GMAG NEWSLETTER

A Focused Group within The American Physical Society

N^0 9, September 2001, Edited by R Bruce van Dover

A Note from the Chair

It a pleasure to welcome you to the current newsletter of the Topical Group on Magnetism and Its Applications (GMAG). Our group is thriving within the APS and continues to gain membership since its inception five years ago, with well over 500 members currently. This provides GMAG with considerable visibility in achieving our dual objectives of highlighting the role of magnetism at the March meeting and within the physics community, and of assisting the APS and the science community in general with communicating the important role that magnetism research plays in our high technology economy. I thought it would be useful to identify the current activities of GMAG, and to ask for the advice and assistance of the membership in carrying out these goals.

One primary function of GMAG is to organize sessions at the March Meeting that will be of interest to our members, and we accomplish this by sponsoring focus topics on magnetism, by organizing invited symposia, and by carrying out the abstract sorting responsibilities for magnetism (sorting category 6) at the sorters meeting in December. Focus topics have a dual purpose; one is to arrange for invited speakers, with approximately one per session, and then organize contributed talks with a similar interest around the invited talks. The second purpose is to arrange the sessions (at the Sorters Meeting) so that there are no conflicts between the sessions themselves, or with invited symposia that the same group of people might want to attend. Last year GMAG cosponsored two focus topics with the Division of Materials Research, one on Magnetoresistive Oxides organized by Adriana Moreo and Jaime Fernandez-Baca, and the other on Magnetic Nanostructures and Heterostructures organized by William Butler and David Lederman. Both of these topics attracted about 150 contributed abstracts for each and were highly successful. We will therefore be cosponsoring these topics again this year. The organizers this year for the oxides topic will be Takeshi Egami, John Mitchell and Peter Schiffer, while the magnetic thin film topic will be organized by Julie Borchers and Liesl Folks. If you have suggestions for invited speakers for these topics you are encouraged to contact the organizers directly; their contact information and

descriptions for these topics can be found elsewhere in this newsletter. These are particularly timely topics, and I'd like to thank the organizers for their efforts on behalf of the GMAG (and DMP) memberships.

GMAG has three Invited Symposia slots to organize for the meeting. The GMAG Program Chair, Dave Sellmyer, is in charge of coordinating these, so if you have suggestions please contact Dave. Having some input into the selection of invited speakers is one of the clear benefits of GMAG membership, and it is absolutely essential that the Program committee have an abundance of good (and detailed) suggestions for symposia from which to choose. So please take the time to develop a proposed symposium and send it to Dave. We will also need volunteers to help with the sorters meeting in College Park (Dec. 14-15), and if you're interesting in helping please contact Dave.

Another member benefit entails GMAG's nomination of members to fellowship status. This is the responsibility of the Fellowship committee, Frances Hellman (Chair), Jack Bass, and James Rhyne. Only =% of the total APS membership can be advanced to fellowship in any given year, which translates into 2-3 nominations for GMAG. This nominations process starts in April with member-submitted nominations which are evaluated by the committee, and then the committee nominates two regular candidates and one alternate candidate to the general APS Fellowship committee. Successful nominations are announced by the end of the calendar year. This process is highly competitive and takes considerable work both for the member nominators and for the committee, and it is important for GMAG to advance strong candidates. If you know of someone in your organization who deserves this honor please consider organizing a nomination. Information about the process and deadlines can be found at http://www.aps.org/fellowship . You can also contact one of the members of the Fellowship committee, who would be one of the best sources of information on what is needed for a successful application.

Tired of sitting on the sidelines and watching the APS in action? Perhaps you should get involved. This year Barbara Jones is chairing the GMAG Nomination committee, with members Jack Bass, Sam Bader, and Art Ramirez. If you have a suggestion for a candidate for office please contact them.

Finally, GMAG has been working with the Division of Condensed Matter Physics and the Division of Materials Physics in two areas that relate to advancing the cause of Materials Research. One item is that we are helping to organize a Congressional Reception this fall. Our goal is to engage members of Congress and staffers in hands-on demonstrations that illustrate the impact of materials physics on their world. The three basic "materials" themes are Magnetism (magnetic recording, high-strength magnets, …), Superconductivity (MRI, high bandwidth cell phone stations, …) and Coherent Radiation (fiber optics, lasers....). We hope to illustrate how materials science is the basis of innovation that drives new business, our global competitiveness, the expanding economy, budget surpluses, information technology, and progress in related high-tech fields such as medicine and biology. The second item is that we voted (at the March meeting) to join DCMP and DMP in supporting the APS involvement in the Federation of Materials

Societies, which entailed a (modest) financial contribution from each unit. The FMS is a consortium of thirteen technical and professional societies and associations concerned with various aspects of materials science and materials engineering, under the direction of Lyle Schwartz. Representatives from FMS member societies meet quarterly, usually in Washington, to exchange information, to hear presentations about federal materials issues, and to plan other FMS-sponsored activities such as hosting a Biennial Conference on National Materials Policy, annually presenting a National Materials Advancement Award, and helping to plan and organize an annual multi-society Congressional Visits Day.

It's a real pleasure working with the leadership of DCMP and DMP on the March meeting organization and on these projects of mutual interest. You're cordially invited to get involved in these endeavors.

