IEEE Magnetics Society
NEWSLETTER

Volume 42, No. 3 July 2004

Martha Pardavi-Horvath, Editor

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10. **HMM 2005** 5th Int. Symposium on Hysteresis and Micromagnetic Modeling, Budapest, Hungary, *May 30 – June1, 2005.*

- **IEEE Publication news**

  AUTHORS NEEDED

  IEEE TRANSACTIONS ON MAGNETICS on the web

- **QUIZ** - Solution

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2003-2004

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Chapters Corner

If you are the local chapter chairman reading this, please share with us all what'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…

News from Central and South Italy Chapter by Gugliamo Rubinacci

Workshop on Electromagnetic diagnostics and its advanced applications in industrial and civil engineering and in cultural goods maintenance.

The workshop was held at the Faculty of Engineering of Terni, Italy, May 28, and was organized under the auspices of the IEEE Magnetics Society and the IEEE Magnetics Society chapter, Central and South Italy Section. The objective of the workshop was to promote research in the field of electromagnetic diagnostics for applications in industrial and civil engineering and in cultural goods maintenance. It was a great opportunity for an exchange of ideas, methods and technical information among researchers of Italian Universities and representatives of the productive world. Researchers from six Universities were present: University of Perugia (organizer); University of Cassino,;2nd University of Napoli; University of Pavia; University of Reggio Calabria; and University of Udine. In addition, exponents of metallurgic industry, manufacturing of equipment for electromagnetic diagnostics, experts of cultural goods safeguard, and renovators of historical buildings attended the event.

The final working report of the MADEND (Methods and Applications of Electromagnetic Non-destructive diagnostic) National Research Project, involving several Italian Universities was presented. After brief welcoming remarks by the chairman Prof. Ermanno Cardelli the following oral contributions were presented, and a panel discussion followed.

- "Remarks on the non-destructive investigations on forged bodies" presented by Dr. Finali and Dr. Bornia of the Società delle Fucine of Terni, Italy;
- "Electromagnetic technique applied on the non-destructive study of the materials and historical buildings" presented by Dr. Morelli of the Geostudi Astler, Livorno, Italy;
- "Remarks about studies on architectural structures by images diagnostic" presented by Dr. Seracini of the Edithec, Firenze, Italy;

Some images from the contributions are shown below. Figures 1 and 2 are two-dimensional electrical tomography images and radar inspections realized by Dr. Morelli of the Geostudi Astler, Livorno, Italy. Figure 3 show a thermographic image realized by Dr. Seracini of the Edithec, Firenze, Italy.

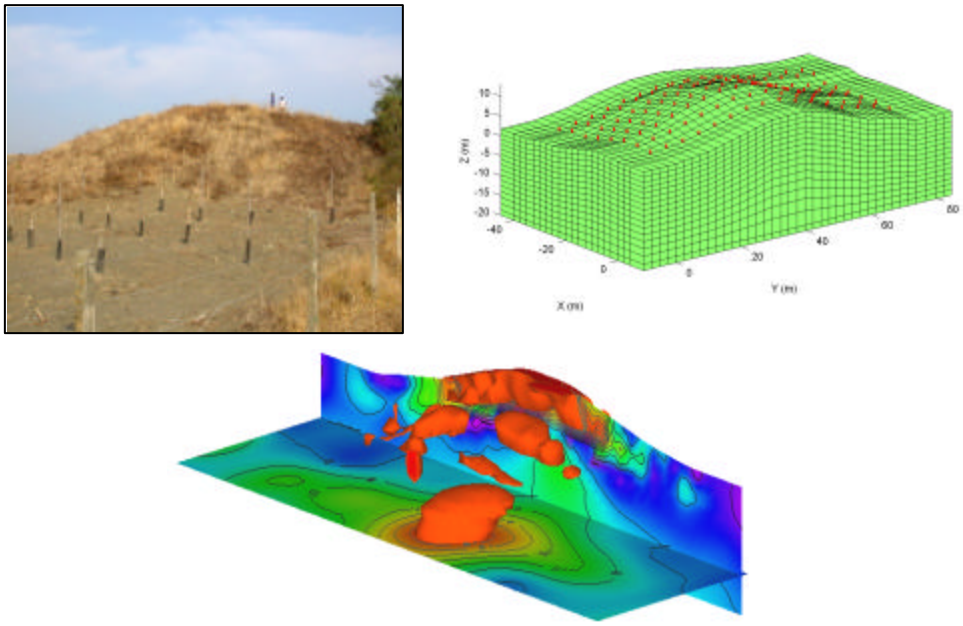


Figure 1: Two dimensional electrical tomography of earth, Montaione, Firenze, Italy.

Figure 2: Radar inspection of a painting by Vasari, Sala del 500, Firenze, Italy.

Figure 3: Thermographic inspection of a building.

News from the Romanian chapter by Alexandru Stancu

The ***IEEE ROMSC 2004*** conference was held 10-11 June 2004 by the Romanian IEEE Magnetics Society Chapter, in Iasi, Romania. Attached are some pictures from the conference.

