IEEE Magnetics Society
NEWSLETTER

Volume 42, No. 4 October 2004

Martha Pardavi-Horvath, Editor

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2003-2004

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Election of New Members to the Magnetic Society Administration Committee

The Nominations Committee of the Magnetic Society Administrative Committee, chaired by P. E. Wigen, has completed the vote counting in the election of 8 new members to serve on the Administrative Committee for the years, 2005-2007.

The ***new members*** are:

- John Chapman,
- Bill Doyle,
- Liesl Folks,
- Burkard Hillebrands,
- Hiroaki Muraoka,
- Martha Pardavi-Horvath,
- Bruce Terris and
- Shan Wang.

They join the ***continuing members***:

(2003-2005 Term)

- Giorgio Bertotti,
- Thomas Howell,
- David Lambeth,
- Robert O'Handley,
- Caroline Ross,
- Dieter Weller,
- Phil Wigen and
- Roger Wood,

(2004-2006)

- David Jiles,
- Doug Lavers,
- Taek Dong Lee,
- Laura Lewis,
- Kamel Ounadjela,
- Jan-Ulrich Thiele,
- Shoogo Ueno and
- Randall Victora.

The term of the new members of AdComm begins January 1, 2005.

Philip E. Wigen,
Nominations Committee Chairman
E-mail: wigen.1@osu.edu

Chapters Corner

If you are the local chapter chairman reading this, please share with us all that's happening in your chapter and local area (e.g. talks, people activity, magnetics news, company or university news etc.). Forward a paragraph (or two), a picture, a reference to an interesting article or something inventive or newsworthy (in your opinion) to me at r.dee@ieee.org so we can include in the next MagSoc newsletter.

NEWS NEWS NEWS…

The ***distinguished lecturers*** have been active

Pittsburg Chapter
Jimmy Zhu
Title : Magnetoresistive RAM
Date : Oct 18,2004
Loc : Seagate Research
Chapter Chair: ***Miklos Gyimesi***

UKRI Chapter
IEEE Distinguished Lecturer Program (DLP)

The first event will be on the 20th October at the University of York, and will feature Dieter Weller of Seagate Technology, presenting his lecture "Assault on Storage Density of 1 Terabit per Square Inch and Beyond".

The second event will be a UK tour by Bob McMichael, presenting his lecture "Dynamics, Damping and Defects in Thin Ferromagnetic Films". Dates are

Oct 25: The University of Glasgow
Oct 27: The University of Sheffield
Oct 29: The University of Exeter

All DLPs will include additional presentations.
Chapter Chair: ***Mike Gibbs***

St. Louis Combined Chapter meeting announcement
Speaker: Dr. John Chapman
Title: "Wall Watching: The Progress of Domains in Small Elements"
Date: Friday November 12th 2004
Time: 11:00 to 12:00 am
Location: Washington University in St. Louis, Bryan 304
Chapter Chair: ***Dave Macke***

Rocky Mountain Chapter ….
has had regular meetings. The meetings are held at the University of Colorado, in collaboration with the Colorado Center for Information Storage and KnowledgeTek. The most recent speakers were

- Jimmy Zhu, from Carnegie Mellon University, on Oct. 22. Jimmy talked about advances in magnetic random access memory.
- On September 2, Dan Dahlberg, from the University of Minnesota, came and gave a tutorial on magnetic force microscopy.
- In July, Ed Nowak visited and discussed noise measurements from magnetic field sensors.

Copies of the talks for our chapter, including most of the above, can be browsed at these talks can be browsed at http://ccis.colorado.edu/

In addition, in June the Rocky Mountain Chapter of the IEEE Magnetics Society sponsored a competition for "Best Student Paper" at the 5th International Symposium on Metallic Multilayers. A committee representing industry, government labs, and the IEEE selected the finalists, and the awards were presented by Richard Dee and David Pappas at the end of the conference. Four awards were presented, with the first place and three "runner-up" receiving cash awards.

Chapter Chair: ***Dave Pappas***

Compiled by

Dr. Richard H. Dee
Magnetics Society Chapters Chair
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IEEE Magnetics Society Distinguished Lecturers for 2005

Half-Metals, Spin Torque, and Nanorings

Chia-Ling Chien
The Johns Hopkins University

The exploration of magnetic nanostructures in recent years has resulted in a string of discoveries such as interlayer coupling, giant magnetoresistance (GMR), exchange bias, and tunneling magnetoresistance. Some of these effects were utilized as read heads in high-density magnetic recording and nonvolatile magnetic storage only a few years after the original discovery. In this talk, I will describe several new topics in magnetic nanostructures from inception to realization to potential applications. Most magnetoelectronic properties are the results of the spin polarization of the constituent materials. The ultimate spin-polarized material with 100% spin polarization is called the half-metal. For example, magnetic tunnel junctions with half-metal electrodes would have the largest possible effect, switching between conducting and insulating states. The unique characteristics of halfmetals, the experimental identifications, and the confirmation of half-metals to date will be described. Since electrons have spin in additional to charge, a spin-polarized current carries angular momentum. For a large current density, the angular momentum can exert a substantial torque onto a receiving magnetic entity to excite spin waves or even to switch its magnetization. The spin torque effects are accomplished in the absence of an external magnetic field. The salient aspects of the spin torque effects in different contexts, such as switching and magnetic recording without a magnetic field, will be described. Nanorings are small entities with special attributes. A magnetic nanoring can support vortex state despite its very small size. The two chiralities of the vortex state can be exploited for magnetic recording purposes. Multilayered nanorings have also been proposed as vertical random access memory (VRAM) units. However, fabrication of nanorings using e-beam lithography has considerable limitations in the number of rings, ring size, and areal density. We have developed a new method with which a large number (10^9) of small (100 nm) rings can be fabricated with a very areal density of 45 rings per square micrometer. The magnetic and other characteristics of such arrays of nanorings will be described.

