IEEE Magnetics Society
NEWSLETTER

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Pallavi Dhagat and Albrecht Jander, Editors

Bits and Bytes from Carl

by Carl Patton, Society President

Welcome. Welcome to the October issue of the IEEE Magnetics Society Newsletter for 2007. For this issue, I will focus on the Administrative Committee of the Society.

For you old timers, in what year (or thereabouts) did your current president look like this?

First, however, I have some sad news. I would like to advise the Magnetics Society membership, as well as the wider magnetics community, of the passing of Dr. Klaas Klaassen of Hitachi GST on September 3. Klaas was a good friend and colleague to many of us. Roger Hoyt, a company associate, colleague, and friend of many years, represented the Society and spoke at the memorial service for Klaas on September 21. A tribute to Klaas appears on page 9 of this Newsletter.

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Nobel Prize for GMR

by Bruce Gurney

The world of magnetism has received much deserved attention as a result of the announcement that Albert Fert and Peter Grünberg are to receive the 2007 Nobel Prize in Physics for their discovery of giant magnetoresistance (GMR). Their fundamental discovery has led to spin valve GMR devices that have revolutionized the information storage industry. It has also opened a new area of study in spin electronic transport.

As members of the Magnetics Society we can be proud of the Society's role in the development of the field of GMR and its applications, which started soon after the discovery of GMR and continues to date. Much of the important scientific understanding and many engineering developments were first reported through the Intermag and Magnetism and Magnetic Materials conferences, which we sponsor, underscoring the important role these conferences

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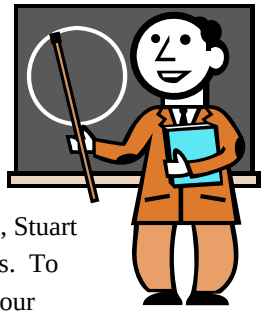
2008 Distinguished Lecturers

by Roy Chantrell, Distinguished Lecturers Coordinator



On an annual basis, Distinguished Lecturers (DL) are nominated and funded by the Magnetics Society to deliver a lecture by invitation of individual institutions or chapters. The DLs for 2008 will be Paulo Freitas, Stuart Parkin, Robert Stamps and Bruce Terris. To invite these distinguished lecturers to your institution, please contact them directly. Their lecture topics, biographies and contact information are found on the following pages. Each DL decides his own itinerary, so contact them early before their schedules are filled. For additional assistance or further information about the program please contact me by e-mail (rc502@york.ac.uk).❖

IEEE Magnetics Society Distinguished Lecturer for 2008

Spintronic Biochips for Biomolecular Recognition

Paulo P. Freitas
INESC Microsystems and Nanotechnologies, Lisbon, Portugal
Physics Department, Instituto Superior Tecnico, Lisbon, Portugal

Integrated spintronic biochip platforms are being developed for portable, point-of-care, diagnostic applications. The platforms consist of a microfluidic unit where the bioassay takes place, an arraying and detector chip consisting of target arraying current lines and integrated magnetoresistive sensors, and electronic control and readout boards. Probe biomolecules are immobilized by microspotting over sensor sites, and target biomolecules, labeled with magnetic nanoparticles, are arrayed over the probe sites (magnetically assisted hybridization). After proper washing, hybridized targets are recognized by the fringe fields created by the magnetic beads, detected by the incorporated magnetoresistive sensors. Detecting geometries using out-of-plane or in-plane bead excitation and dc or ac detection/excitation will be reviewed. Detection limits using spin valve and tunnel junction sensors will be presented, depending ultimately on platform electronic noise and sensor noise characteristics. Applications to gene expression chips (cystic fibrosis gene mutation detection) and immunoassay chips (antibody-antigen recognition; E. coli, salmonella detection) will be presented. Spintronic biochips are also being integrated into multi-module lab-on-chip platforms including biomolecule extraction from biological fluids (magnetophoresis), polymerase chain reaction (PCR) modules (if required), and the biomolecular recognition module. Alternative spintronic biochip geometries will also be presented (lateral flow biosensors), where a magnetoresistive reader scans the surface of a porous strip where labeled target biomolecules bind to immobilized probes. Finally, a brief review of other biomedical applications of magnetoresistive sensors will be given, from hybrid sensors targeted at biomedical imaging, to magnetic tweezers/sensors for DNA translocation monitoring.

