

A Note From the Chair

If it's the beginning of August, then it is already time to start thinking about the 2008 March Meeting. GMAG organizes the Magnetism sessions at the March Meeting, and over the next month we need your input on invited speakers for focus sessions and nominations for the three GMAG-sponsored symposia.

Last year we had only five symposium proposals submitted to GMAG. We also encourage nominations for APS fellows, for Ph. D. student Dissertation Awards, and for members of the GMAG Executive Committee. Deadlines and further information on these and other opportunities to help GMAG and the physics community are given in the following pages of this newsletter.

We always welcome suggestions for new activities and programs you would like to see GMAG initiate. Please send ideas to me or to one of the other GMAG officers. Lastly, please bring the Topical Group on Magnetism (GMAG) to the attention of your colleagues and urge them to join.

—Dan Reich, GMAG Chair



March Meeting Program

The Chair-Elect, Bill Butler (wbutler@mint.ua.edu) is the GMAG program chair for the 2008 March Meeting in New Orleans. He is coordinating the organization of both GMAG sponsored (or co-sponsored) Focus Topics and the GMAG invited symposia.

Focus Topics – Nominations for invited speakers

For the 2008 meeting, GMAG is co-sponsoring seven focus topics. Each focus topic consists of multiple sessions of contributed talks on a common theme. Each session can also include one invited talk. Suggestions for invited speakers are welcome and should be sent to one of the organizers of the focus topic (see below) before August 31, 2007. Contributed talks relating to a focus topic should be submitted under the focus topic sorting category (number given below) and not to a general category. The deadline for contributed talks submissions is November 27, 2007. The GMAG focus topics (co-sponsors are shown in parenthesis) for 2008 are:

6.11.1 *Theory and Simulation of Spin-Dependent Effects and Properties* (DCOMP/DMP/GMAG). Organized by Thomas Schulthess (schulthesstc@ornl.gov) and Oleg Tchernyshyov (olegt@jhu.edu).

6.11.2 *Magnetic Nanostructures: Materials and Phenomena* (DMP/GMAG). Organized by Dan Ralph (ralph@ccmr.cornell.edu) and Sergei Urazhdin (Sergei.Urazhdin@mail.wvu.edu).

6.11.3 *Complex Oxides* (DMP/GMAG). Organized by Ramamoorthy Ramesh (rramesh@berkeley.edu), David J. Singh (singhdj@ornl.gov), Arunva Gupta (agupta@mint.ua.edu) and Stephan Rosenkranz (SRosenkranz@anl.gov).

6.11.4 *Spin Transport and Magnetization Dynamics in Metal-Based Systems* (GMAG/DMP/FIAP). Organized by Stefan Maat (Stafan.Maat@hitachigst.com) and Maxim Tsoi (tsoi@physics.utexas.edu).

6.11.5 *Spin-Dependent Phenomena in Semiconductors* (GMAG/DMP/FIAP). Organized by David Awschalom (awsch@physics.ucsb.edu), Stuart Wolf (saw6b@virginia.edu), and Mark van Schilfgaarde (mark.vanschilfgaarde@asu.edu).

6.11.6 *Nanomagnetic Particles and Structures for Information Storage Applications* (GMAG/FIAP). Organized by J. W. Harrell (jharrell@mint.ua.edu) and Brad Engel (brad.engel@freescall.com).

6.11.7 *Frustrated and Low Dimensional Magnetism* (GMAG). Organized by Jason S. Gardner (jsg@nist.gov) and Jian Shen (shenj@ornl.gov).

Descriptions of these focus topics are found at the end of this newsletter.

The GMAG Executive Committee

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Vice-Chair

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Chris Leighton, Sara Majetich, David Lederman, Stephen Hill, Michael Pechan, and Michael Fitzsimmons

GMAG Symposia – Suggestions for topics

GMAG is the sponsor of three invited symposia for the March Meeting. GMAG members are encouraged to recommend topics for these symposia. The nomination should include the names of the organizer(s) and a tentative list of invited speakers (usually 5 per session). Please send nominations to the GMAG program chair, Bill Butler (wbutler@mint.ua.edu) before August 31, 2007.