Chia-Ling Chien received the B.S. degree in physics from Tunghai University, Taichung, Taiwan, R.O.C., in 1965 and the Ph.D. degree in physics from Carnegie Mellon University, Pittsburgh, PA, in 1972. He has been a Member of the faculty in the Department of Physics and Astronomy of Johns Hopkins University, Baltimore, MD, since 1976, where he is the Jacob L. Hain Professor in Arts and Sciences. He currently directs the Material Research Science and Engineering Center on Nanostructured Materials at Johns Hopkins. His recent research focuses on magnetic nanostructures including magnetic granular solids, nanowires, multilayers, and arrays of rings and dots, and the exploration of GMR, exchange bias, half-metals, spin torque effects, Andreev reflection, and point-contact spectroscopy. He has written more than 300 journal articles and holds several patents. He is one of the ISI's 1120 most cited physicists. He has served as Meeting Chair and Chair of the Advisory Committee of the Conference on Magnetism and Magnetic Materials. He has been awarded honorary professorships at Nanjing, Lanzhou, and Fudan Universities in China. Dr. Chien is a Fellow and the 2004 recipient of the David Adler Award of the American Physical Society.

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Micro-Fabrication Techniques for Magnetic Information Storage Devices: From Bubbles to Thin-Film Recording Heads to Nanomagnetic Structures

Robert E. Fontana, Jr.
Hitachi Global Storage Technologies

This lecture examines magnetic device structures from the perspective of thin-film processing. Techniques for forming magnetic device structure minimum features will be compared with semiconductor processing. Future storage density growth in both magnetic memories and magnetic recording will be projected using semiconductor roadmaps. The "nano" characteristics (thickness and length scale) of next-generation magnetic thin-film heads and magnetic memory devices will be compared with solid-state semiconductor designs. In the past 25 years, the bit cell size for storage products incorporating magnetic device structures decreased from 156 μm^2 bit cells (IBM 3390 disk drive) to 0.007 μm^2 (Hitachi Travelstar 5K100 mobile disk drive). For the same period, the bit cell size in nonvolatile memory products incorporating magnetic device structures decreased from 625 μm^2 (TI 100 kb bubble memory) to 1.6 μm^2 (Motorola 4Mb magnetic random access memory). These 10 to 10 increases in information storage densities resulted from increased understanding in the physics of magnetic phenomena, from advances in materials science and engineering for magnetic thin films, from development of new magnetic modeling techniques, and from dramatic improvements in the capability to fabricate magnetic device structures with smaller minimum features. The manufacture of cost-effective magnetic device based information storage products requires high-yield processing technologies for the magnetic transducer or memory element in these products. Such processing technologies are now producing devices with 120 nm features (80 Gb/in storage densities) and these same processing technologies are extendable to 30 nm features (1 Tb/in storage densities). The lecture will conclude with discussions on nanoscale processing challenges.

Robert E. Fontana, Jr. received the B.S., M.S., and Ph.D. degrees in electrical engineering from the Massachusetts Institute of Technology, Cambridge, in 1969, 1971, and 1975, respectively. He is a Research Staff Member within the recording head processing function of the San Jose Research Center, Hitachi Global Storage Technologies (GST), San Jose, CA. His technical activities have concentrated on developing and improving thin-film processing techniques for fabricating magnetic device structures, first at Texas Instruments from 1975 to 1981 with magnetic bubbles, then from 1981 to 2002 at IBM with thin-film heads, and from 2003 to the present at Hitachi GST with novel flux detecting sensors and nanostructure fabrication with e-beam lithography. During his career, he has transferred processing methodologies for magnetic bubbles, magnetoresistive thin-film heads, spin-valve giant magnetoresistive thin-film heads, and tunnel-valve thin-film heads from research concepts to manufacturing realizations. He has authored 37 papers on magnetic devices and processes and has 55 patents in thin-film magnetic structures. Dr. Fontana was named an IEEE Fellow in 1996 and he received the IEEE Cledo Brunetti Award for excellence in the art of electronic miniaturization in 2000. He was elected to the National Academy of Engineering (NAE) in 2002 for his contributions in magnetic device processing. He has served as President of the IEEE Magnetics Society (2001, 2002), as General Chair of the 1996 Magnetism and Magnetic Materials Conference, as General Chair of the 2004 Joint International Magnetics Conference and Magnetism and Magnetic Materials Conference, and is serving as an NAE member on the National Research Council's (NRC) Board on Manufacturing and Engineering Design (2003–2005).