Paulo Freitas is a full professor of physics at the Instituto Superior Tecnico (IST) in Lisbon, Portugal, and the director of INESC Microsystems and Nanotechnologies. His current research topics include magnetic random access memory (MRAM), read heads for ultra-high density recording, magnetoresistive biochips, and sensors for biomedical applications. He has been involved in research in the area of magnetoresistive materials and devices since he received his Ph.D. in solid state physics from Carnegie Mellon University in 1986. His thesis was on anisotropic magnetoresistance of ferromagnetic thin films and alloys. He joined IBM Research at Yorktown Heights as a postdoctoral fellow working on high-temperature superconductivity and transport properties of ferromagnetic thin films. In 1988 he joined INESC in Lisbon, where he started the Solid State Technology Group. In 1989 he became professor of physics at the Instituto Superior Tecnico in Lisbon. From 1992 to 1996, he was responsible for the start up and operation of INESC's application-specific integrated circuit (ASIC) back-end microfabrication facility. Since 1996, his research areas expanded to magnetoresistive read elements for magnetic data storage, magnetoresistive sensors, MRAM, and biomedical applications including magnetoresistive biochips. He became director of INESC Microsystems and Nanotechnologies in 2001 and full professor of physics at IST in 2002. Over this period, he co-authored over 200 technical papers and several chapter books. Professional activities include membership in IEEE, and participation in several publication, program, and advisory committees for the Magnetism and Magnetic Materials and Intermag Conferences.

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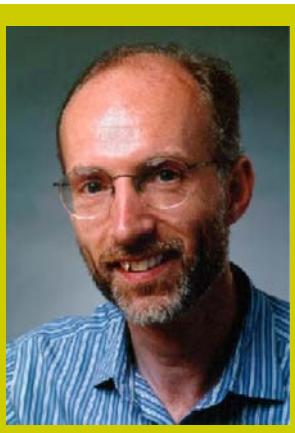
IEEE Magnetics Society Distinguished Lecturer for 2008

The Spin on Electronics!

Stuart Parkin
IBM Almaden Research Center, San Jose, California

Today, nearly all microelectronic devices are based on storing or flowing the electron's charge. The electron also possesses a quantum mechanical property termed "spin," which gives rise to magnetism. Electrical current is comprised of "spin-up" and "spin-down" electrons, which behave as largely independent spin currents. The flow of these spin currents can be controlled in thin-film structures composed of atomically thin layers of conducting magnetic materials separated by nonmagnetic conducting or insulating layers. The resistance of such devices, so-called spin-valves and magnetic tunneling junctions, respectively, can be varied by controlling the relative magnetic orientation of the magnetic layers, giving rise to magnetoresistance tailored for different applications. Recent advances in generating, manipulating and detecting spin-polarized electrons and electrical current make possible new classes of spin based sensors, memory and logic devices, generally referred to as the field of spintronics. In particular, the spin-valve is a key component of all magnetic hard-disk drives manufactured today and enabled their nearly thousand-fold increase in capacity over the past eight years [1]. The magnetic tunnel junction allows for a novel, high performance random access solid state memory which maintains its memory in the absence of electrical power. The respective strengths of these two major classes of digital data storage devices, namely the very low cost of disk drives and the high performance and reliability of solid state memories, may be combined in the future into a single spintronic memory storage technology, the "magnetic racetrack." The racetrack is a novel, three dimensional technology which uses nanosecond pulses of spin-polarized current to move a series of magnetic domain walls along magnetic nanowires [2].

[1] Stuart Parkin et al., "Magnetically engineered spintronic sensors and memory," *Proc. IEEE* **91**, 661-680 (2003).
[2] S. S. P. Parkin, U.S. patents 6,834,005, 6,898,132, 6,920,062, 7,031,178, and 7,236,386 (2004-2007).



