Winter 2011 Newsletter

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A Message from the Chair

This Newsletter presents highlights of the DMP sessions and activities of the upcoming March Meeting, the recipients of the Adler Award and McGroddy Prize, the new APS Fellows supported through the DMP, the student travel award winners, and the newly elected members of the DMP Executive Committee.

Now is the time to propose new Focus Topics for the 2012 March Meeting. The DMP focus topics are a major component of the March Meeting providing numerous sessions on advancing areas of interdisciplinary materials physics. Your colleagues will appreciate and benefit from new topics that capture the exciting new directions of our field. Please consider proposing a new Focus Topic now!

This is also a time to consider nominating a distinguished colleague for one of the DMP supported recognitions – the David Adler Lectureship Award in the Field of Materials Physics, and the James C. McGroddy Prize for New Materials.

New materials, materials phenomena and applications represent the interdisciplinary basis for Materials Physics. Advancements in materials drive almost all new technologies, which affect every aspect of our society. Advances in materials physics may involve students in college and university laboratories as well as large teams of leading researchers taking advantage of national facilities such as nanotechnology centers, neutron scattering capabilities, and accelerator based light sources.

Much new physics arose by the discovery of new phenomena in materials including superconductivity, ferroelectricity, multiferroicity, nanoscience, etc, and Materials Physics researchers continue to bring excitement and new ideas to Physics with new materials such as graphene.

In spite of this, the importance of Materials Physics needs further articulating for our colleagues in the field and for the public in general. The Division of Materials Physics continues to support activities that communicate the excitement and impact of materials physics to our government leaders and to the public.
New students are the basis for the vital future of the field. We greatly appreciate receiving funds to support student travel awards. Drawing from a very strong list of applications, it is a pleasure to announce the 2011 recipients of the Iris Ovshinsky Student Travel Awards below.

Many people contribute to the success of the March Meeting, to the activities of the APS and to the continued advancement of Materials Physics, on behalf of the DMP it is our pleasure to extend our thanks to each and every one.

We looking forward to seeing you in Dallas,

Robert Nemanich, Chair
Division of Materials Physics

New members of the Executive Committee

The following members were elected to serve in the DMP Executive Committee

Vice Chair: David Cahill
Secretary/Treasurer: Chris Palmstrøm
Member at Large: Bruce Harmon
Member at Large: Charles Ahn

We congratulate the new members of the Executive Committee and look forward to their participation and leadership.

Call for DMP Focus Session Topics for 2012 APS March Meeting

The Division of Materials Physics organizes a large number of Focus Topics for each APS March Meeting. A Focus Topic generally consists of a series of sessions, each of which is typically seeded with one invited talk, the remainder of the session being composed of contributed talks (see http://www.aps.org/units/dmp/newsletters/summer2010.cfm#categories for a list of Focus Topics for the 2011 March Meeting). While many Focus Topics are continued from year to year, some are removed and some new topics are added in fields of current interest.

We are now soliciting new ideas for Focus Topics for the 2012 March Meeting, and we hope you will send suggestions. Your suggestions should provide the following information:

- Title of the Focus Topic
- The nominator’s name, affiliation, phone number and e-mail address
- Suggestions for possible organizers
- A brief description of the scope of the topic.

Please send your suggestions by March 15 to Darrell Schlam (schlom@cornell.edu), who will be the DMP Program Chair for the 2012 meeting. Suggestions received after March 15 will be reviewed by the DMP Executive Committee if time allows.

March Meeting: Location

The 2011 March Meeting of the APS will take place, March 21-25, 2011 in the Dallas Convention Center (DCC), Dallas, TX. All scientific sessions will be in the Dallas Convention Center (DCC) but events and activities may be in DCC or the Hyatt Regency Hotel. Check event details for time and place. Bussing will be provided to the convention center from all hotels not within walking distance.
For further information see:
http://www.aps.org/meetings/march/index.cfm

March Meeting: DMP Sponsored Meetings

The Division of Materials Physics will sponsor the following meetings during the 2011 March meeting in Dallas. This is your opportunity to interact with the Executive Committee and to become informed of the activities of the Division.

