromagnetic Monte Carlo Method for Computation of Thermodynamic Equilibrium States in One and Two-Sublattice Systems.** *S. Lepadatu*[1], G. Mckenzie[1], T. Mercer[1], C.R. MacKinnon[1] and P. Bissell[1] *1. University of Central Lancashire, Preston, United Kingdom*

HOM-10. **Solving the Standard Micromagnetic Problems using Unstructured Meshes with MagTense.** *E.B. Poulsen*[1], A.R. Insinga[1] and R. Bjørk[1] *1. Technological University of Denmark, Copenhagen, Denmark*

HOM-11. **Effects of α_1-phase Branch Shapes on Coercivity of Rare-earth Free Alnico Permanent Magnet.** *H. Won*[1], Y. Hong[1], M. Choi[1], G. Mankey[2], J. Lee[3], T. Lee[3] and T. Lim[3] *1. Department of Electrical and Computer Engineering, The University of Alabama, Tuscaloosa, AL, United States; 2. Department of Physics and Astronomy, The University of Alabama, Tuscaloosa, AL, United States; 3. Institute of Fundamental and Advanced Technology (IFAT), Hyundai Motor Company, Uiwang, The Republic of Korea*

HOM-12. **A simple scheme for the inversion of a Preisach like hysteresis operator in advanced saturation conditions.** *S. Perna*[1], M. Balato[1], C. Petrarca[1] and C. Visone[1] *1. DIETI, University of Naples Federico II, Naples, Italy*

HOM-13. **Accurate Small Major Hysteresis Loops Calculation by the Preisach Model With Inverse Switched Hysteresis Operator.** L. Chen[1,2], *T. Zhang*[1], T. Ben[1] and P. Wei[1] *1. College of Electrical Engineering and New Energy, China Three Gorges University, Yichang, China; 2. State Key Laboratory of Reliability and Intelligence of Electrical Equipment and the Province-Ministry Joint Key Laboratory of EFEAR, Hebei University of Technology, Tianjin, China*

Session HPA
MAGNETIZATION DYNAMICS
(Poster Session)

Liliana Buda-Prejbeanu, Co-Chair
SPINtronique et Technologie des Composants, Grenoble, France
Yoshinobu Nakatani, Co-Chair
The University of Electro-Communications, Tokyo, Japan

HPA-01. **Domain wall depinning behavior under spin-polarized current in submicron wires with an asymmetric triangle notch.** *K. Lai*[1], Z. Gao[1], D. Shiu[1], R. Cao[2] and L. Horng[1] *1. Physics, National Changhua University of Education, Changhua, Taiwan; 2. Electrical Engineering, Feng Chia University, Taichung, Taiwan*

HPA-02. **Antiskyrmion excitation modes in antiferromagnetic-exchange coupled disks.** *A. Agorou*[1] and T. Trypiniotis[1] *1. Physics, University of Cyprus, Nicosia, Cyprus*

HPA-03. **Magntic Hopfions in Co/Pt nanostructures and their spin-wave behavior.** *Y. Kumar*[1], N. Arora[1] and P. Das[1] *1. Physics, Indian Institute of Technology Delhi, New Delhi, India*

HPA-04. **High-frequency ultrafast magnetization dynamics mapped by in-situ Lorentz microscopy.** *N. Porwal*[1], J. Weber[1], M. Winklhofer[2] and S. Schaefer[1] *1. Institute of Physics, Carl von Ossietzky Universität Oldenburg, Oldenburg, Germany; 2. Institute for Biology and Environmental Sciences, Carl von Ossietzky Universität Oldenburg, Oldenburg, Germany*

HPA-05. **Domain wall depinning from FM/AF interface defects by spin-polarized current.** F.A. Andrade[1], F.V. Diniz[1], S.M. Martins Jr[2], L.L. Oliveira[3], *A.L. Dantas*[1,3] and A.S. Carriço[2] *1. Department of Physics, State University of Rio Grande do Norte, Mossoró, Brazil; 2. Department of Physics, Federal University of Rio Grande do Norte, Natal, Brazil; 3. Department of Science and Technology, State University of Rio Grande do Norte, Natal, Brazil*

HPA-06. **Magnetostatic coupling between the a ferromagnetic stripe and a nanodot.** *M. Moalic*[1], M.K. Zelent[1] and M. Krawczyk[1] *1. Faculty of Physics, Adam Mickiewicz University, Poznan, Poland*

HPA-07. **Magnetic Properties Affected by the Size and Shape of Magnetic Nanowires.** *Y. Chen*[1] and B. Stadler[2] *1. CEMS, University of Minnesota, Minneapolis, MN, United States; 2. ECE, University of Minnesota, Minneapolis, MN, United States*

HPA-08. **Analytical approaches to the mutual synchronization of spintorque nano-oscillators.** D. Mancilla[1], *M. Castro*[1], S. Allende[1], L.D. Buda-Prejbeanu[2] and U. Ebels[2] *1. Departamento de Fisica, CEDENNA, Universidad de Santiago de Chile, Santiago, Chile; 2. SPINTEC, Univ. Grenoble Alpes, CEA, CNRS, Grenoble INP, Grenoble, France*

HPA-09. **Study on a combined NDT method base on MBN and ACSM.** *Z. Wang*[1] and G. Tian[2] *1. College of Automation Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing, China; 2. School of Engineering, Newcastle University, Newcastle upon Tyne, United Kingdom*

HPA-10. **The Effect of Asymmetric Notch Pinning and Wire Width on Domain Wall Depinning Behavior in Planar Micron-Size Wires.** *D. Shiu*[1], K. Lai[1], R. Cao[2], C. Su[1], Y. Kao[1], J. Wu[1] and L. Horng[1] *1. Physics, National Changhua University of Education, Changhua, Taiwan; 2. Electrical Engineering, Feng Chia University, Taichung, Taiwan*

HPA-11. **Evaluation of the Magnetization Dynamics in Various Thick YIG Films Using Our Proposed Measurement Technique.** T. Nguyen[1] and *Y. Endo*[1] *1. Tohoku University, Sendai, Japan*

HPA-12. **Resonant spin-wave emission from the moving AFM DW without Lorentz invariance.** *X. Ge*[1], F. Chen[1], Z. Li[3], P. Yan[2], H. Piao[4], W. Luo[1], S. Liang[5], X. Yang[1], L. You[1] and Y. Zhang[1] *1. Huazhong University of Science and Technology, Wuhan, China; 2. University of Electronic Science and Technology of China, Chengdu, China; 3. Hebei University of Technology, Tianjin, China; 4. China Three Gorges University, Yichang, China; 5. Hubei University, Wuhan, China*

HPA-13. **Dynamics of Domain Wall Induced by the Voltage-controlled Strain Field Gradients.** *G. Yu*[1], X. He[1], Y. Qiu[1], G. Wu[1], R. Guo[1], M. Zhu[1,2] and H. Zhou[1] *1. Key Laboratory of Electromagnetic Wave Information Technology and Metrology of Zhejiang Province, China Jiliang University, Hangzhou, China; 2. Center for X-Mechanics, Zhejiang University, Hangzhou, China*

HPA-14. **Domain Wall Pinning with Synthetic Antiferromagnets.** *J. Chan*[1], D. Kumar[1], W. Mah[1] and S. Piramanayagam[1] *1. School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, Singapore*

HPA-15. **Depinning Field of Vortex Domain Wall at Triangular Notch with Various Incoming Angles in NiFe Wires.** *D. Shiu*[1], K. Lai[1], R. Cao[2], Y. Kao[1] and L. Horng[1] *1. Physics, National Changhua University of Education, Changhua, Taiwan; 2. Electrical Engineering, Feng Chia University, Taichung, Taiwan*

HPA-16. **Synthetic antiferromagnetic domain wall device as artificial neuron for neuromorphic computing.** *W. Mah*[1], D. Kumar[1] and S. Piramanayagam[1] *1. School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, Singapore*

HPA-17. **Fast and Controlled Sequential Nucleation of Narrow Domains in a Ferromagnetic Nano-strip with Non-localised Electrical Currents.** *D. Osuna Ruiz*[1], V. Raposo[1], Ó. Alejos[2] and E. Martínez[1] *1. Department of Applied Physics, University of Salamanca, Salamanca, Spain; 2. Department of Electricity and Electronics, University of Valladolid, Valladolid, Spain*

HPA-18. **Transient retrograde motion of spin wave-driven skyrmions in multilayer wave guides.** *L. Huang*[1], G. Burnell[1] and C. Marrows[1] *1. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom*

POSTER SESSION

Session HPB
MAGNONS, SPIN DYNAMICS AND MICROMAGNETIC MODELING (Poster Session)

Matthias Benjamin Jungfleisch, Chair
University of Delaware, Newark, DE, United States

HPB-01. **Mode selective excitation of spin waves.** *T. Taniguchi*[1] and C.H. Back[1] *1. Fakulität für Physik, Technische Universität München, München, Germany*

HPB-02. **Arnold tongue of injection locked spin torque nano-oscillators under high and mixed driving signals.** *M. Ibarra Gomez*[1], J. Hem[1], P. Talatchian[1], L.D. Buda-Prejbeanu[1] and U. Ebels[1] *1. SPINTEC, Univ. Grenoble Alpes, CEA, CNRS, Grenoble INP, Grenoble, France*

HPB-03. **Magnon valve effect and resonant transmission in a one-dimensional magnonic crystal.** *Y. Xing*[1], Z. Yan[1] and X. Han[1] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China*

HPB-04. **Study of Coherent Spin Waves in a Three-Dimensional Artificial Spin Ice Structure.** *S. Sahoo*[1], A. May[2], A. van den Berg[2], A.K. Mondal[1], S. Ladak[2] and A. Barman[1] *1. Department of Condensed Matter Physics and Material Sciences, S. N. Bose National Centre for Basic Sciences, Kolkata, India; 2. School of Physics and Astronomy, Cardiff University, Cardiff, United Kingdom*

HPB-05. **Magnonic and phononic dispersion in $Ni_{80}Fe_{20}$ array of antidots.** *S. Chiroli*[1], D. Faurie[1], P. Djemia[1], A. Adeyeye[2,3] and F. Zighem[1] *1. CNRS LSPM Université Sorbonne Paris Nord, Villetaneuse, France; 2. Department of Physics, Durham University, Durham, United Kingdom; 3. Information Storage Materials Laboratory Department of Electrical and ComputerEngineering National University of Singapore, Singapore*

HPB-06. **Collective Hydrodynamic Magnon Transport Study in Magnetically Ordered Insulator Based on Boltzmann Approach.** *Y. Li*[1], C. Chen[1] and J. Zhang[1] *1. School of Physics, Tongji University, Shanghai, China*

HPB-07. **Diffusion equation and fractional viscosity-based magneto dynamic model for electrical steel ferromagnetic hysteresis.** *B. Ducharne*[1] and G. Sebald[2] *1. INSA Lyon, Villeurbanne, France; 2. ELyTMaX UMI 3757, CNRS – Université de Lyon – Tohoku University, International Joint Unit, Tohoku University, Sendai, Japan*

HPB-08. **Midpoint numerical technique for inertial ultra-fast Landau-Lifshitz-Gilbert nutation dynamics.** M. d'Aquino[1], *S. Perna*[1], K. Neeraj[2], S. Bonetti[3,2] and C. Serpico[1] *1. Dipartimento di Ingegneria Elettrica e delle Tecnologie dell'Informazione, Università degli Studi di Napoli Federico II, Napoli, Italy; 2. Stockholm University, Stockholm, Sweden; 3. Dipartimento di Scienze Molecolari e Nanosistemi, Università Ca' Foscari, Venezia, Italy*

HPB-09. **Optical-helicity induced spin-transfer torque in ferromagnetic multilayers with perpendicular magnetic anisotropy.** *S. Iihama*[1,2], K. Ishibashi[3,2] and S. Mizukami[2,4] *1. Frontier Research Institute for Interdisciplinary Sciences (FRIS), Tohoku University, Sendai, Japan; 2. WPI Advanced Institute for Materials Research (AIMR), Tohoku University, Sendai, Japan; 3. Department of Applied Physics, Tohoku University, Sendai, Japan; 4. Center for Spintronics Research Network (CSRN), Tohoku University, Sendai, Japan*

HPB-10. **Current-Induced Magnetization Switching of Exchange-Biased NiO Heterostructures Characterized by Spin-Orbit Torque.** *K. Grochot*[1,2], L. Karwacki[3,4], S. Lazarski[1], W. Skowronski[1], J. Kanak[1], W. Powroznik[1], P. Kuswik[4], M. Kowacz[4], F. Stobiecki[4,1] and T. Stobiecki[1,2] *1. Institute of Electronics, AGH University of Science and Technology, Cracow, Poland; 2. Faculty of Physics and Applied Computer Science, AGH University of Science and Technology, Cracow, Poland; 3. Institute for Theoretical Physics, Utrecht University, Utrecht, Netherlands; 4. Institute of Molecular Physics, Polish Academy of Sciences, Poznan, Poland*

ORAL SESSION

Session IOA
MAGNETIC RECORDING TECHNOLOGY I

Chris Rea, Co-Chair
Seagate, Minneapolis, MN, United States
Wei-Heng Hsu, Co-Chair
Seagate, Minneapolis, MN, United States

IOA-01. **Multiple spin injection into coupled field generation layers for low current operation of MAMR heads.** *Y. Nakagawa*[1], M. Takagishi[1], N. Narita[1], T. Maeda[1] and A. Takeo[2] *1. Corporate Research and Development Center, Toshiba Corporation, Kawasaki, Japan; 2. Toshiba Electronic Devices and Storage Corporation, Yokohama, Japan*

IOA-02. **Spin Transport in an Ultrathin Al Film for Use as a Nonlocal Spin Valve.** *Y. Liu*[1] and R. Victora[1,2] *1. School of Physics and Astronomy, University of Minnesota, Minneapolis, MN, United States; 2. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

IOA-03. **Stoner-Wohlfarth Model with Standard Deviation of Magnetic Easy Axis.** *D. Lee*[1], D. Han[2], S. Jeong[1], N. Lee[1], I. Suzuki[3], Y. Takahashi[3] and S. Kim[1] *1. Department of Physics, University of Ulsan, Ulsan, The Republic of Korea; 2. Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea; 3. National Institute for Materials Science (NIMS), Tsukuba, Japan*

IOA-04. **A Study of Three-Dimensional Equalization for Reproducing a Double-Layer Magnetic Recording Medium.** *Y. Nakamura*[1], M. Nishikawa[1], Y. Kanai[2] and Y. Okamoto[1] *1. Graduate School of Science and Engineering, Ehime University, Matsuyama, Japan; 2. Department of Information and Electronics Engineering, Niigata Institute of Technology, Kashiwazaki, Japan*

IOA-05. **Deep Neural Networks based Soft-Information Improvement for Two-Head/Two-Track Bit-Patterned Magnetic Recording.** *N. Rueangnetr*[1], K. Kanhunthod[1] and C. Warisarn[1] *1. King Mongkut's Institute of Technology Ladkrabang, Bankok, Thailand*

IOA-06. **Machine Learning Detection Channel Enabling Wide Reader for Bit Patterned Media.** *T. Mo*[1,2], D. Laughlin[1,2] and J. Zhu[1,3] *1. Data Storage Systems Center, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Dept. of Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 3. Dept. of Electrical and Computer Engineering, Carnegie Mellon University, Pittsburgh, PA, United States*

IOA-07. **Experimental evolution of two parametric mechanisms of magnetization reversal in FeCoB nanomagnet.** *V. Zayets*[1] *1. Platform Photonics Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan*

IOA-08. **Master structure dependence of double magnet master on magnetic printing performance onto energy-assisted magnetic recording media.** *T. Komine*[1] *1. Ibaraki University, Ibaraki, Japan*

IOA-09. **Higher-order magnetic anisotropy in soft-hard nanocomposite materials.** *B.T. Nguyen*[1], S. Jenkins[1,2], R.F. Evans[1] and R.W. Chantrell[1] *1. Physics, University of York, York, United Kingdom; 2. Physics, University of Duisburg-Essen, Duisburg, Germany*

IOA-10. **Reactive Molecular Dynamic Simulation of Plasma Etching Process of $L1_0$-FePt HAMR Media in Embedded Mask Patterning.** *J. Zhu*[1] and J. Wang[1] *1. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

IOA-11. **Fabrication of Granular FePt-$L1_0$ HAMR Media with High Grain Aspect Ratio.** *C. Xu*[1], B. Zhou[1], T. Du[1], B. Yang[1], B. Varaprasad[1], D. Laughlin[1] and J. Zhu[1] *1. Data Storage Systems Center, Carnegie Mellon University, Pittsburgh, PA, United States*

IOA-12. **Characterization of the Thermal Time Constants of HAMR Media.** *I. Gilbert*[1], C. Rea[2], J. Guzman[2], J. Loven[1] and M. Benakli[2] *1. Seagate Research Group, Seagate Technology, Shakopee, MN, United States; 2. Recording Head Operations, Seagate Technology, Bloomington, MN, United States*

IOA-13. **Dependence of Bit Error Rates on HAMR Transition Curvatures.** *K. Xue*[1] and R. Victora[1] *1. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

IOA-14. **Enhancing Deterministic All-Optical Switching of Co/Gd Based Synthetic Ferrimagnets by He^+ Irradiation.** *P. Li*[1], J.W. van der Jagt[2], R.J. Bruikman[1], R. Juge[2], R. Lavrijsen[1], D. Ravelosona[2,3] and B. Koopmans[1] *1. Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands; 2. Spin-Ion Technologies, Palaiseau, France; 3. CNRS, Centre de Nanosciences et de Nanotechnologies, Palaiseau, France*

ORAL SESSION

Session IOB
MICROWAVE AND MILLIMETER WAVE MATERIALS AND DEVICES

Hanae Kijima-Aoki, Chair
Tohoku University, Sendai, Japan

IOB-01. **Uncooled sub-gigahertz spin bolometer.** ***(Invited)*** *M. Goto*[1,2], Y. Yamada[1], A. Shimura[3], T. Suzuki[3], N. Degawa[3], T. Yamane[3], S. Aoki[3], J. Urabe[3], S. Hara[3], H. Nomura[1,2] and Y. Suzuki[1,2] *1. Osaka University, Toyonaka, Japan; 2. CSRN-Osaka, Toyonaka, Japan; 3. TDK Corporation, Chuo-ku, Japan*

IOB-02. **Tuning RF Acoustic Waves via Magnetism.** *D.A. Bas*[1], P. Shah[1], I. Lisenkov[2], A. Matyushov[3], N.X. Sun[3] and M. Page[1] *1. Materials and Manufacturing, Air Force Research Lab, WPAFB, OH, United States; 2. Independent Researcher, Newton Upper Falls, MA, United States; 3. Electrical and Computer Engineering, Northeastern University, Boston, MA, United States*

IOB-03. **Phase difference detection in spin-torque nano-oscillators.** *M. Jotta Garcia*[1], S. Wittrock[1], L. Martins[2], A. Jenkins[2], R. Ferreira[2], U. Ebels[3], P. Bortolotti[1], R. Lebrun[1] and V. Cros[1] *1. Unité Mixte de Physique, CNRS, Thalès, Université Paris-Saclay, Palaiseau, France; 2. International Iberian Nanotechnology Laboratory, Braga, Portugal; 3. Univ. Grenoble Alpes, CEA, CNRS, Grenoble INP, Spintec, Grenoble, France*

IOB-04. **Robust mutual synchronization of spin Hall nano-oscillator chains.** *A. Kumar*[1], M. Zahedinejad[1], H. Fulara[1], R. Khymyn[1], A.A. Awad[1], M. Dvornik[2], A. Houshang[1] and J. Åkerman[1] *1. Department of Physics, University of Gothenburg, Gothenburg, Sweden; 2. NanOsc AB, Kista, Sweden*

IOB-05. **Hexagonal Nano-ferrites used on a V-band Self-bias On-chip Circulator for CMOS.** W. Quan[1], *M.N. Afsar*[1] and V. Koomson[1] *1. Tufts University, Medford, MA, United States*

IOB-06. **Multiferroic Lamb Wave Antenna.** *R. Zheng*[1], V.M. Estrada[1] and A. Sepulveda[1] *1. MAE, UCLA, Los Angeles, CA, United States*

IOB-07. **Physical origin of bimodal complex permeability spectrum of a noise-suppression sheet.** *T. Igarashi*[1], S. Tamaru[2], N. Kikuchi[3], S. Yoshida[3] and S. Okamoto[3] *1. TOKIN Corporation, Sendai, Japan; 2. Advanced Industrial Science and Technology, Tsukuba, Japan; 3. Tohoku University, Sendai, Japan*

IOB-08. **Miniaturizing Patch Antenna with Multi-layer Soft Ferrite and Dielectric Substrate Structure.** B. Bryant[1], Y. Hong[1], *H. Won*[1] and M. Choi[1] *1. Department of Electrical and Computer Engineering, The University of Alabama, Tuscaloosa, AL, United States*

IOB-09. **Composite Right/Left-Handed Metamaterial Lines with Phase-Shifting Nonreciprocity Enhanced by Spoof Surface Plasmon Mode Propagation.** K. Okamoto[1], *T. Ueda*[1] and T. Itoh[2] *1. Electrical Engineering and Electronics, Kyoto Institute of Technology, Kyoto, Japan; 2. Electrical Engineering, UCLA, Los Angeles, CA, United States*

IOB-10. **New Magnetic Multilayer for Direct On-chip EMI Shielding Layer on Mold Substrate at Sub-100MHz Frequency Range.** *A. Kikitsu*[1], Y. Kurosaki[1], S. Shirotori[1], A. Fujita[2], H. Nishigaki[2] and S. Matsunaka[2] *1. R&D Center, Toshiba Corp., Kawasaki, Japan; 2. Shibaura Mechatronics Corp., Ebina, Japan*

IOB-11. **Microwave Absorption Performance of M-type Hexagonal Ferrite and MXene Composite.** *H. Won*[1], Y. Hong[1], M. Choi[1], K. Lee[2], D. Shin[2] and Y. Yoon[2] *1. Department of Electrical and Computer Engineering, The University of Alabama, Tuscaloosa, AL, United States; 2. Semiconductor Materials Division, LG Chem, Ltd., Yeongdeungpo-gu, The Republic of Korea*

