IEEE MAGNETICS NEWSLETTER

VOLUME 66
ISSUE 1
FEB 2026

Editor:
Jia Yan Law

2026 IEEE MagSoc

Fellows

Award Winners

Distinguished Lecturers

IN THIS ISSUE

Note from the Editor

We're starting the year at full speed, and this first issue is about momentum and the people moving the field forward together.

This issue is designed to feel fast and precise. The visuals lean into geometry and technical drawing to capture motion, structure, and forward progress as we begin the new year.

Inside, we announce our newly elected Fellows and open the Fellow application, linking recognition with opportunity. You will also find highlights of this year's award winners, our new distinguished lecturers, a note from our conference chairs, a new Fellows column, a welcome to the new Chair of Women in Magnetism, and a spotlight on the student organizers of the conference networking event. Vroom, let's go!

ABOUT THE NEWSLETTER

The purpose of the Newsletter of the IEEE Magnetics Society is to publicize activities, conferences, workshops and other information of interest to Society members, sister societies and other people in the area of applied magnetics.

Contributions are solicited from Society and sister society members, Officers & other volunteers, conference organizers, local chapters, and other individuals with relevant material. The Newsletter is published quarterly on the Society website.

Information contained in this newsletter may be copied without permission, provided that copies for commercial advantage are not made or distributed and that the title of the publication and its date appear on each copy. Some images were brought to life with the help of AI prompts and released under a Creative Commons license.

PITCH IN

Passionate about impactful ideas, educational content, or inspiring stories? Got an eye for what makes a great read? We're always on the lookout for powerful ideas, compelling voices, and fresh perspectives. Whether you're a seasoned writer or just passionate about your field, this is your invitation to get involved.

Write to us and come on board!

Student intern
Ana Isabel Jimenez Ramirez

Student intern
Zhonghao Chang

Associate Editor for Industrial Liaison
Brad Dodrill

Editor
Jia Yan Law

TABLE OF CONTENTS

Associate Editor
Ravi Hadimani

FEATURED ARTICLE

2026 IEEE Magnetics Society Fellows

The grade of IEEE Fellow is an exceptional distinction to recognize a member with outstanding record of accomplishment in any of the IEEE fields of interest. The total number of IEEE Fellows selected each year does not exceed one-tenth of one percent of the total IEEE membership.

The 2025 IEEE Magnetics Society Fellow Evaluations Committee (FEC) for candidates for the class of 2026 were: Kai Liu (Chair), Eric Fullerton (Vice Chair), Ching-Ray Chang, Pavel Kabos, Mathias Kläui, Laura Lewis, Yoichiro Tanaka, and John Q. Xiao. The FEC functions as an independent committee within the Magnetics Society, and reports directly to the President.

IEEE uses a two-level evaluation process to ensure nominations from Societies/Councils with similar topics are handled fairly. The Magnetics Society FEC carries out the first evaluation, where each nomination is evaluated by a minimum of five evaluators, with the Chair coordinating the efforts but not allowed to evaluate. Committee members recuse themselves if they have a conflict of interest with respect to a nominee. A report summarizing each nominee's contributions, including nominees' ranking within the society, is then provided to a Cohort Fellow Evaluations Committee (CFEC). The CFEC oversees the second step in the evaluation process for nominees from the Societies/Councils (S/Cs) in IEEE Division IV, including the Magnetics Society. After the initial evaluation by the nominee's S/C FEC, which assesses the nominee's contributions, the CFEC consolidates and ranks nominees from multiple smaller S/Cs. The CFEC discussions involve at least two representatives from the nominee's specific field to ensure accurate technical assessment before forwarding rankings to the IEEE Fellow Committee.

The IEEE Fellow selection is extremely competitive, particularly for the Magnetics Society, which has many outstanding candidates. We congratulate the following Fellows on their elevation and remarkable accomplishments!

Fellow Class of 2026

2026 IEEE Fellows who were evaluated by the Magnetics Society:

- Adekunle Adeyeye
- Arunava Gupta
- Ganping Ju
- Teruo Ono
- Koki Takanashi
- Manuel Vázquez

2026 IEEE Fellows who are members of the Magnetics Society but who were evaluated by other IEEE societies

- Johan Driesen
- Jawad Faiz
- Rhonda Franklin
- Jianguo Zhu

Arunava Gupta
University of Alabama
United States

For contributions to magnetic and superconducting complex oxide films for electronic device applications

Adekunle Adeyeye
University of Durham
United Kingdom

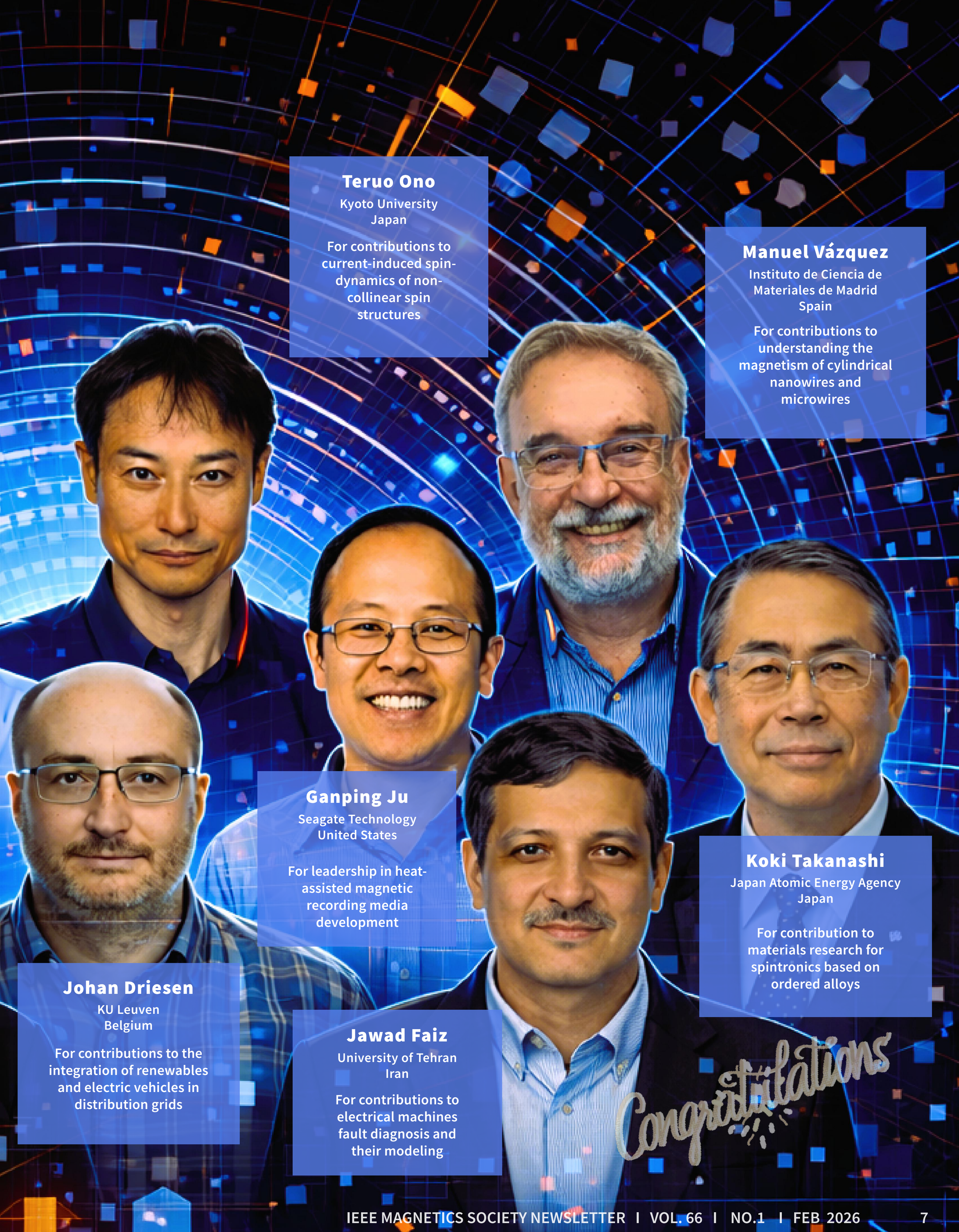
For contributions to synthesis and characterization of magnetic nanostructures for low-power magnonic information processing applications

Jianguo Zhu
University of Sydney
Australia

For contributions to the advanced system-level optimal design of electrical machines and drive systems

Rhonda Franklin
University of Minnesota
United States

For leadership in microwave engineering education and workforce development


Teruo Ono
Kyoto University
Japan
For contributions to current-induced spin-dynamics of non-collinear spin structures
Manuel Vázquez
Instituto de Ciencia de Materiales de Madrid
Spain
For contributions to understanding the magnetism of cylindrical nanowires and microwires
Ganping Ju
Seagate Technology
United States
For leadership in heat-assisted magnetic recording media development
Koki Takanashi
Japan Atomic Energy Agency
Japan
For contribution to materials research for spintronics based on ordered alloys
Johan Driesen
KU Leuven
Belgium
For contributions to the integration of renewables and electric vehicles in distribution grids
Jawad Faiz
University of Tehran
Iran
For contributions to electrical machines fault diagnosis and their modeling
Congratulations

Nominations open for class of 2027 Fellows

The nomination process for the IEEE Fellow Class of 2027 is open. You are encouraged to nominate qualified Senior or Life Senior Members with significant contributions to engineering, science, or technology. The deadline for submissions is **February 7, 2026**.

The Fellow Nominations Committee is available as a resource to support the nomination process. The assistance includes reviewing nomination documents and helping identify suitable nominators, references, and endorsers. Current committee members: Guohan Hu, Peter Fischer, Victorino Franco, and Chih-Huang Lai. If you need guidance or support, please feel free to reach out to any of the committee members. They are here to help make the process smooth and successful.

Let's work together to recognize the best candidates for their exceptional contributions. The detailed nomination process can be found in the following.

How IEEE Fellows Can Assist:

As an IEEE Fellow, your role is crucial in helping the next generation of nominees. You can contribute by:

- Serving as a **reference**, objectively evaluating the nominee's work.
- Offering **endorsements**, which are especially helpful for nominees whose contributions may span multiple fields or are less well-known.
- Advising nominees on **strengthening their submissions** by clarifying the impact and significance of their contributions.

How IEEE Members Can Assist:

For information and help on how to nominate or assist in the application process, please contact IEEE Fellow activities or visit the following websites:

- IEEE Fellows website
- IEEE Fellow | IEEE Magnetics Society
- Fellows Nomination Subcommittee | IEEE Magnetics Society

Nomination Process

To be nominated for IEEE Fellow, a Senior or Life Senior Member must have 15+ years of professional experience and have made specific, exceptional contributions as detailed in the following Evaluation Process. Nominations must be initiated through the IEEE Fellow Portal and must include:

- A completed nomination form
- Three-five references from IEEE Fellows
- Optional endorsements (up to three)

Evaluation Process

The IEEE Fellow evaluation is rigorous and structured as follows:

1. **Scoring:** Each nominee is scored based on **Technical Accomplishments (75%), Strength of References/Endorsements (15%),** and **Professional Activities (10%).**

2. **Categories:** Nominations are based on **one or two significant contributions, not a lifetime of work**. Contributions are categorized as Educator, Research Engineer/Scientist, Technical Leader, Technology Innovator, or Standards Contributor.

