The APS Officers and Meetings Department staff extend sincere thanks to the unit program chairs, abstract sorters and focus session organizers who, during the past year, gave so generously of their time and expertise in sorting abstracts and organizing the program for the March Meeting.

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## PROGRAM ACKNOWLEDGMENTS

### MARCH MEETING 2010 FOCUS SESSION ORGANIZERS

<table>
<thead>
<tr>
<th>Topic</th>
<th>Organizers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advances in Scanned Probe Microscopy I: Novel Approaches and Ultrasensitive Detection</td>
<td>P. Chris Hammel, Ohio State University; Joseph A. Stroscio, National Institute for Standards and Technology</td>
</tr>
<tr>
<td>Advances in Scanned Probe Microscopy II: High frequencies and Optical Techniques</td>
<td>Andreas Heinrich, IBM Almaden Research Center; P. Chris Hammel, Ohio State University</td>
</tr>
<tr>
<td>Advances in Scanned Probe Microscopy III: Scanning Probe Spectroscopic Techniques</td>
<td>Yukio Hasegawa, The University of Tokyo; Andreas Heinrich, IBM Almaden Research Center</td>
</tr>
<tr>
<td>Attosecond Science</td>
<td>Daniel M. Neumark, University of California, Berkeley; Robin Santra, Argonne National Laboratory</td>
</tr>
<tr>
<td>Biological-Synthetic Hybrid Materials</td>
<td>Francis Starr, Wesleyan University; Oleg Gang, Brookhaven National Laboratory</td>
</tr>
<tr>
<td>Bulk Properties of Complex Oxides</td>
<td>Daniel Khomskii, Universitaet zu Koeln; David Mandrus, Oak Ridge National Laboratory; John F. Mitchell, Argonne National Laboratory</td>
</tr>
<tr>
<td>Carbon Nanotubes &amp; Related Materials</td>
<td>Anna Swan, Boston University; Jiwoong Park, Cornell University; Jean-Louis Sauvajol, Universite Montpellier</td>
</tr>
<tr>
<td>Carbon Nanotubes: Chirality Controlled Synthesis and Processing</td>
<td>Avetik R. Harutyunyan, Honda Research Institute USA Inc.; David B. Geohegan, Oak Ridge National Laboratory</td>
</tr>
<tr>
<td>Chemical Control of the Properties of Complex Oxides</td>
<td>Patrick Woodward, Ohio State University; Ram Seshadri, University of California, Santa Barbara</td>
</tr>
<tr>
<td>Complex Oxide Thin Films</td>
<td>Jean-Pierre Locquet, Katholieke Universiteit Leuven; Darrell G. Schlom, Cornell University; Elbio Dagotto, University of Tennessee/Oak Ridge National Laboratory</td>
</tr>
<tr>
<td>Computational Design of New Materials</td>
<td>Talat S. Rahman, University of Central Florida; Craig J. Fennie, Cornell University; Dane Morgan, University of Wisconsin</td>
</tr>
<tr>
<td>Confined and Biological Water</td>
<td>Gerard Hummer, National Institutes of Health</td>
</tr>
<tr>
<td>Controlled Self-Organization of Functional Thin Film Nanostructures</td>
<td>Ray Phaneuf, University of Maryland; Frances M. Ross, IBM T. J. Watson Research Center; Norm Bartelt, Sandia National Laboratories</td>
</tr>
<tr>
<td>Crystallization in Confined Geometry</td>
<td>Christopher Li, Drexel University; Stephen Cheng, University of Akron</td>
</tr>
<tr>
<td>Dielectric, Ferroelectric and Piezoelectric Oxides</td>
<td>Serge M. Nakhmanson, Argonne National Laboratory; Matthew Dawber, Stony Brook University; Beatriz Noheda, University of Groningen</td>
</tr>
<tr>
<td>Dopants and Defects in Semiconductors</td>
<td>Evan R. Glaser, Naval Research Laboratory; Eugene Haller, University of California, Berkeley; Michael Stavola. Lehigh University</td>
</tr>
<tr>
<td>Dynamics of Neural Systems</td>
<td>Herbert Levine, University of California, San Diego</td>
</tr>
<tr>
<td>Dynamics of Polymers and Complex Fluids</td>
<td>Ron Larson, University of Michigan; S. Q. Wang, University of Akron</td>
</tr>
<tr>
<td>Dynamics of Shock Induced Phase Transitions (Experiment and Theory)</td>
<td>David Moore, Los Alamos National Laboratory</td>
</tr>
<tr>
<td>Electricity-to-Light Conversion: Solid State Lighting</td>
<td>Robert M. Biefeld, Sandia National Laboratories; Fernando A. Ponce, Arizona State University</td>
</tr>
<tr>
<td>Electronic Transport in One-dimensional (1D) Nanomaterials</td>
<td>Zhong Lin (Z.L.) Wang, Georgia Institute of Technology</td>
</tr>
<tr>
<td>Extreme Mechanics: Elasticity and Geometry of Thin Objects</td>
<td>Pedro Miguel Reis, Massachusetts Institute of Technology</td>
</tr>
<tr>
<td>Fluid Dynamics at Superhydrophobic Surfaces</td>
<td>Eric Lauga, University of California, San Diego; Lyderic Bocquety, Universite de Lyon, France</td>
</tr>
<tr>
<td>Foundations of Quantum Theory</td>
<td>Robert Spekkens, Perimeter Institute for Theoretical Physics</td>
</tr>
<tr>
<td>Frontiers in Computational Thermodynamics of Materials</td>
<td>Stefano Curtarolo, Duke University; Ernesto E. Marinero, Hitachi San Jose Research Laboratory</td>
</tr>
<tr>
<td>Frustrated and Low Dimensional Magnetism</td>
<td>Oleg Tchernyshyov, Johns Hopkins University; Peter Schiffer, Pennsylvania State University</td>
</tr>
<tr>
<td>Fundamental Challenges in Transport Properties of Nanostructures:</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Jeffrey B. Neaton, Lawrence Berkeley National Laboratory; Latha Venkataraman, Columbia University</td>
<td></td>
</tr>
<tr>
<td>Glass Transition in Thin Films:</td>
<td></td>
</tr>
<tr>
<td>Rodney Priestley, Princeton University; Connie B. Roth, Emory University</td>
<td></td>
</tr>
<tr>
<td>Graphene:</td>
<td></td>
</tr>
<tr>
<td>Eva Y. Andrei, Rutgers University; Antonio H. Castro Neto, Boston University; Philip Kim, Columbia University</td>
<td></td>
</tr>
<tr>
<td>Hierarchically and Templated Ordered Systems:</td>
<td></td>
</tr>
<tr>
<td>Azar Alizadeh, General Electric; Vladimir V. Tsukruk, Georgia Institute of Technology</td>
<td></td>
</tr>
<tr>
<td>Hydrogen Storage; Materials, Measurements &amp; Modeling:</td>
<td></td>
</tr>
<tr>
<td>Donald J. Siegel, University of Michigan; Vidvuds Ozolins, University of California, Los Angeles</td>
<td></td>
</tr>
<tr>
<td>Interface controlled organic thin films for enhancing device performance:</td>
<td></td>
</tr>
<tr>
<td>Suchi Guha, University of Missouri-Columbia; Michael Winokur, University of Wisconsin-Madison</td>
<td></td>
</tr>
<tr>
<td>Intracellular Fluid Dynamics:</td>
<td></td>
</tr>
<tr>
<td>Juan C. del Alamo, University of California, San Diego; Juan C. Lasheras, University of California, San Diego</td>
<td></td>
</tr>
<tr>
<td>Iron Based Superconductors and Related Compounds:</td>
<td></td>
</tr>
<tr>
<td>Paul C. Canfield, Iowa State University; Pengcheng Dai, University of Tennessee/Oak Ridge National Laboratory; David Singh, Oak Ridge National Laboratory</td>
<td></td>
</tr>
<tr>
<td>Jamming: Theory and Experiment:</td>
<td></td>
</tr>
<tr>
<td>Corey O’Hern, Yale University</td>
<td></td>
</tr>
<tr>
<td>Lattice Boltzmann Method and Its Applications:</td>
<td></td>
</tr>
<tr>
<td>Li-Shi Luo, Old Dominion University; Manfred Kraczyk, Technical University of Braunschweig</td>
<td></td>
</tr>
<tr>
<td>Long Range Order in Polymeric Structure and Morphology:</td>
<td></td>
</tr>
<tr>
<td>Thomas H. Epps III, University of Delaware; Kevin A. Cavicchi, University of Akron</td>
<td></td>
</tr>
<tr>
<td>Magnetic Nanostructures:</td>
<td></td>
</tr>
<tr>