—Jeff Lynn

GMAG-sponsored Focus Topics for March 2002

Magnetic Nanostructures and Heterostructures (DMP/GMAG) -- 6.9.1

This session will be focused on the properties of artificial magnetic structures characterized by reduced dimensions at the nanometer length scale. Types of structures include films, superlattices, multilayers, nanocomposites, heterostructures, spin valves, tunnel junctions, exchange-spring magnets, wedges, nanowires, magnetic point contacts, quantum dots, particle arrays and patterned films. These magnetic structures may be composed, for example, of metals, insulators, magnetic semiconductors, half metals, perovskites or intermetallic compounds. This session will cover experimental and theoretical advances in low-dimensional magnetism, interlayer magnetic coupling, exchange bias, spin-dependent transport (especially giant magnetoresistance, tunneling magnetoresistance and spin injection), magnetic quantum confinement, magnetic anisotropy, effects of structural disorder, and other magnetic phenomena. Of special interest are the fabrication of nanostructures with atomic-scale control, high-resolution characterization methods with site and/or element specificity, novel techniques for the creation of nanoscale magnetic features, and unusual physical phenomena present in these systems.

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Magnetoresistive Oxides **(DMP/GMAG) –** 6.9.1

Mixed-valent manganese oxides known as colossal magnetoresistive (CMR) manganites exhibit a dramatic interplay among spin, charge, lattice, and orbital degrees of freedom. The result is a spectacular array of competing ground states that include ferromagnetic metals, antiferromagnetic insulators, charge- and orbital ordered states, and micro- and mesoscopic phase mixtures of these states. This focus topic will address fundamental aspects of such multiple ground states in manganites and related transition metal oxides (ruthenates, cobaltates, etc.). Contributions will include both experimental and theoretical studies of chemical, structural, and physical properties, emphasizing the static and dynamic aspects of magnetic, charge, and orbital ordering, the role of inhomogeneity on varying length scales, field-induced phenomena, and phase segregation. This focus topic will bring together wide-ranging efforts in the manganites and related transition metal oxides to highlight and unify the understanding of their fundamental physics.

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Bylaws Change

At the March 2000 GMAG Business Meeting a motion was passed to formalize the membership of a standing committee of the Topical Group on Magnetism and Its Applications, GMAG, namely the Fellowship Committee. An amendment to the Bylaws was proposed. The APS Executive Council approved this change to the Bylaws. The proposal to make the change was circulated in the Newsletter, Issue 8 (January 2001). The proposal was also announced at the March 2001 Business meeting. The referendum was conducted using an electronic ballot, with hardcopy mail ballots sent to those members with no standing email address and also members whose email was returned undeliverable. Ballots were posted 4 June 2001 with a return deadline of 30 June 2001.

The total number of ballots returned was 133 (132 electronic, 1 by hardcopy mail). I recorded 123 votes in favor of the proposed bylaws change, 6 votes against, and 4 invalid ballots (double votes or no vote). The proposal passed overwhelmingly!

Here is how the Bylaws now read:

Article VII - Appointed Committees

3. Fellowship Committee. The Fellowship Committee shall consist of the Vice-Chair and Members-at-Large of the Executive Committee. The Vice-Chair shall serve as Chair of the Fellowship Committee.

As Secretary/Treasurer, I would like to make a few comments about the process. This was our first Referendum and our first foray into electronic balloting. The process went without any glitches. I was a bit disappointed that, despite the ease of returning an email ballot, the turnout was no greater than we typically obtain in our annual election of Officers. In any case I welcome comments, criticisms, and especially suggestions on how we can improve the process. For example, I receive one message registering dissatisfaction with the fact that it was not a secret ballot. Is that a general concern? Any

ideas on the best way to implement a secret ballot and yet retain the ability to validate voter status? Any comments on the text that accompanied the ballot? Should more or less detail be included? Would voters like more detailed statement from candidates in the General Election? Less detail? Please send comments on the subject to me and I will circulate them to the Executive Committee. Feel free to bring your concerns to the annual Business Meeting also.

—R. Bruce van Dover

GMAG Officers

Chair Members at Large of the Executive Committee (Term ends March xxxx)

Jeff Lynn j*eff.lynn@nist.gov* Jim Rhyne (2002) *jrhyne@showme.missouri.edu*

Ivan Schuller (2002) *ischuller@ucsd.edu*

Chair-Elect Richard Watson (2003) *watson@cmt5.phy.bnl.gov*

David Sellmyer *dsellmyer1@unl.edu* Barbara Jones (2004) *bajones@almaden.ibm.com*

Jack Bass (2004) *bass@pa.msu.edu*

Vice-Chair

Frances Hellman *fhellman@ucsd.edu*

Secretary-Treasurer

R Bruce van Dover *rbvd@agere.com*

Past Chair

Si Foner *sfoner@mit.edu*

Lawrence Bennett *lbennett@seas.gwu.edu*

Carl Patton *patton@lamar.colostate.edu*

David Jiles *gauss@ameslab.gov*

Standing Committees:

Nominating Committee (appointed by GMAG Chair):

Barbara Jones (Chair) *bajones@almaden.ibm.com*

Jack Bass *bass@pa.msu.edu*

Sam Bader *bader@anl.gov*

Art Ramirez (APS Council Member) *aramirez@lanl.gov*

Fellowship Committee:

(GMAG Bylaws specify that the GMAG Vice-Chair be the Chair of the Fellowship Committee)

(The recent amendment to the Bylaws specifies that the Executive Committee Members also serve on the Fellowship Committee)

Frances Hellman (Chair) *fhellman@ucsd.edu*

Executive Committee

Program Committee (by formal convention Chair-Elect serves as Chair of the Program Committee):

David Sellmyer *dsellmyer1@unl.edu*