3. **Narrative and Ranking:** The evaluation narrative must clearly present the strengths and weaknesses of the nominee, and scores must align with the narrative.

4. **Two-Level Review:** Smaller Societies/Councils, including Magnetics Society, are evaluated through both the society **Fellow Evaluation Committee (FEC)** and the **Cohort Fellow Evaluating Committee (CFEC)**, and the latter consolidate rankings across multiple fields.

Best Regards

Kai Liu
Chair, Fellow Evaluations Committee, IEEE Magnetics Society
Guohan Hu
Chair, Fellow Nominations Committee, IEEE Magnetics Society

IEEE MAGNETICS
Advancing magnetism worldwide
intermag2026.org

IEEE MAGNETICS SOCIETY

INTERMAG 2026

MANCHESTER | 13-17 APRIL 2026

REGISTRATION IS OPEN!

Take advantage of the **Early Bird rates available until March 3, 2026**, and save on your conference participation. Consider joining IEEE and the IEEE Magnetics Society — members benefit from reduced registration fees.

14 SYMPOSIA

Tutorial AI and Magnetism

68 INVITED SPEAKERS

Plenary Reception at the National Football Museum

MORE THAN 10 SPECIAL EVENTS & SESSIONS

...and much more!

PLENARY SPEAKER

National Graphene Institute (Manchester, UK)

Photo Credits:ThePlan.it

Prof. Sir Kostya Novoselov FRS

"Magnetic van der Waals heterostructures"

Nobel Prize in Physics 2010 (jointly-awarded) for work on graphene

📷🎨 Most Compelling Image
Show us the beauty of magnetism!
Submission Deadline: **March 16, 2026**

FEATURED ARTICLE

2026 IEEE Magnetics Society Award Winners

Early Career Award 2026
Dr. Samuel Mañas-Valero

Dr. Samuel Mañas-Valero, Ramón y Cajal Fellow at the University of Valencia, is the recipient of the 2026 IEEE Magnetics Society Early Career Award. Established in 2016, this award honors individuals within five years of completing their Ph.D., who have demonstrated outstanding scientific or technical achievements in the field of magnetics.

Citation:
For contributions to advanced two-dimensional magnetism through discoveries in molecular and inorganic van der Waals magnets and heterostructures, highlighting molecular, twisting and stacking engineering.

Dr. Mañas-Valero obtained his Ph.D. in Nanoscience and Nanotechnology at the University of Valencia in 2021 under the supervision of Prof. Eugenio Coronado. His thesis, awarded as the best doctoral dissertation of 2021 by the Spanish Royal Society of Physics, explored strongly correlated layered materials and van der Waals (vdW) heterostructures. He subsequently held prestigious fellowships including postdoctoral positions at Delft University of Technology as Marie-Curie and Kavli Fellows, before being appointed Ramón y Cajal Fellow in 2026 at the University of Valencia.

His research combines chemistry, materials science, and condensed matter physics, leading to key conceptual breakthroughs in molecular magnetism at the single-layer limit, twist-controlled 2D magnetism beyond the moiré paradigm, molecular straintronics, and nanomechanical probing of vdW magnets. His pioneering works have appeared in leading journals such as Nature Materials, Nature Chemistry, Advanced Materials, Advanced Functional Materials, JACS, ACS Nano, and npj Quantum Materials.

Beyond his scientific achievements, Dr. Mañas-Valero has played an active role in the community: supervising students, serving as reviewer for international funding agencies (U.S. Department of Energy, European Research Council, Polish National Science Center), and organizing international young researcher symposia. He has been recognized with multiple awards, including the 2023 European Magnetism Association Young Scientist Award, the 2024 Magnetochemistry Young Investigator Award, and participation in the 73rd Lindau Nobel Laureate Meeting in Physics.

Dr. Samuel Mañas-Valero is an emerging leader in the field of magnetism, and this award highlights his exceptional contributions to advancing two-dimensional magnetism and spintronics for future quantum technologies.

Mid-Career Award 2026
Prof. Andrii Chumak

Citation:
For foundational contributions to magnonics, spintronics, and magnon-based computing.

Professor Andrii Chumak of the Faculty of Physics, University of Vienna, will be presented with the 2026 Mid-Career Award at the 2026 IEEE International Magnetics Conference (INTERMAG) in Manchester, U.K. This award recognizes scientists and engineers at the mid-stages of their career for outstanding scientific and technological contributions in a field represented by the IEEE Magnetics Society. Eligible are members of the IEEE Magnetics Society in the mid-stages of their career (typically between 10 to 20 years after award of the doctoral degree). This award fills a void between the Magnetic Society's Early Career Award, limited to a nominee within 5 years of completion of doctorate, and the Achievement Award, which recognizes a nominee for research that has demonstrated unusually high impact, regardless of career stage.

Prof. Chumak has delivered significant innovations in the field of magnonics, from developing fundamental concepts through creating new approaches for beyond-CMOS computing. Andrii Chumak studied at the Faculty of Radiophysics at Taras Shevchenko National University of Kyiv, earning his bachelor's and master's degrees in radiophysics and electronics with honors. He received his Ph.D. in 2009 from Kyiv National University for pioneering work on parametric spin-wave processes, and in 2016, he completed his Dr. habil. degree at Kaiserslautern University of Technology for advancing the application of magnonic crystals for data processing. He is currently a full professor in the Faculty of Physics and Head of the Nanomagnetism and Magnonics Research Unit at the University of Vienna, Austria.

Achievement Award 2026
Prof. Caroline Ross

Citation:
For the development of magnetic and multiferroic materials that can be modulated with voltage, and of self-assembled nanostructures.

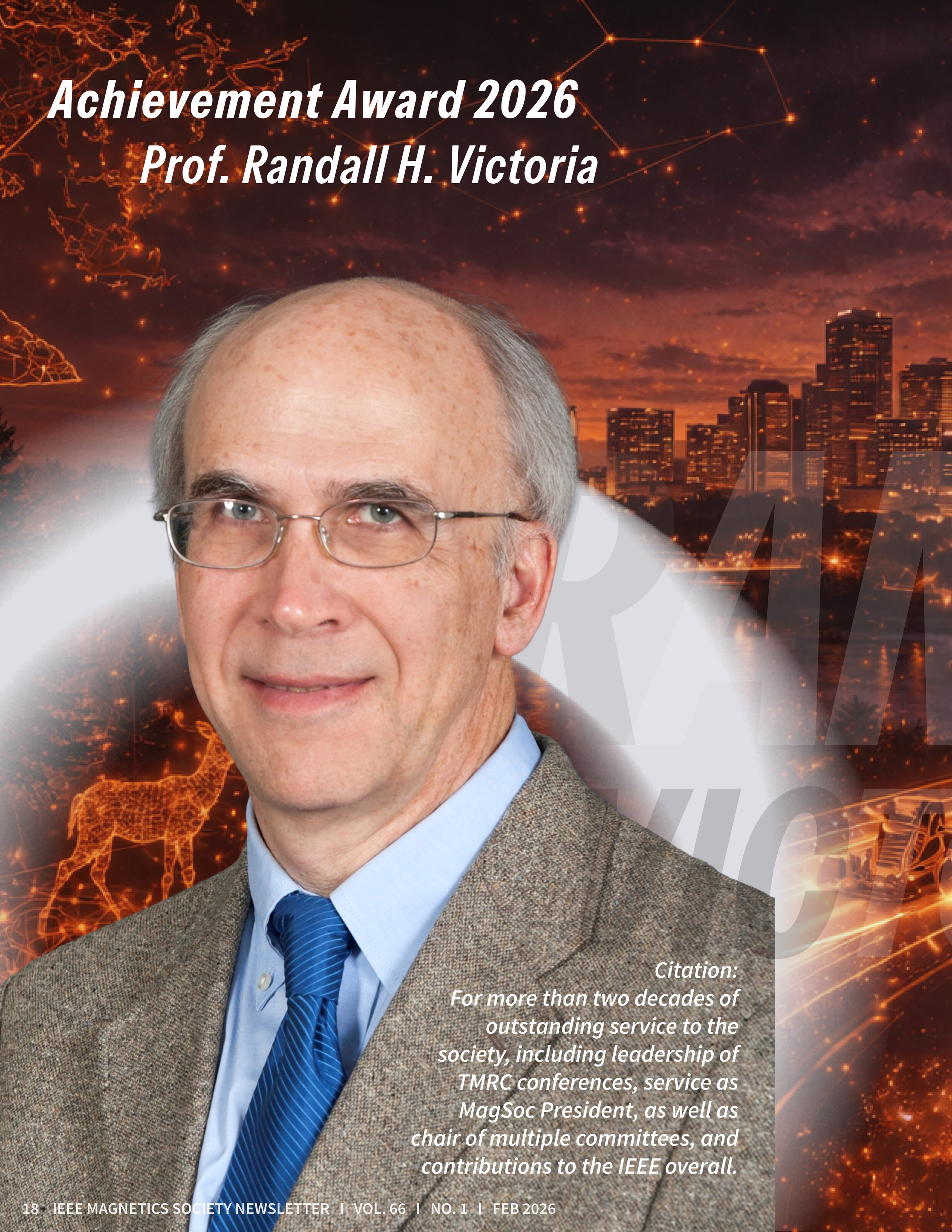
Professor Caroline Ross has been selected as the recipient of the 2026 Magnetics Society Achievement Award, the highest technical honor of the IEEE Magnetics Society. Dr. Ross received her B.S. and Ph.D. degrees in materials science from Cambridge University (United Kingdom). After postdoctoral research at Harvard University, she joined Komag, working on technology for magnetic hard disk drives. In 1997, she became a faculty member in the Department of Materials Science at the Massachusetts Institute of Technology (MIT), becoming a full professor in 2004. She was named an IEEE Fellow in 2013, a Fellow of the American Physical Society in 2004, and a Fellow of the Materials Research Society in 2009.

Prof. Ross and her team are well known for the development of magnetic and multiferroic materials that can be modulated with voltage. She has worked extensively on iron garnets, showing control of magnetic anisotropy through strain and cation ordering, as well as spin orbit torque switching and magnon-driven domain wall motion. She has incorporated magneto-optical garnets into on-chip near-infrared photonic isolators for integrated photonics. She introduced ferroelectricity into $YFeO_3$ through defects that are a result of excess Y, thus introducing new compositions of multiferroic materials, and showed voltage-driven on/off magnetism in SrCoFeO thin films.

Prof. Ross is a leader in using self-assembly, i.e., spontaneous patterning without the need for post-fabrication, to form magnetic nanostructures. She uses the self-assembly of block copolymers to form arrays of nanoscale features that can then be transferred into magnetic materials to form patterned media prototypes and magnetic nanowires. She also works on self-assembled oxide nanocomposites consisting of two different epitaxial phases, for example, ferrimagnetic spinel pillars or ferromagnetic metal wires in a ferroelectric perovskite matrix. She has demonstrated strain-mediated magnetoelectric coupling and voltage modulation of magnon frequency in these composites at room temperature. These demonstrations of voltage-controlled magnetic phenomena are important for the development of improved spin-torque MRAM and other magnetoelectric devices.