We have organized a joint opening of our conference and ICPAM 7 (International Conference on Physics of Advanced Materials). The Rector of our University, professor Dumitru OPREA, participated in the opening ceremony t.

All the papers programmed have been presented. Participants from the USA, Germany, Hungary, Moldavia and Romania were present. During the conference we prepared promotional materials for the IEEE Magnetics Society. We also held discussions with our colleagues from other Romanian research centers (Timisoara, Cluj-Napoca, Constanta) in order to convince them to join our scientific community.

The conference was quite successful, and we are already thinking about how to organize the next scientific event. We plan to organize a half-day meeting in October with the occasion of the visit of Dr. Dieter Weller (distinguished lecturer).

News from the UKRI Chapter by Mike Gibbs

On 21st May 2004 we held a meeting of the UKRI chapter of the IEEE Magnetics Society. There were 5 speakers, the main speaker being Jimmy Zhu of CMU, who is one of this year's Distinguished Lecturers. Below is a complete list of speakers. There were a total of 50 attendees, of whom 15 were IEEE members, the remainder being mainly students from various research groups in the UK. We had representatives from the Universities of Manchester, Sheffield, York, Oxford, Bristol, Exeter, Plymouth, Bangor and Edinburgh, as well as Nanomagnetics Ltd from Bristol.

We intend to host further similar meetings with the other two distinguished lecturers in the fall. Dieter Weller and Bob McMichael have both agreed in principal to talk at meetings in York and Exeter respectively, we are in the process of arranging dates.

Prof Jimmy Zhu, Carnegie-Mellon University
IEEE Distinguished Lecturer 2004
"Magnetoresistive Random Access Memory: the path to competitiveness"

Prof Amanda Petford-Long, Department of Materials, University of Oxford
"Microscopy of information storage materials"

Prof C. David Wright, School of Engineering, Computer Science and Mathematics, The University of Exeter
"Data Storage Network - UK"

Prof C. David Wright, School of Engineering, Computer Science and Mathematics, The University of Exeter
"Tbit/sq.in. storage using scanning probes in phase-change media"

Prof Kevin O'Grady, Department of Physics, University of York
"Thermal activation and demagnetising effects in perpendicular media"

Dr Dieter Suess, Magnetic Materials and Micromagnetics Group, Vienna University of Technology
"Magnetic recording simulations: from the write current to the read back"

Dr. Richard H. Dee
Magnetics Society Chapters Chair
r.dee@ieee.org

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.

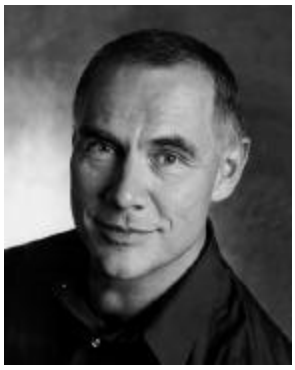
Contact: **Robert D. McMichael**, National Institute of Standards and Technology, 100 Bureau Dr., Stop 8552, Gaithersburg MD 20899; telephone: (301) 975 5121; fax: (301) 975 4553; e-mail: rmcmichael@nist.gov

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).

Contact: ***Dieter Weller,*** Seagate Research Center, Seagate Technology, 1251 Waterfront Place, Pittsburgh, PA 15222; telephone: (412) 918 7128; fax: (412) 918 7222; e-mail: Dieter.Weller@seagate.com

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.

Contact: Professor ***Jian-Gang (Jimmy) Zhu,*** Department of Electrical and Computer Engineering, Carnegie Mellon University, Pittsburgh, PA 15213-3890; telephone: (412) 268 8373; fax: (412) 268 8554; e-mail: jzhu@ece.cmu.edu

2004 IEEE Annual Election Process

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.

URL: 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 News

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 **July** ISSUE:

1. Professional Development Programs Earn Awards for Sections
2. Scholarship Goes to Developer of Keystroke Software for Disabled
3. Share Ideas for Enticing Members On Online Community
4. Wrench Thrown Into Workings of Visa Renewal
5. Submit Your Honors and Recognitions to The Institute
6. What the Tango Can Teach You About Communicating at Meetings
7. Consumer Communications Conference Proceedings Available

The most current version of The Institute can always be found at <http://www.ieee.org/theinstitute>

IEEE-USA Today's Engineer Online Alert

http://www.todaysengineer.org

IEEE-USA Today's Engineer has been updated with new content, including:

+ Demand for Phased Retirement Programs on the Rise

Many professionals nearing retirement age are opting to continue working by taking advantage of one of several phased retirement options. These alternative work arrangements are becoming more and more popular in the American workplace, as they benefit employers and employees alike.

http://www.todaysengineer.org/July04/retirement.asp

+ 10 Thoughts on Innovation

Many modern-day technological advances are remarkable, to be sure, but modest innovations get introduced to the marketplace every day. Whether simple or complex, several general rules of thumb apply to all innovations.