IOB-12. **NiZn ferrite noise suppressor embedded in IC interposer.** *M. Yamaguchi*[1,2], A. Takahashi[2], Y. Miyazawa[2] and M. Nagata[3] *1. Departmemt of Electrical Engineering, Tohoku University, Sendai, Japan; 2. New Industory Creation Hachery Center, Tohoku University, Sendai, Japan; 3. Graduate School of Science, Technology and Innovation, Kobe University, Kobe, Japan*

IOB-13. **Enhanced Electromagnetic Wave Absorption by Bi-layered Nano-hollow Spheres.** *A. Gorai*[1], R. Mandal[2] and D. Mandal[1] *1. Condensed Matter Physics and Material Sciences, Satyendra Nath Bose National Centre for Basic Sciences, Kolkata, India; 2. Electronics and Communications, University of Engineering and Management, Kolkata, India*

Session IOC
SENSORS: MATERIALS, DEVICES AND APPLICATIONS I

Shuichiro Hashi, Chair
Tohoku Gakuin University, Tagajo, Japan

IOC-01. **Measurement of Bio-magnetic Fields with Tunnel Magneto-resistive Sensors. *(Invited)*** *M. Oogane*[1], K. Fujiwara[2], S. Kumagai[2], H. Matsuzaki[2] and Y. Ando[1] *1. Tohoku University, Sendai, Japan; 2. Spin Sensing Factory Corp., Sendai, Japan*

IOC-02. **Adaptive Measurements in Quantum Magnetometry.** *R. McMichael*[1], S. Dushenko[1,2] and S.M. Blakley[1] *1. National Institute of Standards and Technology, Gaithersburg, MD, United States; 2. Institute for Research in Electronics and Applied Physics, University of Maryland, College Park, MD, United States*

IOC-03. **Conductivity Measurement of Nonferrous Plates using a Novel Sensor with Triangular Arrangements of Triple Coils.** *M. Mirzaei*[1], P. Ripka[1] and V. Grim[1] *1. Czech Technical University, Prague, Czechia*

IOC-04. **Resolution Bandwidth of a Spectrum Analyzer Based on a Sweep-Tuned Oscillator.** *P.G. Elphick*[1], S. Louis[2], A.N. Slavin[1] and V. Tyberkevych[1] *1. Physics, Oakland University, Rochester, MI, United States; 2. Electrical and Computer Engineering, Oakland University, Rochester, MI, United States*

IOC-05. **Non-Linear GMI Based Detection Platform for an Enhanced Contactless and Reusable Detection of Magnetic Nanoparticles.** *J.J. Beato-López*[4,2], J. Algueta-Miguel[1,3] and C. Gomez-Polo[4,2] *1. Departamento de Ingeniería de Electricidad, Electrónica y Comunicación, Universidad Pública de Navarra, Pamplona, Spain; 2. Institute for Advanced Materials and Mathematics, INAMAT2, Universidad Pública de Navarra, Pamplona, Spain; 3. Institute of Smart Cities, Universidad Pública de Navarra, Pamplona, Spain; 4. Departamento de Ciencias, Universidad Pública de Navarra, Pamplona, Spain*

IOC-06. **Flux Noise Reduction of HTS SQUID Using Josephson Junctions Made by FIB.** *K. Hayashi*[1], R. Ohtani[1], Y. Tottori[1], S. Ariyoshi[2] and S. Tanaka[2] *1. Department of Applied Chemistry and Life Science, Toyohashi University of Technology, Toyohashi, Japan; 2. EIIRIS, Toyohashi University of Technology, Toyohashi, Japan*

IOC-07. **Flexible multifunctional sensorics for simultaneous strain and magnetic field measurements.** *Y. Zabila*[1,2], A. Maximenko[3], M. Krupinski[2], A. Zarzycki[2], M. Perzanowski[2], P. Horeglad[2], M. Marszalek[2] and D. Makarov[1] *1. Intelligent Materials and Systems, Helmholtz Zentrum Dresden Rossendorf, Dresden, Germany; 2. Department of Magnetic Materials and Nanostructures, The Henryk Niewodniczanski Institute of Nuclear Physics Polish Academy of Sciences, Krakow, Poland; 3. SOLARIS National Synchrotron Radiation Centre, Krakow, Poland*

IOC-08. **2D application-ready magnetoelastic cilia tactile sensing device.** *P. Ribeiro*[2,3], L. Jamone[1] and S. Cardoso de Freitas[2,3] *1. Advanced Robotics at Queen Mary, Queen Mary University of London, London, United Kingdom; 2. INESC - Microsistemas e Nanotecnologias, Lisbon, Portugal; 3. Department of Physics, Instituto Superior Técnico, Lisbon, Portugal*

IOC-09. **Wireless Stress Sensor Based on Magnetoelastic Microwires for Biomedical Applications: detection of collagen concentration, pressure and temperature.** *P. Marin*[1], M. Vélez[2] and J. López[1,3] *1. Instituto de Magentismo Aplicado, Universidad Complutense de Madrid, Las Rozas, Spain; 2. Instituto de Catálisis, Consejo Superior de Investigaciones Científicas, Madrid, Spain; 3. Spanish CRG BM25-SpLine at The ESRF – The European Synchrotron, Grenoble, France*

IOC-10. **Printing magnetostrictive materials for structural health monitoring of carbon fibre composite.** *N. Ahmed*[1], P. Smith[2] and N. Morley[1] *1. Materials Science and Engineering, University of Sheffield, Sheffield, United Kingdom; 2. Mechanical Engineering, University of Sheffield, Sheffield, United Kingdom*

IOC-11. **The compositional dependence of NiFeCr seed layer on the giant magnetoresistance of [FeCoNi/Cu] multilayers.** *P.D. Kulkarni*[1], T. Nakatani[1] and Y. Sakuraba[1] *1. Magnetic Materials Group, Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science, Tsukuba, Japan*

IOC-12. **Investigation of noise origin in a symmetric response magnetoresistance (SRMR) sensor using AC modulation.** *Y. Higashi*[1], A. Kikitsu[1], Y. Kurosaki[1] and S. Shirotori[1] *1. Toshiba Corporation, Kawasaki, Japan*

IOC-13. **Detecting Magnetic Ink Barcodes with Magnetoresistive Sensors.** *S. Abrunhosa*[1,2], I. Gibb[3], R. Macedo[1], E. Williams[3], N. Muller[3], P.P. Freitas[1,2] and S. Cardoso de Freitas[1,2] *1. INESC MN, Lisbon, Portugal; 2. Instituto Superior Técnico, Lisbon, Portugal; 3. MagVision Ltd, Frome, United Kingdom*

Session IOD
POWER DEVICES, INDUCTION

Guijun Li, Chair
Hong Kong University of Science and Technology, Hong Kong, Hong Kong

IOD-01. **Large-Signal Characterization Technique for Power Electronics Magnetic Components by Deep Learning with Double Pulse Test Measurement Image.** *T. Koga*[2,1], K. Matumoto[1], Y. Ishizuka[1], N. Shigei[3], M. Yamaguchi[4], A. Itagaki[5] and T. Nakamura[5] *1. Nagasaki University, Nagasaki, Japan; 2. Ansys Japan, Shinjuku, Japan; 3. Kagoshima University, Kagoshima, Japan; 4. Tohoku University, Sendai, Japan; 5. Ryowa Electronics Co. Ltd., Sendai, Japan*

IOD-02. **A Dual-receiver Inductive Charging System for Automated Guided Vehicles.** *H. Wang*[1] and K. Cheng[1] *1. The Hong Kong Polytechnic University, Kowloon, Hong Kong*

IOD-03. **A Low-cost Novel Method to Fabricate Integrated Magnetic Core Inductor Embedded in Organic Substrate.** *Y. Wu*[1] and H. Yu[1] *1. School of Electrical, Computer and Energy Engineering, Arizona State University, Tempe, AZ, United States*

IOD-04. **Fabrication of thick, laminated, electroinfiltrated magnetic nanocomposites to reduce dimensional resonance effects.** *S. Amirisetti*[1], C.S. Smith[1], S.C. Mills[2], J. Andrew[2] and D. Arnold[1] *1. Electrical and Computer Engineering, University of Florida, Gainesville, FL, United States; 2. Materials Science and Engineering, University of Florida, Gainesville, FL, United States*

IOD-05. **Research on electromagnetic transient characteristics and distribution pattern on UHV converter transformer winding.** *S. He*[1] and J. Li[1] *1. Xi'an Jiaotong University, Xi'an, China*

IOD-06. **Reluctance of Long Solenoids.** *A. Sherwali*[1] and W.G. Dunford[1] *1. University of British Columbia, Vancouver, BC, Canada*

IOD-07. **Meter-Range Wireless Motor Drive for Pipeline Transportation.** *W. Liu*[1], K. Chau[1], H. Wang[1] and T. Yang[1] *1. Department of Electrical and Electronic Engineering, The University of Hong Kong, Hong Kong, China*

IOD-08. **Withdrawn**

IOD-09. **Modification of transformer coupled permeameter (TC-Perm) for wider bandwidth.** *S. Tamaru*[1] *1. Advanced Industrial Science and Technology (AIST), Tsukuba, Japan*

IOD-10. **Pulse Frequency Modulation for Parity-Time-Symmetric Wireless Power Transfer System.** *Z. Hua*[1], K. Chau[1], W. Liu[1] and X. Tian[1] *1. The University of Hong Kong, Hong Kong, China*

IOD-11. **Multi-Resonating-Compensation for Multi-Channel Multi-Pickup Wireless Power Transfer.** *H. Pang*[1], K. Chau[1], W. Liu[1] and X. Tian[1] *1. The University of Hong Kong, Hong Kong, China*

ORAL SESSION

Session IOE
SENSORS, LEVITATION

Xu Li, Chair
Xiamen University, Xiamen, China

IOE-01. **Photothermal actuation of levitated pyrolytic graphite revised.** S. Yee[1] and *H. ElBidweihy*[1] *1. Electrical and Computer Engineering, United States Naval Academy, Annapolis, MD, United States*

IOE-02. **Electromagnetic sensing of the corrosion at different microstructural phases in a medical Ti-Al-4V ELI alloy.** *H. Carreon*[1] and M. Carreon-Garcidueñas[2] *1. Materiales, Universidad Michoacana, Morelia, Mexico; 2. Biomateriales, Universidad de Navarra, Pamplona, Spain*

IOE-03. **Force Analysis of an Electrodynamic Wheel Maglev Drone.** *C. Bruce*[1] and J. Bird[1] *1. Portland State University, Portland, OR, United States*

IOE-04. **Maglev Vehicle Lift-to-Drag Ratio and Specific Power Comparison.** *C. Bruce*[1], B. Dechant[2] and J. Bird[1] *1. Portland State University, Portland, OR, United States; 2. FluxMagic, Inc., Portland, OR, United States*

IOE-05. **Crack detection for welded joint with surface coating using unsaturated AC magnetic flux leakage.** *M. Hayashi*[1], S. Adachi[1], T. Kawakami[1], Y. Miyamoto[2], J. Wang[1], K. Sakai[1], T. Kiwa[1], K. Tsukada[1], T. Ishikawa[3] and M. Hirohata[2] *1. Graduate school of Interdisciplinary Science in Health Systems, Okayama University, Okayama, Japan; 2. Graduate School of Engineering, Osaka University, Suita, Japan; 3. Faculty of Environmental and Urban Engineering, Kansai University, Suita, Japan*

IOE-06. **Magnetic Permeability Sensor Array Prototype To Evaluate Reservoir Phase Permeability in-Situ Downhole.** *R. Adams*[1], J.F. Servin[2], W. Wang[3] and M. Deffenbaugh[1] *1. Sensors Development Team, Aramco Research Center -- Houston, Houston, TX, United States; 2. Reservoir Engineering Technology, EXPEC Advanced Research Center, Dhahran, Saudi Arabia; 3. Reservoir Engineering Technology, Aramco Research Center -- Cambridge, Cambridge, MA, United States*

IOE-07. **Feedback of magnetic nanoparticles susceptibility to their magnetic dipole interaction with ferromagnetic GMR sensor.** *O. Koplak*[1], R. Allayarov[1], E. Kunitsyna[1], R. Morgunov[1] and S. Mangin[2] *1. Spintronics, Institute of Problems of Chemical Physics, Chernogolovka, Russian Federation; 2. Spintronics, Institut Jean Lamour, Nancy, France*

ORAL SESSION

Session IOF
MICROSCOPY, IMAGING AND CHARACTERIZATION I

Amit Chanda, Chair
University of South Florida, Tampa, FL, United States

IOF-01. **Multi-modal Microscopy of real-space Antiferromagnetic Topological textures.** ***(Invited)*** *H. Jani*[1] *1. Physics, National University of Singapore, Singapore*

IOF-02. **Withdrawn**

IOF-03. **High-resolution magnetic imaging of magnetic transition region of perpendicular magnetic recording media by alternating magnetic force microscopy with sensitive amorphous FeCoB soft magnetic tip.** *H. Saito*[1], H. Tanaka[1] and T. Matsumura[1] *1. Graduate School of Engineering Science, Akita University, Akita, Japan*

IOF-04. **Field Sensitivity in Magnetic Force Microscopy.** H.J. Hug[1,2], *Y. Feng*[1,2], M. Penedo[1,3], P. Kappenberger[1,4], X. Zhao[1,5] and A. Mandru[1] *1. Empa, Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland; 2. Department of Physics, University of Basel, Basel, Switzerland; 3. Laboratory for Bio- and Nano-Instrumentation, Lausanne, Switzerland; 4. Condair Group AG, Pfäffikon, Switzerland; 5. Evatec AG, Trübbach, Switzerland*

IOF-05. **Quadratic and third-order magneto-optic Kerr effect in Ni(111) thin films with and without twinning.** M. Gaerner[1], R. Silber[2], T. Peters[1], J. Hamrle[3] and *T. Kuschel*[1] *1. Bielefeld University, Bielefeld, Germany; 2. VŠB - Technical University of Ostrava, Ostrava, Czechia; 3. Charles University, Praque, Czechia*

IOF-06. **Table-Top Low-Field MicroMRI for Cell Imaging.** ***(Invited)*** *E.B. Buchanan*[2], S.E. Russek[1] and K.F. Stupic[1] *1. NIST, Boulder, CO, United States; 2. UT Southwestern Medical Center, Dallas, TX, United States*

IOF-07. **Application of High Sensitive AC Field Modulation GMR Sensor to Magnetic Field Microscope.** *A. Kikitsu*[1], Y. Higashi[1], Y. Kurosaki[1], S. Shirotori[1], T. Nagatsuka[2], K. Suzuki[2] and Y. Terui[2] *1. Toshiba Corp., Kawasaki, Japan; 2. Toshiba Nanoanalysis Corp., Kawasaki, Japan*

IOF-08. **Imaging the Magnetization Vector with Fourier Transform Holography.** *M. Di Pietro Martínez*[1], A. Wartelle[1,2], C. Herrero-Martínez[1], F. Fettar[3], J. Motte[3], L. Turnbull[5], F. Ogrin[4], G. van der Laan[6], H. Popescu[7], N. Jaouen[7], F. Yakhou-Harris[2] and G. Beutier[1] *1. SIMaP, Saint-Martin d'Hères, France; 2. ESRF, Grenoble, France; 3. Institut Néel, Grenoble, France; 4. School of Physics and Astronomy, University of Exeter, Exeter, United Kingdom; 5. Centre for Materials Physics, Durham University, Durham, United Kingdom; 6. Diamond Light Source, Oxfordshire, United Kingdom; 7. Synchrotron SOLEIL, Gif-sur-Yvette, France*

IOF-09. **Depth-resolved magnetization profile of MgO/CoFeB/W perpendicular half magnetic tunnel junctions.** *V. Bansal*[1], J. Tonnerre[1,3], F. Fettar[1], E. Mossang[1], J. Chatterjee[2], S. Auffret[2], L. Prejbeanu[2] and B. Dieny[2] *1. Universite Grenoble Alpes, CNRS, Grenoble INP, Institut Neel, Grenoble, France; 2. University Grenoble Alpes, CEA, CNRS, Grenoble-INP, INAC-SPINTEC, Grenoble, France; 3. Syncrotron Soleil, Saint Aubin, Gif-sur-Yvette Cedex, France*

IOF-10. **X-ray magnetic linear dichroism for time-resolved imaging of spin axial dynamics.** J. Bailey[1,2], S. Finizio[1], J. Förster[3], S. Mayr[1], M. Weigand[4], C. Dubs[5], E. Josten[6], J. Dreiser[1], E. Goering[3], J. Gräfe[3], J. Raabe[1], G. Schütz[3], G. Aeppli[1,2] and *S. Wintz*[1,3] *1. Paul Scherrer Institut, Villigen PSI, Switzerland; 2. EPFL, Lausanne, Switzerland; 3. Max-Planck-Institut für Intelligente Systeme, Stuttgart, Germany; 4. Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany; 5. Innovent, Jena, Germany; 6. Forschungszentrum Jülich, Jülich, Germany*

IOF-11. **Soft X-ray Magnetic Laminography Imaging of Magneto-dynamical Processes.** *S. Finizio*[1], C. Donnelly[2], S. Mayr[1,3], A. Hrabec[1,3] and J. Raabe[1] *1. Paul Scherrer Institut, Villigen PSI, Switzerland; 2. Cavendish Laboratory, University of Cambridge, Cambridge, United Kingdom; 3. Laboratory for Mesoscopic Systems, ETH Zurich, Zurich, Switzerland*

IOF-12. **Magnetooptical 3D holographic display using microlens array.** *Y. Ito*[1], S. Yamagishi[1], Y. Yamamoto[1], S. Mito[2], R. Hashimoto[3], H. Horimai[4], T. Goto[1], Y. Nakamura[1], P.B. Lim[1], M. Inoue[5] and H. Uchida[1] *1. Toyohashi Univ. of Tech., Tohoyashi, Japan; 2. NIT Tokyo College, Hachioji, Japan; 3. NIT Suzuka College, Suzuka, Japan; 4. HolyMine Corp., Numazu, Japan; 5. Tohoku Univ., Sendair, Japan*

Session IOG
MICROSCOPY, IMAGING AND CHARACTERIZATION II

Koji Sekiguchi, Chair
Yokohama National University, Yokohama, Japan

IOG-01. **The Effect of Temperature Variations in Thermal Noise Magnetometry.** *K. Everaert*[1,2], B. Van Waeyenberge[2], J. Leliaert[2] and F. Wiekhorst[1] *1. Biosignals, Physikalisch-Technische Bundesanstalt, Berlin, Germany; 2. Department of Solid State Sciences, UGent, Gent, Belgium*

IOG-02. **Synthesis and Characterization of Fe-Fe_3O_4 Core-Shell Nanoparticles Dispersed in Carbon Matrix.** H. Gyulasaryan[1], E. Papadopoulou[2], N. Tetos[2], G. Chilingaryan[1], E. Myrovali[3], M. Angelakeris[3], M. Farle[2], M. Spasova[2], J. Gray[4], *A.N. Kocharian*[5], O. Bernal[5] and A. Manukyan[1] *1. Institute for Physical Research of National Academy of Sciences, Ashtarak, Armenia; 2. University of Duisburg-Essen, Faculty of Physics and Center of Nanointegration (CENIDE), Duisburg, Germany; 3. Physics Department, Aristotle University of Thessaloniki, Thessaloniki, Greece; 4. Materials Characterization Laboratory, Penn State Materials Research Institute, University Park, PA, United States; 5. Department of Physics and Astronomy, California State University Los Angeles, Los Angeles, CA, United States*

IOG-03. **Highly Stable Copper–Zinc Ferrite Nanoparticles for MRI Thermometry.** D. Lachowicz[1], J. Stroud[2], J. Hankiewicz[2], R. Gassen[2], A. Kmita[1], J. Stepien[1], Z. Celinski[3], M. Sikora[1], J. Zukrowski[1], M. Gajewska[1] and *M. Przybylski*[1,4] *1. Academic Centre for Materials and Nanotechnology, AGH University of Science and Technology, Krakow, Poland; 2. BioFrontiers Center, University of Colorado Colorado Springs, Colorado Springs, CO, United States; 3. Physics Department, University of Colorado Colorado Springs, Colorado Springs, CO, United States; 4. Faculty of Physics and Applied Computer Science, AGH University of Science and Technology, Krakow, Poland*

IOG-04. ***In Situ* Compensation Method for Precise Volume Magnetometry of Biological and Chemical Specimens Requiring Encapsulation.** *M. Sawicki*[1] and K. Gas[1] *1. Institute of Physics Polish Academy of Sciences, Warszawa, Poland*

IOG-05. **Influence of magnetic anisotropy on self-assembly and magnetic properties in binary ferrofluids.** *M. Khelfallah*[1], S. Neveu[3], D. Taverna[1], V. Dupuis[3], P. Sainctavit[1,2] and A. Juhin[1] *1. Sorbonne-Université, Institut de Minéralogie, de Physique des Matériaux et de Cosmochimie, Paris, France; 2. Synchrotron SOLEIL, Gif-Sur-Yvette, France; 3. Sorbonne-Université, PHENIX, Paris, France*

IOG-06. **CT Data as A-Priori Information for Multimodal Magnetorelaxometry Imaging.** *P. Schier*[1], D. Baumgarten[1,2], M. Kuhlmann[3], F. Wiekhorst[4], U. Ankerhold[3] and M. Liebl[3,4] *1. Institute of Electrical and Biomedical Engineering, UMIT - Private University for Health Sciences, Medical Informatics and Technology, Hall in Tirol, Austria; 2. Institute of Biomedical Engineering and Informatics, Technische Universität Ilmenau, Ilmenau, Germany; 3. Physikalisch-Technische Bundesanstalt (PTB), Braunschweig, Germany; 4. Physikalisch-Technische Bundesanstalt (PTB), Berlin, Germany*

IOG-07. **Synthesis Atmosphere Dependence of Charge Density at Zn Sites in Co-doped ZnO.** M.D. Costa[1], M.R. Cordeiro[2], L.F. Pereira[2], C.S. Costa[1], W.L. Ferreira[2], B. Bosch-Santos[2], G.A. Cabrera-Pasca[1] and *A.W. Carbonari*[2] *1. Universidade Federal do Pará-UFPA, Abaetetuba, Brazil; 2. Instituto de Pesquisas Energéticas e Nucleares, IPEN, São Paulo, Brazil*