Achievement Award 2026

Prof. Randall H. Victoria



Citation:
For more than two decades of outstanding service to the society, including leadership of TMRC conferences, service as MagSoc President, as well as chair of multiple committees, and contributions to the IEEE overall.

Dr. Randall H. Victora is recognized with the 2026 IEEE Magnetics Society Distinguished Service Award. The Distinguished Service award, established in 2015, honors exceptional service to the IEEE Magnetics Society, characterized by sustained voluntary contributions that substantially exceed the average expectations of service.

Dr. Victora is a professor and former head of the Department of Electrical and Computer Engineering at the University of Minnesota. He earned B.S. degrees in physics and mathematics from the Massachusetts Institute of Technology (1980). After receiving his Ph.D. degree from the University of California at Berkeley in 1985, he held research positions at Eastman Kodak Research Laboratories (1991–1998) before joining the University of Minnesota in 1998.

Randy's research interests include hard disk drives, spintronic devices, and biomedical applications of magnetic materials. In particular, he is recognized for his contributions to the theory and modeling of magnetic materials for recording media.

While his primary tools are micromagnetic simulation and electronic structure theory based on the local density approximation, he has always kept in mind the ultimate goal of predicting macroscopic properties. His research has been strongly motivated by his industrial experience in the areas of magnetic and optical recording, and his projects have involved an extensive collaboration with experimentalists.

His technical contributions are widely employed in commercial hard disk drives, including exchange coupled composite media, which enabled a large increase in areal density; or the broadly used scaling law that relates magnetic switching fields to measurement times and calculations for magnetic anisotropy. Much of his theoretical work has been prominently published. Recently, a major focus has been the design of very low energy memory based on spin-transfer torque or spin-orbit torque.

Randy has served in the organization of several conferences as Publications Co-Chair for MMM (1993), Program Co-Chair for INTERMAG (1995) and MMM/INTERMAG (2001), and General Chair of the 50th MMM Conference (2006). His contribution to The Magnetic Recording Conference (TMRC) series, where he has served as Chair of the Administrative Committee since 2010, has been outstanding.

He was the President of the IEEE Magnetics Society (2009–2010). He subsequently served as Chair of the Nominations Committee (2011–2012) and on the Conference Executive Committee (2015–2016) and the Achievement Award Selection Committee (2015-present). He was a member of the MagSoc Administrative Committee for many years.

Prof. R. Victora has twice received the Technical Achievement Award of the Information Storage Industry Consortium, INSIC. He is an **APS Fellow** (1997) for quantitatively accurate predictions of magnetic hysteresis, innovative calculations of the magnetic and electronic structure for heterogeneous systems, and the extension of these results to the development of practical materials, and an **IEEE Fellow** (2004) for contributions to the exploration of magnetic and optical properties of materials and devices. He received the 2014 **Achievement Award** of the IEEE Magnetics Society for *contributions to the theory and simulation of magnetic materials, particularly magnetic recording media*.

We are pleased to announce the 2026 edition of Magnetics Frontiers, a conference dedicated to the topic "Spintronics for Computing“ **August 3rd to 7th 2026,** in **Hong Kong,** at the **Hong Kong University of Science and Technology (HKUST)**

Qiming Shao (HKUST)
Xiufeng Han (IOP, CAS)
On behalf of the program and organizing committees

Contact:
magfrontiers@ust.hk
Conference website:
magfrontiers.hkust.edu.hk
We are looking forward to your participation in this exciting event!

The Magnetic Frontiers Conference, the flagship topical event on emerging fundamental and applied magnetism, is initiated and sponsored by the IEEE Magnetic Society. The 2026 edition will be hosted at the Hong Kong University of Science and Technology (HKUST). Dedicated to the topic "Spintronics for Computing," this conference provides a focused forum to define performance metrics, uncover integration barriers, and align roadmaps across materials, devices, circuits, software, and system benchmarks.

Topics

Materials and interfaces for spintronics
Heavy metals, topological materials, 2D magnets, ferri/antiferromagnets, altermagnets; VCMA and magneto-ionics; thermal budgets and BEOL compatibility.

Devices for memory and logic
STT/SOT-MRAM, field-free SOT switching, voltage-controlled switching; domain-wall, skyrmion, racetrack, and perpendicular MTJ devices; stochastic p-bit elements.

Magnonics and wave-based information processing
Room-temperature magnon transport, spin-wave logic and interconnects, hybrid magnonic–CMOS integration.

Compact modeling, EDA, and design enablement
LLG/FMR-to-SPICE compact models, variability and stochasticity modeling, PDK readiness, reliability-aware circuit simulation.

In-memory computing and neuromorphic architecture
MTJ crossbars and bit-cell level operations, analog/digital MACs, probabilistic inference with p-bits, SNNs and learning rules mapped to spintronic primitives.

System integration and packaging
BEOL integration with advanced CMOS nodes, 3D/heterogeneous integration, cryogenic electronics and superconducting spintronics, interfaces and peripherals.

Reliability, test, benchmarking and figures of merit
Retention, endurance, write error rates, variability, aging, radiation and temperature effects; test protocols and standards for compute workloads, energy–delay–area at array and subsystem level, accuracy/energy for probabilistic and analog computing, security and robustness metrics, reproducible open benchmarks.

Industry perspectives and technology transfer
Foundry/process readiness, supply-chain and manufacturability, IP/roadmaps, application pull in edge AI, IoT, and embedded systems

Magnetic Materials and Devices for Mobility, Power Electronics and Energy Conversion

MPEEC 2026

Seville, Spain

9-11 September 2026

This workshop originates as an initiative to integrate different aspects of the role of magnetic materials in energy conversion processes and devices.

It is structured around three main topics: motors and generators, power electronics, and other energy conversion processes (which includes calorics, energy harvesting, etc.).

The interlink between materials and devices will be stressed, with the aim of facilitating synergies between these apparently disjoint communities. This workshop fits in the scope of the IEEE roadmap program on magnetic passive components for power electronics.

IMPORTANT DATES

Abstract submission
16 February - 31 March

Abstract acceptance
22 April

Early registration
27 April - 06 July

Click here for more information:

http://eventos.us.es/go/mpeec2026

SPONSORS

UNIVERSIDAD D SEVILLA 1505

MUFENS

IEEE MAGNETICS

IEEE Magnetics Society Distinguished Lecturers For 2026–2027

Please also note that the 2025–2026 DLs will also be giving talks in 2026.

Structure, Control, and Dynamics of Altermagnetic Textures

Olena V. Gomonay
Johannes Gutenberg University
of Mainz, Germany

Altermagnets are collinear magnetically ordered phases with zero net magnetization and alternating spin polarization. These emergent materials combine fast magnetic dynamics with large spin band splitting. Both effects arise from strong (non-relativistic) exchange interactions between local magnetic moments and electron spins. I will present a phenomenological theory of altermagnets that describes their unique magnetization dynamics and magnetic textures. Focusing on prototypical d-wave altermagnets such as RuO_2, we can intuitively explain the unique lifted degeneracy of their magnon spectra by the emergence of an effective, sublattice-dependent, anisotropic spin stiffness, which arises naturally from the phenomenological theory.

I will discuss a symmetry-based approach to describe altermagnetic textures and dynamics using the altermagnet candidate Mn Si as an example. The approach's key point is an altermagnetic order parameter that formalizes the symmetry of the magnetic atoms' local environment and enables the altermagnetic behavior to be distilled [1]. I will demonstrate how this concept enables us to reconstruct the equilibrium magnetic structure of Mn_5Si_3 from the field dependences of the anomalous Hall effect [2]–[4]. Finally, I will discuss the spin wave spectra and dynamics of the altermagnetic domain wall, focusing on a comparison between the altermagnetic and antiferromagnetic phases of the material.

Olena V. Gomonay (M ’24) obtained the M.Sc. in condensed matter physics in 1985 from the Moscow Institute of Physics and Technology. She was awarded the Ph.D. in 1992 and a further doctoral degree in 2003, both in condensed matter physics, from the Kurdyumov Institute of Metal Physics, National Academy of Sciences of Ukraine, Kyiv. She became Associate Professor in 1995, and Professor in 2002, at the Institute of Physics and Technology, National Technical University of Ukraine – Kyiv Polytechnic Institute. Since 2015 she has been a member of the INSPIRE-SPICE Group at Johannes Gutenberg University of Mainz, Germany. Her research is on antiferromagnetic and altermagnetic spintronics, including magnetism theory, magnetoelasticity, and quantum optics.

[1] O. Gomonay et al., “Structure, control, and dynamics of altermagnetic textures,” npj Spintronics, vol. 2, art. no. 35, Jul. 2024, doi: 10.1038/s44306-024-00042-3.

[2] J. Rial, et al., “Altermagnetic variants in thin films of Mn5Si3,” Phys. Rev. B, vol. 110, art. no. L220411, Dec. 2024, doi: 10.1103/PhysRevB.110.L220411.

[3] M. Leiviskä, et al., “Anisotropy of the anomalous Hall effect in thin films of the altermagnet candidate Mn_5Si_3,” Phys. Rev. B, vol. 109, art. no. 224430, Jun. 2024, doi : 10.1103/PhysRevB.109.224430.

[4] R. Zarzuela, et al., “Transport theory and spin-transfer physics in *d*-wave altermagnets,” Phys. Rev. B, vol. 111, art. no. 064422, Feb. 2025, doi: 10.1103/PhysRevB.111.064422.

Olena V. Gomonay

ogomonay@uni-mainz.de

+49-6131-39-27960

Beyond the Three Traditional Assumptions of Spintronics

Kyung-Jin Lee
Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Republic of Korea

Spintronics has transformed our ability to generate, transfer, and manipulate angular momentum in solids, enabling powerful strategies for current-driven control of magnetic states and devices. Despite its remarkable success, the field has traditionally been built upon three simplifying assumptions: a classical description of localized spins (magnetic moments), exchange interactions that act purely between spin degrees of freedom, and the predominance of spin dipole moments as the primary carriers of angular momentum. This talk explores what new physics emerges when these assumptions are relaxed and when additional internal degrees of freedom are taken seriously.

In particular, I will discuss the role of longitudinal quantum fluctuations in spin transfer processes [1], revealing regimes where angular momentum transport cannot be captured by conventional transverse spin dynamics. I will then introduce current-driven control of magnetism mediated by orbital exchange interactions [2], highlighting how orbital degrees of freedom provide a qualitatively new channel for coupling electric currents to magnetic order. Finally, I will present multipolar pathways for angular-momentum transport that go beyond conventional dipolar mechanisms [3], opening a broader framework for spintronics and orbitronics in which higher-rank moments play an active and controllable role.