http://www.todaysengineer.org/July04/10rules.asp

+ Exports Hold Potential for Small Businesses, Job Growth

The weak U.S. dollar is making American goods less expensive and therefore more attractive to international markets. This export environment should provide benefits for American companies and could benefit U.S. workers in the process.

http://www.todaysengineer.org/July04/exports.asp

+ Bush and Kerry Outline Stances on Technology Issues

Although agreeing on broad technology issues, President George Bush and Democratic challenger John Kerry differ significantly on many of the specific government programs and initiatives in place or needed to reap maximum benefits from advanced technology development. How do their stands compare with IEEE-USA's positions?

http://www.todaysengineer.org/July04/candidates.asp

Also in this issue:

+ Engineering in Pop Culture: Technology and the Olympics
+ Capitol Shavings: Legislators Contemplate Their Own Demise
+ World Bytes: Digital Divide
+ Reader Feedback

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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.

Contact: ***Marsha Longshore***
732 562 6824
908 217 3594 (cell)
m.longshore@ieee.org

MagNews

Suggestion to read:

Hard Disk Drives

http://www.pcguide.com/ref/hdd/index.htm

including

A Brief History of the Hard Disk Drive

http://www.pcguide.com/ref/hdd/hist-c.html

Disk Drive News

Hitachi to boost production of iPod disk drive

Last modified: May 16, 2004, 8:05 PM PDT
By Reuters

The six-week waiting list to get a popular iPod Mini digital music player from Apple Computer is likely to get shorter by the end of the year.

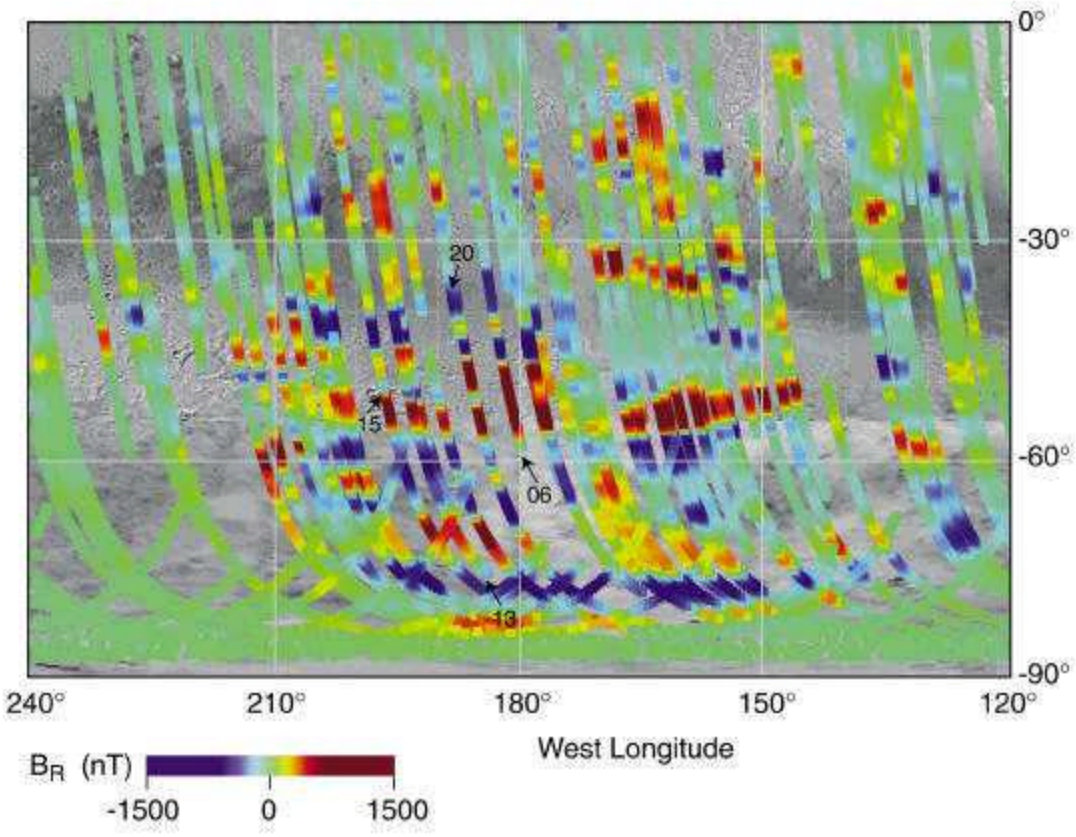
Hitachi's hard disk drive unit said that it will spend about $200 million to double the disk drive output of its Thailand factory, including the 1-inch, 4GB disk drives that are found in the iPod Mini.

Production of Hitachi Global Storage Technologies' Microdrive will rise to about 2 million units per quarter by the end of the year, from 200,000 in the first three months of this year, said John Osterhout, who manages Hitachi GST's Microdrive program.

http://news.com.com/2100-1041_3-5213718.html

QUIZ

What has this to do with magnetism?