IOG-08. **Atomic Structure and Electron Magnetic Circular Dichroism of Individual Rock Salt Structure Antiphase Boundaries in Spinel Ferrites.** *Z. Li*[1,6], J. Lu[2,7], L. Jin[3], J. Rusz[4], V. Kocevski[4,8], H. Yanagihara[5], E. Kita[5], J. Mayer[3,9], R. Dunin-Borkowski[3,9], H. Xiang[2] and X. Zhong[1,6] *1. City University of Hong Kong, Kowloon, Hong Kong; 2. Fudan University, Shanghai, China; 3. Forschungszentrum Jülich GmbH, Juelich, Germany; 4. Uppsala University, Uppsala, Sweden; 5. University of Tsukuba, Tsukuba, Japan; 6. Tsinghua University, Beijing, China; 7. Yancheng Institute of Technology, Yancheng, China; 8. Los Alamos National Laboratory, Los Alamos, NM, United States; 9. RWTH Aachen University, Aachen, Germany*

IOG-09. **Scanning Tunneling Microscopy and Spectroscopy (STM/S) Reveals Small Energy Gap in $CrBr_3$.** *D. Baral*[1], Z. Fu[1], A. Zadorozhnyi[1], R. Dulal[1], A. Wang[1], N. Shrestha[1], U. Erugu[1], J. Tang[1], Y. Dahnovsky[1], J. Tian[1] and T. Chien[1] *1. Physics and Astronomy, University of Wyoming, Laramie, WY, United States*

IOG-10. **Magnetic Domains in 2D van der Waals Material Fe_3GeTe_2.** *M. Yang*[1,3], Q. Li[2,3] and Z.Q. Qiu[3] *1. Anhui Univeisity, Hefei, China; 2. University of Science and Technology of China, Hefei, China; 3. University of California, Berkeley, Berkeley, CA, United States*

IOG-11. **Characterization of Hybrid Domain Wall Structure and Surface Chirality for Amorphous Fe/Gd Thin Films.** *R. Moraski*[1], S. Montoya[2], E. Fullerton[2], W. Parker[1] and B. McMorran[1] *1. Physics, University of Oregon, Eugene, OR, United States; 2. Center for Memory and Recording Research, University of California San Diego, San Diego, CA, United States*

IOG-12. **Curvature-mediated spin textures in magnetic multilayered nanotubes.** *E. Josten*[1], D.W. Raftrey[2,3], A. Hierro-Rodriguez[4], L. Aballe[5], M. Lipinska-Chwalek[6], T. Jansen[6], K. Hoeflich[7], H. Kroencke[7], C. Dubordieu[7,8], D. Buergler[6], J. Mayer[6,9] and P. Fischer[2,3] *1. U Zaragoza, Zaragoza, Spain; 2. LBNL, Berkeley, CA, United States; 3. UC Santa Cruz, Santa Cruz, CA, United States; 4. U Oviedo, Oviedo, Spain; 5. ALBA Synchrotron Light Facility, Cerdanyola del Vallès, Spain; 6. FZ Juelich, Juelich, Germany; 7. Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany; 8. FU Berlin, Berlin, Germany; 9. RWTH Aachen, Aachen, Germany*

IOG-13. **Domain Walls in Magnetic Nanotubes: An Experimental Evidence.** *M. Jaber*[2], D. Tiwari[2], J. Hurst[2], M. Schöbitz[2], M. Scheuerlein[1], W. Ensinger[1], D. Gusakova[2], A. Masseboeuf[2] and O. Fruchart[2] *1. Technische Universität Darmstadt, Darmstadt, Germany; 2. SPINTEC, Univ. Grenoble Alpes, CNRS, CEA, Grenoble, France*

ORAL SESSION

Session IOH
MAGNETIC BIODETECTION AND THERAPY I

Yuko Ichiyanagi, Co-Chair
Yokohama National University, Yokohama, Japan
César de Julián Fernández, Co-Chair
Istituto dei Materiali per l'Elettronica ed il Magnetismo Consiglio Nazionale delle Ricerche, Parma, Italy
Javier Alonso, Co-Chair
Universidad de Cantabria, Santander, Spain

IOH-01. **Bioapplications of magnetic nanowires: barcodes, heaters, biocomposites.** ***(Invited)*** *B. Stadler*[1] *1. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

IOH-02. **Optimized Magnetic Drug Delivery with Limited Particle Spreading.** *R. Van Durme*[1], G. Crevecoeur[1,2], L. Dupré[1] and A. Coene[1,2] *1. Electromechanical, Systems & Metal Engineering, Ghent University, Ghent, Belgium; 2. EEDT Decision & Control, Flanders Make, Lommel, Belgium*

IOH-03. **Harmonic Phases of the Nanoparticle Magnetization: an Intrinsic Temperature Probe.** *E. Garayo*[2], J. Collantes[1], J. Garcia[3], F. Plazaola[1] and O. Sandre[4] *1. Electricidad y Electronica, UPV/EHU, Leioa, Spain; 2. Ciencias, UPNA, Pamplona/Iruña, Spain; 3. Física Aplicada II, UPV/EHU, Leioa, Spain; 4. Laboratoire de Chimie des Polymères Organiques, Université de Bordeaux, Bordeaux, France*

IOH-04. **In Silico Safety Analysis of Magnetic Hyperthermia Treatments of Implant-Bearing Patients.** *I. Rubia-Rodriguez*[1], L. Zilberti[2], A. Arduino[2], O. Bottauscio[2], M. Chiampi[2] and D. Ortega[3,4] *1. IMDEA Nanoscience, Madrid, Spain; 2. Istituto Nazionale di Ricerca Metrologica (INRiM), Turin, Italy; 3. Condensed Matter Physics, Universidad de Cadiz, Puerto Real, Spain; 4. Institute of Research and Innovation in Biomedical Sciences of the Province of Cádiz (INiBICA), Cádiz, Spain*

IOH-05. **Homogenization of Heating in Magnetic Hyperthermia Through Exploitation of Magnetisation Dynamics of Interacting Particles.** J. Leliaert[1], *J. Ortega-Julia*[2] and D. Ortega[3,4] *1. Department of Solid State Sciences, Ghent University, Ghent, Belgium; 2. IMDEA Nanoscience, Madrid, Spain; 3. Condensed Matter Physics, University of Cadiz, Cadiz, Spain; 4. Institute of Research and Innovation in Biomedical Sciences of the Province of Cádiz (INiBICA), University of Cadiz, Cadiz, Spain*

IOH-06. **Vortex nano-discs: from micromagnetic simulations to cancer cells internalization for magneto-mechanically induced damage applications.** *R.P. Magalhães*[1], S. Caspani[1], D. Navas[2], C. Redondo[3], R. Morales[3], S. Lima[4], S. Reis[4], C. Nunes[4], J.P. Araujo[1] and C. Sousa[1] *1. IFIMUP and DFA Faculdade de Ciencias da Universidade do Porto, Porto, Portugal; 2. Instituto de Ciencia de Materiales de Madrid, ICMM-CSIC, Madrid, Spain; 3. Dpto. de Química-Física, Universidad del País Vasco UPV/EHU, Bilbao, Spain; 4. LAQV, REQUIMTE, Faculty of Pharmacy of Porto University, Porto, Portugal*

IOH-07. **Magnetic Techniques for Rapid Diagnostic Testing for Health Care and Environmental Monitoring.** ***(Invited)*** *M. Rivas*[1], M. Salvador[1,2], J. Martinez-Garcia[1], J. Marqués[1], A. Bunge[3], R. Turcu[3], D. Peddis[2,4], M. García[5] and M.D. Cima[5] *1. Physics, University of Oviedo, Gijón, Spain; 2. Istituto di Struttura della Materia, Rome, Italy; 3. National Institute for Research and Development of Isotopic and Molecular Technologies, Cluj-Napoca, Romania; 4. Università degli Studi di Genova, Genova, Italy; 5. Escuela Superior de Ingeniería y Tecnología, Universidad Internacional de la Rioja, Logroño, Spain*

IOH-08. **Imaging of a superparamagnetic iron oxide nanoparticle distribution by a single-sided magnetic particle imaging scanner.** *C. McDonough*[1,2], D. Newey[2] and A. Tonyushkin[1,2] *1. Physics, Oakland University, Rochester, MI, United States; 2. Physics, UMass Boston, Boston, MA, United States*

IOH-09. **Magnetometry with diamond nitrogen-vacancy center by using an optical fiber array for two-dimensional imaging.** *A. Kuwahata*[1,2], Y. Murata[1], H. Tanaka[1], K. Arai[3], R. Katsumi[4], T. Iwasaki[3], M. Hatano[3], R. Igarashi[5], T. Ohshima[5], F. Jelezko[6], M. Kusakabe[2,7], S. Yabukami[1], T. Yatsui[4] and M. Sekino[2] *1. Tohoku University, Sendai, Japan; 2. The University of Tokyo, Tokyo, Japan; 3. Tokyo Institute of Technology, Tokyo, Japan; 4. Toyohashi University of Technology, Toyohashi, Japan; 5. National Institutes for Quantum and Radiological Science and Technology, Chiba, Japan; 6. Ulm University, Ulm, Germany; 7. Matrix Cell Research Institute Inc., Ibaraki, Japan*

IOH-10. **Measurement of Sub-Zero Temperatures in Magnetic Resonance Imaging: Applications for MRI-Guided Cryosurgery.** J. Hankiewicz[1], R. Camley[1] and *Z. Celinski*[1] *1. UCCS BioFrontiers Center, University of Colorado at Colorado Springs, Colorado Springs, CO, United States*

IOH-11. **Development of Magnetic Particle Imaging (MPI) Scanner for Phantom Image of Tracer Agents.** *M. Irfan*[1], N. Dogan[3], O. Mercan Dogan[3] and A. Bingolbali[2] *1. Electronics Engineering, Gebze Technical University, Gebze, Turkey; 2. Bioengineering, Yildiz Technical University, Besiktas, Turkey; 3. Physics, Gebze technical University, Gebze, Turkey*

IOH-12. **TMS-like Magnetic Fields Modulate Metabolic Activity of Hepatic and Colorectal Cancer Cells.** *A. Guller*[1,2], B. Heng[1] and S. Ahn[1] *1. Macquarie University, Sydney, NSW, Australia; 2. The Institute for Regenerative medicine, Sechenov University, Moscow, Russian Federation*

IOH-13. **Oriented Control of the Stimulation Target During Transcranial Magnetic Stimulation Using Space-varying E-field Vector Modulation with Multi-Core Figure-of-Flower Coil.** *I.C. Carmona*[1] and R.L. Hadimani[1,2] *1. Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 2. Biomedical Engineering, Virginia Commonwealth University, Richmond, VA, United States*

IOH-14. **Effect of Neuroanatomy on Motor Evoked Potentials after Intermittent Theta Burst Stimulation.** *N. Mittal*[1], B. Thakkar[3], C.B. Hodges[2], Y. Cho[1], C.J. Lewis[1], A. Andrade[4], B. Nevadomski[1], K. Li[1], R.L. Hadimani[1] and C. Peterson[1] *1. College of Engineering, Virginia Commonwealth University, Richmond, VA, United States; 2. Physical Medicine and Rehabilitation, Virginia Commonwealth University, Richmond, VA, United States; 3. Physical Therapy, Virginia Commonwealth University, Richmond, VA, United States; 4. College of Humanities and Sciences, Virginia Commonwealth University, Richmond, VA, United States*

ORAL SESSION

Session IOI
MAGNETIC FLUIDS, ANTIBACTERIAL APPLICATIONS, AND OTHER EMERGING TOPICS

Manh-Huong Phan, Co-Chair
University of South Florida, Tampa, FL, United States
Jungjin Park, Co-Chair
University of Maryland at College Park, College park, MD, United States

IOI-01. **Encapsulations of Magnetorheological Fluids using 3D Printed Elastomeric Rectangular Cellular Structures.** *J. Park*[1], Y. Choi[1], A. Flatau[1] and N. Wereley[1] *1. University of Maryland, College park, MD, United States*

IOI-02. **Fe-C magnetic nanocomposites for removal of emerging pollutants.** *L. Cervera-Gabalda*[1] and C. Gomez-Polo[1] *1. Departmento de Ciencias-INAMAT2, Universidad Pública de Navarra, Pamplona, Spain*

IOI-03. **Effect of Lubricant Coatings of Magnetic Nanoparticles on the Leakage Rate of Magnetic Powder Sealing.** *Z. Li*[1] and D. Li[1] *1. State Key Laboratory of Tribology, Tsinghua University, Beijing, China*

IOI-04. **Self-Assembled Superparamagnetic Structures for Cell Cluster Arrays.** *Y. Chen*[1,2], K. Zhou[1], Z. Huang[3], X. Liu[2] and Z. Wei[1] *1. Zhengzhou University, Zhengzhou, China; 2. Shinshu University, Wakasato, Japan; 3. Division of Cardiology, Baltimore, MD, United States*

IOI-05. **Nd-Fe-B Based Magnetophoretic Microfluidic Device with High Trapping Efficiency.** *S. Ozunlu*[1,2], N. Gunduz Akdogan[3,2], H.A. Alshammari[1] and O. Akdogan[1,2] *1. Bahcesehir University, Istanbul, Turkey; 2. NANOTerial Technology Corporation, Istanbul, Turkey; 3. Piri Reis University, Istanbul, Turkey*

IOI-06. **A Green Thermomagnetic Technology for Efficient Passive Cooling by Ferrofluids.** *V.B. Varma*[1,2], R. Ramanujan[1,2], S. Cheekati[1,2] and M. Pattanaik[1,2] *1. School of Materials Science and Engineering, Nanyang Technological University, Singapore, Singapore; 2. Singapore-HUJ Alliance for Research and Enterprise (SHARE), Nanomaterials for Energy and Energy-Water Nexus (NEW), Campus for Research Excellence and Technological Enterprise (CREATE), Singapore, Singapore*

IOI-07. **Magnetic Nanoparticle Manipulation Using Strain-Mediated FeGaB/PMN-PT Elliptical Ring Structures.** *P. Pathak*[1], V. Yadav[1] and D. Mallick[1] *1. Electrical Engineering, Indian Institute of Technology Delhi, New Delhi, India*

IOI-08. **Antibacterial activity of g-Fe_2O_3/Ag nanocomposites under alternating magnetic fields.** Y. Luengo[1], B. Sot[1] and *G. Salas*[1] *1. IMDEA Nanociencia, Madrid, Spain*

IOI-09. **Magnetostrictive nanostructured surfaces for antimicrobial applications.** *J. Marqués Marchán*[1], M.M. Fernandes[2,3], J. Fernandez-Roldan[4], M. Méndez[4], V.M. Prida[4], S. Lanceros-Mendez[5,6] and A. Asenjo[1] *1. Instituto de Ciencia de Materiales de Madrid, CSIC, Madrid, Spain; 2. Centre of Physics, University of Minho, Braga, Portugal; 3. Centre of Biological Engineering, University of Minho, Braga, Portugal; 4. Department of Physics, University of Oviedo, Oviedo, Spain; 5. BCMaterials, Leoia, Spain; 6. Ikerbasque, Bilbao, Spain*

IOI-10. **Green Synthesis and Characterization of Magnetic Fe_3O_4, $CoFe_2O_4$ and $NiFe_2O_4$ from Aloe Vera Extract and its Biomedical Potential.** *G.C. Hermosa*[1] and A. Sun[1] *1. Yuan Ze University, Taoyuan, Taiwan*

IOI-11. **Magnetic Field Prediction Using Generative Adversarial Networks.** *S. Pollok*[1]*, N. Olden-Jørgensen[1], P.S. Jørgensen[1] and R. Bjørk[1] *1. Department of Energy Conversion and Storage, Technical University of Denmark, 2800 Kgs. Lyngby, Denmark*

IOI-12. **Pymagnet: User-friendly Field Calculations of Complex Magnets.** *P. Dunne*[1] *1. Applied Magnetism, Strasbourg, France*

IOI-13. **[1]H nuclear relaxation with limited spin diffusion. Development of study model.** D. Lachowicz[1], J.A. Stoll[2], M. Gajewska[1], M. Sikora[1], J. Hankiewicz[2], M. Przybylski[1] and *Z. Celinski*[2] *1. Academic Centre for Materials and Nanotechnology, AGH University of Science and Technology, Krakow, Poland; 2. BioFrontiers Institute, UCCS, Colorado Springs, CO, United States*

POSTER SESSION

Session IPA
MAGNETIC RECORDING TECHNOLOGY II (Poster Session)

Ganping Ju, Co-Chair
Seagate, Fremont, CA, United States
Yingguo Peng, Co-Chair
Seagate, Fremont, CA, United States

IPA-01. **Estimating Interference with Two-Dimensional Viterbi Algorithm for Bit Patterned Media Recording.** *T.A. Nguyen*[1] and J. Lee[1] *1. Soongsil University, Seoul, The Republic of Korea*

IPA-02. **Improving Serial Detection with MAP Algorithm for Bit Patterned Media Recording.** *T.A. Nguyen*[1] and J. Lee[1] *1. Soongsil University, Seoul, The Republic of Korea*

IPA-03. **Bit-Flipping Scheme Using K-Means Algorithm for Bit-Patterned Media Recording.** *S. Jeong*[1] and J. Lee[1] *1. School of Electronic Engineering, Soongsil University, Seoul, The Republic of Korea*

IPA-04. **Optimising Dual Structure Patterned Media for Heat Assisted Magnetic Recording.** H. Yamane[1], *S. Greaves*[1] and Y. Tanaka[1] *1. RIEC, Tohoku University, Sendai, Japan*

IPA-05. **Micromagnetic Analysis of Dual FGL STO.** *R. Itagaki*[1], Y. Kanai[1] and S. Greaves[2] *1. Niigata Institute of Technology, Kasiwazaki, Japan; 2. RIEC, Tohoku University, Sendai, Japan*

IPA-06. **Influence of pulse width and Joule heating on current-induced domain wall motion.** *S. Kambe*[1], S. Ranjbar[1], K. Tanabe[1], S. Sumi[1] and H. Awano[1] *1. Toyota Technological Institute, Nagoya, Japan*

IPA-07. **Dependence of microwave assisted magnetization switching and magnetic recording characteristics on layer anisotropy structure for multilayer media.** *K. Kurihara*[1], K. Kawakami[1], X. Ya[1], Y. Kanai[2] and T. Tanaka[1] *1. Kyushu University, Fukuoka, Japan; 2. Niigata Institute of Technology, Niigata, Japan*

IPA-08. **Estimation of microwave-assisted magnetization switching field by static energy approximation.** *K. Kawakami*[1], K. Kurihara[1], X. Ya[1] and T. Tanaka[1] *1. Kyushu University, Fukuoka, Japan*

IPA-09. **Curie temperature evaluation for $L1_0$ typed FePt alloy and granular films with various degrees of order by adopting Bloch's $T^{3/2}$ law.** *T. Saito*[1], S. Kaneko[1], K. Tham[2], R. Kushibiki[2], T. Ogawa[1] and S. Saito[1] *1. Tohoku University, Sendai, Japan; 2. Tanaka Kikinzoku Kogyo K. K., Tsukuba, Japan*

IPA-10. **Effect of N_2 gas-addition sputtering on nanostructure and magnetic properties of FePt-BN granular films for heat assisted magnetic recording.** *K. Tham*[1], T. Saito[2], R. Kushibiki[1] and S. Saito[2] *1. Tanaka Kikinzoku Kogyo, Tsukuba, Japan; 2. Electronic Engineering, Tohoku University, Sendai, Japan*

IPA-11. **Humidity effects on the perfluoropolyether lubricants under the operational conditions of the heat-assisted magnetic recording.** *H. Son*[1], H. Park[1], H. Yang[1] and P. Chung[1] *1. Energy Systems Engineering, Inje University, Gimhae, The Republic of Korea*

IPA-12. **Control of switching time and energy dissipation for ultrafast photo-magnetic recording in dielectrics.** *T. Zalewski*[1] and A. Stupakiewicz[1] *1. Faculty of Physics, University of Bialystok, Bialystok, Poland*

POSTER SESSION

Session IPB
SENSORS: MATERIALS, DEVICES AND APPLICATIONS II (Poster Session)

Sho Muroga, Chair
Akita University, Akita, Japan

IPB-01. **Non-contact Wideband Current Sensing for High-frequency Power Converters Based on Convection Trace and Out-of-plane Field Sensing with Magnetoresistive Sensors.** *X. Qi*[1], W. Miao[3], P. Pong[4] and C. Liu[2] *1. Electrical and Electronic Engineering, The University of Hong Kong, Hong Kong; 2. School of Energy and Environment, City University of Hong Kong, Hong Kong; 3. School of Mechatronic Engineering and Automation, Shanghai University, Shang Hai, China; 4. Electrical and Computer Engineering, New Jersey Institute of Technology, Newark, NJ, United States*

IPB-02. **DC-biased Eddy Current Sensor for Arbitrary Orientation Defects Detection in Ferromagnetic Steel Using Orthogonal DC Magnetic Field and Eddy Current.** *D. Um*[1] and G. Park[1] *1. Pusan National Univsersity, Busan, The Republic of Korea*

IPB-03. **Controlling of magnetoimpedance property of thin-film element using Joule-heating.** *H. Kikuchi*[1], A. Ueno[1] and M. Tanii[1] *1. Iwate University, Morioka, Japan*

IPB-04. **Development of magnetic tunnel junctions with symmetric R-H curve for specific sensor application.** *S. Manceau*[1,2], V. Pasanisi[1], C. Ducruet[3], P. Sabon[1], C. Cavoit[2], G. Jannet[2], L. Prejbeanu[1], M. Kretzschmar[2] and C. Baraduc[1] *1. Spintec, Grenoble, France; 2. LPC2E, Orléans, France; 3. Crocus, Grenoble, France*

IPB-05. **Specular spin-valve sensors with improved magnetoresistance for polymer-based tubular devices.** M. Ferreira[1,2], D.N. Faye[1], *P. Araujo*[1,2], S. Cardoso de Freitas[1,2] and D. Leitao[1,2] *1. INESC MN, Lisboa, Portugal; 2. Tecnico, University of Lisbon, Lisboa, Portugal*

IPB-06. **Signal to Noise Ratio Analysis of GMR Line Devices for High Sensitive Magnetic Sensor Applications.** *N. Fukatani*[1], M. Ichimura[1] and J. Hayakawa[1] *1. Hitachi Ltd., Kokubunji, Japan*