Kyung-Jin Lee (M ’08, SM ’23) received the B.S., M.S., and Ph.D. degrees from Korea Advanced Institute of Science and Technology (KAIST) in 1994, 1996, and 2000. He was a postdoctoral fellow at SPINTEC in Grenoble, France, from 2003 to 2005. He worked at Samsung Advanced Institute of Technology for five years and at Korea University for 15 years. In October 2020, he joined the Department of Physics at KAIST, where he is currently a KAIST Endowed Chair Professor. Dr. Lee is the recipient of several awards including the Order of Science and Technology Merit Medal from the Korean government and “100 Future Technologies and Leading Scientists in Korea: Spin Memory and Logic Devices” from the National Academy of Engineering of Korea. He is a Fellow of the American Physical Society. His current research interests include angular momentum dynamics and quantum spin transfer.

[1] T. Lee et al., “Signatures of longitudinal spin pumping in a magnetic phase transition,” Nature, vol. 638, pp. 106–111, Jan. 2025, doi: 10.1038/s41586-024-08367-z.

[2] G.-H. Lee, K.-W. Kim, and K.-J. Lee, “Orbital exchange-mediated current control of magnetism,” unpublished, 2025.

[3] H.-W. Ko and K.-J. Lee, “Magnetic octupole Hall effect in d-wave altermagnets,” unpublished, Aug. 2025, arXiv:2508.00794.

Kyung-Jin Lee

kjlee@kaist.ac.kr

+82-42-350-7923

Quantitative MRI: Magnetic Metrology to Solve Some of the World's Most Important Problems

Stephen E. Russek
National Institute of Standards and Technology,
Boulder, Colorado, USA

Magnetic resonance imaging (MRI) can manipulate and detect spins inside the human body and, when made quantitative (qMRI), can be used to measure many important physiological parameters. We do not usually consider humans to be magnetic, but they are complex and important magnetic systems. Understanding and manipulating spins in humans and biomaterials allow measurements of tumor volumes and properties, neural connectivity, tissue water dynamics, tissue electromagnetic and mechanical properties, local temperature, local metabolic and neurotransmitter concentrations, and the absorption and propagation of microwave and X-ray radiation. Since its development over 50 years ago by physicists and engineers, MRI has developed into the premier method to measure properties and functionally inside living systems and biomaterial surrogates, with the ability to do three-dimensional and four-dimensional mapping with sub-millimeter and sub-second resolution. The transition of MRI to qMRI has enabled many new and surprising applications.

I will present recent advances in qMRI that enable the imaging of microwave propagation and absorption in biomaterials using hyperpolarized low-field MRI. We can see how this ubiquitous microwave radiation (from cell phones, WiFi, Bluetooth, etc.) interacts with the complex electromagnetic structures that exist in humans. I will present new qMRI techniques to map radiation dose from therapeutic X-ray and proton sources used in cancer treatments. I will show how qMRI is used to measure water dynamics and spin-relaxation in tissue to enable in-vivo biopsies, where tissue health can be determined without invasive procedures.

$^{3}_{5}$

Stephen E. Russek (M ’16, SM ’18, F ’24) obtained the A.B. in physics from Harvard University in 1980, spent two years working at AT&T Bell Laboratories researching advanced silicon devices, and then obtained the Ph.D. in physics from Cornell University in superconducting devices in 1990. He currently leads the Imaging Physics Project in the Magnetic Imaging Group at NIST and codirects NIST’s MRI Biomarker Measurement Service. He is coauthor of over 250 peer-reviewed publications with over 12,000 citations, has written several book chapters, and has three patents.

Dr. Russek is a Fellow of the IEEE and the American Physical Society (APS). He is a recipient of bronze, silver, and gold medals, and the Ron Brown award, from the U.S. Department of Commerce, for his work on neuromorphic technology, spintronics, and spin oscillators, MRI phantoms, and quantitative medical imaging. He received the Colorado CO-Labs award for high impact research. He has supervised over 30 undergraduate and graduate students and postdoctoral fellows. He is an active member of the medical physics group in APS, the International Society of Magnetic Resonance in Medicine, and the Radiological Society of North America. He was the 2024–2025 chair of the Rocky Mountain Chapter of the Magnetics Society.

Stephen E. Russek

serussek@ieee.org

+1-303-589-5254

Reflection from the General Chair of MMM 2025, Palm Beach, FL – Tiffany Santos

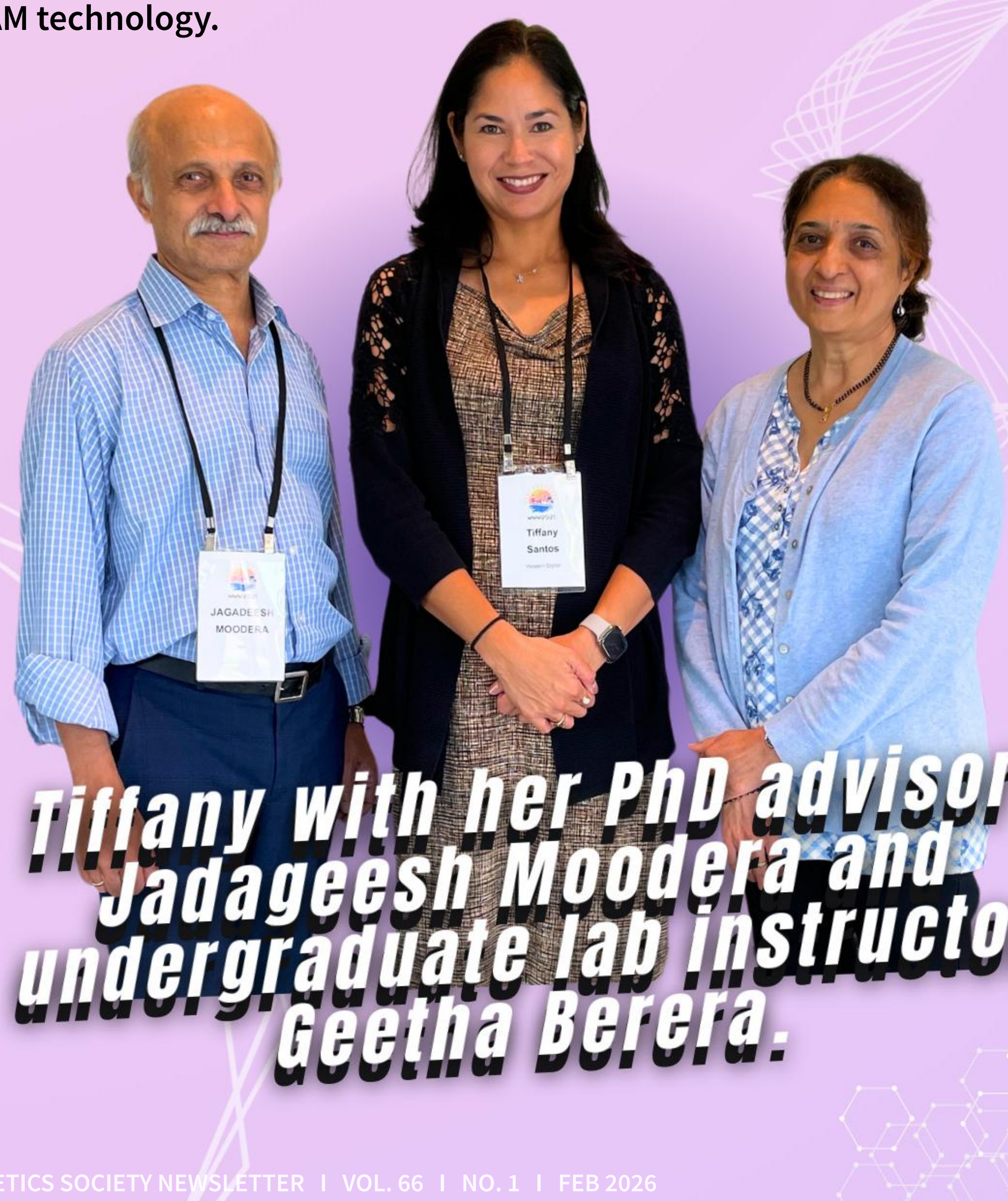
Tiffany at the Welcome Reception enjoying a “Bloody Cocktail”, a custom drink for the Conference made with blood orange by request of the General Chair.

Looking back upon the MMM in West Palm Beach, Florida, I'm so relieved and pleased that I can reflect not only on another successful MMM Conference but also fondly on a truly fun and rewarding time spent with colleagues in a sunny beach town. For a stretch of days leading up to the conference, there was a serious threat that it wouldn't turn out that way, with tropical storm Melissa strengthening and making its way toward Florida. A hurricane coinciding with the MMM was my nightmare scenario ever since I agreed to take on the role of General Chair in early 2022. Imagine my relief when the spaghetti models showed with increasing likelihood that it was headed elsewhere. With air travel already strained due to a prolonged U.S. Government shutdown, the conference had already weathered enough uncertainty and challenges.

When the deadline for contributed abstracts passed in late June, we had the lowest number of abstracts submitted in over a decade. Although we were hoping for better, it was not a big surprise as we have entered a political climate that is less friendly and less enticing to international travelers, compounded by sharp cutbacks in U.S. Government funding for scientific research—pressures that constrain travel budgets and job opportunities. A low number of abstracts led to a prediction of low attendance and near certainty of not filling the required 1443 room nights across our Hilton and Marriott hotel blocks, thus incurring a hefty attrition penalty for every room night left unfilled. As General Chair, I had the unpleasant task of warning our headline sponsors—the IEEE Magnetics Society and AIP Publishing—that the conference was going to operate at a deficit.

In the face of this crisis, this is a time (one of many) when having a fantastic Steering Committee really pays off. We brainstormed ways to boost attendance and attract participants to stay in the conference hotels. We implemented several of these ideas: opening another round of abstract submissions for late-breaking posters, offering free breakfast to attendees staying in the conference hotels, and offering a 50% rebate on the student registration fee for students staying in the conference hotels. The latter idea came with considerable risk. According to the modeling of our Co-Treasurer Vivek Amin, the student rebate would result in an even greater loss if too few students took it or if too many took it. In the end, the hotel pickup for students plus regular attendees surpassed even the best-case scenario in our model. This was a huge, surprising turnaround! This large departure in attendee behavior from the trend observed in previous conferences is likely due to the competitive room rate for the MMM compared to pricey options surrounding the convention center.

That's enough reflecting on the hardships. I happily turn now to the highlights. I was honored to organize and chair the Special Evening Session commemorating 50 years of the magnetic tunnel junction, featuring esteemed experts Jagadeesh Moodera, Hiroaki Sukegawa and Guohan Hu. This was an especially meaningful occasion for me, as I had first started doing research as an undergraduate student in Prof. Moodera's lab at MIT. He advised me in my PhD studies on MTJs with novel materials, and I'm still working on MTJs today. In this special session, Prof. Moodera shared his perspective on his discovery of TMR at room temperature, followed by Dr. Sukegawa account of achieving ever-increasing TMR values. Bringing an industry point-of-view, Dr. Hu described the progress on pushing MTJ performance for next generation STT-MRAM technology.



Tiffany with her PhD advisor Jadageesh Moodera and undergraduate lab instructor Geetha Berera.

Speakers Guohan Hu, Hiroaki Sukegawa, and Jagadeesh Moodera and Chair Tiffany Santos at the Special Evening Session: Commemorating 50 Years of the Magnetic Tunnel Junction.