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Dynamics in Magnetic Micro- and Nanostructures

Burkard Hillebrands
Technische Universitdt Kaiserslautern

For applications in sensors and in data storage, the dynamic properties of microstructures and nanostructures have gained increasing attention. The fundamental excitations in these objects are confined spin waves, and it is useful in particular to understand their properties in view of the noise spectrum in sensor and magnetoresistive random access memory (MRAM) applications. The lecture addresses the dynamics in homogeneously and inhomogeneously magnetized objects starting with an introduction to spin waves and the effects of finite dimensions. In inhomogeneous systems the excitation spectrum is complex, and new phenomena, such as localization and tunneling of modes, are discussed. The key points are illustrated by results obtained by space- and time-resolved Brillouin light scattering, which allows one to follow experimentally the propagation of spin-wave packets and to present the results in an animated format. To conclude the lecture, the analysis of ultra-high-frequency dynamic properties (2–100 GHz) of small magnetic elements with spatial resolution in the 300 nm range is presented.

Burkard Hillebrands received the diploma and Ph.D. degrees in physics from the University of Cologne, Cologne, Germany, in 1982 and 1986, respectively. After a postdoctoral stay at the Optical Sciences Center, Tucson, AZ, he received the habilitation from the RWTH Aachen, Aachen, Germany, in 1993. He was an Associate Professor at the University of Karlsruhe, Karlsruhe, Germany, in 1994. Since 1995, he has been a Full Professor at the University of Kaiserslautern, Kaiserslautern, Germany. He is the coordinator of the German priority program "Ultrafast Magnetization Processes," the vice coordinator of the German research unit "New Materials with High Spin Polarization," and he coordinates a European network on "Ultrafast Magnetization Processes in Advanced Devices." He is currently the head of the Material Research Center for Micro- and Nanostructures (MINAS) at the University of Kaiserslautern. He is a member of the granting board for collaborative research centers (SFB) of the senate of the Deutsche Forschungsgemeinschaft and a member of the Editorial Board of the *Journal of Physics D: Applied Physics*. His research field is mostly in magnetoelectronics. His special interests are in spin dynamics, material properties of thin magnetic films and multilayers, exchange bias, as well as in elastic properties of layered structures. In the field of spin dynamics, he is particularly interested in dynamic magnetic excitations in confined magnetic structures, magnetic switching, and nonlinear magnetic phenomena using space- and time-resolved Brillouin light scattering spectroscopy and time-resolved Kerr effect techniques. He has published more than 170 articles, five patents and patent applications, seven book contributions, and he is co-editor of the Springer-Verlag book series on "Spin Dynamics in Confined Magnetic Structures."

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Magnetics Society Distinguished Lecturers 2004

Dynamics, Damping and Defects in Thin Ferromagnetic Films

Robert D. McMichael
National Institute of Standards and Technology

Modern disk drives can read and write bits every two nanoseconds, a time scale very similar to the magnetic damping time of the ferromagnetic metals used in the heads. The damping characteristics are also important for thermally-driven magnetic noise in sensors. Furthermore, it seems likely that damping will limit data rates in magnetic random access memory, since the magnetization in a memory cell must be allowed to settle between switching events. For all of these applications, measurements of damping are important, and these measurements are most commonly made by ferromagnetic resonance linewidth. The two problems that complicate measurements of damping by ferromagnetic resonance are: 1) defects contribute to the linewidth, so that the linewidth is the combined effect of defects and damping, and 2) the form of the damping itself is the subject of some debate. Patterning is perhaps the ultimate form of magnetic inhomogeneity in a thin film. Unlike the spin-wave normal modes of a continuous film, the normal modes of patterned elements are shape and size dependent. The dynamic properties can be addressed using available micromagnetic modeling software to obtain images of the normal mode precession patterns. In this lecture, I will discuss primarily the role of defects in magnetization dynamics. I will emphasize the competition between interactions, which promotes the collective behavior typified by spin waves, and inhomogeneity, which promotes local behavior. An understanding of these effects allows one to use linewidth data to characterize damping and inhomogeneity separately. I will show examples of line widths and modeling from nominally uniform films, exchange biased films, films with wavy substrates, and films with nonuniform magnetization.

Robert D. McMichael (M'92) received the B.S. degree in engineering-physics from Pacific Lutheran University, Tacoma, WA, in 1985 and the M.S. and Ph.D. degrees in physics from The Ohio State University, Columbus, in 1990. In 1990, he was awarded a National Research Council postdoctoral associateship at the National Institute of Standards and Technology (NIST), and he has continued in the Magnetic Materials Group of the Materials Science and Engineering Laboratory of NIST. His research interests have touched on a diverse set of topics, including: nonlinear magnetization dynamics, ferromagnetic resonance, magnetic refrigeration, hysteresis modeling, giant magnetoresistance, exchange bias, computational micromagnetics, and magnetization dynamics. He currently serves as leader of the Nanomagnetodyamics project in NIST's Metallurgy Division. Dr. McMichael serves on the editorial board of IEEE TRANSACTIONS ON MAGNETICS and on the advisory committee for the Magnetism and Magnetic Materials (MMM) conference. He created the logos for several recent MMM conferences.