IPB-07. **Effects of fall times of pulse currents on output voltages for amorphous-wire-based magnetic sensors.** *T. Kaneko*[1], Y. Honkura[2], S. Honkura[3] and F. Akagi[1] *1. Kogakuin University, Tokyo, Japan; 2. Magnedesign Co. Ltd., Aichi, Japan; 3. Nanocoil Co. Ltd., Aichi, Japan*

IPB-08. **Vibration Signal Suppression Effect of Dual Induction Eddy Current Probe in Dynamic Environment.** *D. Kosaka*[1], T. Shioya[1], Y. Kumakura[2], F. Kojima[3] and H. Yamasaki[2] *1. Polytechnic University, Kodaira, Japan; 2. Tex Riken Co., Ltd., Nishinomiya, Japan; 3. Kobe University, Kobe, Japan*

IPB-09. **Magnetic properties and high frequency characteristic of M-type hexaferrite synthesized by the molten salt method.** *M. Kim*[1], M. Gu[2], K. Kim[2] and J. Kim[1] *1. Department of Materials Science and Chemical Engineering, Hanyang University, Ansan, The Republic of Korea; 2. Department of Physics, Yeungnam University, Gyeongsan, The Republic of Korea*

IPB-10. **Orienting Receiver to Transmitter in an Inductive Power Transfer System Using Tunnel Magnetoresistance Sensors.** *J. Liu*[1], J. Zhou[1], C. Lee[1] and P. Pong[2] *1. Department of Electrical and Computer Engineering, The University of Hong Kong, Hong Kong; 2. Department of Electrical and Computer Engineering, New Jersey Institute of Technology, Newark, NJ, United States*

IPB-11. **Hybrid microfluxgate and current transformer sensor.** *C. Lu*[1], Y. Lin[1], Y. Tian[1] and J. Jeng[2] *1. Department of Mechanical Engineering, National Taipei University of Technology, Taipei, Taiwan; 2. Department of Mechanical Engineering, National Kaohsiung University of Science and Technology, Kaohsiung, Taiwan*

IPB-12. **Two Sources of Offset Drift in Orthogonal Fluxgates: Thermal and Magnetic.** *M. Butta*[1], M. Dressler[1] and M. Janosek[1] *1. Faculty of Electrical Engineering, Czech Technical University in Prague, Prague, Czechia*

IPB-13. **RFID Strain Sensors Applied to Wheel-Rail Contact Force Measurement.** *C. Yang*[1], G. Tian[1] and M. Robinson[1] *1. School of Engineering, Newcastle University, Newcastle upon Tyne, NE1 7RU, United Kingdom*

IPB-14. **Proposal of Inspection Method for Shrinkage Cavity in Spheroidal Graphite Cast Iron Using Differential Vibration Measurement by Electromagnetic Force Vibration.** *S. Niwa*[2], A. Hagisaka[2], I. Yamada[2], S. Shiota[1], Y. Gao[1] and Y. Gotoh[1] *1. Department of Innovative Engineering, Faculty of Science and Technology, Ooita University, Ooita, Japan; 2. Graduate School of Engineering, Ooita University, Ooita, Japan*

IPB-15. **Low-Power AMR Magnetometer Operated in Discontinuous Mode.** *D. Novotný*[1], L. Mičan[1] and V. Petrucha[1] *1. Department of Measurement, Czech Technical University in Prague, Prague, Czechia*

IPB-16. **Rogowski Coil with Ferromagnetic Powder Core.** *V. Grim*[1] and P. Ripka[1] *1. Department of Measurement, Czech Technical University, Prague, Czechia*

IPB-17. **Evaluation of harmonic signals derived from separately located multiple samples for magnetic particle imaging.** *S. Tanaka*[1], H. Hirano[2], M. Futagawa[2], Y. Takemura[3] and S. Ota[2] *1. Electrical and Electronic Engineering Course, Graduate School of Integrated Science and Technology, Shizuoka University, Hamamatsu, Japan; 2. Department of Electrical and Electronic Engineering, Shizuoka University, Hamamatsu, Japan; 3. Department of Electrical and Computer Engineering, Yokohama National University, Yokohama, Japan*

Session IPC
SENSORS, POWER SYSTEM, MACHINES (Poster Session)

Ke Zhu, Chair
HK Electric, Hong Kong, Hong Kong

IPC-01. **Effects of the Electromagnetic Structure of the Power Transformer Core on Hysteresis Squareness Ratio, Noise and Vibration Characteristics.** *C. Hsu*[3], J. Liu[2] and C. Fung[1] *1. Mechanical Engineering, Oriental Institute of Technology, Banqiao District, Taiwan; 2. Digital Multimedia Design, Kainan University, Lu-Zhou, Taiwan; 3. Asia Eastern University of Science and Technology, New Taipei, Taiwan*

IPC-02. **Optimal Design on the Three-degree-of-freedom Hybrid Magnetic Bearing.** *T. Zhang*[1], Z. Wang[1] and X. Ye[1] *1. Faculty of Automation, Huaiyin Institute of Technology, Huaian, China*

IPC-03. **XGboost Algorithm on VMD Mode Mixing Suppression for the Motor Bearing Fault Diagnosis.** *B. Guan*[2], C. Di[1], Z. Ke[1] and X. Bao[1] *1. School of Electrical Engineering and Automation, Hefei University of Technology, Hefei, China; 2. Department of Electrical and Computer Engineering, The Ohio State University, Columbus, OH, United States*

IPC-04. **High-magnetic performance on an H-type dipole electromagnet as a versatile power system.** *J. Baena Rodriguez*[1,2] and A.A. Velasquez Torres[2] *1. EECS, Massachusetts Institute of Technology, Cambridge, MA, United States; 2. School of Sciences, Universidad EAFIT, Medellin, Colombia*

IPC-05. **Magnetic Respiratory Monitoring Technology Based Music Therapy for Covid19 Patients: A New Perspective.** *K. Hwang*[1], D. Nguyen[1], Y. Rahman[1], V.O. Jimenez[1], B. Muchharla[1] and M. Phan[1] *1. University of South Florida, Tampa, FL, United States*

IPC-06. **Estimation of inductance and resistance of toroidal coils in high temperature environment.** *M.D. Noh*[1], T.K. Le[1] and Y. Park[1] *1. Mechatronics Engineering, Chungnam National University, Daejeon, The Republic of Korea*

IPC-07. **Power Adaption Design for Multifrequency Wireless Power Transfer System.** *X. Tian*[1], K. Chau[1], H. Pang[1] and W. Liu[1] *1. Department of EEE, The University of Hong Kong, Hong Kong*

IPC-08. **Analysis of Transformer Audible Noise Based on Redundant Convolutional Encoder Decoder.** *J. Li*[1,2], Z. Liang[1], L. Li[1], Y. Qi[1], G. Li[1], N. Zheng[2] and Z. Wang[2] *1. School of Electrical Engineering, Dalian University of Technology, Dalian, China; 2. R & D, LUTE Electric Co., Ltd, Jining, China*

IPC-09. **Proposal of inspection method for opposite side defect in steel plate using electromagnetic force vibration.** *A. Hagisaka*[1], I. Yamada[1], S. Niwa[1], S. Shiota[2], Y. Gao[2] and Y. Gotoh[2] *1. Department of Innovative Engineering, Oita University, Oita, Japan; 2. Department of Mechanical and Energy Systems Engineering, Oita University, Oita, Japan*

IPC-10. **Examination of electromagnetic inspection method for opposite side defect on steel plate using full-wave rectified alternating magnetic field.** *R. Ou*[1], Y. Ono[1] and Y. Gotoh[2] *1. Department of Engineering, Oita University, Oita, Japan; 2. Department of Innovative Engineering, Oita University, Oita, Japan*

POSTER SESSION

Session IPD
MICROSCOPY, IMAGING AND CHARACTERIZATION III (Poster Session)

Spyridon Angelopoulos, Chair
National Technical University of Athens, Zografou, Attiki, Greece

IPD-01. **Facile Magneto-optic Detection of Tunable Magnetically-Induced Transparency Spectra in Magnon-Magnon Coupled Bilayers.** W. Zhang[1], *J. Inman*[1,2], Y. Xiong[1,2], Y. Li[3], J. Sklenar[4], P. Li[5], S. Louis[2], H. Qu[2], Z. Xiao[3], W. Kwok[3] and V. Novosad[3] *1. Physics Department, Oakland University, Rochester, MI, United States; 2. Electronic and Computer Engineering Department, Oakland University, Rochester, MI, United States; 3. Materials Science Division, Argonne National Laboratory, Lemont, MI, United States; 4. Physics Department, Wayne State University, Detroit, MI, United States; 5. Electronic and Computer Engineering Department, Auburn University, Auburn, AL, United States*

IPD-02. **Development of a User-Friendly Time Resolved Scanning Transmission X-ray Microscope at the Advanced Light Source to Study Magnetization Dynamics.** T. Feggeler[1], E. Norum[1], A. Butko[3], G. Portman[1], D. Shapiro[1] and *H. Ohldag*[1,2] *1. Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 2. Materials Science and Engineering, Stanford University, Stanford, CA, United States; 3. Computer Sciences, Lawrence Berkeley National Laboratory, Berkeley, CA, United States*

IPD-03. **Square-Wave Inverter Excitation for Magnetic Nanoparticle Tomography.** *K. Higashino*[1], N. Okamura[1], T. Sasayama[1] and T. Yoshida[1] *1. Kyushu University, Fukuoka, Japan*

IPD-04. **Dependency of magnetorelaxometry on the temperature of magnetic nanoparticles.** *S. Arsalani*[1], P. Radon[1], M. Liebl[1], U. Steinhoff[1] and F. Wiekhorst[1] *1. Metrologie Magnetischer Nanopartikel, Physikalisch-Technische Bundesanstalt, Berlin, Germany*

IPD-05. **Role of Aggregation Dynamics in Magneto-Optical Scattering by Superparamagnetic Nanoparticles.** *M. Syed*[1], W.J. Li[1] and N. Fried[1] *1. Physics & Optical Engineering, Rose-Hulman Institute of Tech, Terre Haute, IN, United States*

IPD-06. **Static and Dynamic Magnetic Property Characterizations on Self-assembled Magnetic Nanoparticle Chains.** *S. Liang*[1], V.K. Chugh[2], R. Saha[2], K. Wu[2], J. Liu[2], V.D. Krishna[3], M.C. Cheeran[3] and J. Wang[1,2] *1. Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, United States; 2. Department of Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States; 3. Department of Veterinary Population Medicine, University of Minnesota, Minneapolis, MN, United States*

IPD-07. **In situ observation of magnetic vortex in amorphous and nanocrystalline ribbon.** *S. Zuo*[1], Y. Zhang[2], T. Zhao[2] and B. Shen[2] *1. Beihang University, Beijing, China; 2. Institute of Physics, Chinese Academy of Science, Beijing, China*

IPD-08. **Spin-polarized scanning tunneling microscopy on Co-Fe alloy nanoislands.** *H. Yang*[1,2], C. Hsu[3], W. Lin[3] and Y. Hasegawa[1] *1. The University of Tokyo, Kashiwa, Japan; 2. Karlsruhe Institute of Technology, Karlsruhe, Germany; 3. National Taiwan Normal University, Teipei, Taiwan*

IPD-09. **Magnetic properties and domain imaging of IrMn (5 nm)/ Fe_2CoSi (5 nm) bilayer.** *A.K. Jana*[1], M. Raja[2], C. Arout[2] and J. Suryanaryana[1] *1. Physics, IIT Hyderabad, Hyderabad, India; 2. Magnetic Group, DMRL, Hyderabad, India*

IPD-10. **Eddy Current Microscopy Utilizing CoPt Coated Probes.** *Y. Yang*[1], A. Sokolov[2], X. Yin[3], Y. Liu[1,2], J. Trujillo[4] and S. Liou[1,2] *1. Department of Physics and Astronomy, University of Nebraska-Lincoln, Lincoln, NE, United States; 2. Nebraska Center for Materials and Nanoscience, University of Nebraska-Lincoln, Lincoln, NE, United States; 3. Western Digital Corporation, Fremont, CA, United States; 4. Department of Energy's National Security Campus, Kansas City, MO, United States*

IPD-11. **Asymmetric magnetic domain wall motion in a quasi-perpendicularly magnetized with interfacial Dzyaloshinskii-Moriya interaction.** *S. Maji*[1], A. Mukhopadhyay[1] and P. Kumar[1] *1. Department of Physics, Indian Institute of Science, Bangalore, Bangalore, India*

IPD-12. **Observing 360 domain wall switching behavior in submicron permalloy rings.** *K. Lai*[1], D. Shiu[1], R. Cao[2] and L. Horng[1] *1. Physics, National Changhua University of Education, Changhua, Taiwan; 2. Electrical Engineering, Feng Chia University, Taichung, Taiwan*

IPD-13. **Comparison of Driving Methods by SAMR for Amorphous Ribbons Magnetostriction Measurement.** *V. Petrucha*[1] and M. Butta[1] *1. Faculty of Electrical Engineering, Czech Technical University in Prague, Prague, Czechia*

IPD-14. **Magnetic measurement for various types of iron steel thickness using magnetic sensor and the effect of their electromagnetic characteristics.** *K. Tsukada*[1], M. Hayashi[1], T. Kawakami[1], S. Adachi[1], K. Sakai[1], T. Kiwa[1], T. Ishikawa[2], M. Saari[3], K. Hori[4], K. Hisazumi[5] and T. Tominaga[5] *1. Okayama University, Okayama, Japan; 2. Kansai University, Suita, Japan; 3. Universiti Malaysia Pahang, Pekan, Malaysia; 4. Nippon Steel Metal Products Co., Ltd, Kanda, Japan; 5. Nippon Steel Corp, Futtsu, Japan*

POSTER SESSION

Session IPE
MAGNETIC BIODETECTION AND THERAPY II (Poster Session)

Anirudh Sharma, Co-Chair
Johns Hopkins University School of Medicine, Baltimore, MD, United States

Ravi Hadimani, Co-Chair
Virginia Commonwealth University, Richmond, VA, United States

Anna Guller, Co-Chair
Macquarie University, Sydney, Macquarie Park, NSW, Australia

IPE-01. **The Modeling of Magnetic Detection of Iron Oxide Nanoparticles in the Stream of Patient-Specific Coronary Artery with Stenotic Lesion: the Effects of Vessel Geometry and Particle Concentration.** *N.V. Kozlov*[1], S. Volchkov[1], F. Blyakhman[1,2], V. Chestukhin[3] and G.V. Kurlyandskaya[1,4] *1. Ural Federal University, Yekaterinburg, Russian Federation; 2. Ural State Medical University, Yekaterinburg, Russian Federation; 3. Research Institute of Emergency Care, Moscow, Russian Federation; 4. University of the Basque Country UPV/EHU, Leioa, Spain*

IPE-02. **Doxorubicin-loaded photosensitive magnetic liposomes for multimodal cancer therapy.** *S.A. Shah*[1] and M. Arshad[2] *1. Physics, Forman Christian College (University) Lahore, Lahore, Pakistan; 2. Nanoscience Division, National Center for Physics, Islamabad, Pakistan*

IPE-03. **Magnetic Nanoparticle-based Fast and Reliable SARS-CoV-2 Detection Method.** M.N. Bozkurt[1], *L. Doganturk*[1], S. Ozunlu[1], N. Gunduz Akdogan[2,3] and O. Akdogan[1,3] *1. Bahcesehir University, Istanbul, Turkey; 2. Piri Reis University, Istanbul, Turkey; 3. Nanoterial Technology Corporation, Istanbul, Turkey*

IPE-04. **Movable magnetically shielded room with 9-layers of permalloy for biomedical applications.** *A. Kuwahata*[1,2], T. Yamaguchi[3], M. Fushimi[2], S. Chikaki[2], Y. Niwa[3] and M. Sekino[2] *1. Tohoku University, Sendai, Japan; 2. The University of Tokyo, Tokyo, Japan; 3. Ishida Ironwork's Co., Ltd., Mie, Japan*

IPE-05. **Synthesis and characterization of CTAB coated $Ni_xFe_{3-x}O_4$ magnetic nanoparticles for magnetic particle imaging (MPI).** *N. Dogan*[1], M. Irfan[2], N. Diktas[3], B. Mansuroglu[4] and G. Akbas[4] *1. Physics, Gebze Technical University, Gebze, Turkey; 2. Electronics Engineering, Gebze Technical University, Gebze, Turkey; 3. Material Engineering, Gebze Technical Univeristy, Gebze, Turkey; 4. Genetic and Molecular Biology, Yildiz Technical University, Besiktas, Turkey*

IPE-06. **Adhesion and differentiation of stem cells regulated by tuning of nano-ligand frequencies and sequences using barcode nanowires.** *Y. Jeon*[1], S. Min[2], H. Jung[3,4], C. Khatua[2], N. Li[2], G. Bae[2], H. Choi[2], H. Hong[2], J. Shin[2], M. Ko[2], H. Ko[2], I. Jun[5], H. Fu[2], S. Kim[2], R. Thangam[2], J. Song[5], V. Dravid[3,4], H. Kang[2,6] and Y. Kim[2,6] *1. Institute of Engineering Research, Korea University, Seoul, The Republic of Korea; 2. Department of Materials Science and Engineering, Korea University, Seoul, The Republic of Korea; 3. Department of Materials Science and Engineering, Northwestern University, Evanston, IL, United States; 4. International Institute for Nanotechnology, Evanston, IL, United States; 5. Department of Otorhinolaryngology-Head and Neck Surgery, Korea University, Seoul, The Republic of Korea; 6. Department of Biomicrosystem Technology, Korea University, Seoul, The Republic of Korea*

IPE-07. **Effect of Fiber Tracts on Resting Motor Thresholds During Transcranial Magnetic Stimulation.** *C.J. Lewis*[1], N. Mittal[1], C.B. Hodges[2], B. Thakkar[3], Y. Cho[1], A. Andrade[4], B. Nevadomski[1], K. Li[1], C. Peterson[1] and R.L. Hadimani[1,5] *1. Biomedical Engineering, Virginia Commonwealth University, Richmond, VA, United States; 2. Physical Medicine and Rehabilitation, Virginia Commonwealth University, Richmond, VA, United States; 3. Physical Therapy, Virginia Commonwealth University, Richmond, VA, United States; 4. College of Humanities and Sciences, Virginia Commonwealth University, Richmond, VA, United States; 5. Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States*

IPE-08. **Temperature Dependence of DC and AC Magnetization of Magnetic Particles with Low Curie Temperature for Magnetic Hyperthermia.** *L. Ton That*[1] and S. Yabukami[1] *1. Tohoku University, Sendai, Japan*

IPE-09. **Simplified fabrication of magnetic nanoparticles with directly adsorbed antibodies for bacteria detection.** *T. Yoneyama*[1], T. Murayama[2], L. Ton That[1], A. Kuwahata[1], S. Yabukami[1], Y. Sato[3], Y. Teramura[4], W. Ikeda-Ohtsubo[5] and T. Ogawa[1] *1. Engineering, Tohoku University, Sendai, Japan; 2. Tohoku Gakuin University, Sendai, Japan; 3. The University of Tokyo, Bunkyo, Japan; 4. National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan; 5. Agricultural Science, Tohoku University, Sendai, Japan*

IPE-10. **A Study on the Locomotive Advantages of a Multi-Modular Helical Magnetic Millirobot in Curved and Narrow Blood Vessels.** *D. Lee*[1], H. Lee[1], D. Yang[1], K. Lee[1] and S. Jeon[1] *1. Mechanical and Automotive Engineering, Kongju National University, Cheonan, The Republic of Korea*

IPE-11. **3D Printed Electromagnetics Micropump for Implantable Drug Delivery.** *H. Lu*[1], S. Amara[1] and H. Fariborzi[1] *1. CEMSE, King Abdullah University of Science and Technology, Jeddah, Saudi Arabia*

IPE-12. **Is it possible to use transcranial magnetic stimulation for multi-focus deep brain stimulation?** *S. Liu*[1] and M. Sekino[1] *1. Department of Electrical Engineering and Information Systems, Graduate School of Engineering, The University of Tokyo, Tokyo, Japan*

IPE-13. **Implantable Magnetic Microcoils (µcoils) for Neuromodulation.** *R. Saha*[1], S. Faramarzi[2], R. Bloom[1], K. Wu[1], S. Liang[3], W. Low[4], S. Keirstead[4], T. Netoff[2] and J. Wang[1] *1. Electrical & Computer Engineering, University of Minnesota, Minneapolis, MN, United States; 2. Biomedical Engineering, University of Minnesota, Minneapolis, MN, United States; 3. Chemical Engineering and Material Science, University of Minnesota, Minneapolis, MN, United States; 4. Neurosurgery, University of Minnesota, Minneapolis, MN, United States*

IPE-14. **Fe-Co magnetic nanowires for cancer cell destruction by magneto-mechanical actuation.** H. Chiriac[1], *A.E. Minuti*[1,2], A. Ghemes[1], D. Herea[1], L. Labusca[1], G. Stoian[1] and N. Lupu[1] *1. Magnetic Materials and Devices, National Institute of Research and Development for Technical Physics, Iasi, Romania; 2. Faculty of Physics, "Alexandru Ioan Cuza" University, Iasi, Romania*

IPE-15. **A rapid magnetic serological test for COVID-19.** *M. Salvador*[1], J. Marqués[1], F. Brero[2], F. da Silva[4], J. Martinez-Garcia[1], M. Mariani[2], A. Lascialfari[2], V. Pilati[3], C. Kern[3], F. Orsini[5], J. Depeyrot[4] and M. Rivas[1] *1. Department of Physics, University of Oviedo, Gijón, Spain; 2. Physics Department, University of Pavia, Pavia, Italy; 3. Laboratory for Environmental and Applied Nanoscience, Universidade de Brasilia, Brasilia, Brazil; 4. Institute of Physics, Universidade de Brasilia, Brasilia, Brazil; 5. Physics Department, University of Milan, Milan, Italy*

IPE-16. **A detection system for Fusobacterium utilizing changes in the magnetic properties of magnetic nanoparticles-antibody-antigen aggregates.** *S. Yabukami*[1], T. Murayama[2], S. Takahashi[1], J. Washio[1] and N. Takahashi[1] *1. Tohoku University, Sendai, Japan; 2. Tohoku Gakuin University, Sendai, Japan*