Hyatt Regency, 300 Reunion Boulevard, Dallas, Texas, USA 75207
Tel: +1 214 651 1234    Fax: +1 214 742 8126

Tuesday, March 22:
DCMP/DMP/DCOMP/DCP New Fellows and Award Winners Reception
5:30 p.m. - 7:00 p.m.
Hyatt Regency Hotel

DMP Business Meeting
7:00 p.m. - 8:00 p.m.
Reverchon B
Hyatt Regency Hotel

The American Physical Society-Division of Materials Physics
Iris Ovshinsky Student Travel Awards

The Iris Ovshinsky Student Travel Awards have been established to assist the career of student researchers. The Awards are named after Iris Ovshinsky who had a very strong interest and commitment to scientific education. The awards have been endowed by the Ovshinsky family, their colleagues at Energy Conversion Devices (ECD) companies and all their numerous friends from many social, intellectual and business relationships.

The Iris Ovshinsky Student Travel Awards will be presented on at the DCMP/DMP/DCOMP/DCP New Fellows and Award Winners Reception, Tuesday, March 22, 5:30 p.m. - 7:00 p.m. in the Hyatt Regency Hotel

We are extremely grateful to the Ovshinsky family for this award. Special thanks go to Prof. Brian Schwartz who has made this award possible and for all his efforts on behalf of Materials Physics over the years.

The winners of the 2011 Iris Ovshinsky Student Travel Awards for Materials Physics are:

<table>
<thead>
<tr>
<th>NAME</th>
<th>INSTITUTION</th>
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<tbody>
<tr>
<td>E. Akatyeva</td>
<td>Univ. of Minnesota</td>
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<tr>
<td>W.-P. Hsieh</td>
<td>UIUC</td>
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<td>Irfan</td>
<td>Univ. of Rochester</td>
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<td>B. Jalan</td>
<td>UCSB</td>
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<td>X. Jia</td>
<td>MIT</td>
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<td>J. Lyons</td>
<td>UCSB</td>
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<td>G. Sheng</td>
<td>Pen State Univ.</td>
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<tr>
<td>J. Varley</td>
<td>UCSB</td>
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<tr>
<td>J. Velasco</td>
<td>UC Riverside</td>
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<td>P. Yu</td>
<td>UC Berkeley</td>
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Award and Prize Winners

David Adler Lectureship Award in the Field of Materials Physics

Stephen Pearton, University of Florida

"For contributions to the development of compound semiconductor processing methods crucial to the development of electronic and photonic devices."

James C. McGroddy Prize for New Materials

Arthur P. Ramirez, University of California, Santa Cruz

"For the intellectual leadership in the identification of geometrically frustrated magnets as an important class of materials."

2010 Fellows nominated by DMP:

Ahn, Charles
Yale University
Citation: For the elucidation of novel behavior in complex materials subjected to intense ferroelectric fields, and for seminal contributions to the understanding of nanoscale interfacial phenomena in complex oxides.

Asta, Mark
University of California, Davis
Citation: For fundamental contributions to the physics of materials through ab initio density functional theoretical studies.

Bellaiche, Laurent
University of Arkansas
Citation: For pioneering contributions to the first-principles theory of semiconductor alloys and ferroelectric materials.

Christen, David
Oak Ridge National Laboratory
Citation: For sustained discovery and leadership in understanding of superconductive materials, especially their current conduction and vortex state properties.

Dravid, Vinayak
Northwestern University
Citation: For seminal contributions to the materials physics of functional materials through the use of state of the art electron microscopy techniques.

Geohegan, David
Oak Ridge National Laboratory
Citation: For pioneering work in understanding and controlling nonequilibrium growth processes of thin films and nanomaterials through real-time laser spectroscopy, imaging, and plasma diagnostic investigations.

Jiang, Hongxing
Texas Tech University
Citation: For his seminal works in the area of III-nitride wide bandgap semiconductors. In particular, for his significant contributions to the understanding of fundamental optical and defect properties and practical applications of III-nitrides and pioneering contributions to the field of nanophotonics.

Jin, Rongying
Louisiana State University
Citation: For her significant contributions to materials physics, including science-driven
materials development and pioneering studies of their underlying physics.

**Ma, En**  
Johns Hopkins University  
Citation: For pathbreaking research and outstanding publications on metastable, amorphous, and nanocrystalline metals and alloys, and international outreach in the metallic materials field.

**Reimer, Jeffrey**  
University of California, Berkeley  
Citation: For the design and analysis of in situ spectroscopic studies of materials and electrochemical processes.

**Rez, Peter**  
Arizona State University  
Citation: For theoretical and computational developments in electron microscopy and electron spectroscopy of materials.

**Takagi, Hidenori**  
University of Tokyo  
Citation: For outstanding contributions to the exploration of the physics and materials science of strongly correlated transition metal oxides.