<td>John Cumings, University of Maryland; Jan-Ulrich Thiele, Seagate Technology; Ralph Skomski, University of Nebraska</td>
<td></td>
</tr>
<tr>
<td>Materials and Phenomena:</td>
<td></td>
</tr>
<tr>
<td>David Moore, Los Alamos National Laboratory</td>
<td></td>
</tr>
<tr>
<td>Multiphase Equations of State (Experiment and Theory):</td>
<td></td>
</tr>
<tr>
<td>David Moore, Los Alamos National Laboratory</td>
<td></td>
</tr>
<tr>
<td>Multiscale Materials (Theory, Modeling, and Experiments That Bridge Scales):</td>
<td></td>
</tr>
<tr>
<td>Andrey V. Dobrynin, University of Connecticut; Mesfin Tsegue, Southern Illinois University; C. David Sherrill, Georgia Institute of Technology; Axel D. Becke, Dalhousie University</td>
<td></td>
</tr>
<tr>
<td>Multiscale Modeling in Polymer and Soft Matter Physics:</td>
<td></td>
</tr>
<tr>
<td>Gregory Hall, Brookhaven National Laboratory; David Osborn, Sandia-Livermore</td>
<td></td>
</tr>
<tr>
<td>New Frontiers in Electronic Structure Theory:</td>
<td></td>
</tr>
<tr>
<td>Novel Instrumentation &amp; Measurements of Cancer and other Diseases:</td>
<td></td>
</tr>
<tr>
<td>Jerry Lee, National Cancer Institute, Center for Strategic Scientific Initiatives, NIH; Thomas Thundat, Oak Ridge National Laboratory; Larry Nagahara, National Cancer Institute, Center for Strategic Scientific Initiatives, NIH</td>
<td></td>
</tr>
<tr>
<td>Novel Magnetic Devices:</td>
<td></td>
</tr>
<tr>
<td>Nick Rizzo, Everspin Technologies; Johan Akerman, KTH - Royal Institute of Technology; Eric Fullerton, University of California, San Diego</td>
<td></td>
</tr>
<tr>
<td>Optical Properties of Nanostructures:</td>
<td></td>
</tr>
<tr>
<td>Richard Averitt, Boston University; Gernot Guntherodt, RWTH Aachen University; Lu J. Sham, University of California, San Diego</td>
<td></td>
</tr>
<tr>
<td>Organic Electronics and Photonics:</td>
<td></td>
</tr>
<tr>
<td>Max Shtein, University of Michigan; Lynn Loo, Princeton University; Samson A. Jenekhe, University of Washington</td>
<td></td>
</tr>
<tr>
<td>Phonons and electron correlations in high-temperature superconductors:</td>
<td></td>
</tr>
<tr>
<td>Alan R. Bishop, Los Alamos National Laboratory</td>
<td></td>
</tr>
<tr>
<td>Physics and Materials for Inorganic Photovoltaics:</td>
<td></td>
</tr>
<tr>
<td>Junqiao Wu, University of California, Berkeley; Jeffery C. Grossman, Massachusetts Institute of Technology</td>
<td></td>
</tr>
<tr>
<td>Physics of Biochips:</td>
<td></td>
</tr>
<tr>
<td>David Nolte, Purdue University; Peter Kiesel, Electronic Materials and Devices Lab, Palo Alto Research Center</td>
<td></td>
</tr>
<tr>
<td>Physics of Polymer Nanocomposites:</td>
<td></td>
</tr>
<tr>
<td>Sanat Kumar, Columbia University; Michael Mackay, University of Delaware</td>
<td></td>
</tr>
<tr>
<td>Physics Teacher Preparation: Effective Strategies, National Models, and Challenging Issues:</td>
<td></td>
</tr>
<tr>
<td>Stamatis Vokos, Seattle Pacific University</td>
<td></td>
</tr>
<tr>
<td>Topic</td>
<td>Authors</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Polymer Brushes:</td>
<td>Jan Genzer, North Carolina State University</td>
</tr>
<tr>
<td>Polymer Colloids:</td>
<td>Tony Dinsmore, University of Massachusetts, Amherst; Ken Schweizer, University of Illinois at Urbana-Champaign</td>
</tr>
<tr>
<td>Polymer Network Mechanics:</td>
<td>Al Crosby, University of Massachusetts, Amherst; Jeremy Weiner, Brown University</td>
</tr>
<tr>
<td>Polymer-Nanoparticle Interactions:</td>
<td>Ramanan Krishnamoorti, University of Houston; Klaus Schmidt-Rohr, Iowa State University</td>
</tr>
<tr>
<td>Polymers and Energy: Photovoltaic, LED and Batteries:</td>
<td>Alamgir Karim, University of Akron; Tom Russell, University of Massachusetts, Amherst</td>
</tr>
<tr>
<td>Production and Applications of Cold and Ultracold Molecules:</td>
<td>David Chandler, Sandia-Livermore; Jeremy Hutson, University of Durham</td>
</tr>
<tr>
<td>Recent Progress in Quantum Algorithms and Quantum Computational Complexity:</td>
<td>Dave Bacon, University of Washington</td>
</tr>
<tr>
<td>Relaxation Dynamics of Polymeric Glasses:</td>
<td>Jack Douglas, NIST; Greg Mckenna, Texas Tech University</td>
</tr>
<tr>
<td>Research in Mathematics Education and Mathematics in Physics Education:</td>
<td>John Thompson, University of Maine</td>
</tr>
<tr>
<td>Search for New Superconductors:</td>
<td>Yvan Bruynseraede, University of Leuven; Oleg Shpyrko, University of California, San Diego</td>
</tr>
<tr>
<td>Self-organization in Biological Cells and Tissues:</td>
<td>Timothy Newman, Arizona State University</td>
</tr>
<tr>
<td>Semiconducting Qubits:</td>
<td>Malcolm Carol, Sandia National Laboratories</td>
</tr>
<tr>
<td>Single Molecule Biophysics and Chemical Physics:</td>
<td>David Rueda, Wayne State University</td>
</tr>
<tr>
<td>Single Molecule Biophysics:</td>
<td>David Rueda, Wayne State University</td>
</tr>
<tr>
<td>Spin Dependent Phenomena in Semiconductors:</td>
<td>Alberta Bonanni, Johannes Kepler University; Paul Crowell, University of Minnesota; Masaaki Tanaka, University of Tokyo</td>
</tr>
<tr>
<td>Spin Dependent Physics in Organic-based Materials:</td>
<td>Anthony Caruso, University of Missouri-Kansas City; Markus Wohlgemannt, University of Iowa</td>
</tr>
<tr>
<td>Spin Transport and Magnetization Dynamics in Metal Based Systems:</td>
<td>Kristen Buchanan, Colorado State University; Olle Heinonen, Seagate Technology; Gerrit E.W. Bauer, Delft University of Technology</td>
</tr>
<tr>
<td>Stochastic Processes in Biological Systems:</td>
<td>Leah Shaw, College of William and Mary; Ira Schwartz, Naval Research Laboratory</td>
</tr>
<tr>
<td>Structure and Dynamics of Complex Networks:</td>
<td>Alex Vespignani, Indiana University</td>
</tr>
<tr>
<td>Superconducting Qubits:</td>
<td>David DiVincenzo, IBM T. J. Watson Research Center</td>
</tr>
<tr>
<td>Synchrotron X-ray and Neutron Techniques in Soft Matter and Biological Physics:</td>
<td>Mark Foster, University of Akron; Mark Dadmun, University of Tennessee/Oak Ridge National Laboratory; Zhang Jiang, Argonne National Laboratory</td>
</tr>
<tr>
<td>Synchrotron X-ray and Neutron Techniques in Soft Matter and Biological:</td>
<td>Mark Dadmun, University of Tennessee</td>
</tr>
<tr>
<td>Thermoelectric Materials &amp; Phenomena:</td>
<td>Chris Dames, University of California, Riverside; Joseph Heremans, Ohio State University; Rama Venkatasubramanian, RTI International</td>
</tr>
<tr>
<td>Thin Films Copolymers:</td>
<td>Paul Nealey, University of Wisconsin; Juan de Pablo, University of Wisconsin</td>
</tr>
<tr>
<td>Topological Quantum Computing:</td>
<td>Dave Bacon, University of Washington</td>
</tr>
<tr>
<td>Tribophysics: Friction, Fracture and Deformation Across Length Scales:</td>
<td>Michael L. Falk, Johns Hopkins University; Craig Maloney, Carnegie Mellon University; Elisa Riedo, Georgia Institute of Technology; Andre Schirmeisen, University of Muenster; Izabela Szlufarska, University of Wisconsin</td>
</tr>
<tr>
<td>X-ray and Neutron Instruments and Measurement Science:</td>
<td>Albert Macrander, Argonne National Laboratory; Timothy Graber, University of Chicago; Susan M. Mini, Northern Illinois University</td>
</tr>
</tbody>
</table>
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# MARCH MEETING 2010

## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GENERAL INFORMATION</strong></td>
<td>8</td>
</tr>
<tr>
<td>Participating APS Units</td>
<td>8</td>
</tr>
<tr>
<td>Americans with Disabilities Act Statement</td>
<td>8</td>
</tr>
<tr>
<td>Registration Location/Hours</td>
<td>8</td>
</tr>
<tr>
<td>Badge Monitoring</td>
<td>8</td>
</tr>
<tr>
<td>Shuttle Bus Service</td>
<td>8</td>
</tr>
<tr>
<td>Program CD</td>
<td>8</td>
</tr>
<tr>
<td>Abstract Look-up Stations</td>
<td>9</td>
</tr>
<tr>
<td>Email Service</td>
<td>9</td>
</tr>
<tr>
<td>Wireless Service</td>
<td>9</td>
</tr>
<tr>
<td>A-V Office</td>
<td>9</td>
</tr>
<tr>
<td>Speaker-Ready Room</td>
<td>9</td>
</tr>
<tr>
<td>Audio Visual Equipment</td>
<td>9</td>
</tr>
<tr>
<td>Job Fair</td>
<td>9</td>
</tr>
<tr>
<td>APS Membership Booth</td>
<td>9</td>
</tr>
<tr>
<td>APS Souvenir Store</td>
<td>9</td>
</tr>
<tr>
<td>City of Portland Visitor Center</td>
<td>10</td>
</tr>
<tr>
<td>Self-service Business Center/Convention Center</td>
<td>10</td>
</tr>
<tr>
<td>APS Exhibit Show/APS Lounge</td>
<td>10</td>
</tr>
<tr>
<td>Press Room</td>
<td>10</td>
</tr>
<tr>
<td>Press Conference Room</td>
<td>10</td>
</tr>
<tr>
<td>Parent's/Children's Quiet Room</td>
<td>10</td>
</tr>
<tr>
<td><strong>PRE-MEETING PROGRAMS</strong></td>
<td>11</td>
</tr>
<tr>
<td>DPOLY Short Course: Polymers for Energy Generation and Storage</td>
<td>11</td>
</tr>
<tr>
<td>Tutorials</td>
<td>11</td>
</tr>
<tr>
<td>Professional Skills Development Workshop for Women</td>
<td>11</td>
</tr>
<tr>
<td>Post-Docs and Junior Tenure-Track Women Physicists</td>
<td>11</td>
</tr>
<tr>
<td>Education Workshop sponsored by the APS Forum on Education:</td>
<td>12</td>
</tr>
<tr>
<td>Making it Good: A Workshop on Strategies for High-Quality,</td>
<td>12</td>
</tr>
<tr>
<td>Effective Educational Materials and Efforts</td>
<td>12</td>
</tr>
<tr>
<td>Workshop: Writing An Effective Op-ed</td>
<td>12</td>
</tr>
<tr>
<td>Career Workshop</td>
<td>12</td>
</tr>
<tr>
<td><strong>APS MEETINGS / EVENTS</strong></td>
<td>13</td>
</tr>
<tr>
<td>Contact Congress</td>
<td>13</td>
</tr>
<tr>
<td>Gallery of Non-Linear Images</td>
<td>13</td>
</tr>
<tr>
<td>Wine and Cheese Receptions</td>
<td>13</td>
</tr>
<tr>
<td>APS Prizes and Awards Ceremonial Session</td>
<td>13</td>
</tr>
<tr>
<td>Welcome Reception</td>
<td>13</td>
</tr>
<tr>
<td>APS Journals Booth</td>
<td>13</td>
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<tr>
<td>Talk to the APS Journal Editors</td>
<td>13</td>
</tr>
<tr>
<td>Physics Community Outreach: Physics with a Bang!—Session G1</td>
<td>14</td>
</tr>
</tbody>
</table>
ANNUAL MARCH MEETING OF THE AMERICAN PHYSICAL SOCIETY
March 15–19
Portland, Oregon

General Information
We welcome you to the March Meeting 2010 in Portland Oregon. The headquarters hotel is the Hilton Portland and Executive Tower in downtown Portland. The March Meeting technical sessions will be held in the Oregon Convention Center, and APS-sponsored meetings and satellite meetings will take place at the Hilton. Ground transportation from the conference hotels to the convention center is available via the free light-rail system. Shuttle bus service will be provided to the convention center to supplement the free light rail system.

An outstanding scientific program will be presented consisting of more than 100 invited sessions and 550 contributed sessions at which approximately 7,500 papers will be presented. In addition, pre-meeting tutorials and workshops will be offered. A larger and enhanced exhibit show will round out the program during which attendees can visit vendors who will be displaying the latest products, instruments and equipment, and computer software, as well as scientific publications related to the research and application of physics.