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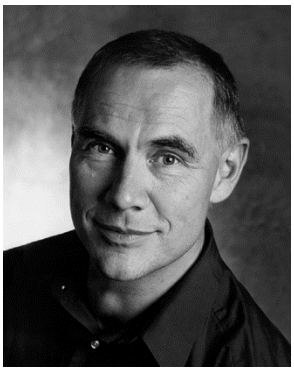
Assault on Storage Density of 1 Terabit per Square Inch and Beyond

Dieter Weller
Seagate Technology

The areal density in magnetic recording has surpassed 50 Gbit/in^2 in products and 100 Gbit/in^2 in laboratory demonstrations. These densities have been achieved with recording media composed of Co-alloy nanostructured materials with horizontal orientation of the magnetization (longitudinal recording). Grain sizes are 8 to 10 nm and grain size distributions are near 20% (standard deviation divided by the mean). Going much beyond 100 Gbit/in^2 requires magnetically harder materials with smaller, thermally stable grains (5 to 8 nm) and tighter distributions (< 15%). Experiments indicate that this may be possible in perpendicular recording, where a soft magnetic imaging layer is used to enhance the write field and enable such grains to be switched. Basic technology demonstrations of about 110 Gbit/in^2 have already been reported, and modeling suggests that extensions to about 1 Tbit/in^2 should be possible using that technology. Going much beyond Tbit/in^2, however, will require more drastic changes of heads and media. One of the fundamental limitations relates to the media sputter fabrication process, which may not allow the tight grain size and magnetic dispersions required in models. So-called "self-organized magnetic arrays" (SOMA) of chemically synthesized Fe-Pt nanoparticles are being explored as alternatives. These structures not only show extremely tight size distributions (< 5%) but are also magnetically much harder than current Co alloys. Writing will require temporal heating and cooling in a magnetic field, as in heat-assisted magnetic recording (HAMR). A combination of SOMA and HAMR may eventually lead to recording on a single particle per bit, with ultimate densities near 50 Tbit/in^2 (with 10 years storage time, ambient temperature, and Fe-Pt type anisotropies).



Dieter Weller received the Diploma in physics from the University of Marburg, Germany, in 1982 and the Ph.D. degree in physics from the University of Cologne, Germany, in 1985. From 1985 to 1990 he worked at the Siemens AG Central Research Laboratories in Erlangen, Germany, on the design, fabrication, and characterization of magneto-optic recording materials and disks. From 1990 through 2000 was with the IBM Research Division in San Jose, CA, where he worked on electronic, magnetic, and magneto-optical properties of thin films and multilayers. He joined Seagate Research in Pittsburgh, PA, in April 2000 as Director of Media Research. His current interests include the exploration of extremely high density magnetic recording schemes and the fabrication of novel nano-phase magnetic materials. He has published over 200 scientific papers as well as several book articles. He is co-editor of *The Physics of High Density Magnetic Recording* (Springer-Verlag, 2001). He holds eight U.S. patents and has 15 pending patent applications. Dr. Weller is a Fellow of the American Physical Society (APS) and a member of the American Vacuum Society (AVS). He has served as guest editor for the *Journal of Applied Physics* and IEEE TRANSACTIONS ON MAGNETICS and was program co-chair of the 8th Joint Magnetism and Magnetic Materials/Intermag Conference (2001).

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Magnetoresistive Random Access Memory: The Path to Competitiveness

Jian-Gang (Jimmy) Zhu
Carnegie Mellon University, Pittsburgh, PA

With the first commercial product on the horizon, magnetoresistive random access memory (MRAM) is on a path to replace static random access memory (SRAM), dynamic random access memory (DRAM), and flash memory (and even disk drives in some applications) as the universal solid-state memory. Non-volatility, fast access time, and compatibility with CMOS technology are three of the most important features that make MRAM potentially superior to other existing memory technologies. To fully exploit these potentials, present MRAM designs need to overcome three major obstacles: stringent fabrication tolerances, relatively high power consumption, and response to write addressing disturbances. Although prototype memory devices have been successfully demonstrated, new, innovative designs are still required to make the technology truly competitive. In the designs employed by today's MRAM manufacturers, the magnetic moment in a memory element is effectively linear, with its orientation representing the memory state "1" or "0." Switching between the two memory states is done by the Ampérean field generated by currents in a pair of orthogonal conducting wires, often referred to as cross-point writing. The cross-point write addressing scheme generates write disturbances because the half-selected memory elements along each of the activated wires experience one of the two field components during a write operation. The result is a stringent requirement for a narrow switching field distribution for all the elements in a memory block, and consequently a stringent fabrication tolerance. The phenomenon is further exacerbated by the possibility of undesired thermally-activated magnetization reversals, especially at small physical dimensions of the memory elements. The lecture will cover the micromagnetic magnetization reversal processes in various types of MRAM elements. Over the past seven years, extensive micromagnetic analyses and experimental investigations have provided key understanding to obtain robust magnetic switching, and they have become the design principles for today's memory elements. I will present a comprehensive study of thermally-activated magnetization reversal at small physical dimensions for various MRAM designs and will discuss the imposed area storage density limitations due to the write disturbance. I will conclude by introducing a novel design that completely eliminates the write addressing disturbance and substantially lowers power consumption by utilizing the spin transfer effect.

Jian-Gang (Jimmy) Zhu (M'89, SM'02) received the B.S. degree in physics from Huazhong University of Science and Technology, Wuhan, China in 1982 and the M.S. and the Ph.D. degrees, both in physics, from the University of California, San Diego in 1983 and 1989, respectively. In 1990 he joined the Department of Electrical Engineering at the University of Minnesota as an Assistant Professor and in 1992 was appointed to the McKnight Land Grant Professorship by the Regents. In 1997 he joined the faculty of Carnegie Mellon University, Pittsburgh, PA, where he is now the ABB Professor of Engineering in the Department of Electrical and Computer Engineering and the Data Storage Systems Center. He has authored or co-authored over 170 technical papers and presented over 40 invited talks at international conferences. He has supervised and graduated 19 Ph.D. students. Currently his research includes MRAM device design, GMR head design, thin film recording media, digital tape recording systems, patterned media, and magnetization noise in magnetic nano-sensors. He is an advisory editor for the *Journal of Magnetism and Magnetic Materials*. Prof. Zhu was a recipient of a 1993-97 NSF Presidential Young Investigator Award. His patent, "Ultra-High Density Magnetic Sensor," won a "Top 100 Inventions" award given by *R&D* Magazine in 1996.