Hint: The false blue and red colors represent magnetic fields that point in opposite directions.

STRIPE DOMAINS?

Solution

Go to the

END

Conference announcement 1

TMRC 2004

An International Conference on Magnetic Recording Media
Boulder, Colorado
August 11-13, 2004

Dear Colleague:

We invite you to attend The Magnetic Recording Conference (TMRC), 11-13 August 2004, in Boulder, Colorado, USA. (The North American Perpendicular Recording Conference will be held the day prior, also in Boulder.)

Complete information, program, and registration form are available at <http://www.iist.scu.edu>. We urge you to register before 25 July for the conference and as soon as possible at the conference hotel (very favorable room rate and limited room availability).

Gerardo Bertero
Chairman, TMRC 2004

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Conference announcement 2

North American Perpendicular Magnetic Recording Conference
Boulder, Colorado 2004
August 10-13, 2004.

North American Perpendicular Magnetic Recording Conference (NAPMRC) is a review of the progress in the development of perpendicular magnetic recording.

The NAPMRC has a single session format with all the invited papers forming the body of the conference. Contributed papers are presented at a special poster session. The conference is a highly interactive meeting serving as a forum to evaluate the up to date status of the development efforts of perpendicular recording. All the major topics related to the technology are presented, which include recording heads, media, system integration, channels, etc.

NAPMRC 2004 will be held in Boulder, Colorado jointly with

The Magnetic Recording Conference **TMRC** on August 10-13, 2004.

http://www.napmrc.org/

Conference announcement 3

Gordon Research Conference on
Magnetic Nanostructures

August 22 –27, 2004
Big Sky Resort (Montana, USA)

Chair: ***P. Bruno*** (Halle)
Vice-chair: ***J.S. Moodera*** (Cambridge, MA)

Topics and invited speakers

Fabrication of nanostructures – top-down / bottom-up: ***C. Ross*** (Cambridge, MA) / ***W.D. Schneider*** (Lausanne)
Magnetic tunnel junctions: ***S. Yuasa*** (Tsukuba)
Magnetic anisotropy of nanoclusters: ***H. Brune*** (Lausanne)
Magnetic microscopies: ***R. Wiesendanger*** (Hamburg)
Spin-current induced magnetic excitations: ***M.D. Stiles*** (Gaithersburg) / ***R.A. Buhrman*** (Ithaca)
Ultrafast spin dynamics: ***Th. Rasing*** (Nijmegen) / ***C. Chappert*** (Orsay) / ***H.C. Siegmann*** (Stanford) **Spin injection:** ***W.W. Rühle*** (Marburg)
Spin logic: ***R. Koch*** (Berlin)
Spin manipulation and quantum computing: ***D.D. Awschalom*** (Santa Barbara)
Point contacts and nanowires: ***G. Tatara*** (Osaka) / ***W. Rippard*** (Boulder)
Magnetic semiconductors: ***P.H. Dederichs*** (Jülich) / ***H. Ohno*** (Sendai)
Kondo effect in self-organized nanostructures: ***K. Kern*** (Stuttgart)
Spin-dependent effects in quantum dots: ***J. Martinek*** (Poznan) / ***D. Goldhaber-Gordon*** (Stanford) **Berry phase, spin chirality, and anomalous Hall effect:** ***Y. Taguchi*** (Sendai)

Information and applications:
http://www.grc.uri.edu/programs/2004/magnano.htm

Contact: bruno@mpi-halle.de
grc-magn-nano@mpi-halle.de

Conference announcement 4

ICF-9

Ninth International Conference of Ferrites

August 23-27, 2004
Cathedral Hill Hotel, San Francisco, California, U.S.A.

Second Announcement and Call for Papers

Abstract Submission Deadline—March 1, 2004

The 2004 International Conference on Ferrites (ICF) is the ninth in a series of conferences that provide a forum for the presentation and discussion of the latest scientific and technological developments in ferrites (magnetic ceramics) and related materials. The International Advisory Committee and the U. S. Organizing Committee are pleased to announce that for the second time in its history, the conference (ICF9) will be held in San Francisco, California.

The eight previous conferences were held in Kyoto, Japan (1970, 1980, and 2000), Tokyo, Japan (1992), Bellevue, France (1976), San Francisco, U.S.A. (1984), Bombay, India (1989), and Bordeaux, France (1996). The last conference in 2000 attracted over 500 attendees from 30 countries and had a technical program of 312 papers (oral and poster).