Nominations for GMAG Officers and members of the Executive Committee

Each year GMAG requests nominations for Vice-Chair (who succeeds to Chair-Elect, Chair, and Past Chair) and for two new at-large members of the Executive Committee. Nominations for these positions should be sent to Sara Majetich (sm70@andrew.cmu.edu), chair of the Nominating Committee, before September 1, 2007.

Nominations for APS Fellowship and Prizes/Awards

The nominations deadlines for APS fellowship and most prizes have passed for this year. However, it is a good time to consider nominations for next year. GMAG nominates 2-3 people for APS Fellowship each year. The next deadline is April 1, 2008 and nominations should be made on-line at <http://www.aps.org/fellowship/>. APS prize descriptions and nomination deadlines are at <http://www.aps.org/praw/>.

Student Dissertation Awards

Outstanding Dissertation in Magnetism Awards: GMAG will present up to three dissertation awards at the next March Meeting. These awards will recognize students who have conducted outstanding research leading to their dissertation and will consist of an invited talk in an appropriate session at the March APS Meeting, a \$500 prize to the student, and up to \$250 toward his/her travel expenses to the March meeting. The student must be in the final year before graduating with a Ph.D., and both the student and the advisor must be current members of GMAG. Nominations will consist of: a nominating letter; an extended abstract of the research; the student's CV and publication list; and contact information for the student, all submitted by the student's advisor or another senior researcher who knows the student's work well. The nominating letter must address the following issues:

- *quality and independence of the student's work;*
- *student's speaking ability;*
- *year the student began graduate school;*
- *student's expected completion date (must be after Sept. 1, 2007 but before Sept. 1, 2008 to be eligible for the 2008 March Meeting);*
- *assessment of the student's future potential as a research scientist.*

Nominations should be sent by email as a single pdf file to Dan Reich (reich@jhu.edu) by August 31, 2007. Evaluation of the nominations will be conducted by the GMAG Executive Committee.

Outreach Funding from GMAG

GMAG invites applications from its members to support outreach activities involving magnetism. Limited funds (up to \$2500 per project) are available to cover supplies and expenses associated with activities that aim to educate non-scientists about magnetism and its applications. Preference will be given to innovative activities that will be documented so that they can be reproduced elsewhere. The outcome of the activities will be disseminated to the GMAG membership through the Newsletter and to the broader magnetism community through the GMAG website. Interested GMAG members should prepare a 1-2 page summary of the proposed activity (including expected duration and outcome) along with a 1 page CV and a list of anticipated expenses. These should be mailed as a single file in .pdf format to the GMAG Chair, Dan Reich, at reich@jhu.edu. The GMAG Executive Board will review proposals on an ongoing basis, beginning June 1, 2007. Further details will appear on the GMAG web site.

Briefly Noted

In this space, we will try to list new books or other publications outside the usual journals that may be of interest to the GMAG membership. This is for information purposes only. No endorsement is expressed or implied. If you have something that you would like listed here, contact Dan Reich.

Biomedical Applications of Nanotechnology V. Labhasetwar and D. Leslie-Pelecky, editors, Wiley (2007). This is review of current and potential uses of magnetic and other nanoparticles for biotechnology. For more information, see <http://www.wiley.com/WileyCDA/Section/id-300698.html>.

Descriptions of GMAG Sponsored/cosponsored Focus Topics — March 2008 APS Meeting

6.11.1 Theory and Simulation of Magnetism and Spin-Dependent Properties

This focus topic centers on recent advances in the theory and numerical simulations of spin-dependent properties of magnetic materials and structures. Covered phenomena include magnetic hysteresis, spin transport, spin relaxation, spin torque, exchange spring, exchange bias, interlayer magnetic coupling, anomalous Hall effect, and dynamics of topological defects. Particular attention will be paid to magnetic systems with a reduced number of spatial dimensions from 0-D molecular magnets and nanodots to 1-D nanowires and 2-D thin films and interfaces. Approaches include material-specific ab-initio techniques (LDA and beyond) as well as a combination of these methods with multi-scale modeling, atomic-scale effective spin Hamiltonians, Monte-Carlo simulations, Langevin dynamics, and micromagnetic modeling. We especially encourage contributions showing benefits of cross-pollination between analytical and numerical approaches for explaining and predicting specific experimental results and materials or systems properties.