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2004 IEEE Annual Election Process

Selecting officers for the top-level leadership positions in the IEEE begins 15 March when the candidate slates are submitted to the IEEE Board of Directors. The Board then announces its list of nominees for each office on 1 May. These include: president-elect delegate/director delegate-elect/director-elect other officers to be elected by voting members for the coming year Ballots are mailed on or before 1 September and must be returned before 12:00 noon on the first business day following 31 October. While election results are announced by the IEEE Tellers Committee, these results are unofficial until the IEEE Board of Directors accepts the Tellers Committee report at its last meeting of the year. For more information about the election process see IEEE Bylaw I-308.

The 2004 IEEE Annual Election process is underway – candidates' names have been announced, and statements of candidacy and websites for the information of you, as the constituent, are in preparation. If you would like to be a part of a candidate e-mail list that will be controlled by IEEE staff, and not the candidates themselves, then please click the following URL: http://www.ieee.org/elections by 13 August to be subscribed. Please include your name and IEEE member number. Your contact information will NOT be shared with the candidates.

In addition to the IEEE Annual Election web page, to which individuals may link to find out about who's running for various positions and what their candidate statements contain, there will also be a message sent in late summer by IEEE staff on behalf of all candidates who will be on the annual election ballot. This message will not only remind members to vote, but will also provide a short message from each candidate as well as the link to his or her Website if one is available.

To reduce or eliminate the perception by members that electioneering is being used to SPAM the membership, allow candidate messages to come through that may contain viruses, or that candidates sending their personal e-mails to members have an unfair advantage over other candidates who might not have that capability, the IEEE Board of Directors has taken seriously the concerns voiced by its membership. In so doing, candidates have been reminded about IEEE policy relative to electioneering. In order for the candidates to reach out with information on how they plan to serve the membership, a standardized way for you to be contacted has been developed. You will be contacted by IEEE staff with information, statements, etc., regarding the annual election. If you wish to be sent such information, you will need to be subscribed to the mailing list that will receive such correspondence in the future.

http://www.ieee.org/elections

Disclaimer: Do NOT reply to this address text. If you have IEEE election questions, send e-mail to corp-election@ieee.org.

Sincerely,
Arthur W. Winston
2004 IEEE President

IEEE Guidelines for Handling Plagiarism

PSPB Approves New Guidelines for Handling Plagiarism Complaints

With so much research now available on the Web, and because the highly searchable nature of electronic content has made it easier to detect unacknowledged copying of original text, the number of reported incidents of alleged plagiarism has been growing. The PSPB Operations Manual now provides helpful and detailed guidelines for identifying and handling instances of plagiarism.

On 18 June 2004, the IEEE Publications Products and Services Board approved new policies and procedures on plagiarism. Specifically, section "8.2 Publication Guidelines" of the PSPB Operations Manual now contains a major new section entitled "Guidelines for Adjudicating Different Levels of Plagiarism." The purpose of this new section is to define 1) plagiarism, 2) five levels or degrees of plagiarism and 3) appropriate corrective actions that correspond to each level of misconduct.

IEEE defines plagiarism as the reuse of someone else's prior ideas, processes, results, or words without explicitly acknowledging the original author and source. It is important for all IEEE authors to recognize that plagiarism in any form, at any level, is unacceptable and is considered a serious breach of professional conduct, with potentially severe ethical and legal consequences.

Equally important to the process of recognizing an act of plagiarism is clarifying who shall be responsible for responding to any complaints of alleged plagiarism. The new guidelines specify that the person responsible for the IEEE publication (referred to generally as "the editor"), shall be responsible for conducting an investigation and determining if plagiarism has in fact taken place. In order to accomplish this critical task, the editor shall also appoint an independent committee of experts in the topic to help make a recommendation on the allegation. Emphasis is placed on the "independence" of the committee, in that the editor cannot be directly involved with the committee's investigation.

Of particular note are the new guidelines for cases involving papers from IEEE conference proceedings. Allegations of misconduct by authors of papers in conference proceedings shall be investigated by the conference publication chair, or by the Publication Officer of the IEEE organizational unit that sponsored the conference if the allegation is made after the publication of the proceedings.

Editors must also bring these efforts to the attention of the Vice President of the Publications Services and Products Board, both at the beginning of an investigation and after findings have been reached for final approval.

In addition, the new guidelines describe procedures for proper referencing of previously published material.

An official, updated version of the
PSPB Operations Manual is now available at
http://a957.g.akamai.net/f/957/3680/1h/www.ieee.org/organizations/pubs/pab/opsmanual.pdf.

The new plagiarism guidelines appear in
section 8.2 Publication Guidelines.