Hosted by: The American Ceramic Society; **Sponsored by:** Japan Society of Powder and Powder Metallurgy International Magnetics Association; **Endorsed by:** The American Physical Society; **Cooperating Society:** IEEE Magnetics Society

Scope

The conference will cover all areas of basic science and technology for ferrites and related materials. Special emphasis will be placed on advanced findings and emerging technologies that are expected to open new horizons for ferrites in the twenty first century. Papers on the results of academic, technical, and industrial studies are welcome. The subject areas for ICF9 are as follows:

Science (S)

1. Physics of ferrites and related materials
2. Chemistry of ferrites and related materials
3. Crystal growth, sintering and microstructure
4. Thin films, multilayers, and fine particles
5. Other basic science

Processing and Applications (PA)

6. Raw materials and manufacturing processes/facilities
7. Soft magnetic materials and cores
8. Hard magnetic materials and magnets
9. Magnetic recording media, heads and systems
10. Magneto-optics and applications
11. High frequency and microwave ferrites
12. Bio-magnetics and medical applications
13. Power magnetics
14. Transducers and sensors
15. Other applications

Special Topics (ST)

16. Nano-structured ferrites and related materials
17. Magnetic fluids, magnetorheological fluids, and novel magnetic devices
18. Multilayer chip inductors

19. Other novel emerging technologies
20. Other special topics

Invited Speakers and Special Sessions

In addition to contributed oral and poster papers in the above areas, ICF9 will include a number of invited speakers, symposia, panel discussions, and workshops. The Program Chair (patton@lamar.colostate.edu) welcomes suggestions for invitees, special topic sessions, as well as the names of possible organizers for such sessions. The Program Committee will review all suggestions and assemble a slate of invited speakers and special sessions in key areas of current interest to the ferrite community.

Possible *symposia, panel, and workshop topics* include:

1. Energy conversion using ferrites and related compounds
2. Magnetite bio-mineralization: new developments and current topics
3. New physics, especially of electronic phase transitions in magnetite, perovskites, and other oxides exhibiting Giant Magnetoresistance (GMR), Colossal Magnetoresistance (CMR), and superconductivity
4. Linear and nonlinear microwave processes in thin films
5. Magnetic and magnetorheological properties of novel ferrite films, including amorphous films and multilayered structures
6. Bonded magnets: basic and applied studies, from raw materials in current use to new products
7. Magnetic materials and components for power electronics
8. New raw materials, methods, and equipment for ferrite processing
9. Ferrite applications [Joint with International Magnetics Association (IMA)]

Abstract Submission

Scientists and engineers working in the broad area of ferrite materials, science, and applications are invited to submit abstracts for consideration by the Program Committee. Abstracts for contributed papers must be submitted electronically through The American Ceramic Society Online Conference Management Submission (OCMS) system. Potential submitters as well as prospective attendees are invited to visit the ICF9 Web site at www.ceramics.org/meetings/ferrites.

Abstracts must be 300 words or less in length, not counting the title, author and address by-lines, and references. An acknowledgement of receipt will be sent by e-mail. If acknowledgement is not received, the abstract was not properly submitted. Contact ocms@ceramics.org if you have problems with submission of your abstracts.

Acceptance notices will be sent out in early April, 2003. The web submission software will automatically produce the accepted abstracts in the proper format for publication in the ICF9 Meeting Guide.

The firm cut-off date for the submission of abstracts is March 1, 2004

Sponsorship and Commercial Exhibits

Organizations and companies with ferrite related services and products are invited to serve as industrial sponsors for the conference. These organizations, especially those involved in ferrite production, raw materials supply, production equipment manufacture, and measuring instrumentation, are invited to exhibit their products in a specially designated ICF9 exhibit area. Further information on sponsorship and exhibits will be sent out shortly. Contact Christine Schnitzer at cschnitzer@ceramics.org for more information.

Conference Proceedings

The ICF9 Proceedings will be published by the American Ceramics Society.

ICF- 9 U. S. Organizing Committee

Conference Chairperson
Dr. Alex Goldman, President, Ferrite Technology Worldwide, ferritetec@aol.com
Secretary General:
Prof. Gareth Thomas, University of California at Berkeley garth@uclink4.berkeley.edu
Program Committee Chairperson:
Prof. Carl E. Patton, Colorado State University, patton@lamar.colostate.edu
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Mr. Thomas M. Coughlin, President, Coughlin Associates, TmCoughlin@aol.com
American Ceramic Society (ACerS) Conference Coordinator
Ms. Christine Schnitzer, e-mail-cschnitzer@ceramics.org

In order to be placed on the ICF9 mailing list for future announcements, please visit the conference web link indicated above or contact Ms. Schnitzer by email.

www.ceramics.org/meetings/ferrites

Conference announcement 5

Joint European Magnetic Symposia

JEMS'04

September 05 – 10, 2004
Dresden, Germany

SCOPE

The Joint European Magnetic Symposia, **JEMS**, are the unification of the two most important conferences on magnetism regularly organized in Europe, namely EMMA (European Magnetic Materials and Applications) and MRM (Magnetic Recording Materials). JEMS focus on magnetism research and applications as well as new magnetic materials.
Information about the conference is available at:

http://www.ifw-dresden.de/imw/jems04/

TOPICS (PRELIMINARY)