Welcome Reception at the Palm Beach County Convention Center

It is also my pleasure to highlight the Women in Magnetism Networking Reception, a recurring event at MMM that I always enjoy. This year's reception was especially delightful because Winedos (winedos.com) provided the wine and Program Co-Chair Enrique del Barco and his wife Elena hosted the wine-tasting. Hearing remarks from the women leaders of our community, including IEEE Magnetics Society President-Elect Sara Majetich, and conversing with enthusiastic, promising female students while sipping wine in a serene, poolside setting made for an inspiring event. Personally, I prefer a wine reception over the traditional bierstube. In fact, upon returned home from Palm Beach, I placed an order with Winedos for the wines featured at the tasting, and I enjoy it now as I write and wrap up this reflection.

Enrique del Barco and his wife Elena host the wine tasting at the Women in Magnetism Networking Reception

The most important task in the role of General Chair is selecting the Steering Committee. I could not have asked for a better team. Every member was communicative, dedicated to their role and a pleasure to work with. I hope they found their involvement in conference organization as rewarding as I have, ever since the first SteCom role I took on, as Exhibits Chair for MMM 2014 in Hawaii. When I was asked to consider being nominated as General Chair for MMM 2025, the first message I sent was to Conference Manager Molly Bartkowski, to check if Simply Vintage would be the managing team in 2025. When she said yes, I knew that with the administrative support of Molly and Simply Vintage, being General Chair was an opportunity I shouldn't pass up.

I want to give a shout-out to Prof. Chris Marrows, General Chair of MMM 2020, which was supposed to be held in these same Palm Beach venues, but turned completely virtual due to COVID. What a tumultuous time to be at the helm of a flagship conference! He did all the work of being General Chair, but without experiencing the in-person festivities. When asked about it in Palm Beach, he said that he got to have fun in Palm Beach while Tiffany did all the work! Now it's Stéphane Mangin's turn. See you in Honolulu…

Tiffany & Co-Treasurer Vivek Amin in costume as Moana and Mark Stiles on Halloween

Tiffany & the Simply Vintage team Regina Mohr, Molly Bartkowski, Ashley Cesare, and Shelbie Jenkins on Halloween

Advances in Magnetism Awards

supported by AIP Advances, to the best paper submitted as part of MMM 2023, held in Dallas, Texas. The winner from the MMM 2025 papers will be presented at MMM 2026 in Honolulu, Hawaii. Each year, the winner receives $3500 plus a travel allowance.

Congratulations to Xinyu Cao for her winning paper from MMM 2023 titled “Feasibility study on on-board magnetoencephalography with optically pumped magnetometers.”

Best Student Presentation Award

supported by Elsevier. This award recognizes and encourages excellence in graduate studies in the field of magnetism. The winner will receive $1,000 and the remaining finalists will each receive $250.

the winner is…

Bob Vermeulen, IMEC; KU Leuven
BC-14: Chirally Coupled Magnetic Tunnel Junctions Resulting from the Dzyaloshinskii-Moriya Interaction

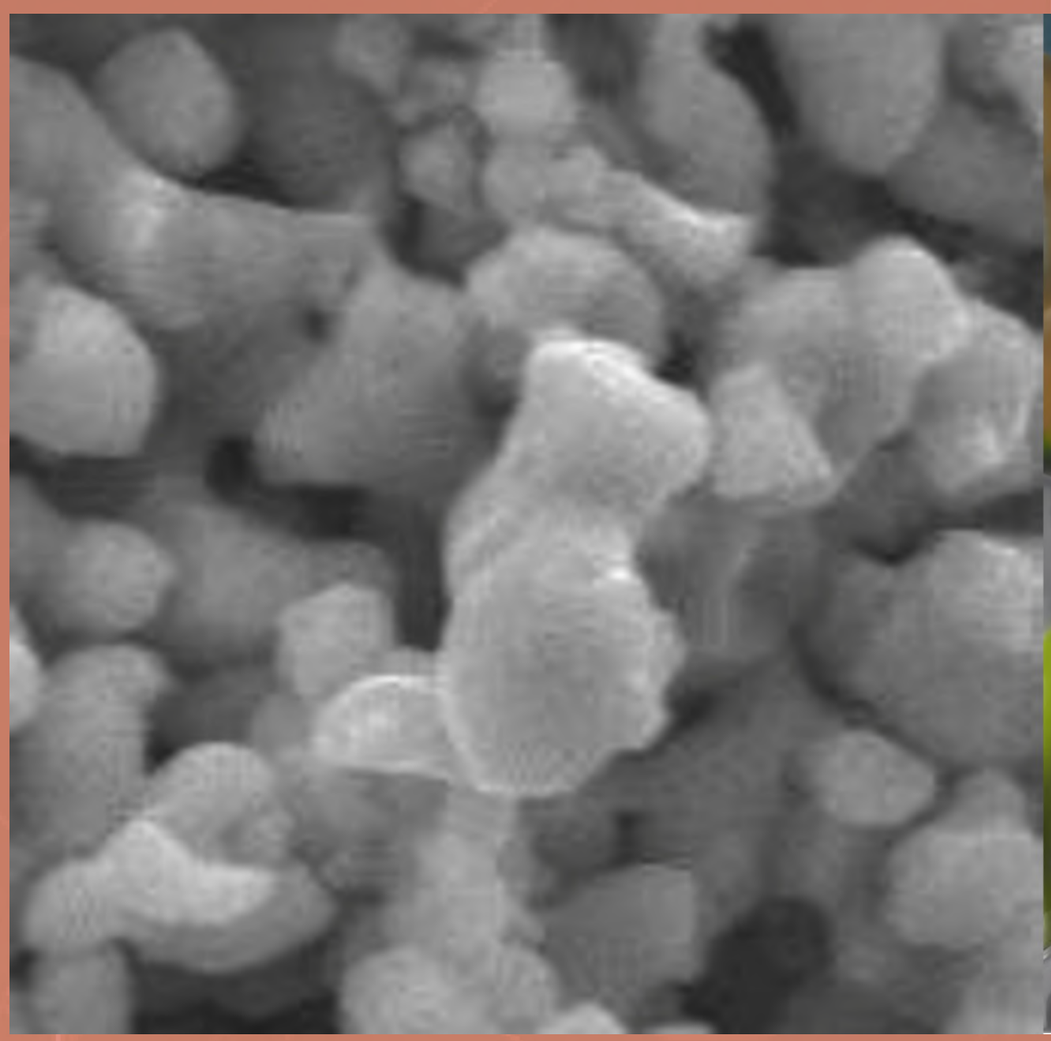
Magnetism as Art Showcase

This event showcases the artistic talents of our attendees while highlighting the beauty of magnetism and magnetic materials.. Each finalist will receive $200, and the winner will receive $400.

The winner, selected by popular vote, is… Rubiya Mohammed for “Meet SEM, The Magnetic Bunny”.

Advances in Magnetism Awards – Xinyu Cao

Best Student Presentation Award – Bob Vermeulen, IMEC, KU Leuven



Magnetism as Art Showcase Winner (popular vote) – Rubiya Mohammed for “Meet SEM, The Magnetic Bunny”.

The 17th Annual MRAM Forum was held as a one-day satellite conference following IEDM 2025. . .

The 2025 MRAM Global Innovation Forum Highlighted MRAM Technology Innovations, Advances, & Research from Industry Experts

- *The technical program featured invited talks from leading MRAM experts and researchers*
- *The evening panel topic was: "MRAM in System Level Design: Benefits & Challenges"*

The MRAM Global Innovation Forum is the industry's premier platform for magnetoresistive random access memory (MRAM) technology, bringing together leading magnetics experts and researchers from industry and academia to share the latest MRAM advancements. Now in its 13th year, the annual one-day conference was held the day after the IEEE International Electron Devices Meeting (IEDM) on December 11, 2025, at the Hilton San Francisco Union Square Hotel.

Nonvolatile MRAM technology is known for its high speed, endurance, scalability, low power consumption, and radiation hardness, and it is increasingly being used in embedded memory applications for automotive microcontrollers, edge artificial intelligence (AI) devices, data centers, sensors, aerospace, and in wearable devices.

The 2025 MRAM technical program consisted of 12 invited presentations from leading global MRAM experts, as well as an evening panel.

"The STT-MRAM market is growing rapidly now, especially with use of embedded STT-MRAM in next-generation automotive microcontroller units," said Kevin Garello, MRAM Forum co-chair (since 2021) and senior researcher engineer at SPINTEC. "I expect edge AI applications to be the next big market for STT-MRAM."

"I am pleased to see that, over the years, the MRAM Forum series has grown into a landmark event within the MRAM industrial ecosystem," said Bernard Dieny, former MRAM Forum co-chair (2017–2023), and director of research at SPINTEC. "We are witnessing a steady increase in the adoption of this technology across the microelectronics industry, and the initial concerns associated with this new technology are steadily fading away."

Here are details of the 2025 MRAM Global Innovation Forum technical program:

Technical Presentations (Invited)

A series of invited talks by leading industry experts formed the technical program at the MRAM Forum, presented consecutively in four technology areas:

17th MRAM Global Innovation Forum

Hilton Union Square – room Imperial B, San Francisco

SAMSUNG December 11, 2025 IEEE MAGNETICS

SESSIONS		TOPICS	SPEAKERS
08:45-09:00: WELCOME & INTRODUCTION (K. Garello, D. Worledge)			
TECHNOLOGY DEVELOPMENT Chair: Jean Anne Incorvia	09:00	High-Performance MRAM for Advancing Automotive Innovation	Allen Wang *TSMC*
	09:30	MRAM Macro Design Challenges for Automotive Applications in 22nm-FDSOI Technology	Siddarth Gupta *GlobalFoundries*
	10:00	Recent Advances in Robust and Scalable Embedded MRAM	Jeong-Heon Park *Samsung*
	10:30	Magnetic Field Immunity Demonstration for STT-MRAM	Kerry Nagel *Everspin*
10:45-11:00 COFFEE BREAK			
PRODUCT DEVELOPMENT Chair: Luc Thomas	11:00	MRAM at the Edge	Thomas Jew *NXP*
	11:30	Trends in Embedded MRAM MCUs for Edge AI Applications	Tomoya Saito *Renesas*
	12:00	eMRAM for Image Sensor Applications	Masanori Hosomi *Sony*
	12:30	MRAM Powered by Numem's AI Memory Engine - Paving the Way for Low-Power Intelligence Everywhere	Max Simmons *Numem*
12:45-14:15 LUNCH BREAK			
EXPLORATORY TOPICS Chair: Jordan Katine / TOOLING	14:15	Tight-pitch MRAM Patterning with Lam IBE System	Xiaoyu Kang *LAM*
	14:30	Innovations in Wafer-Level Testing for Modern and Next-Generation MRAM Technologies	Siamak Salimy *HProbe*
	14:45	Applications & Performance Goals of MRAM in Defense Applications	Mike Burkland *Raytheon*
	15:00	Progress and Gaps in Double Spin-torque MTJs for Last Level Cache Applications	Guohan Hu *IBM*
	15:30	Challenges of CMOS/Spintronics-Hybrid Logic Design for Edge AI Hardware	Takahiro Hanyu *Tohoku Univ.*
16:00-18:00 BIERSTUBE			
PANEL Lead: Daniel Worledge	16:45	MRAM in System-Level Design: Benefits & Challenges Tomoya Saito (*Renesas*), Masanori Hosomi (*Sony*); Max Simmons (*Numem*), Kevin Conley (*Applied Brain Research*), Reza Kazerounian (*Alif Semiconductor*)	
17:45 CLOSING REMARKS			

High-Performance MRAM for Advancing Automotive Innovation

Allen (Yu-Jen) Wang, TSMC

STT-MRAM technology delivers high speed, superior endurance, and high-retention capabilities with scalable, reliable solutions required for evolving autonomous and software-defined vehicles. Key developments of N16 MRAM included meeting Autograde-1 CFR of <1 ppm, and performance that surpasses other nonvolatile memory (NVM) applications while achieving high production yields. The work also evaluated emerging N5 MRAM, including Flash-like and RAM-like offerings.