IPE-17. **Development of Biocompatible Ni-ferrite Nanoparticles for Magnetic Hyperthermia.** K. Ohara[1], K. Kodama[3], S. Hamada[1], K. Nashimoto[1], K. Aoki[3], K. Nakazawa[3] and *Y. Ichiyanagi*[1,2] *1. Physics, Yokohama National University, Yokohama, Japan; 2. Osaka University, Osaka, Japan; 3. Yokohama National University, Yokohama, Japan*

IPE-18. **Handheld Magnetic Particle Spectroscopy (MPS) for Rapid, One-step, Wash-free Detection of SARS-CoV-2 Spike and Nucleocapsid Proteins in Liquid Phase.** *K. Wu*[1], V.K. Chugh[1], V.D. Krishna[2], A. di Girolamo[1], Y. Wang[3], R. Saha[1], S. Liang[4], T.D. Gordon[5], P. Keady[5], M.C. Cheeran[2] and J. Wang[1,4] *1. Department of Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States; 2. Department of Veterinary Population Medicine, University of Minnesota, St. Paul, MN, United States; 3. Ocean Nano Tech LLC, San Diego, CA, United States; 4. Department of Chemical Engineering and Material Science, University of Minnesota, Minneapolis, MN, United States; 5. Aerosol Devices Inc., Fort Collins, CO, United States*

IPE-19. **Temporal Interference for Dual Site Transcranial Magnetic Stimulation.** *Z. Higgs*[1], J. Boldrey[1] and D. Jiles[1] *1. Electrical and Computer Engineering, Iowa State University, Ames, IA, United States*

IPE-20. **Combinational effects of GDNF, Aβ42, and pulsed magnetic stimulation on N27 neuronal cells.** *J. Boldrey*[1], R. Yang[1], L. Que[1], I. Schneider[3], R.L. Hadimani[2] and D. Jiles[1] *1. Electrical and Computer Engineering, Iowa State University, Ames, IA, United States; 2. Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 3. Chemical and Biological Engineering, Iowa State University, Ames, IA, United States*

IPE-21. **Investigation of magnetic relaxation of intratumor magnetic nanoparticles for hyperthermia.** *K. Honda*[1], K. Shimizu[2], H. Hirano[3], M. Futagawa[3], Y. Takemura[4] and S. Ota[3] *1. Electrical and Electronic Engineering Course, Graduate School of Integrated Science and Technology, Shizuoka University, Hamamatsu, Japan; 2. Department of Molecular Imaging, Institute for Medical Photonics Research, Hamamatsu University School of Medicine, Hamamatsu, Japan; 3. Department of Electrical and Electronic Engineering, Shizuoka University, Hamamatsu, Japan; 4. Department of Electrical and Computer Engineering, Yokohama National University, Yokohama, Japan*

POSTER SESSION

Session IPF
GEOMAGNETISM, BIOMAGNETISM, MAGNETIC FLUIDS, AND OTHER EMERGING TOPICS (Poster Session)

Tomoyuki Ogawa, Co-Chair
Tohoku University, Sendai, Japan
Mariana Proenca, Co-Chair
IFIMUP (Portugal) and ISOM-UPM (Spain), Porto, Portugal

IPF-01. **Conceptual Design for Microplastic Collection Device from Seawater with High Field HTS Magnet.** *T. Mato*[1] and S. Nogushi[1] *1. Hokkaido University, Sapporo, Japan*

IPF-02. **An adaptive alternating magnetic interference suppression (AAIS) algorithm for geomagnetic vector measurement.** *W. Wang*[1], K. Li[1], Z. Yang[1], J. Chen[1], L. Miao[1], J. Ou-Yang[1] and X. Yang[1] *1. Huazhong University of Science and Technology, Wuhan, China*

IPF-03. **Simulating the Heating of a Magnetic Fluid with Coupled Molecular Dynamics and Micromagnetics.** *S. Helbig*[1], C. Abert[1], P. Sanchez[1], S. Kantorovich[1] and D. Suess[1] *1. Faculty of Physics, University of Vienna, Vienna, Austria*

IPF-04. **Coherent Compensation Method for Non-model Interference of Aeromagnetic Vector.** *L. Miao*[1], W. Wang[1], Z. Yang[1], J. Ou-Yang[1] and X. Yang[1] *1. Huazhong University of Science and Technology, Wuhan, China*

IPF-05. **Dynamics of nonmagnetic inclusions in a microchannel with a magnetic fluid in an inhomogeneous magnetic field.** P. Ryapolov[1], *E. Sokolov*[1], A. Vasilyeva[1] and D. Kalyuzhnaya[1] *1. SouthWest State University, Kursk, Russian Federation*

IPF-06. **Random Number Generation from Different Types of Magnetic Domain Images.** *S. Yoshida*[3], T. Kawashima[1], I. Nakamura[1], K. Yamada[2], H. Uchida[1] and S. Mito[3] *1. Toyohashi Univercity of technology, Toyohashi, Japan; 2. Utsunomiya University, Utsunomiya, Japan; 3. National Institute of Technology, Tokyo College, Hachioji, Japan*

IPF-07. **Adaptively Tunable Magnetorheological Elastomer-Based Vibration Absorber for a Propeller Aircraft Seat.** *Y. Choi*[1] and N. Wereley[1] *1. Department of Aerospace Engineering, University of Maryland, College Park, MD, United States*

IPF-08. **Cyclic Adhesion and Differentiation of Stem Cells by Reversible Stretching of Ligand-presenting Nanocoils.** *M. Ko*[1], S. Min[1], H. Jung[2], W. Kim[3], S. Han[4], Y. Kim[1], G. Bae[1], S. Lee[1], R. Thangam[1], N. Li[5], Y. Jeon[1], H. Park[1], Y. Kim[1], U.K. Sukumar[6], J. Song[5], S. Park[7], S. Yu[8], Y. Kang[1], K. Lee[9], Q. Wei[10], D. Kim[4], S. Han[3], R. Paulmurugan[6], H. Kang[1] and Y. Kim[1] *1. Department of Materials Science and Engineering, Korea Univeristy, Seoul, The Republic of Korea; 2. Department of Materials Science and Engineering, Northwestern University, Evanston, IL, United States; 3. Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology, Daejeon, The Republic of Korea; 4. KU-KIST Graduate School of Converging Science and Technology, Korea University, Seoul, The Republic of Korea; 5. Department of Otorhinolaryngology-Head and Neck Surgery, Korea University, Seoul, The Republic of Korea; 6. Department of Radiology, Stanford University School of Medicine, Palo Alto, CA, United States; 7. Department of Advanced Materials Engineering, Chung-Ang University, Anseong, The Republic of Korea; 8. Department of Department of Chemical and Biological Engineering, Korea University, Seoul, The Republic of Korea; 9. Department of Chemistry and Chemical Biology, Rutgers University, Piscataway, NJ, United States; 10. College of Polymer Science and Engineering, Sichuan University, Chengdu, China*

IPF-09. **Magnetic Moment Direction Estimation Method Based on Full Magnetic Gradient Orthonormal Basis Function.** *Y. Qin*[1], M. Li[1], K. Li[1], J. Chen[1], Y. Pan[1], X. Yang[1] and J. Ou-Yang[1] *1. Huazhong University of Science and Technology, Wuhan, China*

IPF-10. **Chirality Induced Spin Selectivity in a 2D Chiral Channel.** *N. Pandey*[1], A. Saha[1], D. Saha[1] and S. Ganguly[1] *1. Electrical Engineering, IIT Bombay, Mumbai, India*

IPF-11. **All-Optical Study of the Hard Magnetic Anisotropic Strontium Hexaferrite Nanoparticles Dynamics in Viscous Media.** *V.V. Korolev*[1], A. Eliseev[1], E.O. Anokhin[1] and L. Trusov[1,2] *1. Lomonosov Moscow State University, Moscow, Russian Federation; 2. Shenzhen MSU-BIT University, Shenzhen, China*

IPF-12. **ELF Magnetic Regulation of Amphibian Metamorphosis: A qualitative Control of Following Salamanded Axolotl.** *H. Nakagawa*[1], M. Fujimoto[2], S. Fujiwara[2] and T. Tadokoro[1] *1. Tokyo Denki University, Tokyo, Japan; 2. CPCC, Tokyo, Japan*

ORAL SESSION

Session JOA
INDUCTION MACHINE AND SPECIAL MACHINE I

Mohammad Sedigh Toulabi, Chair
Windsor University, Windsor, ON, Canada

JOA-01. **Coupled Numerical and Circuit Model Considering Stator and Field Winding Flux Linkage for Loss Minimization Control of Wound Field Synchronous Machines.** A. Balamurali[1], *A. Kundu*[1], V. Kurramsetty[1], L. Iyer[2] and N. Kar[1] *1. University of Windsor, Windsor, ON, Canada; 2. Magna International Inc., Troy, MI, United States*

JOA-02. **The Outer Solid Rotor Induction Motor as an Alternative for Electric Vehicle Traction Applications.** T. Abdo[1] and *A. Adly*[1] *1. Cairo University, Giza, Egypt*

JOA-03. **Winding Function-Based Analytical Modeling of Core Loss in an Induction Machine Considering Slotting Effects and the Frequency Dependent B-H Curve Characteristics.** *B. Guruwatta Vidanalage*[1], M. Toulabi[1], T. Stachl[1], A. Lombardi[2], J. Tjong[3] and N. Kar[1] *1. Electrical and Computer Engineering, University of Windsor, Windsor, ON, Canada; 2. Nemak, Windsor, ON, Canada; 3. Mechanical Automotive and Materials Engineering, University of Windsor, Windsor, ON, Canada*

JOA-04. **Validation of Standstill Magnetization Strategy of a Single Pole Pair FeCrCo-based Memory Motor.** *F.D. de Sousa*[1], A. Battiston[1], F. Meibody-Tabar[2] and S. Pierfederici[2] *1. Mobility and Systems, IFP Energies nouvelles - Institut Carnot IFPEN Transports Energie, Rueil-Malmaison, France; 2. LEMTA Laboratory - Université de Lorraine, Vandoeuvre-Les-Nancy, France*

JOA-05. **Characteristics Analysis and Comparison of Conventional and Segmental Rotor Type 12/8 Double Stator Bearingless Switched Reluctance Motors.** *Z. Xu*[1], Z. Fan[1], Z. Zhou[1], Y. Qi[1] and F. Zhang[1] *1. Shenyang University of Technology, Shenyang, China*

JOA-06. **Research on Magnetic Field Analytical Model of Annular Linear Induction Electromagnetic Pump.** *T. Mei*[1], G. Liu[1], Z. Xu[1], S. Jin[1] and F. Zhang[1] *1. School of Electrical Engineering, Shenyang University of Technology, Shenyang, China*

JOA-07. **Power capability of shifted inductances axes permanent magnet machines.** *H. Diab*[1], S. Asfirane[1] and Y. Amara[1] *1. GREAH, Université Le Havre Normandie, Le Havre, France*

JOA-08. **Optimal Design of Hybrid Stator Pole Type Bearingless Switched Reluctance Motor with Simulated Annealing Particle Swarm Optimization Algorithm.** *Z. Xu*[1], Z. Zhou[1], Y. Qi[1], Z. Fan[1] and F. Zhang[1] *1. Shenyang University of Technology, Shenyang, China*

JOA-09. **Design and Testing of a Novel, Dual Wound, Magnetically Geared, Power-split Device.** *J.G. Birchall*[1] and G. Cooke[1] *1. Magnomatics Limited, Sheffield, United Kingdom*

ORAL SESSION

Session JOB
HIGH SPEED AND SPECIAL ROTATING ELECTRICAL MACHINES I

Wenlong Li, Chair
Nanjing University of Science and Technology, Nanjing, China

JOB-01. **Design and Analysis of a Novel Brushless Double-Fed Generator with Series Cage Bar Assisted Magnetic Barrier Rotor.** *S. Yu*[1], P. Tian[1], Z. Diao[1] and F. Zhang[1] *1. Shenyang University of Technology, Shenyang, China*

JOB-02. **A Novel Dual-Rotor Hybrid-Excited Axial Flux Permanent Magnet Machine with Yokeless and Segmented Armature.** *L. Jia*[1], M. Lin[1], W. Le[1], A. Yang[1] and K. Lin[2] *1. School of Electrical Engineering, Southeast University, Nanjing, China; 2. Hohai University, Nanjing, China*

JOB-03. **Ultra-Lightweight Motors for Urban Air Mobility Propulsion.** *S. Duggan*[1], G. Cooke[1], D.J. Powell[1] and S.D. Calverley[1] *1. Magnomatics Ltd, Sheffield, United Kingdom*

JOB-04. **Rotating Permanent Magnet Disc for Wireless Charging Autonomouns Guided Vehicles.** *E. de Melo Henriques*[1], J. Lu[1] and S. Stegen[1] *1. School of Engineering, Griffith University, Brisbane, QLD, Australia*

JOB-05. **Research on Interturn Short-circuit Characteristic of the High-speed Permanent-magnet Machine with Gramme-ring Windings.** N. Meng[1], *Y. Wan*[1], L. Zhu[1] and Y. Jia[2] *1. Nanjing University of Science and Technology, Nanjing, China; 2. AVIC Nanjing Engineering Institute of Aircraft System, Nanjing, China*

JOB-06. **Research on Optimization Design of Low Speed and High Torque Motor with Single Hybrid Rotor and Double Stator Based on Surrogate Models.** Z. Zhang[1,2], *S. Yu*[1], X. Li[1] and F. Zhang[1] *1. Shenyang University of Technology, Shenyang, China; 2. Dalian SMART DRIVE Co., Ltd., Dalian, China*

JOB-07. **Full Bridge Converter Control of a PM-SRM with Extended Conduction Strategy.** *F. Kucuk*[1,2] and T. Nakamura[1] *1. Electrical Engineering, Kyoto University, Kyoto, Japan; 2. Electrical and Mechanical System Eng., Kyoto University of Advanced Science, Kyoto, Japan*

JOB-08. **Design of Litz Wires for a Slotless High-speed Permanent Magnet Motor with Gramme-ring Windings.** *L. Zhu*[1], N. Meng[1], Y. Wan[1] and Q. Li[1] *1. Nanjing University of Science and Technology, Nanjing, China*

JOB-09. **Performance Anaysis of Semi-Cloased C-Core Permanent Magnet Transverse Flux Generator.** A. Muhammad[1], F. Khan[1], *B. Ullah*[1], M. Yousuf[1] and S. Hussain[1] *1. Electrical and Computer Engineering, COMSATS University Islamabad, Abbottabad Campus, Abbottabad, Pakistan*

ORAL SESSION

Session JOC
LINEAR MOTORS, ENERGY HARVESTING AND VIBRATION ANALYSIS

Amr Adly, Chair
Cairo University, Giza, Egypt

JOC-01. **Design Optimization and Performance Investigation of a Novel Permanent-Magnet Synchronous Linear Motor with Traveling Magnetic Electromagnetic Halbach Array.** *W. Qin*[1] *1. School of Electrical Engineering, Beijing Jiaotong University, Beijing, China*

JOC-02. **A Two-Dimensional Elliptically-shaped Electromagnetic Vibration Energy Harvester.** *C. Imbaquingo*[1], C. Bahl[1], A.R. Insinga[1] and R. Bjørk[1] *1. Energy Conversion and Storage, Technical University of Denmark, Kongens Lyngby, Denmark*

JOC-03. **Key steps in designing a micro thermomagnetic generator.** *M. Almanza*[1], N. Belkadi[4], E. Fontana[3], D. Nguyen Ba[1,2], T. Devillers[3], L. Becerra[2], N. Dempsey[3], M. Marangolo[2], F. Parrain[4] and M. LoBue[1] *1. Université Paris-Saclay, ENS Paris-Saclay, CNRS, SATIE, Gif-Sur-Yvette, France; 2. Sorbonne Université, CNRS, Institut des NanoSciences de Paris, Paris, France; 3. Université Grenoble Alpes, CNRS, Grenoble INP, Institut Néel, Grenoble, France; 4. Université Paris-Saclay, CNRS, Centre de Nanosciences et de Nanotechnologies, Palaiseau, France*

JOC-04. **Research on vibration reduction method of switched reluctance motor with amorphous alloy cores based on inverse-magnetostriction effect.** T. Ben[1,2], *J. Wang*[1], L. Chen[1] and H. Nie[1] *1. College of Electrical Engineering and New Energy, China Three Gorges University, Yichang, China; 2. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China*

JOC-05. **Design and Analysis of Modular C-core Moving Magnet Linear Oscillating Actuator for Miniature Compressor Application.** S. Khalid[1], F. Khan[1], Z. Ahmad[2] and *B. Ullah*[1] *1. Electrical and Computer Engineering, COMSATS University Islamabad, Abbottabad Campus, Abbottabad, Pakistan; 2. Electrical, School of Electrical Engineering, Southeast University, Nanjing, China*

JOC-06. **An Experimental Comparison Between an Ironless and a Traditional Permanent Magnet Linear Generator.** *M. Trapanese*[1], V. Franzitta[1], D. Curto[1], C. Nevoloso[1], F. Raimondi[1] and R. Miceli[1] *1. Dipartimento di Ingegneria, Palermo University, Palermo, Italy*

JOC-07. **Design and Analysis of Parallel Hybrid-Excited Superconducting Linear Motor for High Speed EMS Maglev.** *X. Shi*[1], Y. Shen[1], T. Shi[1] and C. Xia[1] *1. College of Electrical Engineering, Zhejiang University, Hangzhou, China*

JOC-08. **A Novel Electromagnetic Energy Harvester Based on Unbalanced Magnetic Compressing and Releasing Mechanism.** Y. Shen[1] and *X. Li*[1] *1. Aalborg University, Aalborg, Denmark*

Session JOD
MAGNETICALLY GEARED, VARIABLE FLUX AND RELUCTANCE MACHINES

Siavash Pakdelian, Chair
University of Massachusetts Lowell, Lowell, MA, United States

JOD-01. **Cogging Torque Reduction of Integer Gear Ratio Axial-flux Magnetic Gear for Wind-Power Generation Application by Using Two New Types of Pole-Pieces.** *B. Dai*[1], K. Nakamura[1], Y. Suzuki[2], Y. Tachiya[2] and K. Kuritani[2] *1. Graduate School of Engineering, Tohoku University, Sendai, Japan; 2. Prospine Co., Ltd., Osaki, Japan*

JOD-02. **Optimizations of Rotating Cylinder Planetary Gear for High Torque Capability.** *Y. Zhan*[1], Z. Zhang[1], X. Yuan[1], G. Xu[1] and N. Ding[2] *1. School of Electrical and Electronic Engineering, North China Electric Power University, Beijing, China; 2. Key Laboratory of Cleaner Production and Integrated Resource Utilization of China National Light Industry, Beijing Technology and Business University, Beijing, China*

JOD-03. **Design of Bridged Flux Modulators in Coaxial Magnetic Gear.** *Y. Zhan*[1], K. Wang[1], G. Xu[1] and N. Ding[2] *1. School of Electrical and Electronic Engineering, North China Electric Power University, Beijing, China; 2. Key Laboratory of Cleaner Production and Integrated Resource Utilization of China National Light Industry, Beijing Technology and Business University, Beijing, China*

JOD-04. **Vector Control for 12/10 Switched Reluctance Motor Using a 9-Switch Inverter.** *N. Takemura*[1], K. Hirata[1], N. Niguchi[1] and H. Suzuki[1] *1. Osaka University, Suita, Japan*

JOD-05. **Design and Analysis of a Novel 2-Phase 4/3 FSPMM with Chamfering and Flange Rotor Poles.** *B. Li*[1], J. Zhu[2], C. Liu[1] and Y. Li[1] *1. Hebei University of Technology, Tianjin, China; 2. University of Sydney, Sydney, NSW, Australia*

JOD-06. **Torque Ripple Suppression of Doubly Salient Brushless DC Machine With Even-order Current Harmonic Injection.** *Y. Sun*[1], Z. Zhang[1], X. Chen[1] and L. Yu[1] *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

JOD-07. **Analytical Model of Radial Magnetic Force in Switched Reluctance Machines with Consideration of Magnetic Saturations.** H. Hua[1], W. Hua[2], G. Zhao[3] and *Z. Zhou*[1] *1. Department of Electrical Engineering, Shanghai Jiao Tong University, Shanghai, China; 2. School of Electrical Engineering, Southeast University, Nanjing, China; 3. School of Electrical and Automation Engineering, Nanjing Normal University, Nanjing, China*

JOD-08. **Ultra-light Fault Tolerant Magnetically Geared Motor for Aerospace Pitch Control Actuation.** *R.S. Dragan*[1], S. Duggan[1], D.J. Powell[1], G. Wilson[1] and R. Kinghorn[1] *1. Magnomatics Limited, Sheffield, United Kingdom*

JOD-09. **Investigation on Low Coercive Force Magnets in Variable Flux Memory Machines for Traction Applications.** *Z. Zhou*[1], H. Hua[1], B. Zhang[1] and L. Zhu[1] *1. Department of Electrical Engineering, Shanghai Jiao Tong University, Shanghai, China*

ORAL SESSION

Session JOE
SURFACE AND INTERIOR MOUNTED PERMANENT MAGNET ELECTRICAL MACHINES I

Ebrahim Amiri, Chair
The University of New Orleans, New Orleans, LA, United States

JOE-01. **An Interior Permanent Magnet Design for Less Acoustic Noise.** *F. Sadeque*[1] and B. Mirafzal[1] *1. Electrical and Computer Engineering, Kansas State University, Manhattan, KS, United States*

JOE-02. **Noise and Vibration Prediction of a Six-Phase IPMSM in a Single Open-Phase Failure Under a Negative Sequence Current Compensated Fault Tolerant Control Mode.** *P. Song*[1], W. Li[1], Z. Li[1], M. Toulabi[1] and N. Kar[1] *1. Department of Electrical & Computer Engineering, University of Windsor, Windsor, ON, Canada*

JOE-03. **Decoupled Estimation Scheme for PMSMs Towards Accurate Inductance Modelling.** Z. Li[2], W. Li[2], *P. Song*[2], D. O'donnell[2], J. Tjong[1] and N. Kar[2] *1. Department of Mechanical, Automotive and Materials Engineering, University of Windsor, Windsor, ON, Canada; 2. Department of Electrical & Computer Engineering, University of Windsor, Windsor, ON, Canada*