- Soft magnetic materials and their applications
- Magnetic recording materials
- Spin electronics and magnetic semiconductors
- Giant magnetoresistive and giant magnetoimpedance materials
- Artificially structured materials, small structures
- Magnetic materials and advanced characterization
- Micromagnetism, magnetization processes and magnetic viscosity
- Sensors and micro-devices
- Numerical modelling, devices and machines
- Imaging and probe techniques
- Permanent magnetic materials and their applications
- Magnetocaloric, magnetostrictive and ferromagnetic shape memory materials
- Magnetic materials in high magnetic fields

IMPORTANT DATES

February 1, 2004	Deadline for abstract submission
March 15, 2004	Notification about abstract acceptance
May 15, 2004	Deadline for advanced registration
June 30, 2004	Deadline for paper submission

CONTACTS

For further information, please contact the organisers at the following address:

A. Kirchner: IFW Dresden, P.O. Box 27 00 16, 01171 Dresden, Germany
Phone: +49 351 4659 405 / 460
Fax: +49 351 4659 541
email: jems04@ifw-dresden.de

http://www.ifw-dresden.de/imw/jems04/

Conference announcement 6

EIGHTH INTERNATIONAL SYMPOSIUM ON MAGNETIC MATERIALS, PROCESSES AND DEVICES

Part of the 206th Meeting of The Electrochemical Society

October 3-8, 2004, Honolulu, Hawaii

Call for Papers

Magnetic thin films play important roles in data recording systems, sensors, microelectromechanical systems (MEMS), and other devices. New knowledge continues to be acquired in magnetic film processing including: film nucleation and growth, structure of deposits, stress and micromagnetics of films, thermal and magnetic annealing, electrochemical and electroless plating systems, etching, process chemistry, tool design, process control, etc. Our understanding of the correlations between deposition parameters, film composition, structure, properties and device performance also continues to improve.

The purpose of the symposium is to bring together electrochemists, physicists, engineers, and device designers who are working in the area of magnetic thin-film technology to review the present state of the field and to point out fruitful new areas for research. Materials of interest include Fe, Ni, Co, and their alloys, as well as laterally patterned, laminated or compositionally modulated structures, including nanowires and self-organized films

The symposium will further cover subjects specific to the fabrication of thin-film heads, microelectromechanical systems, micromotors, and other magnetic devices. The symposium will include invited review or tutorial papers and contributed papers.

Publication of a Proceedings Volume to be available after the Meeting is provisionally planned.

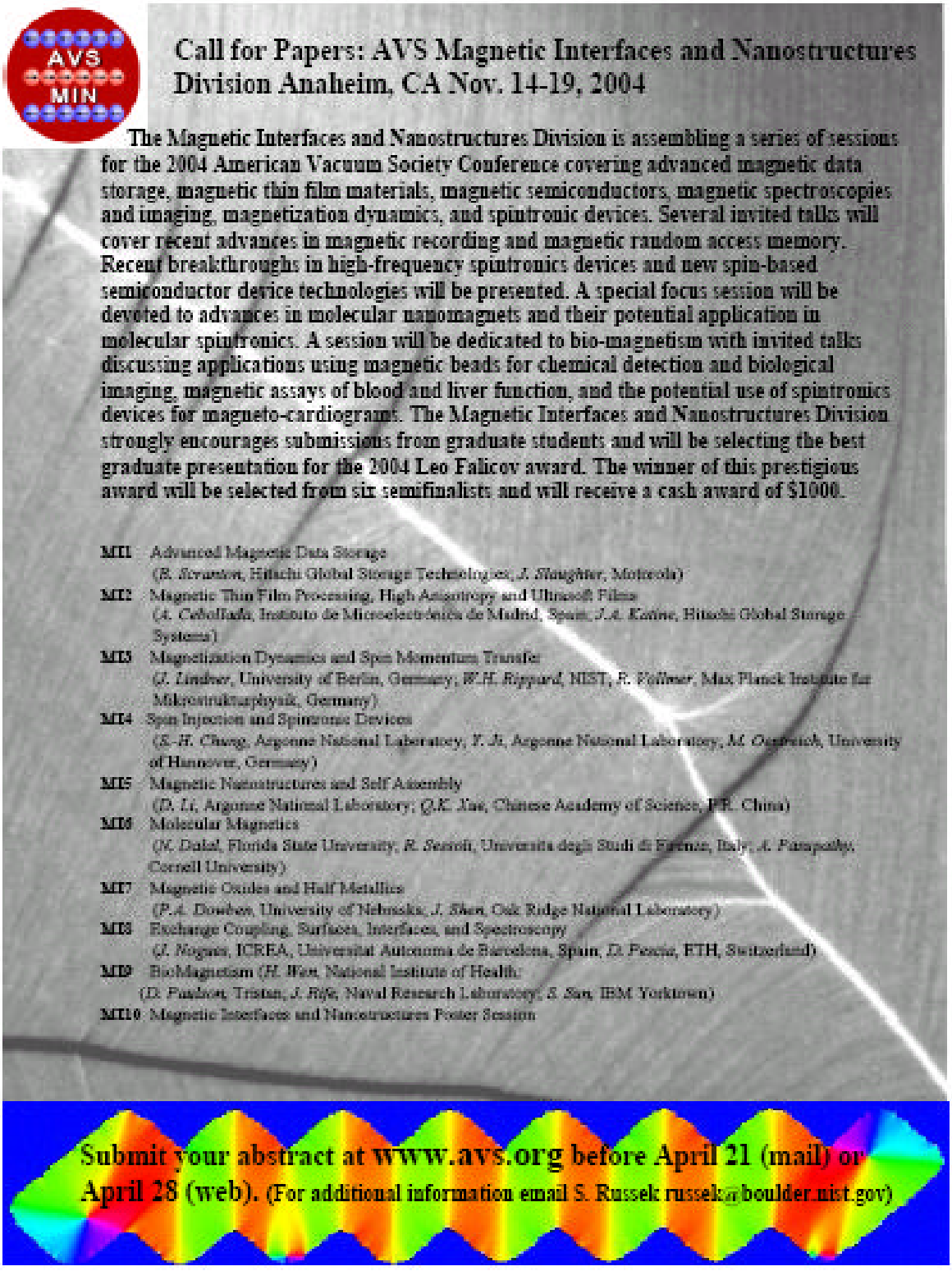
Acceptance of a paper in this symposium (oral or poster) obliges the authors to submit a camera-ready copy of the full proceedings volume manuscript at the meeting. Instructions for preparing the manuscript will be sent out by the symposium organizers after the notification of acceptance is distributed by the ECS Headquarters Office. Abstracts, suggestions, and inquiries should be sent electronically to ECS Headquarters and the symposium organizers. Abstracts must be received at ECS Headquarters by June 1, 2004.