Participating APS Units
Divisions: Condensed Matter Physics, Materials Physics, Polymer Physics, Chemical Physics, Biological Physics, Fluid Dynamics, Laser Science, Computational Physics and Atomic, Molecular and Optical Physics, Physics of Beams

Topical Groups: Instrument and Measurement Science, Magnetism and Its Applications, Statistical and Nonlinear Physics, Quantum Information, Energy Research and Applications

Forums: Industrial and Applied Physics, Physics and Society, History of Physics, International Physics, Education and Physics; Graduate Student Affairs

Americans with Disabilities Act Statement
The APS wishes to take any steps required to ensure that no individual with a disability is excluded, denied services, segregated or otherwise treated differently due to the absence of auxiliary aids and services identified in the Americans with Disabilities Act. If any such services are necessary in order for you to participate in the March Meeting, please communicate your needs in advance to the APS Meetings Department by checking the appropriate box on the registration form or by sending an e-mail to gaier@aps.org

Registration Location/Hours
Convention Center, Pre-function C

The APS Registration Desk will open and close at the following times.

<table>
<thead>
<tr>
<th>Day</th>
<th>Hours</th>
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<tr>
<td>Sunday, March 14</td>
<td>2:00pm–7:00pm</td>
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<td>Monday, March 15</td>
<td>7:00am–5:00pm</td>
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<td>Tuesday, March 16</td>
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<td>Thursday, March 18</td>
<td>7:00am–3:00pm</td>
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<tr>
<td>Friday, March 19</td>
<td>7:00am–10:00am</td>
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Badge Monitoring
All attendees must register for the meeting. Attendees must wear their badges at all times. Security personnel will be checking for badges before allowing admission to the sessions and the exhibit show. Attendees without badges will not be admitted to sessions and exhibits. If you lose your badge, please go to the APS registration desk for a new one. We will give you one replacement badge free. After that replacement badges will cost $10.00.

Shuttle Bus Service
Most hotels in the APS housing block are within walking distance of the free downtown light-rail system. APS will provide supplemental ground transportation from the hotels to the Oregon Convention Center. Shuttle bus service will begin from the hotels to the convention center on Sunday, March 14 at 1:30pm. The last trip from the hotels to the convention center on Sunday will be at 6:30pm. Registration opens at the convention center at 2:00pm in Pre-function C. A schedule of the shuttle busses will be available at your hotel upon your arrival, and printed bus schedules will be available at the convention center when you arrive to register.

Program CD
There are a limited number of copies of the March Meeting program on CD. If you would like one, they are available at the APS Registration Desk.
Abstract Look-up Stations
If you want to look up an abstract, abstract look-up stations are located throughout the corridors of the convention center for this purpose. These computers do not include e-mail access or access to the internet.

Email Service
An email pavilion will be set up in the exhibit hall for attendees to retrieve and send email messages on Monday, Tuesday, and Wednesday during exhibit hours only. On Thursday, limited email service will be available near the APS registration desk. Email access is available in the business offices at most hotels for a fee. Please be advised that email access is provided as a service to attendees, and that we cannot provide unlimited access to email stations, both in terms of the number of e-mail stations provided and the times they are available.

Wireless Service
APS will sponsor free wireless in the public space and the exhibit hall in the Convention Center. Wireless service will not be available in the meeting rooms.

A-V Office
Convention Center, D132

Speaker-Ready Room
Convention Center, D131

The speaker-ready room will be open as follows:
- Sunday, March 14: 2:00pm–7:00pm
- Monday, March 15: 7:00am–5:00pm
- Tuesday, March 16: 7:00am–5:00pm
- Wednesday, March 17: 7:00am–5:00pm
- Thursday, March 18: 7:00am–5:00pm
- Friday, March 19: 7:00am–12:00noon

Audio Visual Equipment
All rooms will be equipped with an LCD projector, overhead projector, screen, lavalier microphone, and pointer. If you plan on doing a PowerPoint presentation, please bring your program on your own laptop computer, and be sure to visit the Speaker-Ready Room to run through your presentation to ensure that it goes smoothly during the session. (We recommend that you also bring your presentation on vugraphs as a back-up to your computer presentation). When you arrive at the session in which you are speaking, if you are using the LCD projector, please have your laptop turned on and ready to go. If you require additional equipment it can be rented by ordering directly through APS’s contracted A-V company servicing the meeting during the meeting. The cost of additional equipment must be covered by the speaker. Note: you are not allowed to bring/use your own projectors at the meeting.

Job Fair
Convention Center, Exhibit Hall C/D

- Monday, March 15: 10:00am–5:00pm
- Tuesday, March 16: 10:00am–5:00pm

The Job Fair is the best place to connect with employers and job seekers from all areas of physics, engineering and related physical sciences.

Attendees are encouraged to visit the Job Fair to take advantage of our many recruiting services:
- Showcase your company with a Recruitment Exhibit
- Search our high-powered job and resume database
- Network and interview with companies and job candidates on-site
- Create alerts to inform you of new resumes and jobs
- Manage your interview calendar online

For additional information, please contact Alix Brice at 301-209-3187 or at jobfairs@aps.org or visit http://www.aps.org/meetings/march/events/jobfair/index.cfm.

APS Membership Booth
Convention Center, Pre-Function C

- Monday through Wednesday: 8:00am–5:00pm
- Thursday: 8:00am–3:00pm

The APS Membership Department staff will be on hand to answer questions about APS Membership, journal subscriptions and other new services.

APS Souvenir Store
Convention Center, Pre-function C

- Monday through Wednesday: 9:00am–5:00pm
- Thursday: 9:00am–3:00pm

Come browse our t-shirts, bumper stickers and more.
City of Portland Visitor Center
Located in main lobby of the Oregon Convention Center. Stop by for information about the city, sight-seeing, restaurants, and more.

Self-service Business Center/Convention Center
Located on the second level off the main lobby; open 7 days a week, 7:00am–11:00pm. Fees for use of the business center services.

APS Exhibit Show/APS Lounge
*Exhibit Hall C/D*

Monday, March 15 ..........................10:00am–5:00pm
Tuesday, March 16 ..........................10:00am–5:00pm
Wednesday, March 17 ......................9:00am–4:00pm

The annual exhibit show days are Monday through Wednesday. The exhibits are an important adjunct to the meeting, offering information on a wide variety of physics-related products and services. In addition, book and periodical publishers will be participating as exhibitors. The poster sessions, and food concessions will be located in the exhibit hall, as will the E-mail Pavilion. A wine and cheese reception will be held in the exhibit hall on Monday and Tuesday from 4:00pm–5:00pm. Plan to stop by to visit the exhibits, view the posters and enjoy the refreshments.

**NOTE:** You must display your badge to be admitted to the exhibit hall.

Press Room
*Convention Center, A104*

Monday through Thursday..................8:00am–5:00pm
Phone: 412-325-6060
Fax: 412-325-6010

Press Conference Room
*Convention Center, A103*

A schedule of news conferences can be obtained from the Press Room.

Parent’s/Children’s Quiet Room
*Convention Center, A102*

APS has designated a small room for parents who are bringing young children to the meeting. The purpose of the room is to provide a quiet place for parents of infants and young children to come for quiet time and relaxation with their children. This is not intended to be a playroom. The room will be furnished with comfortable furniture and water.
**PRE-MEETING PROGRAMS**

**DPOLY Short Course: Polymers for Energy Generation and Storage**
(Pre-registration only—no on-site registration. Registration deadline February 5)

- **Saturday, March 13**
  1:00pm–5:30pm
  Convention Center, C120-122

- **Sunday, March 14**
  9:00am–5:00pm

**Fees (pre-registration only)**
- APS Member $150
- Students/Post Docs $100
- Non-Member $250

**Tutorials**

- **Sunday, March 15**
  All pre-meeting tutorials will be held in the Oregon Convention Center.