Stuart Parkin is an IBM Fellow and manager of the Magnetoelectronics Group at the IBM Almaden Research Center, San Jose, California, and a consulting professor in the Department of Applied Physics at Stanford University. He is also director of the IBM-Stanford Spintronic Science and Applications Center, which was formed in 2004. He received the B.A. and Ph.D. degrees from the University of Cambridge and joined IBM as a postdoctoral fellow in 1982, becoming a permanent member of the staff the following year. In 1999 he was named an IBM Fellow, IBM's highest technical honor. His research interests have included organic superconductors, high-temperature superconductors, and, for almost the past two decades, magnetic thin film structures and spintronic materials and devices for advanced sensor, memory, and logic application. He is a Fellow of the Royal Society, the American Physical Society, the Institute of Physics (London), the IEEE, and the American Association for the Advancement of Science. He is the recipient of numerous honors, including a Humboldt Research Award (2004), the 1999-2000 American Institute of Physics Prize for Industrial Applications of Physics, the European Physical Society's Hewlett-Packard Europhysics Prize (1997), the American Physical Society's International New Materials Prize (1994), the Materials Research Society (MRS) Outstanding Young Investigator Award (1991), and the Charles Vernon Boys Prize from the Institute of Physics, London (1991). In 2001, he was named *R&D* magazine's first Innovator of the Year and in October 2007 was awarded *The Economist* magazine's "No Boundaries" 2007 Award for Innovation. In 2007, he was named a distinguished visiting professor at the National University of Singapore, a visiting chair professor at the National Taiwan University, and an honorary visiting professor at University College London. He has been awarded honorary doctorates by the University of Aachen, Germany, and the Eindhoven University of Technology, The Netherlands. He has authored about 350 papers and has about 63 issued patents.

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IEEE Magnetics Society Distinguished Lecturer for 2008

Turbulent Transitions and Frustrated States:

Some Issues in Reversal

Robert Stamps
University of Western Australia, Perth

A trend over the last few decades in many areas of science and technology has been to modify and control material properties through careful choice of dimensions. A key feature of such endeavors is to create useful physical properties governed by surfaces and interfaces. Important length scales in magnetic metals are spin diffusion, which ranges from angstroms to nanometers, and exchange lengths, which can be on the order of several nanometers. Advanced techniques now allow us to create structures on these length scales in three dimensions. This is a remarkable achievement because it often represents true atomic level engineering, and is based on years of detailed study of thin films and multilayers.

A rich wealth of fascinating phenomena has emerged from studies of these types of constrained geometry structures within the contexts of high speed magnetization reversal and magnetic domain stability. This lecture will provide an introduction to essential concepts, illustrate examples of new physics, and present some challenging, unanswered questions. Topics will include examples of frustration in exchange bias systems and analogies to spin glasses; control of nonlinear processes in patterned magnetic structures and parametric processes incurred during high speed reversal; pinned and viscous domain wall motion in ultra-thin films and nanowires; and electronic and spin wave transport through domain walls. These examples will illustrate reversal processes and domain stability issues relevant for a wide variety of magnetic device applications, including concepts being explored for novel spin logic schemes.

Robert Stamps received the B.S. and M.S. degrees from the University of Colorado, and the Ph.D. in physics from Colorado State University. He has taught at the University of Colorado and Ohio State University, and has been with the University of Western Australia since 1997 where he is associate professor of physics. He has held a Humboldt Junior Fellowship at RWTH Aachen, CNRS Professorial Fellowships (Strasbourg and Orsay), a CNR Fellowship (Florence), a University of Paris VII Visiting Professorship. He also received a Faculty Excellence in Teaching Award in 2001. His work on exchange bias and magnetization dynamics featured in his tenure as the 2004 Wohlfarth Lecturer. He has published over 140 papers on a range of topics in magnetism, including linear and nonlinear dynamics of magnetic and ferroelectric nanostructures, frustrated spin systems and spin glasses, inelastic light scattering and ferromagnetic resonance, spin electronics, and domain wall dynamics in constrained geometries and random systems. He is a member of the U.K. Institute of Physics, the Australian Institute of Physics, and the IEEE Magnetics Society. He was the chair of the 2007 Metallic Multilayers (MML) Symposium, and currently serves on the advisory editorial board of the *Journal of Magnetism and Magnetic Materials.*

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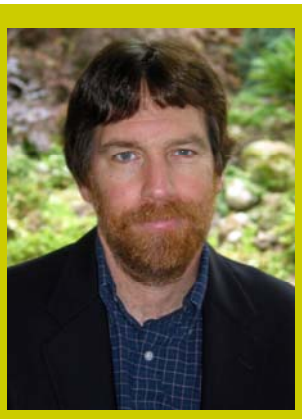
IEEE Magnetics Society Distinguished Lecturer for 2008