Recent Advances in Robust and Scalable Embedded MRAM

Jeong-Heon Park, Samsung

Embedded STT-MRAM scalability and reliability are advancing rapidly, as demonstrated by a logic-compatible 8 nm, 128 Mb device with a 0.017 μm^2 cell, sub-ppm read- and write-failure rates, and stable operation from –40 to 150 °C. In parallel, wafer-level shielding enhances magnetic robustness, integrating a soft magnetic layer in the back-end-of-line (BEOL) process to increase protection against external magnetic fields with efficiency that outperforms conventional package-level methods.

MRAM Macro Design Challenges for Automotive Applications in 22 nm FDSOI Technology

Siddarth Gupta, GlobalFoundries

MRAM's expansion into automotive arenas requires robust performance across wide voltage and temperature ranges, with ultralow error rates, high endurance, long-term retention, and immunity to magnetic interference. Compared to embedded Flash, MRAM offers high write speeds that enable rapid over-the-air updates for automotive systems. The work presented GlobalFoundries' 22 nm FDSOI (fully depleted silicon on insulator) 4 MB automotive MRAM, highlighting design advancements tailored for automotive operations and discussing system-on-chip (SoC) integration challenges.

Magnetic Field Immunity Demonstration for STT-MRAM

Kerry Nagel, Everspin

STT-MRAM is susceptible to external magnetic fields from fixed magnets or high-current lines in industrial and commercial applications. STT-MRAM has significantly higher magnetic field immunity than hard disk drives or Toggle MRAM, used for decades in harsh environments. The work presented a discussion of magnetic fields expected from various inputs, and their impact to use cases, along with a live bit error rate demonstration using a fixed-magnet STT-MRAM device.

MRAM at the Edge

Thomas Jew, NXP

Microcontrollers (MCUs) with embedded MRAM are expanding into smart Edge devices. Foundries are extending MRAM beyond 2x technology nodes into 1x and 0x nodes, enabling MRAM/MCU migration into advanced complementary metal oxide semiconductors (CMOS) for high-performance computation with low power/energy capabilities in connected applications, including the ultimate Edge devices, software-defined vehicles (SDVs). This talk focused on MRAM in zonal controllers, making it an ideal memory to drive SDVs into reality

Trends in Embedded MRAM MCUs for Edge AI Applications

Tomoya Saito, Renesas

AI is transforming every aspect of life and is essential for data centers and embedded systems at the edge. AI enhances industrial applications, smart homes, and safety/security systems, minimizing communication latency and improving real-time performance by processing data locally in embedded systems on MCUs/MPUs. The emergence of TinyML has enabled compact models optimized for limited memory and computing, expanding the adoption of AI into MCU-based systems.

eMRAM for Image Sensor Applications

Masanori Hosomi, Sony

Limitations of pixel bonding and logic wafers have necessitated the use of dynamic and static random access memory (DRAM and SRAM) to meet sensor functions and area limitations. Reduction of memory macro area is achieved with embedded STT-MRAM at less than one-third of SRAM area with nonvolatile characteristics for smart MCUs without external memory. eMRAM has been commercialized in GPS, smart watch, and wireless systems, as well as image sensor systems.

MRAM Powered by Numem's AI Memory Engine—Paving the Way for Low-Power Intelligence Everywhere

Max Simmons, Numem

As AI expands into autonomous robots, smart devices, and embedded systems, the need for intelligent, ultra-efficient memory is critical. Traditional memory was not designed for the low power, fast response, and small form factors required for edge AI. Numem's advanced foundry MRAM-based AI Memory Engine redefines the memory-compute relationship, delivering high-speed, low-leakage, scalable memory optimized for efficient intelligent edge systems.

Tight-Pitch MRAM Patterning with Lam IBE System

Xiaoyu Kang, LAM

MRAM magnetic tunnel junction (MTJ) patterning is inherently challenging, and conventional reactive ion etch produces a tapered profile and MgO damage. As MRAM scales, the ion beam is increasingly shadowed by hard-mask, making it challenging to remove metal residuals to prevent device shorting and retain magnetic properties. The Lam Kyber® system is an ion beam etching module that provides integrated etch and encapsulation, featuring a broad collimated ion beam that covers the wafer.

Innovations in Wafer-Level Testing for Modern and Next-Generation MRAM Technologies

Siamak Salimy, HProbe

MRAM is expanding to MCUs, with current deployment based on spin transfer torque MTJs. Immunity of MRAM devices to external magnetic fields is critical, requiring tests under controlled magnetic excitation during operation. MRAM evolution demands high-speed, robust memory, especially for AI and machine learning. Spin orbit torque (SOT), cross-point, and Gate-SOT MRAM are emerging to meet these requirements, introducing unique opportunities for wafer-level testing.

Applications & Performance Goals of MRAM in Defense Applications

Mike Burkland, Raytheon

In addition to performance considerations for MRAM in defense applications, there are market and business considerations that make up the calculus for adoption. The work presented a brief discussion of the current challenges for transfer of spintronic-based technologies into production in the context of non–von Neumann architectures. As well, the maturation of technologies, in general, crossing the "Valley of Death" was discussed.

Progress & Gaps in Double Spin-Torque MTJs for Last-Level Cache Applications

Guohan Hu, IBM

This work included evaluation of double spin-torque (DS) MTJs, demonstrating 25% efficiency improvement compared to single MTJs. Optimized DS-MTJ stacks with synthetic antiferromagnetic bottom reference layers enable reliable antiparallel alignment for a 4 kbit DS-MTJ array. Switching of 4 k devices with 2 ns write pulses was demonstrated for the first time. Next is DS-MTJ stacks combining high top reference layer efficiency with high activation energy, steep write error rate (WER) slope, and low offset field.

Challenges of CMOS/Spintronics-Hybrid Logic Design for Edge AI Hardware

Takahiro Hanyu, Tohoku University

In AI hardware, power supply is limited in edge environments. To reduce cloud computing loads, it is necessary to enhance processing capability on the edge side. Spintronics devices feature nonvolatility, fast read/write, and high endurance, capable of replacing RAM and low-power, high-performance very-large-scale integration (VLSI) processors in edge AI. Nonvolatile near-memory using embedded MRAM can be stacked on central processing units, reducing distance and control complexity, with power-gating control to reduce power consumption.

Panel Session

Following the technical presentations, a panel discussion was held on the theme, "***MRAM in System-Level Design: Benefits & Challenges***." This year's panel was moderated by Daniel Worledge, Distinguished Research Scientist, IBM Research. Panelists included:

- Kevin Conley, CEO, Applied Brain Research
- Masanori Hosomi, Principal Engineer, Sony Semiconductor Solutions
- Reza Kazerounian, Co-founder & President, Alif Semiconductor
- Tomoya Saito, Senior Principal Process Engineer, Renesas Electronics
- Max Simmons, CEO, Numem

Sponsorship

For 13 years, the MRAM Global Innovation Forum has been supported by Samsung Electronics through a donation to the IEEE Magnetics Society. Additional funding and logistical support are provided by the IEEE Magnetics Society. Additional sponsorship was provided by Everspin Technologies, Canon Anelva, HProbe, and Western Digital.

For further information about the 2025 MRAM Global Innovation Forum, please visit:
https://sites.google.com/view/mramforum/home

MRAM Evening Session

MRAM Forum Sponsors

Building Science, Community, and Impact:

Reflections from the New Chair of Women in Magnetism

Sonal Shreya

Sonal Shreya is an assistant professor at Aarhus University, Denmark, where she leads the Spintronics and Neuromorphic Engineering group, advancing interdisciplinary research at the intersection of physics, materials science, electrical engineering, and neuroscience.

As the newly elected Chair (January 2026) of IEEE Women in Magnetism, I invite researchers at all stages to join a community built on support, mentorship, and shared ambition—because together, there is truly no limit to how high we can fly.

I am Sonal Shreya, originally from India, where I completed my foundational and higher education at premier institutions including the National Institute of Technology (NIT) and the Indian Institute of Technology (IIT). Growing up in a small town, I carried big aspirations, guided primarily by perseverance, optimism, and a belief in the transformative power of education.

I am deeply grateful to my parents and my grandfather, who shaped my confidence early on and encouraged me to view education as a pathway to independence and impact. Becoming the first female engineer in my family was a meaningful milestone, although at the time I did not foresee the long and demanding journey that would eventually lead me to serve as Chair of the IEEE Women in Magnetism (WiM) Committee.

Across the globe, women and other underrepresented groups continue to navigate additional barriers—visibility challenges, career interruptions, caregiving responsibilities, and systemic biases. My experience reflected many of these realities. During my Master's degree studies, I was the only woman in my cohort. I was fortunate to have a dedicated thesis supervisor whose own professional journey demonstrated that while the path in science can be challenging, it is also deeply rewarding.

My engagement with WiM has been a constant source of motivation and resilience. Observing the leadership of former Chair Montserrat Rivas, and learning from the experiences of WiM leaders such as Diana Leitão, Pallavi Dahat, Sara A. Majetich, Oksana Chubykalo-Fesenko, and many others, reinforced a powerful message: Progress is built collectively. WiM is more than a committee, it is a community defined by mutual support, trust, and shared ambition.

The IEEE MagSoc has played a unique role in this journey. While my earlier involvement with professional societies offered mixed experiences, MagSoc has consistently provided an inclusive and supportive environment where women are encouraged to lead and thrive. The strong institutional backing WiM receives across MagSoc committees is both tangible and deeply appreciated.

After completing my Ph.D. at IIT Roorkee in 2020, I moved to Denmark as a postdoctoral researcher. In 2023, I received faculty offers in both Denmark and the Netherlands. With a young child at the time, I chose Aarhus University, supported by my family's shared commitment to building a stable and fulfilling life. Shortly thereafter, the sudden passing of my Ph.D. supervisor, Prof. Brajesh Kumar Kaushik, alongside other professional challenges, marked a difficult period of transition.