**Tutorial Program Chair**
Mark Johnson, NRL, Washington, DC

**Registering for Tutorials**
You must sign up for pre-meeting tutorials when you pre-register for the March Meeting – registration deadline is February 5. You cannot register for tutorials on-site. Eight half-day tutorials will be presented Sunday, March 14. You may select one tutorial from the morning schedule and one from the afternoon schedule.

**Tutorial Fees**
Each tutorial is $100 ($40 for students).

**Morning Tutorials**
8:30am–12:30pm

- **Tutorial #1**
  Room D136
  Complex Oxide Thin Films and Superlattices

- **Tutorial #2**
  Room D137-139
  Topological Insulators

- **Tutorial #3**
  Room C123
  Advances in Josephson Quantum Circuits

- **Tutorial #4**
  Room C124
  Density Functional Theory

**Afternoon Tutorials**
1:30pm–5:30pm

- **Tutorial #5**
  Room C124
  Emergent Phenomena in Bulk Complex Oxides

- **Tutorial #6**
  Room D137-139
  Graphene

- **Tutorial #7**
  Room D131-132
  Physics Careers in Industry and Government

- **Tutorial #8**
  Room C123
  Spintronics

**Professional Skills Development Workshop for Women Post-Docs and Junior Tenure-Track Women Physicists**

- **Sunday, March 14**
  Hilton Hotel, Council Suite

**Workshop**
8:00am–5:00pm

The Professional Skills Development Workshop is a one-day workshop offering training on effective negotiation and communication skills for women post doctoral associates and tenure-track women faculty in physics. Workshop will be led by professional facilitators using an interactive format that encourages highly personal learning. Lunch will be provided and a reception for participants will follow the workshop.

**Reception**
5:00pm–6:30pm

Reception is for workshop participants only.
Pre-Meeting Programs

Education Workshop sponsored by the APS Forum on Education: Making it Good: A Workshop on Strategies for High-Quality, Effective Educational Materials and Efforts

Workshop Registration
You Must Pre-register for this Workshop

Sign up for all pre-meeting workshops when you preregister for the March Meeting. There is no on-site registration for pre-meeting workshops.

Sunday, March 14
1:00pm–5:00pm
Hilton Hotel, Broadway IV

Cost: $10

Who Should Attend
This workshop is designed for anyone who currently engages in education-outreach, who desires to engage in education-outreach, and/or who develops educational materials. The workshop will address the entire iterative development process for creating educational materials, from initial concept to evaluation. A range of product types will be discussed, including laboratory activities and hands-on demonstrations, as well as a range of audience levels, including public, K-12, and undergraduate. Participants will try example activities and kits, draft sample evaluation tools, and create tentative education plan related to their own research areas.

Workshop Description
Education and outreach efforts are becoming increasingly visible, active, and pervasive in the scientific community as a result of governmental requirements like the National Science Foundation’s broader impacts criterion and gradual institutional attitudinal shifts toward placing a higher emphasis on engaging non-technical audiences.

Many early career scientists recognize it as both an obligation and a pleasure to share their research with general audiences, whether pre-school-age children and their care givers, senior citizens, or advanced undergraduate students. However, in addition to enthusiasm and funding agency mandates, equally essential to successful education-outreach efforts are effective, engaging educational materials.

Hands-on demonstrations, classroom lesson plans, science-based games, theatrical presentations, and educational-oriented laboratory experiments are just a few examples of the wide variety of materials from which science educators can currently choose.

This workshop will provide an overview of the development philosophy of the University of Wisconsin-Madison (UW) Materials Research Science and Engineering Center (MRSEC) on Nanostructured Interfaces and their approach to creating high-quality, cutting-edge educational materials. The entire iterative development process, from initial concept to evaluation, will be addressed, as well as a range of product types, including laboratory activities and hands-on demonstrations. Participants will try example activities and kits, draft sample evaluation tools, and create tentative education plan related to their own research areas.

Speaker and Organizer
Greta Zenner Petersen
Materials Research Science and Engineering Center
University of Wisconsin–Madison

Workshop: Writing An Effective Op-ed
Sunday, March 14
2:00pm–4:30pm
Hilton Hotel, Executive Tower, Salon I

Interested in learning how to write a great op-ed to help science? Then you should register for this op-ed workshop. Bob Caldwell, Editorial Page Editor of the Oregonian, will provide tips on how to craft a well-written piece that’s sure to capture an editor’s attention. Attendance is limited, so please RSVP to Tawanda Johnson, APS Press Secretary–tjohnson@aps.org

Career Workshop
Sunday, March 14
4:00pm–7:00pm
Convention Center, B110-111

Cost: Free

Do you need some useful guidance that will take your job search to the next level? Come to this free interactive Career Workshop where you will learn the fine points of Networking to tap into the hidden job market, how to improve your resume, and ways to ace your interview, plus a host of other helpful hints. There will also be opportunities to put your new networking skills to practice.
Contact Congress
Sunday–Thursday
March 14–18
Convention Center

Sponsors:
Division of Condensed Matter Physics (DCMP)
Division of Materials Physics (DMP)

Contact Congress Hours
Sunday, March 14 ................................................. 3:00pm–6:00pm
Monday, March 15 .................................................. 9:00am–6:00pm
Tuesday, March 16 ................................................. 9:00am–6:00pm
Wednesday, March 17 .......................................... 9:00am–6:00pm
Thursday, March 18 ............................................... 9:00am–1:00pm

Q: What’s the best-spent minute at the March Meeting?
A: Stopping by the Contact Congress booth to sign your name to letters to your Congressional delegation on the importance of federal funding for basic research. It takes only a minute. By doing so, you are making your voice heard in Washington and helping to influence the funding levels for physics research and education. To amplify the impact, the APS Washington Office follows up each letter with a call or visit to congressional staff.

Be a Science Advocate
The strongest and most persuasive advocates on Capitol Hill come from a Senator or Representative’s constituents. That means you! If you live in the United States, you are qualified to write to your members of Congress. Contact Congress is overseen by the APS Washington Office. If you have any questions about what is happening in D.C., just stop by the Contact Congress desk to ask the experts. If you have questions in advance, please email APS Washington Office.

Gallery of Non-Linear Images
Monday, Tuesday, Wednesday
During Exhibit Hours
Convention Center, Exhibit Hall C/D

Wine and Cheese Receptions
Monday and Tuesday
4:00pm–5:00pm
Convention Center, Exhibit Hall C/D

APS Prizes and Awards Ceremonial Session
Monday, March 15
5:45pm–6:45pm
Convention Center, Portland Ballroom 251

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. See page 29 for a list of prize and award winners. The Awards Program will be followed by the Welcome Reception at 6:45pm in Exhibit Hall B.

Welcome Reception
Monday, March 15
6:45pm–8:00pm
Convention Center, Exhibit Hall B

All attendees are invited.

APS Journals Booth
Monday Tuesday, Wednesday, March 15, 16, 17
Oregon Convention Center, Exhibit Hall C/D – Booth #501

Talk to the APS Journal Editors
Editors of the APS journals and members of the technical and marketing staff will be on hand at the APS Journals Booth located in the exhibit hall to answer questions on all matters pertaining to the APS journals. Access to the online journals will be available. Your ideas, concerns, and suggestions are welcome.