For more information, please contact

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IEEE News

The INSTITUTE online

Here's your report on news around the IEEE, from the editors of The Institute. The most current version of The Institute can always be found at <http://www.ieee.org/theinstitute>

IN THE **October** ISSUE:

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4. Electron Devices Conference Celebrates 50 Years of Breakthroughs
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IEEE-USA Today's Engineer A Monthly webzine

http://www.todaysengineer.org

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The **IEEE** is the world's largest technical professional society with approximately 360,000 members in 170 countries. Through its members, the IEEE is a leading authority on areas ranging from aerospace, computers, and telecommunications to biomedicine, electric power, and consumer electronics. The IEEE produces 30 percent of the world's literature in the electrical and electronics engineering and computer science fields, and has developed more than 900 active industry standards. The organization also sponsors or cosponsors more than 300 international technical conferences each year. Additional information is available at www.ieee.org.

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MagNews

HDD NEWS from ZDNN (http://news.zdnet.com/)

Making disk drives the star of the show

By *Ed Frauenheim*

Agere is working to make tiny drives the heart of MP3 players and other devices. But are nonstandard approaches worth the risk?

Semiconductor company Agere Systems is shopping around the idea of making hard drives the heart of products such as cell phones, by expanding the tasks handled by the drive component.

Bottom line: Integrating drives and handheld devices in this fashion could trim costs--a critical issue in consumer electronics. But such a custom approach could leave device makers without multiple hard drive suppliers, a risky strategy.

Read more at http://news.zdnet.com/2100-9584_22-5404031.html

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SOS For the Venerable Disk Drive?

> Disk drive makers are in a battle to rescue profits, the Wall Street Journal reports in a front-page article today. "The **TiVo** video recorder, the **iPod** music player and the **Xbox** game machine all owe their existence to the same high-tech innovation: smaller, denser, cheaper disk drives. For nearly 50 years the disk-drive industry has driven advances in computers and gadgets by supplying new ways to store data. But there's one thing drive makers can't produce: sustainable profits. Even during the tech boom, when makers of other high-tech innards like software and chips feasted, drive makers collectively lost money in 1998 and 1999. More losses followed during the bust." According to the article, "[a]ll three of the main independent suppliers have been suffering. Net income at No. 3 **Western Digital Corp.** fell 17% in the fiscal year ended June 30. For the quarter ended that same date, **Seagate Technology**, the No. 1 maker, and No. 2 **Maxtor Corp.** each posted losses and laid off workers. Shares of the three companies are down an average of 51% from a year ago, while the Nasdaq Composite Index is down less than 1%."
> • **The Wall Street Journal: Behind TiVo, iPod and Xbox: An Industry Struggles for Profits**

(Subscription required)

http://www.washingtonpost.com/wp-dyn/articles/A32114-2004Oct14_2.html

Suggestion To Read:

Magnetism shapes beauty in the heavens

Read at
http://www.innovations-report.com/html/reports/physics_astronomy/report-14169.html

The Joseph Henry Papers Project

is documenting the life of Joseph Henry (1797-1878), the most revered American scientist of his times and the first Secretary (director) of the Smithsonian Institution. Henry's pioneering work in electricity and magnetism helped bring about the invention of the telegraph, the electric motor, and the telephone. At the Smithsonian Institution he created the outlines of the unique research and cultural institution that we know today.

Joseph Henry's Contributions to the Electromagnet and the Electric Motor

By *Roger Sherman*
Museum Specialist, National Museum of American History
at
http://www.si.edu/archives/ihd/jhp/joseph21.htm