During this time, WiM became an anchor. Regular committee interactions, online meetings, and engagement at INTERMAG and MMM conferences offered encouragement and perspective. I am grateful to the WiM committee members, including Yuko Ichiyanagi, Cindi Dennis, Sai Li, Lourdes Marcano, Tatiana Damatopoulou, Elizabeth Martin Jefremovas, Vanessa Pilati, Hind Bourouis, Radhika Barua, and many others, whose dedication continues to sustain the spirit and mission of WiM.

The past year has represented an important step toward research independence and leadership. I have been actively establishing my own research direction, contributing as a co-Principal Investigator to several Danish and European initiatives. This effort culminated in securing a major research grant as Principal Investigator of the SpinChip project, funded under Horizon Europe (Chips JU) with national support from Innovation Fund Denmark. Beyond its scientific ambition, this project carries a strong sense of responsibility and opportunity to generate long-term societal impact.

Balancing research funding, teaching, student supervision, and group building has been demanding, yet deeply fulfilling. I am currently developing a research program in Spintronics and Neuromorphic Engineering at the Department of Electrical and Computer Engineering, Aarhus University, spanning device modeling and characterization, circuit-to-system design, and brain-inspired computing architectures. The strong support from my department, the university, and Denmark's long-standing commitment to diversity and equality has made this journey both meaningful and sustainable.

SpinChip is more than a research project, it is a collaborative ecosystem. With the support of the project coordinator, Paolo Bortolotti, and 28 European partners across academia, research institutes, Small and Medium-sized Enterprises, and industry, the project creates tangible opportunities for early-career researchers and women scientists to engage in high-impact research, leadership, and cross-sector collaboration. Large-scale European initiatives like this play a critical role in empowering women to pursue ambitious ideas and translate scientific excellence into real-world impact.

As I look ahead, I am excited not only to serve Women in Magnetism in Europe, but also to contribute to its growing global impact within IEEE Magnetics Society. I already see WiM members reaching important milestones, and I am confident this community will continue to inspire, uplift, and lead.

To female students, researchers, and professionals in academia and industry: I warmly invite you to join Women in Magnetism. Here, you will find mentorship, opportunity, and a community that believes in your potential. My journey has reinforced one simple truth, when we support one another, there is no limit to how high we can rise.

MEET IEEE MAGSOC FELLOW

Prof. Adekunle Adeyeye

Citation: "for contributions to synthesis and characterization of magnetic nanostructures for low-power magnonic information processing applications," Class of 2026 IEEE Fellow

Dr. Adekunle Adeyeye is a Professor of Physics at Durham University, United Kingdom. He received his B.Sc. degree in physics from the University of Ilorin, Nigeria, in 1990, followed by an M.Phil. in Microelectronic Engineering and Semiconductor Physics (1993) and a Ph.D. (1996) from the University of Cambridge. In 1996, he was elected a Junior Research Fellow at Trinity College, Cambridge. He subsequently served as a Senior Research Engineer at the Data Storage Institute in Singapore before returning to Cambridge to continue his fellowship at the Nanoscale Science Laboratory.

In 2000, Dr. Adeyeye joined the Department of Electrical & Computer Engineering at the National University of Singapore (NUS) as an assistant professor. He was promoted to associate professor with tenure in 2006 and to full professor in 2012.

Professor Adeyeye's research focuses on advanced nanofabrication and nanomagnetism. He has pioneered methods for synthesizing complex magnetic nanostructures using deep ultraviolet lithography and innovative resolution enhancement techniques, enabling fabrication well beyond conventional limits. His work has provided key insights into critical scaling behavior in nanoscale magnetic devices, significantly advancing fundamental understanding in the field.

A leading figure in magnonics, Professor Adeyeye invented a technique for guiding and manipulating spin waves at the nanoscale. His breakthrough enables spin wave propagation in both straight and curved structures without external magnetic fields—overcoming a longstanding barrier in the field. His team further demonstrated controlled signal manipulation analogous to transistor gating, marking a major step toward practical magnonic devices.

He is a Fellow of the American Physical Society, Fellow of the Institute of Physics, Fellow of the Institute of Nanotechnology, and a Royal Society Wolfson Fellow.

From Shorelines To Field Lines: Students in Magnetism Make Networking Waves at the MMM 2025 Conference, Palm Beach, FL

Gina Pantano, Samuel Tkacik, May Inn Sim, Students in Magnetism (SiM)

Students in Magnetism (SiM) is the youngest entity of the IEEE Magnetics Society, and their mission is to bring graduate students in magnetism together from all around the world as a community and facilitate meaningful connections. We believe that was the heart of our presence this year at the 2025 MMM conference in Palm Beach, Florida. We had the honor of organizing not one but two student-centric networking events where we played lots of games, ate good food, and enjoyed even better company. The following sections take a deep dive into the preparation behind the conference events and the fun ways we got students involved! Thank you again to Shelbie Jenkins (Special Events/Support Manager), Hari Srikanth (Special Sessions & Events Chair), and the entire MMM organizing committee for making these events possible.

Event Preparation

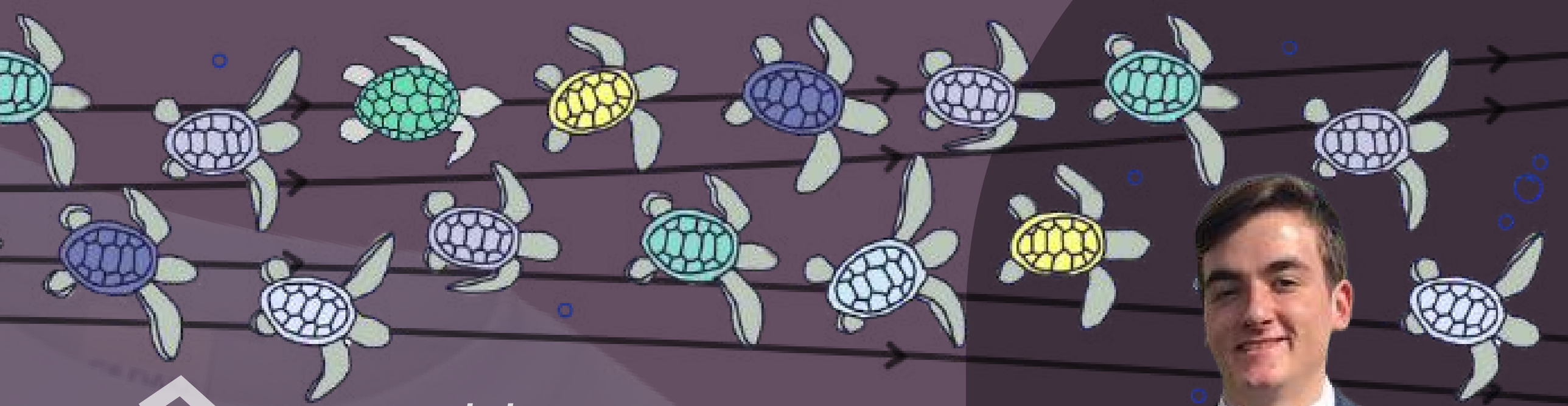
Organizing the SiM events for the MMM conference was an incredibly rewarding experience. We began planning back in April 2025 when the special events chair, Professor Hari Srikanth, introduced May Inn (the chair of SiM) to Gina and Samuel, both applied physics Ph.D. students at the University of South Florida. The SiM organizing committee very quickly bonded over our early and late night zoom calls with an 11 hour time difference between Florida and Singapore. I think we can collectively agree that one of the highlights of this experience was getting to know each other and sharing the same passion for student outreach. During every brainstorming session, we tried to outdo our previous ideas.

The SiM organizing committee! From left to right: Gina Pantano, Samuel Tkacik and May Inn Sim.

Gina Pantano

Gina Pantano is a Ph.D. student in applied physics at the University of South Florida and earned a B.S. in physics and mathematics from the University of Tampa in May 2021. She is currently investigating the electronic structure and transport of chiral quantum materials with planar defects using first principle calculations and Wannier tight-binding Hamiltonians. She hopes to connect her interests in astrophysics, computational physics, and condensed matter physics in the future by developing innovative quantum technologies for space-related applications. Outside of physics, she is a mom of two cats and enjoys cooking, traveling, hanging out with friends, and watching a good sci-fi movie!

As a committee, we had three main objectives to complete: picking a theme to represent SiM's presence at West Palm Beach, designing games to get students involved, and choosing prizes to make the events memorable. The theme, or what we call our visual identity, represents what we want SiM's presence to be at the selected location for the MMM conference. The visual identity should incorporate elements of the conference venue, what SiM stands for, and make a connection to our favorite subfield of physics, magnetism. We thought about Florida icons such as palm trees, alligators, and seashells, but ultimately, we settled on the loggerhead sea turtle, the most common native species to Florida. The loggerhead sea turtle uses the Earth's magnetic field as a map to navigate thousands of miles across the ocean and return to the same beaches on which they were born to lay their eggs, including West Palm Beach! Sea turtles also represent wisdom, endurance, perseverance, and good fortune, embodying the spirit of our graduate students and the blessings of Florida that we would like them to bring back with them for their endeavors.



custom turtle banners

The design that was finalized to represent the sessions at Palm Beach, FL

Samuel Tkacik

Samuel completed his bachelor's degree in physics and mathematics as an honor's student at the University of South Florida and is now a doctoral student and member of the Quantum Chiraltronics Group. He is currently investigating topological properties and emergent quantum states in symmetry-reducing environments of 2D and 3D quantum materials. He uses complementary first principle calculations and tight-binding models to predict relevant transport properties including emergent magnetic phases due to extended defects present in the system. In his free time, Samuel enjoys creating his own math puzzles, spending time with his dog, and leading physics outreach initiatives. He is also a seasoned traveler, having studied abroad in Exeter, England, where he embarked on adventures that required all different forms of transportation.

We brainstormed about the games and prizes that would maximize interactions among the student attendees. We felt building connections is more important now than ever to navigate the changing field of science. Thus, we advocated for not just one, but two networking events, mid-summer, which was only made possible by Shelbie Jenkins, Hari Srikanth, and the MMM 2025 organizing committee. The goal of this new session was to be more relaxed and come-and-go at your own pace compared to the main networking session, which is higher energy and requires all attendees to participate. We felt this balance was a perfect way to get more students involved and advertise the main SiM event prior to the session.

Preparing for the sessions

The first networking session, MarioKart & Games, took place in the Palm Beach Convention Center during lunch on Tuesday, October 28th. The main SiM networking session took place during dinner on the Hilton West Palm Beach event lawn next to the convention center on Wednesday, October 29th.

One of the custom Guess Who boards featuring the invited and symposia speakers, and decks of their presentation abstracts, each hand painted and assembled

MarioKart & Games Session

SiM brought the race to West Palm Beach with an exciting and original Magnetism x MarioKart session, open to attendees beyond the student population. More than 30 participants joined the event and were greeted by the organizers Gina, Samuel, and May Inn. The session offered attendees a laid-back networking opportunity and new perspectives on how the physics of magnetism can appear in unexpected places. Participants eagerly awaited their turn to grab a controller and compete with their peers on the digital tracks, including the dreaded rainbow road.