We look forward to interacting with you on any journal matters, and to the opportunity to thank you in person for your contributions as an author or a reviewer. We are always pleased to receive feedback on our journals, to hear your ideas and concerns, and to learn more from our community about all aspects of physics research. We hope you will be able to drop by! The APS Booth will be open throughout the Exhibit Show for information on the APS and its journals.
Physics Community Outreach: Physics with a Bang!—Session G1
Monday, March 15
8:00pm
Convention Center, C120-C122

Heinrich Jaeger of the University of Chicago, will present “Physics with a Bang!”—a session on physics community outreach.

APS Editorial Q & A—Session L31
Tuesday, March 16
2:30pm– 4:00pm
Oregon Convention Center, Room E141

Following a brief “State of the Journals” address by APS Editor in Chief, Gene Sprouse, moderated questions and comments will be invited. Editors from Physical Review A, B, E, Focus, and Letters, Reviews of Modern Physics, and Physics, will also be on hand to provide responses.

Topics for discussion might include:

- Possible enhancements of both content and delivery
- Implications of open access
- APS copyright
- Impact factors
- Growth in submissions
- Efficiency of the selection process
- Quality of published articles
- Outstanding Referees
- PRL’s recent reinvigoration of its standards.
- The APS editors look forward to a productive exchange!

Meet the Editors of AIP and APS Reception
Tuesday, March 16
4:00pm–6:00pm
Convention Center, Pre-function E

The Editors of AIP and APS cordially invite you to join them for conversation and refreshments. Your questions, criticisms, compliments, and suggestions about the journals are welcome. We hope you will be able to join us.

Services and Publications of the American Institute of Physics:
AIP UniPHY
Applied Physics Letters

Services and Publications of the American Physical Society:
PROLA
Physical Review A
Physical Review B
Physical Review E
Physical Review Focus
Physical Review Letters
Physical Review Special Topics – Accelerators and Beams
Physical Review Special Topics – Physics Education Research
Physics
Reviews of Modern Physics

Estate Planning Seminar
Tuesday, March 16
5:30pm–7:00pm
Hilton Hotel, Broadway I

Nobel Prize Session—Session U1
Wednesday, March 17
5:45pm–7:00pm
Convention Center, Portland Ballroom 252

Speaker: George E. Smith, Bell Labs (retired)
The Invention and Early History of the CCD
Panel Discussion: Fuels of the Future—
Session U10
Wednesday, March 17
7:00-8:30 p.m.
Oregon Convention Center, Portland Ballroom 254

Oil accounts for 40% of energy usage, devoted primarily to transportation fuels. Last year, the United States imported 60% of its oil. Increasing carbon dioxide emissions from the developed and the developing world threaten climate stability. The panel will consider the impact of these and other issues on our choices for fuel mixes of the future including fossil and biofuels. The three panelists will each give a 10-minute opening statement followed by open discussion with the audience and among the panel.

Panelists:
John Cain, Principal Adviser, Carbon Management, Chevron Corporation

Stephen Long, Deputy Director, Energy Biosciences Institute and Professor of Crop Sciences, University of Illinois at Urbana-Champaign

Linda Horton, Director, Materials Science and Engineering Division, Basic Energy Sciences, Department of Energy

Moderator:
George Crabtree, Argonne National Laboratory

Public Lecture
The Physics of Superheros
Wednesday, March 17
7:00pm–8:00pm
Convention Center, Oregon 204

Speaker: James Kakalios, University of Minnesota

“Trends” in the APS Publication Physics –
Session U45
Wednesday, March 17
7:30pm–9:00pm
Hilton Hotel, Pavilion Ballroom

Trends articles in the APS publication Physics are concise surveys of a particular area that also anticipate developments in that field. Come to this general-interest session to hear three speakers present talks on emerging topics in condensed matter physics: David Awschalom on spintronics, Michael R. Norman on iron-based superconductors, and Florian Marquardt on optomechanical devices. The talks follow-up on Trends articles published in Physics by the speakers. Pizza and beer will be served.

Optomechanical Devices
Florian Marquardt, Ludwig-Maximilians-Universitaet Muenchen

The interplay of light and mechanical motion on the nanoscale has emerged as a very fruitful research topic during the past few years. Optomechanical systems are now explored as ultrasensitive force and displacement sensors. By using light to cool a mechanical system to its quantum ground state, researchers hope to explore the foundations of quantum mechanics in a new regime.

Spintronics
David Awschalom, University of California, Santa Barbara

The spin-orbit interaction in the solid state offers several versatile all-electrical routes for generating, manipulating, and routing spin-polarized charge currents in semiconductors. We describe recent experiments that explore several guises of this effect for the nascent field of spintronics. This includes new opportunities—and challenges—for making the transition from fundamental studies to a future spin-based technology for classical and quantum information processing.

Iron-Age Superconductors
Michael R. Norman, Argonne National Laboratory

A new class of high-temperature superconductors has been discovered in layered iron arsenides. In these materials, magnetism and superconductivity appear to be intimately related. Results in this rapidly moving field may shed light on the still unsolved problem of high-temperature cuprate superconductivity.

Physics Sing-along/Listen-along
Wednesday, March 17
9:00pm–10:00pm
Hilton Hotel, Grand Parlor B-C
Companion’s Welcome Breakfast  
Monday, March 15  
9:00am–10:30am  
Hilton Hotel, Salon Ballroom I-III  

Cost: Free to companions and families of attendees only.  
Companions of the attendees of the March Meeting are invited to a complimentary breakfast to meet other companions and learn about the city of Portland. Presentations will be made by a representative of the Portland Convention and Visitors Bureau. At the breakfast you will receive information about the sites and attractions in the city. Restricted to companions and families only—registered meeting attendees not admitted.

Gallery of Images  
Sponsored by GSNP  
Monday, Tuesday, Wednesday  
Convention Center, Exhibit Hall C/D  

Future Physicist Days  
Monday, March 15  
Tuesday, March 16  
Hilton Hotel  

Planned Events  
Special events for undergraduate Physicists will be held at the March Meeting 2010 of the American Physical Society.  

Events will include:  
• Undergraduate Research Presentations  
• Sessions— oral and poster  

SPS Undergraduate Reception  
Monday, March 15  
1:15pm–2:30pm  

March Meeting Welcome Reception  
Monday, March 15  
6:45pm  

Evening Student Reception and Physics Jeopardy®  
Tuesday, March 16  
5:30pm  
Pavilion West  

CSWP/FIAP Networking Breakfast for Women Physicists in Industry  
Tuesday, March 16  
7:30am–9:30am  
Hilton Hotel, Galleria I  

Guest Speaker: Juana Rudati  
Cost: $15 for Meeting attendees, $5 for physics students  
Enjoy a delicious full breakfast and hear an informal talk by a woman physicist in industry. Both men and women are welcome.  

Pre-registration is required. If any seats remain, tickets will be available for sale at the APS Registration Desk in the Convention Center. No tickets will be sold at the Hilton.

High School Physics Teachers Day  
Tuesday, March 17  
8:00am–3:00pm  
Hilton Hotel, Grand Ballroom II  

The APS Department of Education and Diversity is sponsoring High School Physics Teachers’ Day for teachers in the Portland area.  

The program includes:  
• Hands-on workshops presenting innovative, classroom-ready activities  
• Research talks on cutting-edge physics  
• Welcome breakfast, and a chance to network with fellow teachers  
• Lunch with a physicist  

If you are a physicist attending the March Meeting and would like to join the teachers for lunch, email Ed Lee – lee@aps.org All students are welcome. Plan to attend and socialize with your fellow students and enjoy the refreshments.