Patterned Nanomagnetic Bits and Devices

Bruce D. Terris
Hitachi Global Storage Technologies, San Jose, California

As conventional magnetic recording technology extends to ever higher areal density, it is possible the often predicted, and constantly increasing, density limit will be reached. This limit will likely be in the range of 750 to 1000 Gb/in^2. The use of nanofabrication to create patterned magnetic elements, or patterned media, is one of the proposed approaches with the promise of delaying the onset of superparamagnetism and thus enabling higher areal density. I will discuss many of the challenges that must be overcome for patterned media to be successful, including fundamental physics and materials science problems, new fabrication technologies, nanometer-scale manufacturing tolerances, and low cost budgets.

One of these challenges is to controllably reverse one magnetic element, or bit, without affecting neighboring elements. A narrow anisotropy distribution will be required, yet data suggest that as the element size shrinks, their distribution widens. This distribution arises from a number of sources, including shape and size distributions, edge effects, variation in the full film anisotropy, and magnetostatic fields from neighboring elements. As will be discussed, understanding and controlling the switching properties of magnetic nanostructures is critical not only for patterned media, but for device applications such as magnetic random access memory (MRAM) cells and spintronic devices and for current-induced as well as field-induced reversal.



Bruce D. Terris received the B.S. degree in applied physics from Columbia University and the M.S. and Ph.D. degrees in physics from the University of Illinois at Urbana-Champaign. After receiving his doctorate, he was a postdoctoral fellow for two years at Argonne National Laboratory. In 1985, he joined IBM as a research staff member at the Almaden Research Center, San Jose, California, and subsequently joined Hitachi Global Storage Technologies when it was founded in 2003, and where he is currently the manager of Nanostructures Group. His research interests have included thin film superconductivity and magnetism, contact electrification of insulators, and new types of scanning probe microscopes. His current research is on nanoscale patterning of magnetic structures, thermally assisted magnetic recording, novel approaches to high density data storage, and spin-torque devices. He has co-authored over 90 refereed publications and been issued more than 20 U.S. patents. He has recently served as program co-chair for the 2006 Intermag Conference and program chair for the Nanoscale Science and Technology Division of the American Vacuum Society (AVS) for 2005. He currently serves on the Administrative Committees of the IEEE Magnetics Society and the Magnetism and Magnetic Materials Conference. He will serve as U.S. program chair for the 2008 Intermag Conference and U.S. conference chair for Intermag 2011 (Taipei). He is a Fellow of the American Physical Society and the AVS, and is a member of IEEE.

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The AdCom Explained

by Carl Patton, Magnetics Society President

Organization. The Administrative Committee, or "the AdCom" in the vernacular, is the body that manages the main affairs of the Society. Twenty four of its members are voting elected members. These are elected 8 at a time for staggered three year terms. Until this year, new members were elected by the seated AdCom itself. In 2007, for the first time, the election of new members was made society wide. In alternate years, the AdCom elects a President-Elect and a Secretary-Treasurer for two year terms. The President-Elect then advances to President for a two year term. The President, President-Elect, Secretary-Treasurer, and immediate Past President serve as elected voting members of the AdCom. Standing committee chairs, appointed by the President with the approval of the AdCom, also serve as voting appointed members of the AdCom. There are also several non-voting members, including the Executive Director and several sub-committee chairs. At present, there are 38 voting members and four non-voting members. The voting members are comprised of the 24 elected members, the four officers, and the standing committee chairs. Our constitution requires that no fewer than two-thirds of the voting members shall be elected members.

AdCom Election Results

by Ronald Indeck, Nominations Committee Chair

This year marked an important milestone in the history of the Magnetics Society. Our new Constitution and Bylaws provided for a society-wide election of AdCom members and 2007 was the first year to see this process implemented. Nominations were opened up to all Magnetics Society members and solicitations were sent out this spring. This process resulted in sixteen candidates placed on the Society-wide AdCom Election paper ballot and mailed out to 2,819 members. 333 ballot cards were returned with participation from all ten regions. The following candidates have been elected for a three-year term beginning January 1, 2008. ❖

John N. Chapman
Olle G. Heinonen
Burkard Hillebrands
Klaas Klaassen*
Dmitri Litvinov
Hiroaki Muraoka
Martha Pardavi-Horvath
Bruce D. Terris
Usha Varshney