6.11.2 Magnetic Nanostructures: Materials and Phenomena

This topic focuses on magnetic materials and phenomena at the nanometer-scale. Magnetic nanostructures include thin films,

multilayers, nanoparticles, nanowires, nanorings, nanocomposites, core-shell structures, hybrid structures, magnetic point contacts and self-assembled as well as patterned magnetic arrays. This session will cover both experimental and theoretical advances in low dimensional magnetism, proximity effects, interlayer magnetic coupling, exchange spring, exchange bias, magnetic quantum confinement, magnetic anisotropy, glassy dynamics, memory effect and other relaxation phenomena, inter-particle interactions, effects of structural disorder, modeling of hysteresis, thermal and quantum fluctuations, and other nanoscale magnetic phenomena. Of special interest is the fabrication of nanostructures with atomic-scale control using physical and chemical methods, self and directed assembly of nanostructure arrays, high-resolution characterization methods with site and/or element specificity, novel techniques for the creation of nanoscale magnetic features, and other unusual physical phenomena present in these systems.

6.11.3 Complex oxides

Transition metal oxides exhibit a wide range of intriguing phenomena which originate from the complexity induced by the close competition of multiple interactions and the presence of various ground states with incompatible order. Associated with this complexity is a tendency for short range order such as the formation of stripes, ladders, checkerboards, dimers, or phase separation, and an enhanced response to external fields that gives rise to giant and colossal effects with potential for applications. This Focus Topic explores the nature of the various ground states observed in these complex oxides and the interactions responsible, the ways in which the spin, charge, orbital, and strain degrees of freedom respond on a variety of length scales, how they interact and compete with each other to produce the unusual phenomena in the bulk and film, and how they change near surfaces and interfaces and in particular near interfaces between two such systems with competing ground-states, where novel phenomena may occur. It provides a forum to discuss recent developments and results covering basic and applied aspects from synthesis and fabrication to experiment, theory and simulation of bulk, films, and artificial superlattices of complex oxides, including multiferroics, manganites, nickelates, cobaltites, ruthenates, and their interfaces.

6.11.4 Spin Transport & Magnetization Dynamics in Metal-Based Systems

This topic will focus on experimental and theoretical investigations of the transport and transfer of spin, as well as magnetization dynamics, in metal-based magnetic systems. Topics of interest include all aspects of spin-dependent transport and scattering, in the diffusive, ballistic, tunneling and hot electron transport regimes as evidenced, for example, in giant magnetoresistance (GMR), tunneling magnetoresistance (TMR), tunneling spectroscopy of spin states, spin filtering and related effects. Furthermore, a main focus will be magnetization dynamics in confined geometries investigated both in the time and frequency domain. Also of particular interest are studies of the interplay between spin currents and magnetization dynamics in magnetic nanostructures. Additional topics include, but are not limited to, spin-charge-separation in transport processes including spin-diffusion and spin-relaxation, interfacial spin

transport, spin injection and detection, mechanisms for magnetic damping, especially in magnetic nanostructures, spin-current-driven magnetization and domain wall dynamics, and studies in ferromagnetic — normal metal and ferromagnetic — superconductor systems. Studies that emphasize spin phenomena in semiconductor systems will be covered in a separate focus topic.

6.11.5 Spin Dependent Phenomena in Semiconductors

Since the discovery of ferromagnetism in GaMnAs and very long spin lifetimes in semiconductors and semiconducting nanostructures, there have been recent advances in and concomitant growing interest in exploring the spin dependent properties of a variety of semiconductors, particularly after the successes of metallic spintronic heterostructures for magnetic storage. This series of sessions solicits contributions focused on understanding the spin-dependent processes in magnetic and non-magnetic structures incorporating semiconducting materials. Topics can include (1) growth, characterization, electrical, optical and magnetic properties in ferromagnetic semiconductors and hybrid ferromagnet-semiconductor structures including quantum dots, nanocrystals, nanowires, and organic semiconductors; (2) novel transport and dynamical effects in semiconductors either because of large spin-orbit interactions or the lack of such interaction, electrical and optical spin injection manipulation and detection, spin coherence, spin Hall effect, spin interference, spin filtering, spin lifetime effects, spin dependent scattering, spin torque and domain structure and motion. In addition memory and logic device structures based on these effects are also solicited including quantum information devices.