**Weber, William**  
University of Tennessee  
Citation: For his seminal contributions and scientific leadership in the materials physics of defects, defect processes, ion-solid interactions and radiation damage processes in ceramics.

**Wolverton, Christopher**  
Northwestern University  
Citation: For innovative contributions to atomic- and multi-scale computational materials physics, particularly in the area of phase stability of materials.

**March Meeting: DMP Sponsored Symposia & Special Events**

**I. Session D3: Materials for Energy Ballroom A3**  
Sponsoring Units: DMP GERA  
Room: Ballroom A3; Monday, March 21, 2011 2:30PM - 5:30PM

2:30AM-3:06PM  
D3.00001: Material tradeoffs in direct thermal to electric energy conversion systems,  
Invited Speaker: Ali Shakouri

3:06PM-3:42PM  
D3.00002: Photophysics of Strongly Confined Multiexcitons from the Perspective of Lasing and Solar Energy Conversion  
Invited Speaker: Victor Klimov

3:42PM-4:18PM  
D3.00003: Engineering Interfaces for Photovoltaic Energy Conversion,  
Invited Speaker: Stacey Bent

4:18PM-4:54PM  
D3.00004: Experimental and Theoretical Studies on Phonon Mean Free Path in Thermoelectric Materials  
Invited Speaker: Gang Chen
II. Session P3: Adler, IAP, Pake Award/Prize Prize Session  
Sponsoring Units: DMP DCMP FIAP  
Room: Ballroom A3; Wednesday, March 23, 2011  
Chair: Thomas Theis, IBM T.J. Watson Research Center  

8:36AM - 9:12AM  
P3.00002: David Adler Lectureship Award in the Field of Materials Physics Talk: Novel Nitride and Oxide Electronics  
Invited Speaker: Stephen Pearton

III. Session T3: Buckley, McGroddy, Davisson-Germer Award/Prize Session  
Sponsoring Units: DCMP DMP  
Room: Ballroom A3; Wednesday, March 23, 2011  
Chair: Ward Plummer, Louisiana State University  

4:18PM - 4:54PM  
T3.00004: James C. McGroddy Prize for New Materials Talk: Geometrically Frustrated Materials  
Invited Speaker: Arthur Ramirez

IV. Session V5: Physics for Everyone  
Sponsoring Units: DMP DCMP  
Room: Ballroom C1; Thursday, March 24, 2011  
Chair: Ivan Schuller, University of California, San Diego  

8:00AM - 8:36AM  
V5.00001: Biomagnetism and Magnetotaxis in Bacteria: What Bacteria Know About Magnetic Materials and Permanent Magnet Design  
Invited Speaker: Richard Frankel  

8:36AM - 9:12AM  
V5.00002: Voodoo Science  
Invited Speaker: Robert Park

9:12AM - 9:48AM  
V5.00003: M&Ms Packing and Research with Undergrads  
Invited Speaker: Paul Chaikin  

9:48AM - 10:24AM  
V5.00004: Science and Cooking: Motivating the Study of Freshman Physics  
Invited Speaker: David Weitz  

10:24AM - 11:00AM  
V5.00005: Making a frothy shampoo or beer  
Invited Speaker: Douglas Durian

V. Session W3: Advances in ZnO Physics and Applications  
Sponsoring Units: DCMP DMP  
Room: Ballroom A3; Thursday, March 24, 2011  
Chair: Scott Chambers, Pacific Northwest National Laboratory  

11:15AM - 11:51AM  
W3.00001: Hybrid functional studies of defects and impurities in ZnO  
Invited Speaker: John Lyons
March Meeting: APS Special Symposia & Events

APS Prizes & Awards Ceremonial Session

Monday, March 21
5:45 p.m. - 6:45 p.m.
Convention Center

- Prizes and awards will be bestowed on several individuals for outstanding contributions to physics. Please plan on attending the Awards Program and join us in honoring these individuals. The names of the awards and awardees will be included in the printed Preamble distributed at the Meeting.

- The Welcome Reception will begin immediately following the Awards Program.