**This election was marred by the sad news that our colleague, Klaas Klaassen, passed away September 3, 2007.*

The Standing Committees. The main work of the Society is carried out by the Standing Committees. Presently the standing committees are (1) the Chapters Committee, (2) the Conference Executive Committee, (3) the Education Committee, (4) the Finance Committee, (5) the Honors and Awards Committee, (6) the Membership Committee, (7) the Nominations Committee, (8) the Planning, Constitution, and By-laws Committee, (9) the Publications Committee, (10) the Publicity Committee, and (11) the Technical Committee. The Planning Committee is always chaired by the President-Elect. The functions of these committees are fairly clear from the titles. The Conference Executive Committee, or "CEC," oversees all of the conferences sponsored by the Society, monitors and approves conference budgets, manages the mandated Memorandum of Understanding (or MoU) for any special conferences, monitors conference management and approves final audits for the Society. The Finance Committee works with all of the other committees to work up the budget of the Society for the coming year, usually starting as early as January, and then works with the IEEE to realize the final approved budget, usually by November. Some Standing Committees are "committees of one" and some have many members. The Technical Committee, for example, has about 40 members with areas of expertise that span all of the magnetics sub-topics featured in most of our conferences. These members provide expertise to our conferences and the AdCom in general, participate in conference program committees, and support the referee functions for our Transactions. The Education Committee organizes and sponsors special sessions at our conferences and is presently organizing a special summer school for 2008. The Membership Committee is currently undertaking a new effort to bring in younger professionals to the IEEE and the Society through the recently initiated GOLD (Graduates of the Last Decade) program by the IEEE Regional Activity Board (RAB). The Publications Committee manages the IEEE Transactions on Magnetics through its designated Editor-in-Chief, the Newsletter through its editors, and oversees many of the conference related issues of the Transactions, among other things. The Publicity Committee continually maintains and improves the excellent Society web site at http://www.ieeemagnetics.org/. Check it out!

The Money. Naturally, the main line item budgets are for the Publications and Conference categories. Our publications and conferences are very successful enterprises that provide exemplary service to the Society and to the

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magnetics community, and bring in the bulk of the funds that enable the Society to serve its members. The main budget items initiated and controlled directly by the AdCom include those for the Distinguished Lecturer program, regular Society funding for local chapters, funding for special initiatives (such as the planned summer school for 2008 noted above), meeting costs for the AdCom itself and the various committees, a substantial (and growing) student travel award program for sponsored conferences, special awards, and conference registration subsidies for Magnetics Society members. In many cases, these registration subsidies offset to a very large extent the cost of the members' IEEE and Magnetics Society annual dues!

The Goal. Overall, the AdCom and all of the committees continually strive to increase member involvement in the Society, bring in "new blood" to the AdCom itself, and come up with new and creative ways to provide more and better member benefits.

You can become involved too! There are many ways in which you, as a member, can become involved and contribute to the Society and the magnetics community at large. First of all, support your local chapter if there is one. If there is not one, work with your local IEEE section to identify Magnetics Society members in your locale and consider forming a new chapter. Movements are currently underway to form new chapters in Boston, Houston, and Nanjing, China, to name a few. Secondly, if any of the different standing committees strike a resonance with you, contact the chair and get involved. All of the committee chairs are interested in hearing from people willing to help. The Technical Committee is a good place to start for many interested prospective volunteers, especially if you have a unique area of expertise to offer. If you have an interest in a more active society involvement and do not know how to get started, feel free to contact me directly. I will lose no time in getting you properly connected! ❖

Best wishes,
Carl Patton, President
patton@lamar.colostate.edu

Conference Sponsorship

by Doug Lavers, Conference Executive Committee Chair

Attendance at a technical conference is one of the common interactions that a Magnetics Society member has with his or her Society. The Society sponsors several conferences each year, either fully (e.g. INTERMAG, TMRC), or as a 50% co-sponsor (e.g. MMM).

The technical content of these conferences, the opportunity to interact and network with colleagues, and a reduced registration fee at IEEE conferences, are all tangible benefits that membership in the Society offers. Recognizing the importance of conferences, the Society is presently seeking to increase the number of conferences that it is financially involved with, particularly those that have international exposure. For example, over the next 12 month period, the Society will fully sponsor MML 2007 (a conference on metallic multilayers) in Perth, Australia, and assume a major co-sponsorship position with CEFC 2008 (a conference on computational electromagnetics) in Athens, Greece.