JOE-04. **Performance Evaluation of Hybrid Spoke-type Ferrite-NdFeB Permanent Magnet Motor.** *H. Won*[1], Y. Hong[1], M. Choi[1], S. Li[1], H. Yoon[2], T. Haskew[1], J. Lee[3], T. Lee[3] and T. Lim[3] *1. Department of Electrical and Computer Engineering, The University of Alabama, Tuscaloosa, AL, United States; 2. Department of Mechanical Engineering, The University of Alabama, Tuscaloosa, AL, United States; 3. Institute of Fundamental and Advanced Technology (IFAT), Hyundai Motor Company, Uiwang, The Republic of Korea*

JOE-05. **Design and Analysis of Novel Axial Flux Interior Permanent Magnet Machines with Yokeless and Segmented Armature.** *L. Jia*[1], K. Lin[2], M. Lin[1], W. Le[1] and A. Yang[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China; 2. College of Energy and Electrical Engineering, Hohai University, Nanjing, China*

JOE-06. **A Nonuniform Step Skew Method for Cogging Torque Reduction in Permanent Magnet Synchronous Motor.** Y. Cheng[1], *Y. Shen*[1], Y. Yan[1] and T. Shi[1] *1. College of Electrical Engineering, Zhejiang University, Hangzhou, China*

Session JOF
(SEMI)-ANALYTICAL AND NUMERICAL TECHNIQUES FOR DESIGN

Pierre-Daniel Pfister, Chair
Zhejiang University, Hangzhou, China

JOF-01. **General 2-D Analaytical Framework for Interior Permanent Magnet Machines.** V.Z. Faradonbeh[1], A. Rahideh[1], *E. Amiri*[2] and G.A. Markadeh[3] *1. Department of Electrical and Electronics Engineering, Shiraz University of Technology, Shiraz, The Islamic Republic of Iran; 2. Electrical and Computer Engineering, University of New Orleans, New Orleans, LA, United States; 3. Engineering Department, Shahrekord University, Shahrekord, The Islamic Republic of Iran*

JOF-02. **A Domain Decomposition Finite Element Method for the Magneto-Thermal Field Analysis of Electric Machines.** Y. Zhang[1], X. Yang[2], W. Miao[1], Q. Zhou[1], *Z. Qiao*[1] and W. Fu[3] *1. Department of Electrical Engineering, Shanghai University, Shanghai, China; 2. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China; 3. Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, Shenzhen, China*

JOF-03. **Withdrawn**

JOF-04. **A Novel Reluctance Network Analysis Applicable for Open Magnetic Circuits.** *Y. Hane*[1], K. Sugahara[2] and K. Nakamura[3] *1. Department of Electrical Engineering, Tohoku University, Sendai, Japan; 2. Faculty of Science and Engineering, KindainUniversity, Higashiosaka, Japan; 3. Department of Management Science and Technology, Tohoku University, Sendai, Japan*

JOF-05. **Magnetic Field Leakage Canceller Based on Loop Antenna Theory for Inductive Power Transfer.** *Y. Narusue*[1] and H. Morikawa[1] *1. The University of Tokyo, Bunkyo, Japan*

JOF-06. **Full Analytical Solution for the Magnetic Field of Uniformly Magnetized Cylinder Tiles.** *F. Slanovc*[1], M. Ortner[2], C. Abert[1] and D. Suess[1] *1. Faculty of Physics, University of Vienna, Vienna, Austria; 2. Silicon Austria Labs, Villach, Austria*

JOF-07. **Particular Multi-Objective Permanent Magnet Machine Optimization for Ship Propulsion Applications.** E. Karamanis[1] and *A.G. Kladas*[1] *1. Electrical and Computer Engineering, National Technical University of Athens, Athens, Greece*

JOF-08. **Current Loop Off Axis field Approximations with Excellent Accuracy and Low Computational Cost.** *G.H. Chapman*[1] and D.E. Carleton[1] *1. School of Eng Sciece, Simon Fraser University, Burnaby, BC, Canada*

JOF-09. **Analytical Modeling and Optimization of High Temperature Superconducting Single-sided Linear Induction Motor.** *W. Qin*[1] *1. School of Electrical Engineering, Beijing Jiaotong University, Beijing, China*

JOF-10. **Design and Analytical Magnetic Modeling of a Spherical Motion Generator with Multi-dof Electromagnetic Actuation.** *X. Li*[1] and S. Bai[1] *1. Department of Materials and Production, Aalborg University, Aalborg, Denmark*

JOF-11. **Efficient Modeling Framework for the Synthesis of a Novel Magnet Array for Planar Motors.** A. Casado Ramoneda[1], *M. Kleijer*[1], D. Krop[1] and E. Lomonova[1] *1. Electrical Engineering, Eindhoven University of Technology, Eindhoven, Netherlands*

JOF-12. **3-D Analytical Magnetic Field Analysis of Axial Flux Coreless Permanent-Magnet Machine.** *W. Qin*[1] and Y. Ma[2] *1. School of Electrical Engineering, Beijing Jiaotong University, Beijing, China; 2. Taiyuan Institute of China Coal Technology and Engineering Group, Taiyuan, China*

JOF-13. **Reduced Order Modeling Based on Multiport Cauer Ladder Network for Space Harmonics of Air-gap Flux Density in Cage Induction Motor.** *Y. Takahashi*[1], K. Fujiwara[1], K. Sugahara[3] and T. Matsuo[2] *1. Department of Electrical Engineering, Doshisha University, Kyoto, Japan; 2. Graduate School of Engineering, Kyoto University, Kyoto, Japan; 3. Faculty of Science and Engineering, Kindai University, Osaka, Japan*

JOF-14. **Comparaison Between Analytical and Reluctance Network Models in the Sizing Optimization of Permanent Magnet Synchronous Generator for Large Wind Turbine.** *A. Bensalah*[1], G. Barakat[1] and Y. Amara[1] *1. Université Le Havre Normandie, Le Havre, France*

JOF-15. **3D Permeance Network Modeling for an Axial Field Flux Focusing Magnetic Gear.** *H. Diab*[1], Y. Amara[1] and G. Barakat[1] *1. Université Le Havre Normandie, GREAH, Le Havre, France*

Session JOG
DESIGN OPTIMIZATION, LOSS AND THERMAL MODELLINGS, MEASUREMENT OF ELECTRICAL MACHINES

Kyung-Hun Shin, Chair
Chonnam National University, Yeosu, The Republic of Korea

JOG-01. **From Backstage to Center Stage: Auxiliary Automotive Drives.** ***(Invited)*** *A. Mütze*[1] *1. Electric Drives and Machines Institute, Graz University of Technology, Graz, Austria*

JOG-02. **A boundary topology optimization approach for lightweighting electric machines inspired by additive manufacturing.** *L. Sethuraman*[1] and G. Vijayakumar[1] *1. National Wind Technology Center, National Renewable Energy Laboratory, Golden, CO, United States*

JOG-03. **Influence of magnetization fixture winding parameters on airgap flux profile and performance of isotropic bonded NdFeB motor.** *N.K. Sheth*[1], R.C. Angara[1], K.W. Hsu[1], N.E. Onal[1] and P. Villar[1] *1. Research and Development, Neo Performance Materials Pte Ltd, Singapore, Singapore*

JOG-04. **A Novel Spoke-type PM Rotor with Hybrid Radial and Axial Flux Concentration for Reduction of Interpolar Leakage Flux.** *J. Wang*[2,1], W. Geng[2,1], Q. Li[2,1] and L. Li[2,1] *1. School of Automation, Naijing, China; 2. Nanjing University of Science and Technology, Naijing, China*

JOG-05. **Iron Loss Calculation Method of Interior Permanent Magnet Motor Taking Carrier Harmonics into Account Based on Reluctance Network Analysis Representing Dynamic Hysteresis Characteristics.** *Y. Hane*[1], Y. Uchiyama[2] and K. Nakamura[2] *1. Department of Electrical Engineering, Tohoku University, Sendai, Japan; 2. Department of Management Science and Technology, Tohoku University, Sendai, Japan*

JOG-06. **A Spoke Supported Superconducting Rotor with Rotating Cryocooler.** *J. Xiao*[1], A. Samarakoon[1], T. Balachandran[1] and K. Haran[1] *1. University of Illinois at Urbana Champaign, Champaign, IL, United States*

JOG-07. **Residual Flux Density Measurement Method of the Three-Phase Transformer Based on Transient Current.** *Y. Ren*[1], Y. Wang[1] and C. Liu[1] *1. Hebei University of Technology, Tianjin, China*

JOG-08. **Analytical Investigation and Optimization of Surface Mounted Permanent Machines With Hybrid Magnetic Structure.** *B. Poudel*[1] and E. Amiri[1] *1. Department of Electrical and Electronics Engineering, University of New Orleans, New Orleans, LA, United States*

JOG-09. **Reactor Vibration Reduction Using Global Topology Optimization Algorithms.** T. Ben[1,2], *P. Zhang*[1], L. Chen[1,2] and L. Hou[1] *1. College of Electrical Engineering and New Energy, China Three Gorges University, Yichang, China; 2. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China*

POSTER SESSION

Session JPA
INDUCTION MACHINE AND SPECIAL MACHINE II (Poster Session)

Po-Wei Huang, Co-Chair
National Cheng Kung University, Tainan, Taiwan
Thanh Anh Huynh, Co-Chair
National Cheng Kung University, Tainan, Taiwan

JPA-01. **Investigation of Hybrid Magnet Arrangements in Dual-Layer PM Variable Flux Memory Machines.** *W. Liu*[1], H. Yang[1] and H. Lin[1] *1. School of electrical engineering, Southeast University, Nanjing, China*

JPA-02. **Flux Analytical Calculation in the E-shape Stator Pole of Linear Rotary Permanent Magnet Motor.** *K. Guo*[1] *1. Anhui University of Science and Technology, Huainan, China*

JPA-03. **Impact of End-Winding Regions for Air-Core Fully Superconducting Machines.** *D. Lee*[1], N. Salk[1] and K. Haran[2] *1. Hinetics, LLC, Champaign, IL, United States; 2. Department of Electric and Computer engineering, University of Illinois, Urbana, IL, United States*

JPA-04. **Modeling and Analysis of Force Characteristics for Hybrid Excited Electrodynamic Wheels for Maglev Transportation.** *W. Qin*[1], Y. Ma[2] and S. Tanzil[1] *1. School of Electrical Engineering, Beijing Jiaotong University, Beijing, China; 2. Taiyuan Institute of China Coal Technology and Engineering Group, Taiyuan, China*

JPA-05. **Electromagnetic Analysis of the Eddy Current Effect to Impedance Performance of a Balanced Armature Receiver.** *D. Xu*[1,2], X. Zhu[1], Y. Jiang[3], C. Wang[1,2] and S. Hwang[3] *1. Dept. of Precision Mechanical Engineering, Shanghai University, Shanghai, China; 2. Science and Technology on Near-surface Detection Laboratory, Wuxi, China; 3. School of Mechanical Engineering, Pusan National University, Busan, The Republic of Korea*

JPA-06. **Study on the dynamic characteristics of an electromagnetic brake during power-loss braking.** *X. Zhang*[1], L. Wang[2] and R. Pei[1] *1. Electrical Engineering, Shenyang University of Technology, Shenyang, China; 2. Suzhou InnMag New Energy,. Ltd, Suzhou, China*

JPA-07. **Analytical Model of Wound Rotor Synchronous Machine for Electric Vehicle Traction.** *R. Hamidouche*[1,2], S. Mezani[1], T. Lubin[1] and T. Hamiti[2] *1. GREEN, Université de Lorraine, Nancy, France; 2. Nidec PSA emotors, Carrières-sous-Poissy, France*

JPA-08. **Influence of Different Rotor Slot Structure on Electromagnetic Characteristics of Dual-Excited Synchronous Generator.** *G. Xu*[1], R. Li[1], Y. Zhan[1] and H. Zhao[1] *1. North China Electric Power University, Beijing, China*

JPA-09. **Magnetic Field Analysis and Operating Characteristics of a Brushless Electrical Excitation Synchronous Generator with DC Excitation.** *S. Zhu*[1], J. Yu[1], C. Liu[1] and K. Wang[1] *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

JPA-10. **Three-phase Brushless Synchronous Generator Topology Without an Exciter with Experimental Verification.** A. Arif[1], *M. Ayub*[3], N. Baloch[2], F. Arif[1] and B. Kwon[2] *1. Electrical Engineering, GIKI Topi KPK, Swabi, Pakistan; 2. Hanyang University, Ansan, The Republic of Korea; 3. Electronic Engineering, BUITEMS, Quetta, Pakistan*

JPA-11. **Fault Tolerant Performance and Open Circuit Compensation Strategy of Six-phase Permanent Magnet Synchronous Motor for All-electric Aircraft.** Y. Li[1], *L. Chen*[1] and Z. Yu[1] *1. Shenyang University of Technology, Shenyang, China*

JPA-12. **Optimal Design of IPMSM Constant Power Speed Range for High-speed Operation Using Fradual Meta-modeling Method.** *D. Shin*[1], I. Yang[2] and W. Kim[1] *1. Electrical Engineering, Gachon University, Seongnam, The Republic of Korea; 2. Electrical Engineering, Hanyang Uniersity, Wangsimni, The Republic of Korea*

JPA-13. **Bearing Fault Numerical Model for the Closed-slot Rotor Submersible Motor.** *Z. Ke*[1], C. Di[1], X. Bao[1], B. Guan[2] and J. Yan[1] *1. School of Electrical Engineering and Automation, Hefei University of Technology, Hefei, China; 2. Department of Electrical and Computer Engineering, The Ohio State University, Columbus, OH, United States*

JPA-14. **An Efficient Air-Gap Flux Density Analysis Method for the Design of Induction Machines.** *J. Liu*[1], C. Di[1] and X. Bao[1] *1. School of Electrical Engineering and Automation, Hefei University of Technology, He Fei, China*

JPA-15. **A Comprehensive Effect Analysis of the Rotor Auxiliary Slot Geometry for the Water-filled Submersible Induction Motors.** *J. Li*[1], C. Di[1] and X. Bao[1] *1. School of Electrical Engineering and Automation, Hefei University of Technology, He Fei, China*

JPA-16. **Identification of magnetizing inductance of squirrel cage induction machine using FEM.** Y. Djouadi[1], *A. Tounzi*[3], S. Taibi[2] and K. Idjdarene[1] *1. Laboratoire LTII, University of Bejaia, Bejaia, Algeria; 2. University of Batna 2, Batna, Algeria; 3. Univ. Lille, Arts et Metiers Institute of Technology, Centrale Lille, Junia, Lille, France, Villeneuve d'Ascq, France*

JPA-17. **A Study on the Characteristics of Al/Cu Dissimilar Materials Applied to the Rotor Bar of IE4 Class Induction Motor.** *M. Kim*[1,2], J. Park[1], K. Lee[1], S. Lee[1] and J. Choi[2] *1. Automotive material & Components R&D Group, Korea institute of Industrial Technology, Gwang-ju, The Republic of Korea; 2. Chungnam National University, Dae-jeon, The Republic of Korea*

POSTER SESSION

Session JPB
HIGH SPEED AND SPECIAL ROTATING ELECTRICAL MACHINES II (Poster Session)

Hui Yang, Co-Chair
Southeast University, Nanjing, China
Qian Chen, Co-Chair
Jiangsu University, Zhenjiang, China

JPB-01. **Study of Charging and Discharging of Regenerative Electric Energy of Direct Drive Generator on Electric Vehicle.** *C. Hsu*[3], C. Fung[1] and J. Liu[2] *1. Mechanical Engineering, Oriental Institute of Technology, Banqiao District, Taiwan; 2. Digital Multimedia Design, Kainan University, Lu-Zhou, Taiwan; 3. Asia Eastern University of Science and Technology, New Taipei, Taiwan*

JPB-02. **Design and Analysis of a High Speed Axial Flux Machine with Sinusoidal and Third Harmonic Permanent Magnet Shape.** *S. Kumar*[1] and M. Ayub[2] *1. Ghulam Ishaq Khan Institute of Engineering Sciences and Technology, Topi, Swabi, Pakistan; 2. Balochistan University of Information Technology, Engineering and Management Sciences, Quetta, Pakistan*

JPB-03. **A Novel Dual-layer Variable Flux Memory Machine with Segmented PM Design.** *W. Liu*[1], H. Yang[1] and H. Lin[1] *1. School of electrical engineering, Southeast University, Nanjing, China*

JPB-04. **Influence of Low-Coercive-Force Magnet Property on Electromagnetic Performance of Variable Flux Memory Machines.** *W. Liu*[1], H. Yang[1] and H. Lin[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China*

JPB-05. **Classical and Mutually Coupled Winding Configuration Comparison for the Axial-Field Switched Reluctance Machine with Segmented Rotor.** *S. Asfirane*[1], M. Hatoum[1], G. Barakat[1] and Y. Amara[1] *1. GREAH, Université Le Havre Normandie, Le Havre, France*

JPB-06. **Study of a Variable-Flux Memory Machine with Delta-Type PM Configuration and Negative-Saliency Feature.** *S. Zhang*[1], P. Zheng[2] and M. Wang[2] *1. College of Marine Electrical Engineering, Dalian Maritime University, Dalian, China; 2. School of Electrical Engineering & Automation, Harbin Institute of Technology, Harbin, China*

JPB-07. **An Axial Flux Permanent Magnet Motor with Magnetorheological Fluid Brake Structure.** *Y. Hu*[1] and W. Xu[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China*

JPB-08. **Increment of the linkage flux to the HTS by improved magnetic circuit in the HTS magnetic bearing.** *R. Taniguchi*[1], S. Ishida[1], M. Minamitani[1] and S. Ohashi[1] *1. Eectrical and Electronic Engineering, Kansai University, Suita, Japan*

JPB-09. **Open-phase fault modeling for dual three-phase PMSM using vector space decomposition and negative sequence components.** W. LI[1], *P. Song*[1], Q. Li[2], Z. Li[1] and N. Kar[1] *1. University of Windsor, Windsor, ON, Canada; 2. Nanjing University of Science and Technology, Nanjing, China*

JPB-10. **A Design of 3kW E-booster and Motor Drive with 12V and 48V System Comparison.** *E. Park*[1] and Y. Kim[2] *1. Faculty of Smart Vehicle System Engineering, Chosun university, Gwangju, The Republic of Korea; 2. The Department of Electrical and Computer Engineering, Chosun university, Gwangju, The Republic of Korea*

JPB-11. **Electromagnetic characteristic analysis according to PAM-PWM inverter system of high-speed permanent magnet motor.** *J. Woo*[1], T. Bang[1], J. Lee[1] and J. Choi[1] *1. Electrical Engineering, Chungnam-National University, Yuseong-gu, The Republic of Korea*

JPB-12. **A Study on the Reduction of Eddy Current Loss through Sleeve Design and the Improvement of Torque Density through Ferrofluid.** *S. Song*[1], D. Kim[1] and W. Kim[2] *1. Department of Electrical Engineering, Hanyang University, Seoul, Kuwait; 2. Department of Electrical Engineering, Gachon University, Seong-Nam, The Republic of Korea*

JPB-13. **Novel Dual-Stator Single Rotor Consequent Pole PM Machine.** *J. Yang*[1], Z. Wang[1] and S. Huang[1] *1. College of Electrical and Information Engineering, Hunan University, Changsha, China*

JPB-14. **Design of an Integrated Pump and Axial Flux Switching Permanent Magnet Motor Based on Magnetic 3D Printing.** *P. Huang*[1], T. Chang[1], C. Chang[1], C.U. Ubadigha[2], I. Jiang[1], M. Hsieh[3] and M. Tsai[2] *1. Electrical Motor Technology Research Center, National Cheng Kung University, Tainan, Taiwan; 2. Mechanical Engineering, National Cheng Kung University, Tainan, Taiwan; 3. Electrical Engineering, National Cheng Kung University, Tainan, Taiwan*

JPB-15. **Structure and Design of a Novel AC Six-Pole Hybrid Magnetic Bearing.** *T. Zhang*[1], Z. Wang[1] and X. Ye[1] *1. Faculty of Automation, Huaiyin Institute of Technology, Huaian, China*

JPB-16. **Broadening Design and Optimization of High Efficiency Region for a Dual-Mechanical Port Flux-Switching Permanent Magnet Motor.** Z. Xiang[1], *J. Ren*[1] and L. Quan[1] *1. Jiangsu University, Zhenjiang, China*

JPB-17. **Novel Steel-Bar Starting Cage Line-Start Permanent Magnet Machine with Spoke Type Insulation Layers.** *L. Li*[1], W. Fu[2] and S. Niu[1] *1. Electrical Engineering, Hong Kong Polytechnic University, Hong Kong, Hong Kong; 2. Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, Shenzhen, China*

JPB-18. **Proposal of a Two-DOF Actively Controlled Consequent-Pole Bearingless IPM Motor.** *Y. Fujii*[1] and A. Chiba[1] *1. Tokyo Institute of Technology, Tokyo, Japan*

JPB-19. **Analysis of a Saliency Ratio-Changeable Variable-Flux Permanent-Magnet Synchronous Machine.** *S. Zhang*[1], P. Zheng[2] and M. Wang[2] *1. College of Marine Electrical Engineering, Dalian Maritime University, Dalian, China; 2. School of Electrical Engineering & Automation, Harbin Institute of Technology, Harbin, China*

JPB-20. **Withdrawn**

POSTER SESSION

Session JPC
LINEAR MACHINES AND LINEAR ACTUATORS (Poster Session)

Mi-Ching Tsai, Co-Chair
National Cheng Kung University, Tainan, Taiwan
Chinweze Ubadigha, Co-Chair
National Cheng Kung University, Tainan, Taiwan

JPC-01. **Force Ripple Minimization Design for Consequent Pole Permanent Magnet Linear Synchronous Motor.** *Y. Yue*[1], S. Jia[1], D. Liang[1] and Y. Liang[1] *1. Xi'an Jiaotong University, Xi'an, China*

JPC-02. **Back-to-back Ω Stator Transverse Flux Permanent Magnet Linear Machine.** *Z. Jia*[1], S. Peng[1], W. He[1], L. Yu[1], Y. Cao[1] and H. Jia[1] *1. Jiangsu Collaborative Innovation Center of Atmospheric Environment and Equipment Technology (CICAEET), Nanjing University of Information Science and Technology, Nanjing, China*