Symposium organizers:

C. Bonhôte, Hitachi Global Storage Technologies, christian.bonhote@hgst.com;
S.R. Brankovic, Seagate Research, stanko.r.brankovic@seagate.com;
W. Schwarzacher, University of Bristol, w.schwarzacher@bristol.ac.uk;
G. Zangari, University of Virginia, gz3e@virginia.edu;
T. Osaka, Waseda University, osakatet@waseda.jp
Y. Kitamoto, Tokyo Institute of Technology kitamoto@iem.titech.ac.jp

Visit the Symposium website at
http://researchweb.watson.ibm.com/SymposiumMMPD/
for updates and to see the Table of Contents of previous Proceedings volumes.

Conference announcement 7



Conference announcement 8

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

Abstracts must be submitted prior to the **July 2, 2004 deadline**. This deadline will be strictly observed. 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 will all be available on the MMM Conference website by this summer. Room reservations can be made beginning in August. http://www.magnetism.org/

Magnetism & Magnetic Materials

MMM 04

Conference announcement 9

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 10

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.

***

Correspondence

Co-Chair, ***Dr. Amalia Ivanyi***
Executive Secretary, **Mr. Miklos Kuczmann**
Technical Secretary, **Mr. Peter Kis**
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E-mail: secretariat@hmm2005.bme.hu