6.11.6 Nanomagnetic Particles and Structures for Information Storage Applications

This Topic focuses on nanoscale magnetic materials for information recording and memory applications. Recent technological advances have brought this field to a point where fundamental physical properties such as stability (super-paramagnetic effect) and speed (intrinsic and extrinsic damping) reach crucial significance, and materials fabrication technologies become most challenging. Simultaneously, novel technologies like perpendicular recording, patterned media, thermally assisted recording, anisotropy graded media, and magnetic random access memory are emerging in this field. This Topic covers materials intended to advance storage applications, their magnetic properties and characterization techniques, including magnetic reversal for high-speed switching, and theoretical descriptions and modeling of materials and processes. Novel recording materials of interest include: thin and ultrathin films, multilayers, nanoparticles, cluster-assembled nanocomposites and other nano-assemblies, as well as lithographically defined nanostructures. Applied and technological topics include conventional and emerging information-storage and memory applications.

6.11.7 Frustrated and Low Dimensional Magnetism

There is a robust framework for describing the low temperature structures, phase transitions, and excitations of conventional three dimensional magnetic materials. However, when fluctuations are enhanced by low dimensionality or competing interactions, qualitatively new behavior can emerge. This is best

established in one dimension where controlled theory and experiment have uncovered phases that lack long-range magnetic order and exhibit fractional quantum numbers. Competing interactions can also produce novel magnetic phases in higher dimensions including valence bond solids and various forms of spin liquids. This Focus Topic solicits abstracts for presentations that explore both theoretical and experimental aspects of the field. Topics of interest include: one dimensional quantum magnetism, geometrical frustration and cooperative paramagnetism, magnetism in artificial structures, including 1D atomic chain or 2D monolayer film, order by disorder, spin ice, the role of magnetoelastic coupling, frustration induced spin liquid phases and topological order, quantum critical two dimensional spin systems and magnon Bose condensation. Also of interest are the effects of strongly fluctuating spins on properties beyond magnetism including transport, thermal transport and ferroelectricity.

Ask your colleagues to Join GMAG

For only \$7 additional dues APS members can become GMAG Members with the following benefits (students are free for one year.)

- *Quarterly GMAG newsletter.*
- *Eligibility for GMAG graduate student awards and sponsorship.*
- *Potential to increase the number of APS Fellows sponsored by GMAG.*
- *Potential to increase the number of invited talks on Magnetism at the March Meeting.*
- *Opportunity to help shape the voice and future of the Magnetism community (your community) in the US.*

See the GMAG website: <http://www.aps.org/units/gmag/index.cfm>. TO JOIN: Go to the APS page for "Application to add units" (<http://www.aps.org/memb/unitapp.html>) and follow instructions for adding a unit to your membership. Or call the APS at 301-209-3280 and tell a Membership Rep that you want to join topical group GMAG.

Upcoming Magnetism Conferences and Workshops

SpinOS 2007 –Workshop on Spintronic Effects in Organic Semiconductors

September 9-11, 2007, Bologna, Italy
<http://www.spinoss.org/>

6th International Conference on Fine Particle Magnetism

October 9-12, 2007 Rome, Italy
<http://www.iefpm.mlib.cnr.it/>

52nd MMM Conference

November 5-9, 2007, Tampa, FL
<http://www.magnetism.org>

2007 MRS Fall Meeting

November 26-30, 2007, Boston, MA
http://www.mrs.org/s_mrs/sec.asp?CID=4749&DID=164574

Intermag 2008

May 4-8, 2008, Madrid, Spain
<http://www.intermagconference.com/intermag2008/index.htm>

7th International Conference on the Scientific and Clinical Applications of Magnetic Carriers

May 21-24, 2008, Vancouver, Canada
<http://www.magneticmicrosphere.com/meetings/meet2008>

53rd MMM Conference

November 10-14, 2008, Austin, TX