Nobel Prize Session

Wednesday, March 23
5:45 p.m. - 7:00 p.m.
Ballroom A1
Chair: Warren Pickett

Konstantin Novoselov “Graphene: Materials in the Flatland”
Physics Nobel Laureate (2010)

Session J3: Nobelist Perspectives on 100 Years of Superconductivity
Kavli Foundation Special Symposium
Tuesday, March 22; 11:15 a.m.
Ballroom A3
Chair: Warren Pickett

11:15AM - 11:51AM
Theoretical work on superconductivity up to 1956
Invited Speaker: Anthony Leggett

11:51AM - 12:27PM
The Exceptional Properties of Superconductivity in Cuprates
Invited Speaker: K.A. Mueller
Discovery of Superconductive Tunneling
Invited Speaker: Ivar Giaever

Superconductivity and particle physics
Invited Speaker: Frank Wilczek

Superfluidity in an Atomic Gas of Strongly Interacting Fermions
Invited Speaker: Wolfgang Ketterle

**Session Q2: Superconductivity Centennial: Future Research Developments**
Kavli Foundation Special Symposium
Wednesday, March 23
11:15 a.m. - 2:15 p.m.
Convention Center
Ballroom A2
Chair: Zachary Fisk

Superconductivity: A Continuous Surprise or "How I Learned to Love the Surprises"
Invited Speaker: Robert Dynes

Research opportunities in new superconducting materials
Invited Speaker: L.H. Greene

Iron-based superconductors and relevant materials: progress and opportunity
Invited Speaker: Hideo Hosono

Exploring electron-phonon interactions in superconductors
Invited Speaker: Marvin Cohen

Electronic Pairing Interactions
Invited Speaker: D.J. Scalapino

**March Meeting: Premeeting Workshops**

DPOLY Short Course
Saturday, March 19 - 12:30 p.m. Sunday, March 20 - 8:30 a.m.
Physics Careers in Industry and Government
Sunday, March 20 - 8:30 a.m.
Industrial Physics Forum (IPF)
Sunday, March 20 - 1:00 p.m. & Monday, March 21 - 8:00 a.m.
Improving Your Skills as a Research Mentor
Sunday, March 20 - 1:30 p.m.
Careers In Physics Workshop
Sunday, March 20 - 5:00 p.m. DCC Room C140
March Meeting: Tutorials

Sunday, March 20
Dallas Convention Center
Tutorial Program Chair
Mark Johnson, Naval Research Laboratory, Washington, DC

Morning Tutorials
Convention Center
8:30 a.m. - 12:30 p.m.
Tutorial #1
Spintronics
Tutorial #2
Complex Oxides
Tutorial #3
Topological Insulators
Tutorial #4
Microfluidics

Afternoon Tutorials
Convention Center
1:30 p.m. - 5:30 p.m.
Tutorial #5
Graphene
Tutorial #6
New Directions in Biological Physics
Tutorial #7
Quantum Simulation and Computing with Atoms
Tutorial #8
GPU Programming Applied to Condensed Matter Physics

March Meeting: Tutorial for Authors and Referees

Sponsored by APS Journals
Tutorial for Authors and Referees
Wednesday, March 23 - 8:00 a.m. DCC D225-226
APS Journals Booth
Monday - Wednesday, March 21-23, 10:00 a.m. Exhibit Hall
APS Editorial Q & A
Tuesday, March 22 - 3:00 p.m. DCC D223-224
Meet the Editors of AIP and APS Reception
Tuesday, March 22 - 4:00 p.m. DCC Lobby E
"Trends" in the APS Publication Physics
Wednesday, March 23 - 7:30 p.m. Hyatt Reunion A-D
**DMP Executive Committee**

The Executive Committee Officers for the 2011-2012 year, who begin their terms immediately following the March meeting in Portland, are:

Chair: Peter Schiffer (03/11 – 03/12)  
Penn State University

Chair-Elect: D.G. Schlom (03/11-03/12)  
Cornell University

*Vice Chair: David Cahill (03/11-03/12)  
Univ. of Illinois Urbana Champaign

Past Chair: Robert Nemanich (03/11 – 03/12)  
Arizona State University

Secretary/Treasurer: Chris Palmstrøm (03/11-03/14)  
University of California, Santa Barbara

Councilor: Theodore L Einstein (01/09 - 12/12)  
University of Maryland-College Park

**Members-at-Large:**

David J. Sellmyer (03/09 – 03/12)  
University of Nebraska

Nicola Spaldin (03/09 – 03/12)  
ETH Zurich

Amanda Petford-Long (03/10 – 03/13)  
Argonne National Laboratory

Philip Duxbury (03/10 – 03/13)  
Michigan State University

*Bruce Harmon (03/11 - 03/14)  
Ames Laboratory

*Charles Ahn (03/11 - 03/14)  
Yale University

*Newly elected