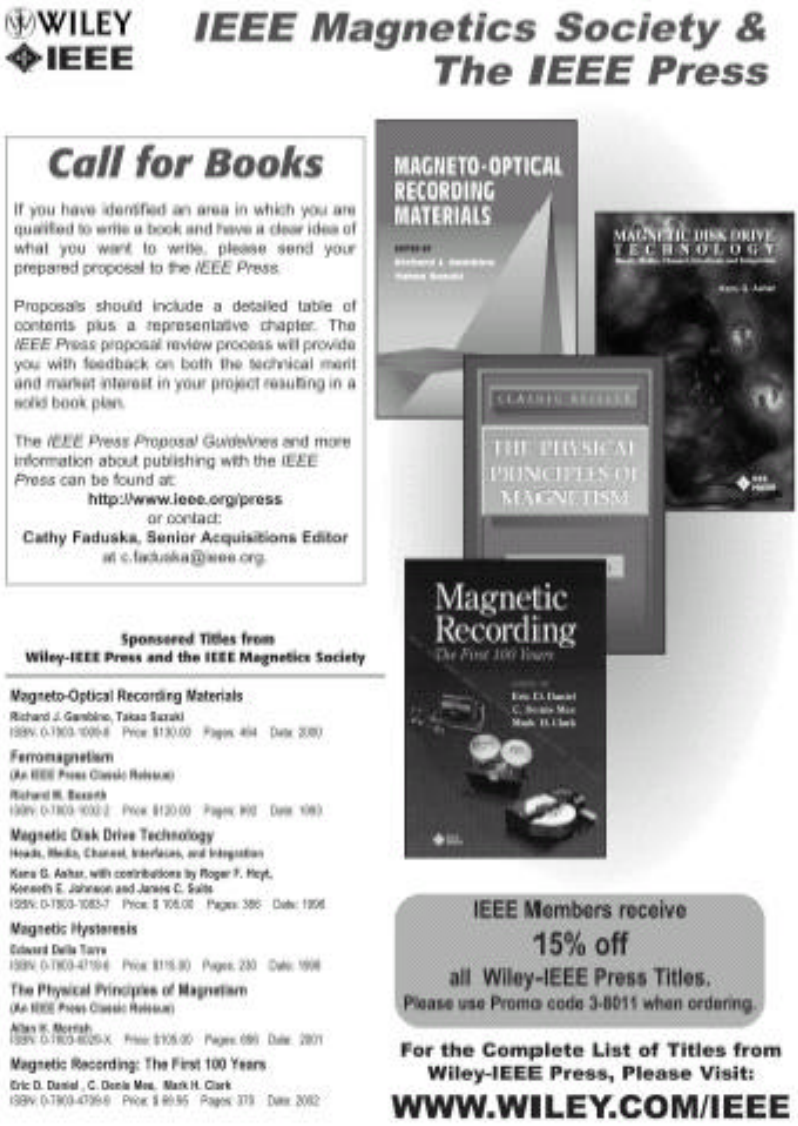
http://www.HMM2005.bme.hu

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



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For more information on this release, visit
<http://ieeexplore.ieee.org/xpl/ReleaseNotes.jsp>

Starting in 1965 with *vol*. 1, now all papers published in **IEEE TRANSACTIONS ON MAGNETICS** are available at ***IEEE Xplore,*** as well as the searchable
Cumulative Index 1985-2000, Volumes 21-36

Ron Goldfarb
Editor in Chief
r.goldfarb@ieee.org

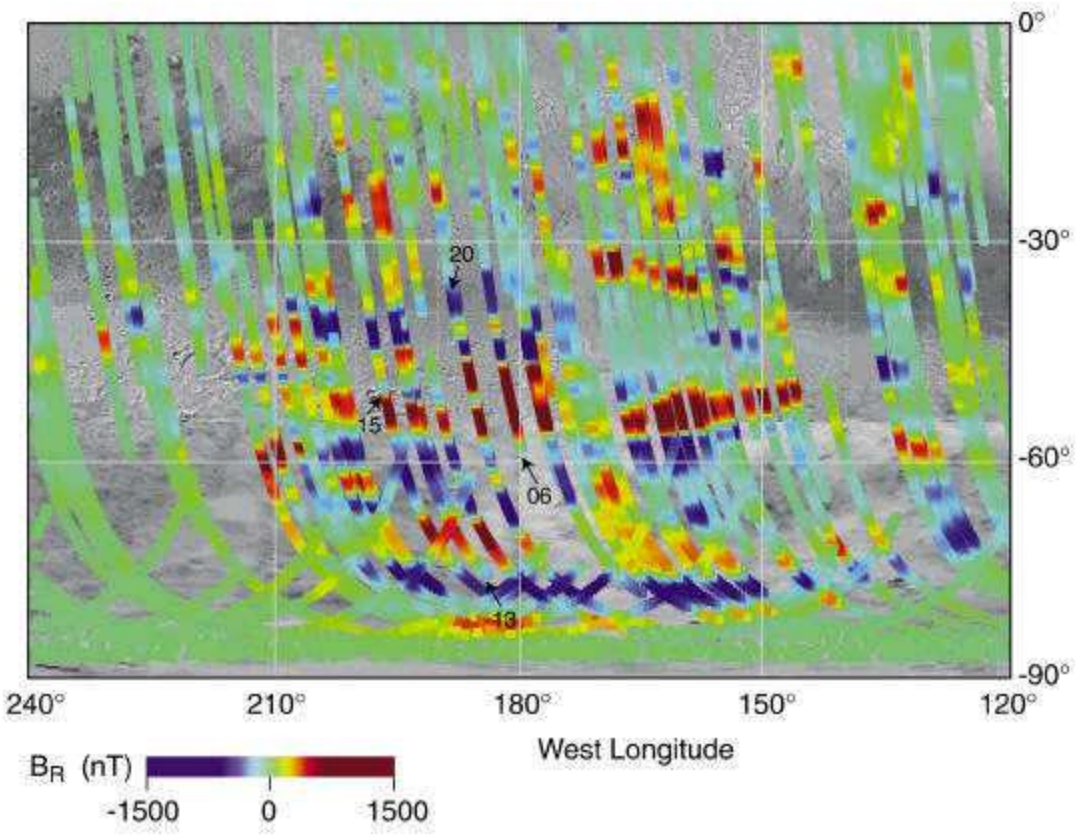
QUIZ – Solution

STRIPE DOMAINS?

This is a map of **Martian magnetic fields** in the southern highlands of Mars. In this area on Mars magnetic stripes possibly resulting from crustal movement are the most prominent.

The false blue and red colors represent invisible magnetic fields in the Martian crust that point in opposite directions.

The magnetic fields appear to be organized in bands, with adjacent bands pointing in opposite directions. These stripes are strikingly similar to patterns seen in the Earth's crust at the mid-oceanic ridges.



http://www.the-planet-mars.com/maps-charts/maps.html