The excitement wasn't limited to the races. While attendees waited to brave the blue shells and banana peels, they had the opportunity to investigate an informative poster on the "Physics behind MarioKart" and enjoy a treat as delicious as the Palm Beach ocean views, saltwater taffy. Some flavors like key-lime pie introduced participants to Florida's culinary signatures, while others like the controversial chili mango brought passionate discourse. The session also introduced a show-stealing game for attendees in the queue, *Guess Who—Invited Speakers Edition*.

A fresh twist was taken on the classic game by replacing cartoonish subjects with the esteemed symposia and invited speakers of the MMM 2025 conference. Participants were provided custom Guess Who boards with the speakers of the conference and informational cards that included the speakers' abstracts, affiliations, and the times and locations of their talk. The game managed to bring fun competition while players learned about each other and the speakers—so much so that players chased Guess Who victory long after the MarioKart finish lines were crossed for the last time! The boards were crafted with much effort channeled into them: from curating the speaker profile photos and their abstracts, to hand-painting and assembling the plywood board with hinges and adhesives.

Students from the University of South Florida playing the custom Guess Who board games and racing in MarioKart with other attendees.

We would also like to give a shout out to the generous ladies from the Department of Physics at the University of South Florida for helping assemble the Guess Who boards onsite. In the usual SiM conference event fashion, attendees got to take home with them some goodies that will hopefully give them a little boost in their research: some anchor bottle opener keychains, 6-in-1 multitool pens, and hilarious stickers.

Attendees racing in a MarioKart tournament on Moo Moo Meadows track

SiM Networking Session

Using the momentum from a great first session on Tuesday, we got prepped for the networking session on Wednesday. We had a lot of moving parts, from the amazing AV system support staff putting up the giant projector screen to the catering staff setting up the food and bar for attendees on the lawn of the Hilton West Palm Beach hotel. The event welcomed more than 85 attendees and started off with an introduction to SiM by May Inn while the attendees savored some cuisine, which included empanadas and fried alligator bite sliders—a Florida specialty brought to the session as a special menu item by the hotel chefs! Attendees were also able to enjoy drinks from a fully stocked bar.

Once the attendees were done with their food, the networking activities began with the iconic SiM bingo. Each bingo card had 5 x 5 squares of peculiar questions/statements, and attendees had to complete their bingo cards by crossing squares off when they found peers who matched the prompt. Samuel helped add a fun twist to this iconic SiM game by incorporating cluster questions. He would announce a polarizing question such as Coffee or Tea and students would mix up in groups to engage more with new acquaintances and help fill out their bingo cards. We handed out custom tote bags with our turtle designs as prizes to three winners: The first to get 5 in a row, the first to get 5 diagonal, vertical, and horizontal in row, and the first to complete their board. It was absolutely amazing to witness the attendees buzzing around and chatting with one another while trying to figure out what the intentionally puzzling bingo questions actually meant.

After the Bingo game was complete, the magnetics jeopardy game was up next. This exhilarating game required all hands on deck—Gina hosted the magnetics jeopardy game, Samuel was the score keeper, and May Inn helped survey the crowd and track which team buzzed in first. The attendees split up into 8 teams. The objective of the game was to be the first to buzz in and answer the questions correctly to earn the most points. The magnetics jeopardy game consisted of 5 categories that each team could pick from: Magnetic Fundamentals, Electromagnetism in Action, Magnetic Materials, Florida, and Name It/Them (Equations & Physicists).

Each category had 5 questions ranging in difficulty worth 200–1000 points. We had prepared game buzzers, which we had initially determined to be extremely loud (and at times amusingly annoying) when tested indoors. During the game, we realized the buzzers were too quiet outdoors to hear, which made it challenging to determine the team that buzzed in first. However, the attendees were great sports about the situation, and we think it added to the friendly debates and discussions among the students, which was the main goal! The game brought forth a sense of camaraderie within the teams while they worked together with their newly acquainted peers to answer the questions. The winning team all got bucket hats with a custom embroidered MMM 2025 x SiM logo with the loggerhead turtles. If you were unable to attend the event, you can still play the game with your friends at home! Feel free to access the game via this link.

Overall, magnetics Jeopardy was a huge hit with energy levels through the roof (if there was a roof), and we hope SiM will have a chance to do it again in the future, even for one of our Virtual Coffee Hours sessions—Do keep an eye out! At the end of the session, we distributed freebies such as our limited edition MMM 2025 x SiM T-shirts to the attendees!

Things did not end when everyone dispersed after the session. It was absolutely delightful to see the attendees catching up with us about the fun time they had and hanging out with one another in the following days of the conference. Mission accomplished!

To our new friends: We hope to see you again soon and wish you all the best in your endeavors!

One of the custom Guess Who boards featuring the invited and symposia speakers, and decks of their presentation abstracts, each hand painted and assembled

One of the Human Bingo cards the attendees had to complete

Can count up to three in three languages. Name: Languages:	**Works with 2D materials.** Name:	**Has presented or is going to present at MMM 2025.** Name: Topic:	**Enrolled at a FL university** Name:	**Is a Students in Magnetism volunteer.** 😉 Name:
Is theoretically an experimentalist. Name:	**Is a MuMax master.** Name: Address them with the "Master" prefix from now on.	**Has published a paper** Name: Give them a high five :)	**Traveled from a different country than you did.** Name:	**Share a fun lab story with someone you have never met!** Name: Did they laugh?
Is going to explore Palm Beach after the conference. Name: Which attractions to visit?	**Is a theorist.** Name: Tell them you hope that they will have a theory named after them!	**Has never consumed CoFe.** Name: How does it taste?	**Share about your research with someone!** Name: Did they understand it?	**Is writing their thesis or manuscript tonight.** Name: Tell them that they've got this!
Saw a Florida gator! Name: Did they understand it?	**Has attended other special sessions at MMM 2025!** Name:	**Bean juice or leaf juice or wheat juice or fruit juice?** Name: Preference:	**Has attended SiM virtual coffee hours.** Name: What does virtual coffee taste like?	**Operates a SQUID.** Name: Have they operated a KRAKEN?
Can draw a M-H loop with their eyes closed. Name: What is its saturation field?:	**Whose PhD supervisor is not at MMM 2025.** Name: Ask them if they feel liberated.	**Wearing the same color as you.** Name: Tell them that they have great taste in fashion.	**Knows what MMM stands for.** Name: Magnetism of Magnetic Magnets?	**Dabbles in the art of magnetic multilayers.** Name: Which art gallery?:

Fun times during the MarioKart & Netoworking Session

Captured moments during the Jeopardy and Bingo games

Smiles and laughter shared during the Jeopardy and Bingo activities.

Organizers and attendees got a taste of Florida with a special menu item of alligator bite sliders.

Checking... my Bingo...

Attendees networking with each other during the Bingo game

First winner from Human Bingo, Prerna Sharma, with her new MMM 2025 x SiM tote bag!

(specially designed by the session organizers with hand-illustrated loggerhead sea turtles)

SiM would like to take this opportunity to thank the following people for their generous support for our sessions at the MMM 2025 Conference:

- Our volunteers from the University of South Florida: Gina Pantano, Samuel Tcacik, and their colleagues who helped us with the event logistics preparations

- Hari Srikanth, Special Events Chair
- Shelbie Jenkins, Special Events Manager
- Tiffany Santos, General Chair
- Vanessa, the Hilton Event Manager
- Robert and the IT & AV team
- Alex and the catering team
- Pat, the barista
- Ron Goldfarb
- Atsufumi Hirohata
- and all the participants of the sessions!

Elnaz Jaberolansar, Dani Luu, Yasinthara Wadumesthri, Prerna Sharma, who helped Gina and Samuel assemble the Guess Who boards

We sincerely hope that all attendees enjoyed the networking sessions as much as we did. Stay tuned for our next networking session at ***INTERMAG 2026 in Manchester, UK (April 2026).***

Catch up with us in one of our bimonthly SiM Virtual Coffee Hours!

Find out more about SiM at https://www.studentsinmagnetism.org/.

The Jeopardy winners in their custom MMM2025 x SiM bucket hats, embroidered with the loggerhead sea turtles illustrated by the session organizers

MMM 2026

November 2 – 6, 2026

Honolulu, Hawaii

IMPORTANT DATES

February 9 – Abstract submission site opens

February 23 – Abstract submission deadline for early decision for visa applications

April 24 – Abstract submission deadline

www.magnetism.org

AIP Publishing

IEEE MAGNETICS

Awards & Nominations Calendar

IEEE FELLOW

FEB 7

DISTINGUISHED LECTURER

JUN 17

EARLY-CAREER AWARD

JUL 31

MID-CAREER AWARD

JUL 31

DISTINGUISHED SERVICE AWARD

JUL 31

ACHIEVEMENT AWARD

JUL 31

Conference & School Calendar

Altermagnetism & Unconventional Magnetic Orders in Quantum Materials

29 Mar - 3 Apr 2026
Aspen, Colorado, US

MAGNET 2026
IX Italian Conference on Magnetism

4 - 6 Feb 2026
Lecce, Italy

THERMAG 2026
Int'l IIR THERMAG XI conference

7 - 11 Jun 2026
Ljubljana, Slovenia

INTERMAG 2026
2026 IEEE Int'l Magnetics Conference

13 - 17 Apr 2026
Manchester, UK

PM '26
Physics of Magnetism 2026

22 - 26 Jun 2026
Poznań, Poland

MagSocSS 2026
2026 IEEE Magnetics Society Summer School

14 - 19 Jun 2026
Cairo, Egypt

Magnetic Frontiers 2026

IEEE Magnetics Frontiers - Spintronics for Computing

3 - 7 Aug 2026
Hongkong

EMSA 2026

2026 European Magnetic and Actuators Conference

6 - 9 Jul 2026
Eindhoven, Netherlands

UMC 2026

2026 Ultrafast Magnetism Conference

28 Sep - 2 Oct 2026
Eindhoven, Netherlands

MPEEC 2026

Magnetic Materials and Devices for Mobility, Power Electronics, and Energy Conversion

9 - 11 Sep 2026
Seville, Spain

ICM 2027

2027 Int'l Conference on Magnetism

13 - 18 Jun 2027
San Juan, Puerto Rico

Trends in Magnetism 2026

7 - 11 Sep 2026
Milan, Italy

MMM 2026

2027 IEEE Int'l Magnetics Conference

10 - 14 May 2027
Jeju Island, South Korea

MMM 2026

71st Annual Conference on Magnetism and Magnetic Materials

2 - 6 Nov 2026
Honolulu, HI, USA

IEEE MAGNETICS

Newsletter Advertising Kit

Special discounted rates now! Get in touch with us for more information and/or customized packages!

Newsletter Advertising

The Newsletter is published quarterly (in interactive animated flipbook and PDF) on the Society website at: http://www.ieeemagnetics.org.

Having your ad prominently displayed in the IEEE Magnetics Society's Newsletter will make your company stand to our readership.

IEEE MAGNETICS

Brad Dodrill

(Newsletter Associate Editor for Industrial Liaison, brad.dodrill (at) lakeshore.com)

CONTACT US:

Editor: Jia Yan Law

Associate Editor for Industrial Liaison: Brad Dodrill

Resource Center

IEEE.tv