When the Society assumes a financial role in a conference, the Society must first approve the conference budget. In addition, a memorandum of understanding must be signed wherein the parties involved with the conference agree on a division of responsibilities and obligations, financial and otherwise. The conference, in turn, receives a guarantee of financial stability, access to start-up funds in the form of a repayable loan, as well as technical assistance and publicity.

Aside from financial sponsorship, either as sole sponsor or as co-sponsor, the Society can also provide technical sponsorship. Technical sponsorship is often given to smaller meetings and workshops that wish to be linked to the Society, particularly in terms of publicity and assistance with the technical program. When the Society provides technical sponsorship, it does not assume any financial responsibility for the conference.

Recommendations on sponsorship are made, on behalf of the Society, by the Conference Executive Committee (CEC) of the Society. As CEC chairman, I invite members to write to me (doug.lavers@utoronto.ca) concerning potential sponsorship of conferences or workships.❖

Registration Fees, Subsidies and Member Benefits

by Doug Lavers and Liesl Folks

Registration fees can represent a significant cost when attending a conference. Probably the most difficult task facing a Conference Steering Committee is that of maintaining the registration fee at a manageable level. The registration fee can represent up to 90% of the conference income. Thus, setting the registration fee requires a balance between the desires of the registrants and the cost of meeting these desires (e.g. delivery of the technical program, management of the conference, social activities, publication of papers). In addition, the IEEE policy under which we operate mandates that conferences budget for a surplus of up to 20%. This surplus, in turn, contributes to many of the activities that the Society sponsors.

Over the past several years, the Society has been in excellent financial shape. Consequently, discussions have been ongoing on how best to use some of the conference generated surplus to enhance member benefits. In the short term, decisions have been made to use such funds to subsidize several conferences that the Society sponsors. To date the Administrative Committee (AdCom) of the Society has voted to subsidize the 2007 MMM Conference in Tampa FL, and the 2008 INTERMAG Conference next May in Madrid, Spain.

Sponsorship of the MMM Conference in Tampa is shared equally by the Magnetics Society, through the IEEE, and Physics Conferences Inc. (PCI), an entity related to the American Institute of Physics. Funds that flow to any MMM conference do so via a conference reserve fund that is maintained jointly by the IEEE and PCI. Under normal circumstances, the MMM conference in Tampa would not be eligible for any extra funding for new initiatives or attendee benefits. However, the 2007 Joint INTERMAG-MMM Conference in Baltimore resulted in an unexpectedly large (and unbudgeted) surplus. The AdCom voted to transfer $50K of this surplus to reduce the registration fees and host a social event at the MMM conference in Tampa. PCI voted to transfer an equal amount. In both cases, the funds to be transferred would normally have gone to the conference reserve fund.

The AdCom also approved two initiatives to benefit Society members at the 2008 INTERMAG in Madrid: The first initiative will provide a registration subsidy of up to $100 for Full and Affiliate Members of the Magnetics Society, and up to $80 for Students and Retired Members. The estimated cost of this initiative is $50-60K. A second initiative for $65K of Society funds to sponsor a networking reception at INTERMAG 2008 was also approved with a view to enhancing the strength of the magnetics community through discussion and interactions at this important international meeting. ❖

Two New Chapters

Bob McMichael, Chapters Chair

Announcing two new Magnetics Society chapters!

Manuel Vazquez Villalabeitia is the chair of the new Spain chapter of the Magnetics Society, which was approved in September.

In the Houston section, Jim Rantschler is the chair of a chapter, which has been holding regular meetings for some time. The Houston chapter was originally formed jointly with the Antennas & Propagation Society, the Electron Devices Society and the Microwave Theory and Techniques Society. Now, the Houston chapter has been re-estabilished as an independent Magnetics Society chapter, a move that required considerable extra effort. Congratulaions to Jim and the local membership on their new chapter.

If no chapter exists in your Section, please consider forming one to get the most out of your membership. There are three requirements to form a new chapter:

1. A petition with 12 signatures of current, regular Magnetics Society members in your section,
2. Approval of the section executive board, and
3. Approval of the society president (our president is going to say "yes").