JPC-03. **Eddy Current Loss Analysis in Permanent Magnet Linear Gear Using Analytical Method.** *J. Lee*[1], T. Bang[1], H. Lee[1], J. Woo[1], G. Jang[2] and J. Choi[1] *1. Chungnam National University, Daejeon, The Republic of Korea; 2. Korea Electric Power Research Institute, Daejeon, The Republic of Korea*

JPC-04. **Design and Analysis of a Linear-Rotary PM Actuator with Consequent-Pole Staggered Mover.** *G. Jiang*[1], H. Zhou[1], W. Tao[1] and Q. Chen[1] *1. College of Electrical Information Engineering, Jiangsu University, Zhenjiang, China*

JPC-05. **Electromagnetic Design of Single-Phase Permanent Magnet Linear Oscillation Actuator Considering Detent Force Minimum.** *H. Zhang*[1], L. Jin[1], H. Yu[1], Z. Xu[1], J. Leng[1] and X. Zhu[1] *1. Southeast University, Nanjing, China*

JPC-06. **Design optimization and Analysis of a Novel High Force Density Magnetic Lead Screw with Discretized PMs and Different Magnetized Directions.** *Y. Liu*[1], H. Yu[1], Y. Wang[1] and Q. Zhang[1] *1. College of Electrical Engineering, Southeast University, Nanjing, China*

JPC-07. **Design and Analysis of Novel Double-sided Flux Concentrated Permanent Magnet Linear Machines with Saturation Relieving Effect.** *Y. Shen*[1], T. Shi[1] and C. Xia[1] *1. College of Electrical Engineering, Zhejiang University, Hangzhou, China*

JPC-08. **Design and Analysis of a Novel Tubular High-PM-Utilization Transverse-Flux Linear Machine.** *B. Liu*[1], J. Bai[1], G. Qiao[1], G. Liu[1], Y. Liu[1] and P. Zheng[1] *1. School of Electrical Engineering & Automation, Harbin Institute of Technology, Harbin, China*

JPC-09. **Analysis and Experimental Comparison of Detent and Static Force of a 3 kW Single-Phase Linear Permanent Magnet Generator for Stirling Engines.** *K. Lee*[1], S. Lee[1], J. Park[1] and J. Choi[2] *1. Korea Institute of Industrial Technology, Gwang-ju, The Republic of Korea; 2. Chungnam National University, Daejeon, The Republic of Korea*

JPC-10. **Design of a Novel Hybrid-Excited Transverse-Flux Tubular Linear Machine with Complementary Structure.** *Z. Li*[1] and S. Niu[1] *1. The Hong Kong Polytechnic University, Hong Kong, Hong Kong*

JPC-11. **Axial Flux Generator with Consequent-Pole PM Stator for Direct Drive Wave Energy Conversion.** *Y. Li*[1], L. Huang[1], M. Chen[1], P. Tan[1] and M. Hu[1] *1. Department of Electrical Engineering, Southeast University, Nanjing, China*

JPC-12. **Magnetic Flux Control Based on Magnetic Convergence or Divergence.** *S. Park*[1], M.D. Noh[2] and Y. Park[2] *1. Graduate School, Chungnam National University, Daejeon, The Republic of Korea; 2. Mechatronics Engineering, Chungnam National University, Daejeon, The Republic of Korea*

Session JPD
VIBRATION ANALYSIS AND ENERGY HARVESTING MAGNETIC DEVICES (Poster Session)

Jonathan Bird, Co-Chair
Portland State University, Portland, OR, United States
Xuerong Li, Co-Chair
Aalborg University, Aalborg, Denmark

JPD-01. **Effects of Unequal-tooth Widths on Electromagnetic Vibration Source of Permanent Magnet Motors.** *Z. Wu*[1] and Y. Fan[1] *1. Southeast Univeristy, Nanjing, China*

JPD-02. **Design and Analysis of Omnidirectional Power Extender for Long-Range Underwater Wireless Power Transfer System.** *X. Tian*[1], K. Chau[1], W. Liu[1] and H. Pang[1] *1. Department of EEE, The University of Hong Kong, Hong Kong*

JPD-03. **Magnetic actuator capable of movement in all directions by the phase control of vibration components.** *H. Yaguchi*[1] and S. Yamori[1] *1. Tohoku Gakuin University, Tagajo, Japan*

JPD-04. **Control of Large Oscillation by Switching the Damping Mode of the Damper Coils in Electrodynamic Suspension System.** *R. Betsunoh*[1], R. Yamamoto[1] and S. Ohashi[1] *1. Graduate school of Science and Engineering, Kansai University, Suita, Japan*

JPD-05. **A Study on the Improvement of Noise Vibration Characteristics of Inner SPM Type Motor.** *J. Jung*[1], J. Lee[2], D. Jung[3] and J. Lee[1] *1. Hanyang University, Seoul, The Republic of Korea; 2. Korea Electronics Technology Institute, Bucheon, The Republic of Korea; 3. Halla University, Wonju, The Republic of Korea*

JPD-06. **Feature Extraction and State Identification of Transformer DC Bias Vibration Based on HHT-SVM.** Z. Liang[1], *J. Li*[1], L. Li[1], Y. Qi[1], G. Li[1], N. Zheng[2] and Z. Wang[2] *1. School of Electrical Engineering, Dalian University of Technology, Dalian, China; 2. R & D, LUTE Electric Co., Ltd, Jining, China*

JPD-07. **Measurement and Frequency Characteristics Analysis of 500 kV Transformer Surface Vibration Signals.** Z. Liang[1], *J. Li*[1,2], L. Li[1], Y. Qi[1], G. Li[1], N. Zheng[2] and Z. Wang[2] *1. School of Electrical Engineering, Dalian University of Technology, Dalian, China; 2. R & D, LUTE Electric Co., Ltd, Jining, China*

JPD-08. **Design of Battery-less Wireless Switch that Share Coils in Common Using Electromagnetic Induction Energy Harversting Mechanism.** *S. Yang*[1], M. Jeong[1], J. Bea[2] and W. Kim[1] *1. Gachon University, Gyeonggido, The Republic of Korea; 2. Dongyang Mirae University, Seoul, The Republic of Korea*

JPD-09. **The Effect of Magnetism and Magnetic field on Locomotion of Hydrogen and Hydrogen Production Efficiency.** Y. Chen[1], *Y. Li*[2,1] and C. Chen[1] *1. Mechanical Engineering, National Yang Ming Chiao Tung University, Hsinchu, Taiwan; 2. Mechanical and Aerospace Engineering, Chung-Cheng Institute of Technology, National Defense University, Taoyuan, Taiwan*

JPD-10. **Study on Vibration and Acoustic Noise of Anode Saturable Reactor under Sinusoidal and Non-sinusoidal Excitation.** *C. Zhang*[1], T. Chen[1], Y. Li[1] and Q. Yang[1] *1. School of Electrical Engineering, Hebei University of Technology, Tianjin, China*

JPD-11. **Vibration Analysis of Variable Flux Machines Considering the Memory Effect.** *F. Liu*[1], P. Zheng[1], M. Wang[1] and G. Qiao[1] *1. Harbin Institute of Technology, Harbin, China*

POSTER SESSION

Session JPE
MAGNETICALLY GEARED MACHINES AND RELUCTANCE MACHINES (Poster Session)

Kais Atallah, Chair
University of Sheffield, Sheffield, United Kingdom

JPE-01. **Comparative Study of New Dual-Stator Consequent Pole Flux Reversal Arc Permanent Magnet Machines.** *Y. Meng*[1], S. Fang[1], Z. Pan[1] and L. Qin[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China*

JPE-02. **Electromagnetic Characteristic Analysis of an Axial-Flux Magnetic-Geared Double-Rotor Machine with Interior-Modulating-Rotor.** *J. Lang*[1], C. Tong[1], J. Bai[1], P. Zheng[1], J. Liu[1] and G. Liu[1] *1. Department of Electrical Engineering, Harbin Institute of Technology, Harbin, China*

JPE-03. **Investigation of a Transversely-Dislocated Brushless Double-Rotor Machine Based on Magnetic-Field Modulation.** *Y. Wang*[1], Y. Sui[1], J. Liu[1], G. Liu[1] and P. Zheng[1] *1. Harbin Institute of Technology, Harbin, China*

JPE-04. **A Novel Coaxial Magnetic Gear with Convex Halbach Arrays and Spoke Structure.** L. Jing[1] and *W. Liu*[1] *1. College of Electrical Engineering and New Energy, China Three Gorges University, Yichang, China*

JPE-05. **Gear ratio combination analysis and optimization for high torque density of dual magnetic gear.** *E. Park*[1] and Y. Kim[2] *1. Faculty of Smart Vehicle System Engineering, Chosun University, Gwangju, The Republic of Korea; 2. The Department of Electrical and Computer Engineering, Chosun University, Gwangju, The Republic of Korea*

JPE-06. **Loss Analysis of Magnetic Gear with Halbach Arrays and Copper Bar.** L. Jing[1] and *T. Wang*[1] *1. College of Electrical Engineering and New Energy, China Three Gorges University, Yichang, China*

JPE-07. **A Novel Ironless Stator Magnetic-Geared Double-Rotor Machine.** C. Tong[1], *J. Lang*[1], J. Bai[1], P. Zheng[1], J. Liu[1] and C. Ge[1] *1. Department of Electrical Engineering, Harbin Institute of Technology, Harbin, China*

JPE-08. **Topology Optimization of the Reluctance Magnetic Gear.** R. Safarpour[1] and *S. Pakdelian*[1] *1. Electrical and Computer Engineering, University of Massachusetts Lowell, Lowell, MA, United States*

JPE-09. **12/10 Switched Reluctance Motor with a Hex Connection.** *H. Suzuki*[1], K. Hirata[1], N. Niguchi[1] and N. Takemura[1] *1. Graduate School of Engineering, Osaka University, Osaka, Japan*

JPE-10. **Torque Characteristic of Switched Reluctance Motor with Hybrid Excitation Segmented Rotor.** L. Jing[1] and *Y. Rao*[1] *1. College of Electrical Engineering and New Energy, China Three Gorges University, Yichang, China*

JPE-11. **Modeling and Simulation of Switched Reluctance Machine with Less and More Input Data: An Experimental Investigation.** A. Memon[1], K. Abro[1], *S. Bukhari*[3,2] and J. Ro[2] *1. Mehran University of Engineering and Technology Jamshoro, Jamshoro, Pakistan; 2. Chung-Ang University, Seoul, The Republic of Korea; 3. Sukkur IBA University, Sukkur, Pakistan*

JPE-12. **A Study on High Efficiency Design by Reducing Rotor IronLoss of Synchronous Reluctance Motor.** *J. Lee*[1], K. Lee[1] and D. Jung[2] *1. Korea Electronics Technology Institute, Bucheon, The Republic of Korea; 2. School of Smart Mobility, Halla University, Wonju, The Republic of Korea*

JPE-13. **Core Loss Analysis of Switched Reluctance Motor Considering Hysteresis Effect.** L. Chen[1,2], *Z. Zou*[1] and T. Ben[1] *1. College of Electrical Engineering and New Energy, China Three Gorges University, Yichang, China; 2. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China*

JPE-14. **A Novel Slot-PM-assisted Consequent-pole-PM Doubly-salient Machine with Hybrid Magnets of Ferrite PMs and Rare-earth PMs.** *J. Jiang*[1] and S. Niu[1] *1. Electrical engineering department, The Hong Kong Polytechnic University, Hong Kong, Hong Kong*

Session JPF
VERNIER MACHINES
(Poster Session)

Shuangxia Niu, Chair
The Hong Kong Polytechnic University, Kowloon, Hong Kong

JPF-01. **A Magnetic Variable Speed Permanent Magnet Vernier Motor with Unequal Halbach Array and Non-uniform Air Gap.** L. Jing[1] and *W. Tang*[1] *1. College of Electrical Engineering and New Energy, China Three Gorges University, Yi chang, China*

JPF-02. **A Novel Stator-PM Consequent-pole Dual Stator/Rotor Armature Winding Flux Modulated Machine for Multi-Torque Components.** S. Jia[1], *S. Feng*[1], D. Liang[1] and X. Dong[1] *1. Xi'an Jiaotong University, Xi'an, China*

JPF-03. **A Dual Armature Winding Vernier Reluctance Machine with Stator Five-phase DC-biased Current.** S. Jia[1], *S. Feng*[1], Z. Liu[1] and D. Liang[1] *1. Xi'an Jiaotong University, Xi'an, China*

JPF-04. **A New Staggered Dual Stator Field Modulation Machine with O-Shape Permanent Magnet Excitation.** H. Wang[1], *H. Zhu*[1], Z. Li[1], S. Chen[1] and S. Ding[1] *1. Nanjing Normal University, Nanjing, China*

JPF-05. **The Reduction of Eddy Current Losses in Permanent Magnet Vernier Machines.** M.S. Zeinali[1], A.D. Aliabad[1] and *E. Amiri*[2] *1. Yazd University, Yazd, The Islamic Republic of Iran; 2. Department of Electrical and Electronics Engineering, University of New Orleans, New Orleans, LA, United States*

JPF-06. **A New Hybrid Magnet Dual Stator Field Modulation Machine With Different Split Ratios of Stators.** H. Wang[1], *H. Zhu*[1], C. Wu[1], Z. Wei[1] and S. Ding[1] *1. Nanjing Normal University, Nanjing, China*

JPF-07. **Torque Performances Improvement Method of Double-Stator Permanent Magnet Motor by Compensating Harmonic Torque.** *D. Fan*[1], L. Quan[1] and X. Zhu[1] *1. Jiangsu University, Zhenjiang, China*

JPF-08. **A New Hybrid Model for Copper Loss Analysis of Vernier Motor With Multi-Layer Winding.** *Q. Chen*[1], Y. Fan[1] and Y. Lei[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China*

JPF-09. **Accurate Analytical Calculation of Magnetic Field of Permanent Magnet Vernier Motor.** *B. Guo*[1], Y. Du[2], F. Peng[2], J. Dong[3], X. Qiu[1] and Y. Huang[2] *1. School of Electrical and Automation Engineering, Nanjing Normal University, NanJing, China; 2. School of Electrical Engineering, Southeast University, NanJing, China; 3. Faculty of Electrical Engineering, Delft University of Technology, Delft, Netherlands*

JPF-10. **Torque Ripple Suppression of the Permanent Magnet Vernier Motor With Shifted Permeance Design.** *T. Wang*[1], X. Zhu[1] and Z. Xiang[1] *1. Jiangsu University, Zhenjiang, China*

JPF-11. **Optimization Design and Investigation of a Vernier Permanent Magnet Machine with Improved Power Factor Based on Flux Modulation Theory.** *J. Zhou*[1], X. Zhu[1] and D. Fan[1] *1. Jiangsu university, Zhenjiang, China*

JPF-12. **Stator Core Loss Analysis and Investigation of Flux-Modulated Permanent Magnet Machine from Perspective of Harmonic Group Modulation.** Z. Xiang[1], *J. Wei*[1] and X. Zhu[1] *1. Jiangsu University, Zhenjiang, China*

JPF-13. **A Novel Fractional Slot Distributed Winding Vernier Motor Design Using Air-Gap Permeance Method.** *H. Kim*[1], S. Kang[1], Y. Kim[2] and S. Jung[1] *1. Department of Electrical and Computer Engineering, Sungkyunkwan University College of Information and Communication Engineering, Suwon, The Republic of Korea; 2. Department of Electrical Engineering, Chosun University, Gwangju, The Republic of Korea*

POSTER SESSION

Session JPG
VARIABLE FLUX MACHINES
(Poster Session)

Xing Zhao, Chair
The Hong Kong Polytechnic University, Hong Kong, Hong Kong

JPG-01. **A New Partitioned Stator Hybrid Excitation Machine with Internal Magnetic Ring.** X. Zhu[1] and *L. Xu*[1] *1. Jiangsu University, Zhenjiang, China*

JPG-02. **Design and Analysis of a Reverse-Salient Hybrid-PM Variable-Flux Machine with Flux Bypass Path.** *F. Liu*[1], P. Zheng[1], M. Wang[1] and G. Qiao[1] *1. School of Electrical Engineering & Automation, Harbin Institute of Technology, Harbin, China*

JPG-03. **A Novel Series Hybrid Magnet Separated Variable Flux Memory Machine with Wide Flux Regulation Range.** *X. Zhao*[1] and H. Lin[1] *1. Southeast University, Nanjing, China*

JPG-04. **Influence of Inverter Open-Circuit Fault on Variable Flux Memory Machine.** *X. Zhao*[1] and H. Lin[1] *1. Southeast University, Nanjing, China*

JPG-05. **Study on Variable Flux Memory Machine with Inter Turn Short Circuit Fault.** *X. Zhao*[1] and H. Lin[1] *1. Southeast University, Nanjing, China*

JPG-06. **Investigation of an Axial Flux Switched Flux Hybrid Permanent Magnet Memory Machine.** *L. Qin*[1], H. Yang[1], S. Fang[1], Z. Pan[1] and Y. Meng[1] *1. Southeast University, Nanjing, China*

JPG-07. **A New Hybrid-Excited Partitioned Stator Flux Modulated Machine With Dual-PM.** *Y. Meng*[1], S. Fang[1], Z. Pan[1] and L. Qin[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China*

JPG-08. **A Novel Slot-PM-assisted Hybrid Magnet Memory Machine for Wind Power Generation.** *J. Jiang*[1] and S. Niu[1] *1. Electrical Engineering Department, The Hong Kong Polytechnic University, Hong Kong, Hong Kong*

JPG-09. **Analysis of a Variable Reluctance Field-modulated Transverse Flux Linear Generator.** *M. Chen*[1], L. Huang[1], T. Xia[2], Y. Li[1], P. Tan[1], G. Ahmad[1] and M. Hu[1] *1. Electrical Engineering, Southeast University, Nanjing, China; 2. Nanjing Institute of Technology, Nanjing, China*

JPG-10. **A New Variable Reluctance Memory Machine with DC Bias Magnetization Capability.** *L. Qin*[1], H. Yang[1], S. Fang[1], Z. Pan[1] and Y. Meng[1] *1. Southeast University, Nanjing, China*

JPG-11. **Design Method of the Variable Flux Machines for Improving Torque Density.** *F. Liu*[1], P. Zheng[1], M. Wang[1] and G. Qiao[1] *1. Harbin Institute of Technology, Harbin, China*

JPG-12. **Comparative Study on Two DC Exicited Multitooth Flux-Switching Machines.** *Z. Li*[1], G. Zhao[1], W. Hua[2], H. Hua[3] and X. Jiang[1] *1. Nanjing Normal University, Nanjing, China; 2. Southeast University, Nanjing, China; 3. Shanghai Jiao Tong University, Shanghai, China*

POSTER SESSION

Session JPH
SURFACE AND INTERIOR MOUNTED PERMANENT MAGNET ELECTRICAL MACHINES II (Poster Session)

Metin Aydin, Co-Chair
Kocaeli University, Umuttepe, Izmit, Turkey
Chunhua Liu, Co-Chair
City University of Hong Kong, Hong Kong

JPH-01. **Machine learning for fault detection in permanent magnet synchronous machines.** *M. Hsieh*[1] and K. Shih[1] *1. National Cheng Kung University, Tainan, Taiwan*

JPH-02. **A Study on Reducing Cogging Torque and Torque Ripple by Applying Rotating Tapering.** *S. Lee*[1], I. Yang[2] and W. Kim[1] *1. Electrical Engineering, Gachon University, Seongnam, The Republic of Korea; 2. Electrical Engineering, Hanyang University, Seoul, The Republic of Korea*

JPH-03. **Study and Experiments of Permanent Magnet Assembly in 10MW-class Permanent Magnet Synchronous Generator for Offshore Wind Turbine Using Analytical Method to Calculate the Magnetic Force.** *H. Shin*[1] and J. Choi[1] *1. Chungnam National University, Daejeon, The Republic of Korea*

JPH-04. **Design of a Circulatory Assistance Actuator Applied to an Artificial Lung.** *A. Sahnoune*[1,2], M. Hage Hassan[1], G. Krebs[1], C. Marchand[1], P. Dessante[1], O. Mercier[2] and J. Guihaire[2] *1. Paris-Saclay University, CentraleSupélec, CNRS, Laboratory of Electrical and Electronic Engineering of Paris, Gif sur-Yvette, France; 2. Preclinical Research Unit, Marie Lannelongue Hospital, Groupe Hospitalier Paris Saint Joseph, Paris Saclay University, Le Plessis-Robinson, France*

JPH-05. **A New Partitioned Stator Machine Based on Flux Modulation Effect.** *H. Wang*[1], H. Zhu[1], S. Ding[1], Z. Wei[1] and C. Wu[1] *1. Nanjing Normal University, Nanjing, China*

JPH-06. **Application Analysis of Self-bonded Silicon Steel Sheet in High Power Density SPMSM.** *Z. Yu*[1], Y. Li[1], Y. Jing[1] and J. Wang[1] *1. Shenyang University of Technology, Shenyang, China*

JPH-07. **A Study on Optimal Design of Rotor Using Gradual Meta-Modeling to Reduce Cogging Torque and Torque Ripple of IPMSM Spoke Type BLDC Motor.** *D. Shin*[2], S. Song[1] and W. Kim[2] *1. Electrical Engineering, Hanyang University, Seongnam, The Republic of Korea; 2. Electrical Engineering, Gachon University, Seongnam, The Republic of Korea*

JPH-08. **All in one Magnetic Bearing in Permanent Magnet Synchronous Motor by Halbach Array.** *I. Yang*[1], S. Lee[2], J. Lee[1], W. Kim[2] and D. Jung[3] *1. Electrical Engineering, Hanyang University, Seoul, The Republic of Korea; 2. Electrical Engineering, Gachon University, Seongnam, The Republic of Korea; 3. Smart Mobility, Halla University, Wonju, The Republic of Korea*

JPH-09. **Design and Analysis of a Novel Hybrid-Flux Consequent-Pole Permanent Magnet Memory Machine with Transverse Field Excitation.** *M. Jiang*[1] and S. Niu[1] *1. Department of Electrical Engineering, The Hong Kong Polytechnic University, Kowloon, Hong Kong*