Meeting Sponsors

![APS physics](image)
![CUR](image)
![SPS](image)
DCMP/DMP/DCOMP/DCP New Fellows and Award Winners Reception  
Tuesday, March 16  
5:30pm–7:00pm  
Hilton Hotel, Grand Ballroom I

Forum on International Physics (FIP) Reception  
Tuesday, March 16  
6:00pm–8:00pm  
Hilton Hotel, Salon Ballroom I-II

Please join us as we honor the FIP/APS Fellows! Co-sponsors will also be giving out awards.

The FIP reception is a wonderful opportunity to interact with speakers, officers of the American Physical Society, members of the co-sponsoring organizations, and your fellow FIP members!

Reception Co-Sponsors:  
• APS Office of International Affairs  
• Overseas Chinese Physics Association (OCPA)  
• Association of Korean Physicists in America (AKPA)  
• American Chapter of the Indian Physics Association (ACIPA)  
• Iranian-American Physicists Group Network (IrAP)

Tutorial for Authors and Referees—Session P41  
Wednesday, March 17  
8:00am–9:30am  
Convention Center

Editors from Physical Review Letters and Physical Review will provide information and tips for our less experienced referees and authors. This session is aimed at anyone looking to submit to or review for any of the APS journals, as well as anyone who would like to learn more about the authoring and refereeing processes.

Topics for discussion will include:  
• Advice on how to write good manuscripts  
• Similarities and differences in writing referee reports for PRL and PR  
• Ways in which authors, referees, and editors can work together productively

Following a short presentation from the editors, there will be a moderated discussion. Refreshments will be served.

Graduate Students Lunch with the Experts  
Wednesday, March 17  
1:00pm–2:30pm  
Exhibit Hall B

Cost: Free; attendance is limited, eight students per topic

Graduate students may sign up on-site to enjoy complimentary box-lunch while participating in an informal discussion with an expert on a topic of interest to them. Topics will be identified in January and listed on this web page.

Registration  
Sign-up will take place beginning on Monday, March 16 at 1:00pm, at the APS Registration Desk (Convention Center, 3rd floor), and will be on a first-come, first-served basis.

DCMP:  
Solar Fuels: Semiconductor Photocatalytic Water Splitting  
Philip B. Allen, Professor, Stony Brook University

Topological Insulators  
E. J. (Gene) Mele, University of Pennsylvania

DMP:  
Correlated Electrons and Electron Spectroscopy  
Daniel S. Dessau, University of Colorado

Superconductivity and Energy Research  
Laura Greene, University of Illinois at Urbana-Champaign

Semiconductor Spintronics, Thermoelectrics and Multifunctional Materials  
Chris Palmstrom, University of California, Santa Barbara

Geometrically Frustrated Magnets  
Peter Schiffer, Penn State

Nanoscience  
Ivan Schuller, University of California, San Diego

Nanomagnetism  
David J Sellmyer, University of Nebraska

Designing New Materials Using Electronic Structure Theory  
Nicola Spaldin, University of California, Santa Barbara

DPOLY:  
Physics of a Lung: Interface of Soft Matter and Medicine  
Michael Rubinstein, University of North Carolina

FIAP:  
Physics and Applications of Nanomaterials and Nanodevices for Information Storage and Microelectronics  
Ernesto E. Marinero, Hitachi San Jose Research Laboratory
**APS EVENTS/MEETINGS FOR SPECIAL GROUPS**  
(In chronological order)

**GERA:**  
*Thermoelectrics: Conversion of Waste Heat to Electrical Power*  
Terry Tritt, Clemson University

**GQI:**  
*Quantum Computing*  
David DiVincenzo, IBM TJ Watson Research Center

**GSNP:**  
*Granular Science*  
Mark Shattuck, CCNY

**Student Reception**  
**Wednesday, March 17**  
5:30pm–6:30pm  
*Exhibit Hall B*

The Student Reception is sponsored by APS and the Forum on Graduate Student Affairs (FGSA). The Forum on Graduate Student Affairs will present a short program highlighting their latest activities.

**COM/CSWP Networking Reception**  
**Wednesday, March 17**  
7:30pm–9:30pm  
*Hilton Hotel, Galleria I*

Come learn about the work of the Committee on Minorities in Physics and the Committee on the Status of Women in Physics, network with colleagues, and unwind after a long day of sessions.

**APS Unit Business Meetings**  
**Tuesday, March 16**  
5:45pm–6:45pm  
*Convention Center*

- **GQI Business Meeting** D137
- **DBP Business Meeting** Portland Ballroom 254
- **DPOLY Business Meeting** B116
- **GMAG Business Meeting** C146
- **GSNP Business Meeting** A107-109
- **FIAP Business Meeting** C123
- **GSCCM Business Meeting** D139
- **GERA Business Meeting** B115

**Tuesday, March 16**  
7:00pm–8:00pm  
*Hilton Hotel*

- **DCP Business Meeting** Council Suite
- **DCOMP Business Meeting** Senate Suite
- **DMP Business Meeting** Broadway III
- **DCMP Business Meeting** Broadway II

**Wednesday, March 17**  
5:45pm–6:45pm  
*Convention Center*

- **GIMS Business Meeting** Oregon Ballroom 204

**Alumni Reunions**  
**Tuesday, March 16**  
6:00pm–8:00pm  
*Hilton Hotel*

- **IBM Grand Parlor C**
- **University of Illinois** Pavilion East
- **Michigan State** Forum Suite
- **Cornell University** Galleria North
- **Brown University** Directors Suite
- **Chinese Academy** Grand Ballroom II
Meet your Program Director and Learn About Funding Opportunities at NSF
   Wednesday, March 17
   5:30pm–7:00pm
   Convention Center, E147-148

American Chapter of the Indian Physics Association
   Wednesday, March 17
   7:00pm–9:00pm
   Hilton Hotel, Galleria II
FOCUS SESSIONS

DAMOP
Q31…..Focus Session: Quantum Simulation using AMO Systems
V31…..Focus Session: Strongly Interacting Quantum Gases

DAMOP/GQI
J31…..Focus Session: Hybrid AMO-condensed Matter Systems for Quantum Information Science

DBP
V10…..Focus Session: Dynamics of Neural Systems
P10…..Focus Session: Physics of Behavior
Q10…..Focus Session: Physics of Biochips I
T10…..Focus Session: Physics of Biochips II

DBP/GSNP
D39…..Noise and Fluctuations in Biochemical Networks

DCMP
A21…..Focus Session: Graphene: Quantum Interference and Transport
B40…..Focus Session: Iron Based Superconductors Physical Properties I
A40…..Focus Session: Phonons and Electron Correlations in High Temperature Superconductors I
H40…..Focus Session: Phonons and Electron Correlations in High Temperature Superconductors II
Q32…..Focus Session: Self Assembly of Molecules on Surfaces
T32…..Focus Session: Self Assembly on Novel Templates

DCP
J12…..Focus Session: Carbon Nanotubes: Thermal Transport
Q40…..Focus Session: Iron Based Superconductors Physical Properties III
B39…..Focus Session: Iron Based Superconductors Synthesis and Doping
V39…..Focus Session: Iron Based Superconductors: Lattice Probes & Irradiation
L39…..Focus Session: Iron Based Superconductors: Magnetism and Structure
W39…..Focus Session: Iron Based Superconductors: Neutron Scattering and Magnetism
P40…..Focus Session: Iron Based Superconductors: Physical Properties II
J39…..Focus Session: Iron Based Superconductors: Properties and Pressure