QUIZ

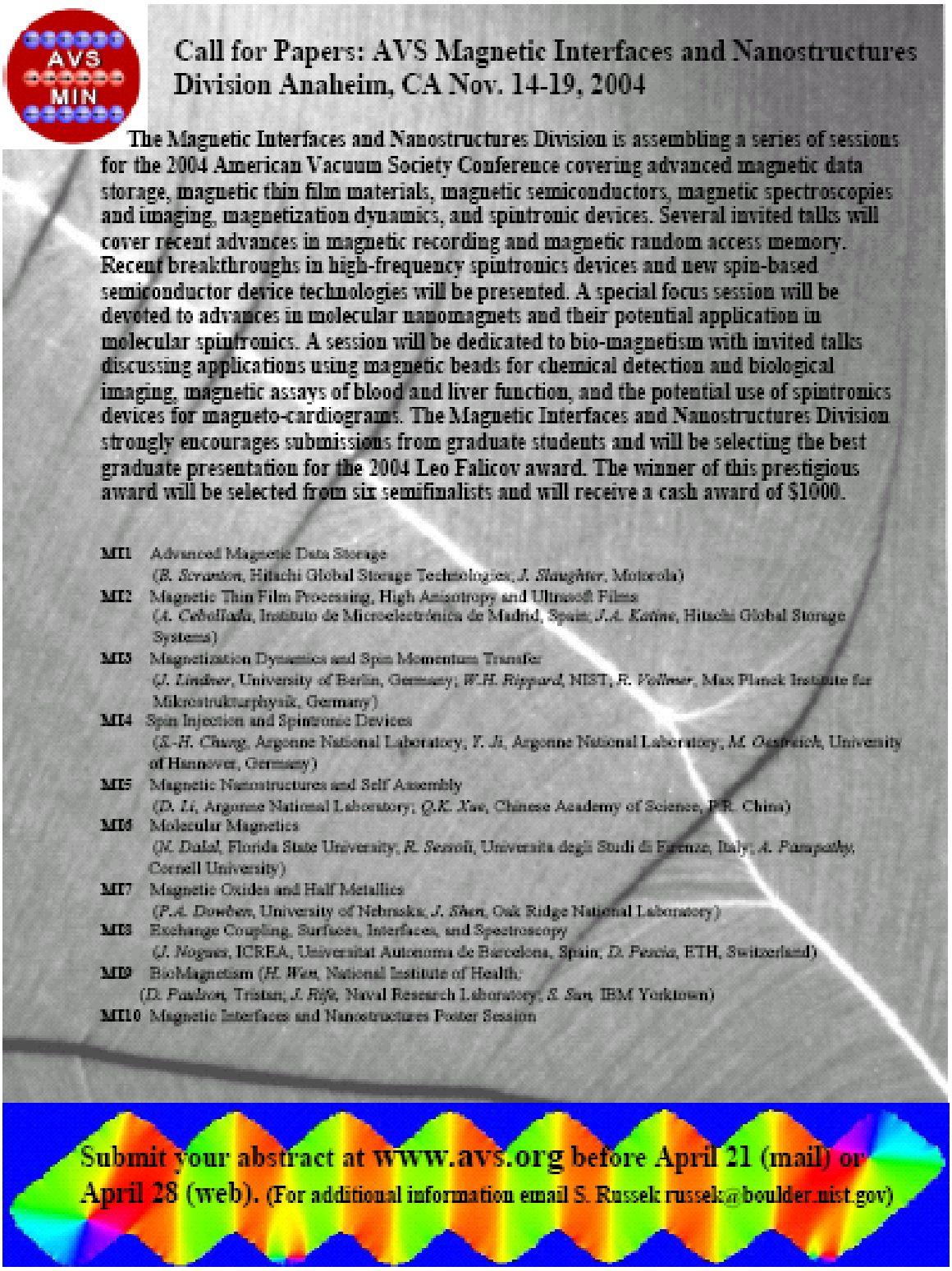
WHAT HAS THIS TO DO WITH MAGNETISM?

Hint: it is a gun, or rifle

Solution

Go to the **END**

Conference announcement 1



Conference announcement 2

MMM 2004

49th Conference on Magnetism and Magnetic Materials

November 7-11, 2004 - Jacksonville, Florida

This conference annually brings together scientists and engineers interested in recent developments in all branches of fundamental and applied magnetism. Emphasis is placed on experimental and theoretical research in magnetism, the properties and synthesis of new magnetic materials, and advances in magnetic technology. The Program consists of invited and contributed papers. Abstract booklets will be made available at the Conference, and Proceedings will be published in the Journal of Applied Physics.

Categories for submission include:
I. Fundamental Properties and Cooperative Phenomena II. Magnetoelectronic Materials and Applications III. Computational Magnetics and Imaging IV. Soft Magnetic Materials and Applications V. Hard Magnetic Materials and Applications VI. Structured Materials VII. Special Magnetic Materials VIII. Magnetic Recording IX. Applications and Interdisciplinary Topics

Advance Registration for the conference will be available by August 1, 2004. More information will be posted on the **MMM Homepage.** Advance Registration via the web is the most convenient way to register and is highly recommended.

The conference will take place in **Jacksonville, Florida.** Jacksonville was the site of the first European settlement in Florida, and it is now the largest city in Florida and the largest city in the United States by land area. More than a million souls make their home in Jacksonville. It is a major hub of commerce and has extensive freight-handling facilities. Blessed with a deep-water port, the town has prospered from shipyards, automobile imports and naval operations. The area's remarkable natural beauty makes tourism a leading industry. The conference hotel, the Adam's Mark Jacksonville, is the newest premier hotel in Northeast Florida. Located downtown on the St. Johns Riverfront, the hotel is adjacent to the Jacksonville Landing entertainment and shopping area and only 18 miles from the airport.

More details, conference rates and a Hotel Room Reservation Form all available on the MM Conference website Room reservations can be made beginning in August. http://www.magnetism.org/

Magnetism & Magnetic Materials

MMM 04

Conference announcement 3

INTERNATIONAL MAGNETICS CONFERENCE

INTERMAG 2005

APRIL 4 - 8, 2005
NAGOYA CONGRESS CENTER
NAGOYA, JAPAN

SUBMISSION DEADLINES

Digests	November 23, 2004
Manuscripts	February 7, 2005

Intermag 2005 Secretariat
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Conference announcement 4

HMM 2005

5th International Symposium on Hysteresis and Micromagnetic Modeling

May 30 – June1, 2005
Budapest, Hungary,

***Venue*: Hungarian Academy of Sciences, Budapest, Hungary, Roosevelt Sq. 9.**

http://www.HMM2005.bme.hu

Organized by the
Budapest University of Technology and Economics
in cooperation with the
Hungarian Academy of Sciences
Research Institute for Technical Physics and Materials Science
Pollack Mihaly College of Engineering, University of Pecs

Call for Papers

The **5th International Symposium on Hysteresis and Micromagnetic Modeling (HMM-2005)** will be held at Budapest, Hungary. The previous Symposia were held at The George Washington University, Virginia Campus. Ashburn, VA, USA (1996), University of Perugia. Perugia, Italy (1999), The George Washington University, Virginia Campus. Ashburn, VA, USA (2001), and at the University of Salamanca. Salamanca, Spain (2003). The 5th International Symposium on Hysteresis and Micromagnetic Modeling is devoted to the 100 year anniversary of birth of Hungarian scientist F. Preisach, the creator of the hysteresis model, bearing his name.