The Magnetics Society is ready to support the activities of its chapters around the globe. Please contact me by email at bob.mcmichael@ieee.org about chapter formation in your area, or visit the IEEE new chapters website http://www.ieee.org/portal/pages/tab/cha/newchap.html ❖

2008 Conference Calendar

Intermag 2008

May 4-8, 2008, Madrid, Spain

http://www.intermagconference.com/intermag2008/index.htm

The 7th Intl. Conf. on Scientific & Clinical Applications of Magnetic Carriers

May 21-24, 2008, Vancouver, Canada

http://www.magneticmicrosphere.com/meetings/meet2008/

10th International Conference on Ferrites (ICF10)

October 10-14, 2008, Chengdu, China

http//www.cnmagnet.net

53rd Conf. on Magn. & Magn. MatER. (MMM 2008)

November 10-14, 2008, Austin, TX, USA

http://www.magnetism.org

In Memoriam

Klaas Berend Klaassen

1941-2007

Klaas Klaassen, a long-time and active participant in the Magnetic Society passed away on September 3rd. His former colleagues, Roger Hoyt and Michael Ross provided this tribute to his life.

Klaas received his Ph.D. degree in Systems Reliability from Delft University of Technology in the Netherlands in 1978. In 1979, he became a tenured professor in the Electrical Engineering Department of Delft University, where he established its Electronics Instrumentation Laboratory and helped found the university's now well known Integrated Micro-Electronics Facility. He taught courses there on reliability, measurement, electronics and avionics. On a summer sabbatical in 1981, he came to IBM's San Jose Research Center, prior to its becoming the Almaden Research Center, and in 1983 returned as a full time member of the research staff. Known for his analog circuit design skills, Klaas also made a name for himself within IBM as an expert in identifying — and ultimately reducing and minimizing — electrical noise in the electronic and magnetic sensors that lie at the heart of every hard-disk drive.

In all, Klaas wrote seven technical books, more than 75 research papers, and held more than 40 patents. In 1997, Klaas was elected a Fellow of the IEEE, in recognition of his valuable contributions to advanced measurement and analog circuit designs for magnetic recording. He received numerous company awards for his research, and was named an IBM Master Inventor owing to the portfolio value of his patents.

Klaas was a very enthusiastic and entertaining speaker. He was recently nominated to be a 2008 IEEE Distinguished Lecturer. Klaas also was recently nominated to serve on the Magnetics Society's Administrative Committee. He was a frequent and tireless contributor and behind-the-scenes facilitator in managing myriad duties of the IEEE Magnetics Society and several local and international conferences. He served as a program committee member for a number of International Magnetics (Intermag) and Magnetism and Magnetic Materials (MMM) conferences, chaired many sessions at these and other IEEE conferences, and served as the program co-chair of the 2007 Magnetic Recording Conference (TMRC).

As characterized by one of his colleagues, Klaas was "an engineer's engineer." This is a very high compliment, indeed. We, and all your fellow engineers, admired you, Klaas, and we will miss you greatly. ❖

Nobel

(continued from page 1)

play in the magnetism community. The Society also contributed through the publication of peer reviewed articles in our journal, the IEEE Transactions on Magnetics. Seminal papers can be found in its pages on the design and fabrication of GMR recording heads, and extensions of GMR to biological sensors and other uses.

Many of our colleagues in the Society have contributed to the research of GMR and to its applications. They have helped establish the GMR phenomenon on par with other Nobel Prizes, including the laser and transistor, whose discoveries have also led to useful, commonplace devices.

The awarding of this prize is a wonderful reminder to all of us about just how rich, fascinating, and exciting magnetism really is, and that there are discoveries in magnetism yet to be made, and new devices still to be developed. ❖

About the Newsletter

The purpose of the **IEEE Magnetics Society Newsletter** is to publicize activities, conferences, workshops and other information of interest to the Society members and technical people in the general area of applied magnetics. Manuscripts are solicited from the Magnetics Society members, organizers of conferences, officers of the Society, local chapters, and other individuals with relevant material.

The Newsletter is published in January, April, July and October electronically on the Magnetics Society webpage, http://www.ieeemagnetics.org/

Submission deadlines are January 1, April 1, July 1, and October 1 respectively. Please send articles, letters and other contributions to the editors:

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