JPH-10. **Accurate Demagnetization Analysis of Outer Rotor In-wheel Motor Under Braking Condition.** *D. Jiang*[1], X. Huang[1], Z. Li[1] and Z. Liu[1] *1. Zhejiang University, Hangzhou, China*

JPH-11. **Novle Spoke-type Permanent Magnet Synchronous Generator Design considering the Characteristics of Wind Power Generator.** *D. Kim*[1], S. Kim[2], I. Yang[1], J. Lee[1] and W. Kim[3] *1. Hanyang University, Seongnam, The Republic of Korea; 2. Korea Electronics Technology Institute, Gwangju, The Republic of Korea; 3. Gachon University, Seongnam, The Republic of Korea*

JPH-12. **A Study on motor control technology through a new concept flux-torque control look up table based on electromagnetic flux.** *H. Pyo*[1], D. Nam[1], G. Park[2], W. Kim[1] and Y. Hwang[2] *1. Electrical Engineering, Gachon University, Gyeonggido, The Republic of Korea; 2. Electric System Development Team, Hyundai-Wia, Gyeonggido, The Republic of Korea*

JPH-13. **Study on inductance parameter curve fitting method for flux-torque control of IPMSM.** *H. Pyo*[1], D. Kim[2], M. Jeong[1], I. Yang[2], S. Song[2] and W. Kim[1] *1. Electrical Engineering, Gachon University, Gyeonggido, The Republic of Korea; 2. Electrical Engineering, Hanyang University, Seoul, The Republic of Korea*

JPH-14. **Combined electromagnetic and mechanical optimisation of an interior permanent magnet rotor.** *G. Zhang*[1] and G.W. Jewell[1] *1. Electronic and Electrical Engineering, University of Sheffield, Sheffield, United Kingdom*

POSTER SESSION

Session JPI
SURFACE AND INTERIOR MOUNTED PERMANENT MAGNET ELECTRICAL MACHINES III (Poster Session)

Oleksandr Dobzhanskyi, Co-Chair
Point Park University, Pittsburgh, PA, United States
Narayan Kar, Co-Chair
University of Windsor, Windsor, ON, Canada

JPI-01. **Reducing Zero-Mode Vibration for Permanent Magnet Synchronous Machines through Changing Phases of Concentrated Forces.** Y. Xu[1] and *Z. Xu*[1] *1. School of Electrical Engineering and Automation, Harbin Institute of Technology, Harbin, China*

JPI-02. **Suppression of Torque Ripple in a New Consequent-Pole Permanent Magnet Machine by Segmented Structure.** G. Qu[1], Y. Fan[1] and *Q. Chen*[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China*

JPI-03. **Spoke-type Permanent Magnet Synchronous Generator Design to Improve Magnetizing and Cogging Torque Performance.** *D. Kim*[1], I. Yang[1], S. Song[1], J. Lee[1] and W. Kim[2] *1. Hanyang University, Seoul, The Republic of Korea; 2. Gachon University, Seongnam, The Republic of Korea*

JPI-04. **Characteristics Analysis and Design of Permanent Magnet Synchronous Motor Considering Cryogenic Environment.** *D. Kim*[1], I. Yang[1], S. Song[1], D. Kim[2] and W. Kim[2] *1. Hanyang University, Seoul, The Republic of Korea; 2. Gachon University, Seongnam, The Republic of Korea*

JPI-05. **Stator Design of Interior PMSM for Reduction Shaft Voltage Considering the Electromagnetic Characteristics.** *H. Yoon*[1], S. Jun[1], C. Kim[1], T. Ji[1], Y. Kim[2] and S. Jung[1] *1. Department of Electrical and Computer Engineering, Sungkyunkwan University, Suwon, The Republic of Korea; 2. Department of Electrical Engineering, Chosun University, Gwangju, The Republic of Korea*

JPI-06. **Segmented Asymmetrical Stator of PMSM for Torque Ripple Reduction.** *C. Liu*[1], J. Zou[1], Y. Xu[1], G. Yu[1] and L. Zhuo[1] *1. Harbin Institution of Technology, Harbin, China*

JPI-07. **Design of Five-Phase PMSM with Hybrid Single/Double Layer Fractional Slot Winding for Torque Improvement under Third Harmonic Current Injection.** *J. Huang*[1], Y. Sui[1], Z. Yin[1], Z. Yuan[1] and P. Zheng[1] *1. Harbin Institute of Technology, Harbin, China*

JPI-08. **A Novel High Torque Density Dual Three-Phase PMSM with Low Space Harmonic Content.** *J. Huang*[1], Y. Sui[1], Z. Yin[1], Z. Yuan[1] and P. Zheng[1] *1. Harbin Institute of Technology, Harbin, China*

JPI-09. **Effects of Harmonic and Power of Single-Phase Two-Pole Permanent Magnet Synchronous Generator.** *C. Hsu*[3], J. Liu[2] and C. Fung[1] *1. Mechanical Engineering, Oriental Institute of Technology, Banqiao District, Taiwan; 2. Digital Multimedia Design, Kainan University, Lu-Zhou, Taiwan; 3. Asia Eastern University of Science and Technology, New Taipei, Taiwan*

JPI-10. **Novel Method of Deriving Torque and Speed Curve of the Permanent Magnet Synchronous Motor Using Initial State Finite Element Analysis.** *J. Son*[1] and D. Lim[1] *1. Department of Electrical, Electronic, and Computer Engineering, University of Ulsan, Ulsan, The Republic of Korea*

JPI-11. **Research on Cogging Torque and Radial Magnetic Force in Surface-Mounted Permanent Magnet Synchronous Motor with Dynamic Eccentricity.** *L. Feng*[1], F. Zhang[1] and S. Yu[1] *1. Shenyang University of Technology, Shenyang, China*

JPI-12. **A Study on the Design Methodology of Spoke-type Motor with Overhang.** *J. Jung*[1], J. Lee[2], D. Jung[3] and J. Lee[1] *1. Hanyang University, Seoul, The Republic of Korea; 2. Korea Electronics Technology Institute, Bucheon, The Republic of Korea; 3. Halla University, Wonju, The Republic of Korea*

JPI-13. **Improvement of No-Load Back EMF through Ferrofluid Pipe in Airgap of SPMSM.** *I. Yang*[1], D. Shin[2], S. Lee[2], W. Kim[2] and K. Kim[3] *1. Electrical Engineering, Hanyang University, Seoul, The Republic of Korea; 2. Electrical Engineering, Gachon University, Seongnam, The Republic of Korea; 3. Smart Mobility, Halla University, Wonju, The Republic of Korea*

Session JPJ
(SEMI)-ANALYTICAL AND NUMERICAL TECHNIQUES FOR THE OPTIMAL DESIGN OF ELECTROMAGNETIC DEVICES (Poster Session)

Jean-Philippe Lecointe, Chair
Univ. Artois, UR 4025, Laboratoire Systèmes Electrotechniques et Environnement (LSEE), Béthune, France

JPJ-01. **Rotor Yoke Optimization of the Axial-Transverse Hybrid Flux Permanent-Magnet Machine Considering Magnetic Saturation.** *P. Ma*[1], Q. Wang[1] and Y. Li[1] *1. Harbin Institute of Technology, Harbin, China*

JPJ-02. **Electromagnetic Analysis of the Saturation Effect of a Balanced Armature Receiver with Different Nonlinear Soft Magnetic Materials and Magnetizations.** *D. Xu*[1,2], X. Zhu[1], Y. Jiang[3], C. Wang[1,2] and S. Hwang[3] *1. Dept. of Precision Mechanical Engineering, Shanghai University, Shanghai, China; 2. Science and Technology on Near-surface Detection Laboratory, Wuxi, China; 3. School of Mechanical Engineering, Pusan National University, Busan, The Republic of Korea*

JPJ-03. **Optimal Design of Electromagnetic Characteristics of Surface Mounted Synchronous Machine Considering Rotor Eccentricity.** *N. Kim*[1], C. Kim[1], S. Jun[1], S. Noh[1], Y. Kim[2] and S. Jung[1] *1. Department of Electrical and Computer Engineering, Sungkyunkwan University, Suwon, The Republic of Korea; 2. Department of Electrical Engineering, Chosun University, Gwuangju, The Republic of Korea*

JPJ-04. **Multi-Objective Optimal design of SPMSM for Electric Compressor Using Analytical Method and NSGA-II Algorithm.** *W. Kim*[1], C. Kim[2], K. Shin[3], T. Bang[1] and J. Choi[1] *1. Electrical Engineering, Chungnam National University, Daejeon, The Republic of Korea; 2. E&E Department, Hanon Systems, Daejeon, The Republic of Korea; 3. Power System Engineering, Chonnam National University, Jeonnam, The Republic of Korea*

JPJ-05. **A robust optimization design approach for hybrid PM motor considering manufacturing uncertainties of PMs.** *J. Wu*[1], X. Zhu[1] and D. Fan[1] *1. Jiangsu University, Zhenjiang, China*

JPJ-06. **A Study on Performance Improvement by Reducing Axial Force of Double-Layer Spoke-type PMSM with Core Skew Structure.** *D. Nam*[1], K. Lee[2], H. Pyo[1], M. Jeong[1] and W. Kim[1] *1. Electrical Engineering, Gachon University, SeongNam, The Republic of Korea; 2. Electrical Engineering, Michigan State University, East Lansing, MI, United States*

JPJ-07. **Analysis of Unbalanced Magnetic Pull in Flux-Reversal Permanent Magnet Machines.** *X. Zhu*[1] *1. Nanjing Normal University, Nanjing, China*

JPJ-08. **High-Speed Motor Design through PWM Voltage Source Analysis and Harmony Search Algorithm.** *I. Yang*[1], J. Lee[1], Z. Geem[2] and W. Kim[2] *1. Electrical Engineering, Hanyang University, Seoul, The Republic of Korea; 2. Electrical Engineering, Gachon University, Seongnam, The Republic of Korea*

JPJ-09. **Random walk algorithm and semi 3D magnetic equivalent circuit based SPMSM design method.** *S. Kim*[1], W. Kim[1], T. Bang[1] and J. Choi[1] *1. Electrical Engineering, Chungnam National University, Daejeon, The Republic of Korea*

JPJ-10. **Design and Selection of Optimum Slot Parameters for SMPMSM Saturation Saliency with BP Net Approach.** *H. Wang*[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China*

JPJ-11. **Experimental and Comparative Study of NVH of Permanent Magnet Machines According to Rotor Eccentricity with Fractional Pole/Slot Combinations.** *T. Bang*[1], K. Shin[2], J. Lee[1], H. Lee[1], H. Cho[3] and J. Choi[1] *1. Electrical Engineering, Chungnam National University, Daejeon, The Republic of Korea; 2. Power System Engineering, Chonnam National University, Yeosu, The Republic of Korea; 3. Electro. Electric. and Comm. Eng. Education, Chungnam National Univeristy, Daejeon, The Republic of Korea*

POSTER SESSION

Session JPK
(SEMI)-ANALYTICAL AND NUMERICAL TECHNIQUES FOR THE MODELING OF ELECTROMAGNETIC DEVICES (Poster Session)

Yacine Amara, Chair
University of Le Havre, Le Havre, France

JPK-01. **Equivalent Analytical Calculation Theory of Inner Rotor and Outer Rotor Permanent Magnet Motor.** *B. Guo*[1], Y. Du[2], F. Peng[2], J. Shi[1], X. Qiu[1] and Y. Huang[2] *1. School of Electrical and Automation Engineering, Nanjing Normal University, NanJing, China; 2. School of Electrical Engineering, Southeast University, NanJing, China*

JPK-02. **Demagnetization Fault Detection of FSCW Axial Flux Permanent Magnet Motor Using Magnetic Equivalent Circuit with Node Segmentation.** *T. Ji*[1], C. Kim[1], S. Noh[1], H. Yoon[1], Y. Kim[2] and S. Jung[1] *1. Department of Electrical and Computer Engineering, Sungkyunkwan University, Suwon, The Republic of Korea; 2. Department of Electrical Engineering, Chosun University, Gwangju, The Republic of Korea*

JPK-03. **An Improved Hybrid Method for Magnetic Field Calculation in Spoke PM machine.** *B. Guo*[1], Y. Du[2], F. Peng[2], J. Dong[3] and Y. Huang[2] *1. School of Electrical and Automation Engineering, Nanjing Normal University, Nanjing, China; 2. School of Electrical Engineering, Southeast University, Nanjing, China; 3. Faculty of Electrical Engineering, Delft University of Technology, Delft, Netherlands*

JPK-04. **2-D Analytical Modeling of Surface Mounted Permanent Magnet Machines With External Rotor Core.** V.Z. Faradonbeh[1], A. Rahideh[1] and *E. Amiri*[2] *1. Department of Electrical and Electronics Engineering, Shiraz University of Technology, Shiraz, The Islamic Republic of Iran; 2. Department of Electrical and Computer Engineering, University of New Orleans, New Orleans, LA, United States*

JPK-05. **Withdrawn**

JPK-06. **Dynamic Modeling of Multi Disks Rotor System of Maglev Turbomachineries.** *C. Wu*[1], Z. Su[1], D. Wang[1] and H. Jiang[1] *1. Naval university of Engineering, Wuhan, China*

JPK-07. **Experimental Verification and Characteristic Analysis of a Permanent Magnet Synchronous Generator Using the Subdomain Method.** *H. Lee*[1], T. Bang[1], J. Lee[1], J. Woo[1] and J. Choi[1] *1. Chungnam National University, Daejeon, The Republic of Korea*

JPK-08. **Semi 3D Analysis of a Permanent Magnet Synchronous Generator Considering Overhang Structure Using 2D Finite Element Analysis and Equivalent Magnetic Circuit.** *J. Hong*[1], H. Lee[1], J. Lee[1] and J. Choi[1] *1. Chungnam National University, Daejeon, The Republic of Korea*

JPK-09. **Mathematical Modeling of Wound Field Flux-switching Machines Considering Magnetic Saturation.** X. Jiang[1], G. Zhao[1], W. Hua[2], H. Hua[3] and *Z. Li*[1] *1. Nanjing Normal University, Nanjing, China; 2. Southeast University, Nanjing, China; 3. Shanghai Jiao Tong University, Shanghai, China*

JPK-10. **Electromagnetic Analysis and Experimental Verification of Permanent Magnet Synchronous Machine Considering Axial Leakage Flux Using Subdomain Method.** *K. Shin*[1], H. Park[2], H. Cho[3] and J. Choi[3] *1. Chonnam National University, Yeosu, The Republic of Korea; 2. Hyundai Mobis, Yongin, The Republic of Korea; 3. Chungnam National University, Daejeon, The Republic of Korea*

JPK-11. **Magnetic Circuit Analysis of a New Radial-Axial Hybrid Excitation Machine.** X. Wang[1], Y. Fan[1], Q. Chen[1] and *Z. Wu*[1] *1. Southeast University, Nanjing, China*

JPK-12. **Circuit Conversion Technique for Decomposition by Power Supplies of Combined Equivalent Circuit Based on Cauer Ladder Network Method.** *H. Kaimori*[1], T. Matsuo[2] and H. Eskandari[2] *1. Science Solutions International Laboratory, Inc., Tokyo, Japan; 2. Kyoto University, Kyoto, Japan*

JPK-13. **An Improved Subdomain and Magnetic Circuit Hybrid Model for SPM Machines Accounting for Iron Saturation.** *l. Wu*[1] and J. Li[1] *1. Zhejiang University, Hang Zhou, China*

POSTER SESSION

Session JPL
LOSS AND THERMAL MODELLING OF ELECTRICAL MACHINES, MAGNETIC BEARING (Poster Session)

Yanhui Gao, Chair
Oita University, Oita, Japan

JPL-01. **Iron Losses Model for Induction Machines Considering the Influence of Rotational Iron Losses.** *J. Yan*[1], C. Di[1] and X. Bao[1] *1. School of Electrical Engineering and Automation, Hefei University of Technology, Hefei, China*

JPL-02. **Iron Loss Prediction in SPMSM by Using Deeping Learning Approach.** *B. Guo*[1], Y. Du[2], J. Shi[1], X. Qiu[1], F. Peng[2] and Y. Huang[2] *1. School of Electrical and Automation Engineering, Nanjing Normal University, NanJing, China; 2. School of Electrical Engineering, Southeast University, NanJing, China*

JPL-03. **Characteristic Analysis and Experimental Verification of Electromagnetic Losses Considering Current Harmonics in High-Speed Permanent Magnet Synchronous Motors.** K. Shin[1], H. Cho[2], J. Choi[2] and *T. Bang*[2] *1. Chonnam National University, Yeosu, The Republic of Korea; 2. Chungnam National University, Daejeon, The Republic of Korea*

JPL-04. **Nonlinear Analytical Model for Predicting Magnet Loss in Surface-Mounted Permanent-Magnet Motors.** Z. Li[1], X. Huang[1], Z. Chen[1], *X. Xu*[1] and T. Shi[1] *1. Zhejiang University, Hangzhou, China*

JPL-05. **AC Loss Calculation and Analysis of Hollow Conductor for Doubly Salient Brushless DC Generator.** J. Zhang[1], *Y. Xia*[1] and Z. Zhang[1] *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

JPL-06. **Electromagnetic Simulation of Current and Temperature Distribution in Railgun Based on Moving Contact Resistance Model.** *C. Zhang*[1], S. Guan[1], Y. Li[1] and Q. Yang[2] *1. Hebei University of Technology, Tianjin, China; 2. Tiangong University, Tianjin, China*

JPL-07. **Integrated Magnetics, Insulation and Cooling Architecture for Slotless Electric Machines.** *D. Lee*[1], N. Salk[1] and K. Haran[2] *1. Hinetics, LLC, Champaign, IL, United States; 2. Department of Electric and Computer Engineering, University of Illinois, Urbana, IL, United States*

JPL-08. **Electromagnetic Thermal Coupling Optimization of Concentrated Winding PM Motor with Auxiliary Teeth for Electric Vehicle.** *T. Zhu*[1], W. Geng[1] and L. Li[1] *1. Nanjing University of Science and Technology, Naijing, China*

JPL-09. **Asymmetrical Axial Magnetic Bearings for Turbomachineries.** *H. Jiang*[1], Z. Su[1], D. Wang[1], C. Wu[1] and Z. Li[1] *1. Naval University of Engineering, Wuhan, China*

JPL-10. **A study on Radial Magnetic Bearing of a new stator shape for high manufacturability and reduction of core loss and weight.** *S. Song*[1], I. Yang[1], D. Shin[2] and W. Kim[2] *1. Department of Electrical Engineering, Hanyang University, Seoul, The Republic of Korea; 2. Department of Electrical Engineering, Gachon University, Seong-Nam, The Republic of Korea*

JPL-11. **Principle and Implementation of a Novel Double-stator Hybrid Magnetic Bearing.** *X. Ye*[1] and Z. Wang[1] *1. Faculty of Automation, Huaiyin Institute of Technology, Huaian, China*

Session JPM
DESIGN OPTIMIZATION OF ELECTRICAL MACHINES (Poster Session)

Weimin Guan, Chair
Wuhan University, Wuhan, China

JPM-01. **Rapid multi-material discrete topology optimization for the design of electrical machines.** *M. Hage Hassan*[1], T. Guillemot[1], X. Mininger[1], G. Krebs[1], A. Boumesbah[1] and P. Dessante[1] *1. Université Paris-Saclay, CentraleSupélec, CNRS, Laboratoire de Génie Electrique et Electronique de Paris, Gif-sur-Yvette, France*

JPM-02. **Comparative Study on Three Novel Hybrid Excited Multitooth Flux-switching Permanent Magnet Machines.** *Z. Jin*[1], X. Zhu[1], S. Ding[1], S. Chen[1] and Z. Li[1] *1. Nanjing Normal Univercity, Nanjing, China*

JPM-03. **A Robust Optimization Methodology of e-Supercharger Using Harmony Search Algorithm.** *S. Yang*[1], H. Pyo[1], Y. Hwang[2] and W. Kim[1] *1. Gachon University, Gyeonggido, The Republic of Korea; 2. Automotive parts R&D Center, Hyundai-Wia Company, Gyeonggido, The Republic of Korea*

JPM-04. **An efficient decoupling approach for reliability-based design optimization of electrical machines.** B. Ma[1], *J. Zheng*[1] and J. Zhu[2] *1. Hunan University, Changsha, China; 2. University of Sydney, Sydney, NSW, Australia*

JPM-05. **Field-Regulation Capability Research of Dual-Direction Hybrid Excitation Synchronous Generator.** *J. Yu*[1], S. Zhu[1] and C. Liu[1] *1. Nanjing University of Aeronautics & Astronautics, Nanjing, China*

JPM-06. **Design and Investigation of a New Variable Flux Memory Machine with Self-Flux Leakage Path.** *X. Zeng*[1] and H. Lin[1] *1. Southeast University, Nanjing, China*

JPM-07. **Improvement of Torque Density by Rotor Structure of IPMSM with Dy-free Rare-Earth Magnet for Servo Motor.** *D. Jang*[1], Y. Hwang[1], S. Lee[1], S. Kang[1] and S. Jung[1] *1. Department of Electrical and Computer Engineering, SungKyunKwan University, Suwon, The Republic of Korea*

JPM-08. **Detent Force Optimization in Linear Oscillatory Generator with Assisted Permanent Magnet and Semi-3D Effect for Stirling Engines Using Subdomain Analytical Method.** *K. Shin*[1], J. Choi[2], H. Cho[2], K. Lee[3] and S. Lee[3] *1. Chonnam National University, Yeosu, The Republic of Korea; 2. Chungnam National University, Daejeon, The Republic of Korea; 3. Korea institute of Industrial Technology, Gwangju, The Republic of Korea*

JPM-09. **Electromagnetic Analysis and Vibration Reducing of Segmented Skew Rotor for Built-in U-shaped Permanent Magnet Motor.** *Q. Li*[1], Q. Li[1] and W. Geng[1] *1. Nanjing University of Science and Technology, Naijing, China*

JPM-10. **A Study on Design of Variable Power Electronic Brake Design for Semiconductor Manufacturing Process.** *J. Lee*[1], R. Kim[1], J. Seo[1] and D. Jung[2] *1. Korea Electronics Technology Institute, Bucheon, The Republic of Korea; 2. Halla University, Wonju, The Republic of Korea*

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