The aim of the 5th International Symposium on Hysteresis and Micromagnetic Modeling is intended to be a forum for presentation and discussion of the most recent advancements in the fields of hysteresis modeling and computational micromagnetics. Continuing with the tradition of the previous HMM symposia, HMM-2005 has a strong interdisciplinary

character . Our aim is to bring together scientists with a wide range of backgrounds and interests (physicists, mathematicians, material scientists, engineers, etc) to exchange ideas, methods, and results. Although special emphasis will be on magnetic hysteresis, there will be sessions in the program focused on the universal aspects of hysteresis, independently of its origin. The scientific program of the 3-day symposium will consist of several talks by invited speakers, and a larger number of contributed talks and posters, organized along different thematic sessions.

Topics of the Symposium

- General hysteresis and coupled problems, mathematics of hysteresis, statistical aspects, etc.
- Preisach modeling.
- Vector hysteresis modeling.
- Hysteresis experiments and measurements.
- Barkhausen noise, disorder, chaotic behavior.
- Nonmagnetic hysteresis.
- Classical spin models, random-field models, domain wall models, etc.
- Dynamic hysteresis, thermal relaxation, aftereffects.
- Micromagnetics, theory.
- Micromagnetics, numerical techniques, field calculations, standard problems.
- Micromagnetics, applications, hysteresis properties of nanoparticles, spin dynamics of coherent structures, etc.

Abstract Book

Authors are invited to send 2 pages short contribution to the Abstract Book. After reviewing, the accepted papers will be presented in oral and poster sessions at the Symposium. The full version of the papers after second review will be published in *Physica B*.

Important dates

- ***Submission of Abstracts*, January 10, 2005.**
- ***Notification of acceptance*, February 10, 2005.**
- ***Pre-registration and hotel reservation*, till March 30, 2005.**
- ***Submission of full papers*, May 30, 2005.**
- ***Symposium*, 30 May --1 June 2005**

Preisach Memorial Book

As the 5th International Symposium on Hysteresis and Micromagnetics Modeling (HMM-2005) will be devoted to the memory of the 100 year anniversary of the birth of Ferenc Preisach, whose hysteresis model is bearing his name, on this occasion a memorial volume on the Preisach model and its different modifications will be published, where researchers, working in the field of Preisach models are cordially invited to submit manuscripts.. After a peer review process the papers will be published in Preisach memorial book.

The topics are

- Play and stop operator in the Preisach model
- The classical Preisach model
- Extended versions of Preisach model
- Vector formulations in Preisach models
- Dynamic hysteresis aftereffects and disorder in magnetic simulation
- Micromagnetic simulation and Preisach models
- Experimental validation of the Preisach model
- Preisach models in applications.

The accepted manuscripts submitted will be published by the Akadémiai Kiadó, Budapest.

Deadlines

Full paper to the book: 10 January, 2005
Review and acceptance of the paper: 10 February, 2005.
Corrected version of the paper: 10 March, 2005.

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Correspondence

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IEEE Publication news

Members who would like to volunteer their services as technical reviewers are needed. Society members with **ideas for new books** or candidates for the ***Classic Re-Issue*** series are urged to get in touch with:

John T. Scott,
Magnetics Society Liaison to IEEE Press
E-mail: john.scott@physics.org

For ***Classic Re-Issues***, the contact is

Stan Charap charap@ece.cmu.edu

For ***new books in data storage***, the contact is

"Gordon F. Hughes" gfhughes@ucsd.edu

For ***new books in other areas***, the contact is

John T. Scott john.scott@physics.org

IEEE TRANSACTIONS ON MAGNETICS

The following is an excerpt from the

IEEE Magnetics Society Publications Report

Boulder, Colorado, 9 August 2004
Submitted by Ron Goldfarb, Publications Chairman

Publications Department for 2004 — *IEEE Transactions on Magnetics*: Ron B. Goldfarb (Editor-in-Chief),

"Statistics on *Xplore* usage are maintained by IEEE. Of 165 IEEE periodicals, including newsletters and magazines, *IEEE Transactions on Magnetics* ranked 8th in terms of number of hits (PDF views) in 2003 (9th in 2002). This does not include access to the *Transactions'* legacy digitized papers published before 1988. In terms of the subset of institutional users, the *Transactions* ranked 8th in 2003 (9th in 2002). For the subset of member users, it ranked 6th in 2003 (13th in 2002). The total number of PDF views increased by 122% from 2002 to 2003, institutional use increased by 144%, and member use increased by 52%. We expect a larger increase in member usage for 2004 because the paper version of the *Transactions* is no longer mailed to members (unless they subscribe to that version). "

IEEE TRANSACTIONS ON MAGNETICS on the web

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- Google to index IEEE abstracts, enabling searches to locate IEEE content directly from a Google web search
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Ron Goldfarb
Editor in Chief
r.goldfarb@ieee.org

QUIZ – Solution

The Gauss Rifle:
or
How to Build a Magnetic Linear Accelerator

This very simple toy uses a magnetic chain reaction to launch a steel marble at a target at high speed.

See details at

http://www.scitoys.com/scitoys/scitoys/magnets/gauss.html