T39…..Focus Session: Iron Based Superconductors: Scanning Probe
Y39…..Focus Session: Iron Based Superconductors: Spectroscopy I
Z39…..Focus Session: Iron Based Superconductors: Spectroscopy II
D39…..Focus Session: Iron Based Superconductors: Theory I
Q39…..Focus Session: Iron Based Superconductors: Theory III
Y40…..Focus Session: Iron Based Superconductors: Magnetism and Transport

DCOMP
Q30…..Focus Session: High Pressure III

DCOMP/GSCCM
J30…..Focus Session: High Pressure II: Equations of State
W30…..Focus Session: High Pressure IV: Dynamics of Shock Induced Phase Transitions

DCP
V27…..Focus Session: Attosecond Science and Strong Field Chemical Physics I
W27…..Focus Session: Attosecond Science and Strong Field Chemical Physics II
V28…..Focus Session: Charge Transport in Nanostructures I
W28…..Focus Session: Charge Transport in Nanostructures II
X28…..Focus Session: Charge Transport in Nanostructures III
X27…..Focus Session: Chemical Control of the Properties of Complex Oxides I
Y27…..Focus Session: Chemical Control of the Properties of Complex Oxides II
A28…..Focus Session: Confined and Biological Water I
H27…..Focus Session: Confined and Biological Water II
J27…..Focus Session: Confined and Biological Water III
L27…..Focus Session: Confined and Biological Water IV
H28…..Focus Session: New Frontiers in Electronic Structure Theory I
J28…..Focus Session: New Frontiers in Electronic Structure Theory II
P28…..Focus Session: New Frontiers in Electronic Structure Theory III
Q28…..Focus Session: New Frontiers in Electronic Structure Theory IV
P27…..Focus Session: New Trends in Spectroscopy II
Q27…..Focus Session: New Trends in Spectroscopy III
### FOCUS SESSIONS

<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>J23</td>
<td>Focus Session: Plyler Prize Session and New Trends in Spectroscopy I</td>
</tr>
<tr>
<td>H24</td>
<td>Focus Session: Production and Application of Cold Molecules I</td>
</tr>
<tr>
<td>T28</td>
<td>Focus Session: Production and Application of Cold Molecules II</td>
</tr>
<tr>
<td>A10</td>
<td>Focus Session: Single Molecule Biophysics and Chemical Physics I</td>
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<tr>
<td>B10</td>
<td>Focus Session: Single Molecule Biophysics and Chemical Physics II</td>
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<td>D10</td>
<td>Focus Session: Single Molecule Biophysics and Chemical Physics III</td>
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<td>Focus Session: Single Molecule Biophysics and Chemical Physics IV</td>
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<td>T11</td>
<td>Focus Session: Single Molecule Biophysics and Chemical Physics V</td>
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<td>A32</td>
<td>Focus Session: Directed Self Assembly of Dots, Islands and Wires on Templates</td>
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<td>H25</td>
<td>Focus Session: Dopants and Defects in Semiconductors - Si</td>
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<tr>
<td>A25</td>
<td>Focus Session: Dopants and Defects in Semiconductors - ZnO</td>
</tr>
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<td>B22</td>
<td>Focus Session: Graphene Structure: Local Probes</td>
</tr>
<tr>
<td>Q21</td>
<td>Focus Session: Graphene: Bilayers I</td>
</tr>
<tr>
<td>T21</td>
<td>Focus Session: Graphene: Bilayers II</td>
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<td>D21</td>
<td>Focus Session: Graphene: Correlated States</td>
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<td>X21</td>
<td>Focus Session: Graphene: Devices</td>
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<td>Y21</td>
<td>Focus Session: Graphene: Field-Effect Devices</td>
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<td>Z21</td>
<td>Focus Session: Graphene: Growth</td>
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<td>Focus Session: Graphene: Local Probes</td>
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<td>Focus Session: Graphene: Magnetic Properties</td>
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<td>V21</td>
<td>Focus Session: Graphene: Mechanical and Thermal Properties</td>
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<td>H21</td>
<td>Focus Session: Graphene: Nanoribbons</td>
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<td>W21</td>
<td>Focus Session: Graphene: Strain</td>
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<tr>
<td>J21</td>
<td>Focus Session: Graphene: Transport I</td>
</tr>
<tr>
<td>L21</td>
<td>Focus Session: Graphene: Transport II</td>
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<tr>
<td>D20</td>
<td>Focus Session: Hydrogen Storage I</td>
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<tr>
<td>L30</td>
<td>Focus Session: Hydrogen Storage II — Complex Hydrides</td>
</tr>
<tr>
<td>T30</td>
<td>Focus Session: Hydrogen Storage III</td>
</tr>
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<td>P21</td>
<td>Focus Session: Nano-Graphene</td>
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<tr>
<td>T9</td>
<td>Focus Session: Optics of Nanostructures - Near Field, Single Molecule, and Plasmonics</td>
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</tbody>
</table>
FOCUS SESSIONS

J14 ..... Focus Session: Optics of Nanostructures — Plasmons, Nanoantennas, and Quantum Dots
A9 ..... Focus Session: Optics of Nanostructures — Quantum Dots I
W14 ..... Focus Session: Optics of Nanostructures — Quantum Dots II
Q14 ..... Focus Session: Optics of Nanostructures: Quantum Dots and Nanomaterials
X41 ..... Focus Session: Search for New Superconductors - Carbides, Borides and Organics
L41 ..... Focus Session: Search for New Superconductors - Heterostructures, Thin Films, Intercalated and High-Pressure Compounds
T41 ..... Focus Session: Search for New Superconductors - Nanotubes and Fullerides
W41 ..... Focus Session: Search for New Superconductors - Silicides, Nickelates and Cobaltates
A14 ..... Focus Session: Transport Properties of Nanostructures I: Single-Molecule Junctions
D14 ..... Focus Session: Transport Properties of Nanostructures II: Non-Equilibrium and Correlated Electron Phenomena
H14 ..... Focus Session: Transport Properties of Nanostructures III: Theory and Computation I
L14 ..... Focus Session: Transport Properties of Nanostructures IV: Charge Dynamics and Imaging of Photoactive Molecules
P14 ..... Focus Session: Transport Properties of Nanostructures V: Theory and Computation II
V14 ..... Focus Session: Transport Properties of Nanostructures VI: Inorganic Nanostructures and Nanomechanics

DMP/DCMP

T40 ..... Focus Session: Iron Based Superconductors: Doping and Magnetism
H39 ..... Focus Session: Iron Based Superconductors: Pairing Symmetry
X39 ..... Focus Session: Iron Based Superconductors: Spin Excitation
P39 ..... Focus Session: Iron Based Superconductors: Theory II
A39 ..... Focus Session: Iron Superconductors: New Materials

DMP/DPOLY

X16 ..... Focus Session: Organic Electronics and Photonics: Electronic Structure and Interfaces
Z16 ..... Focus Session: Organic Electronics and Photonics: Fundamentals
B16 ..... Focus Session: Organic Electronics and Photonics: Solar Cell Materials and Devices
D16 ..... Focus Session: Organic Electronics and Photonics: Solar Cells and Photophysics
W16 ..... Focus Session: Organic Electronics and Photonics: Transistors and Light Emitting Devices
T16 ..... Focus Session: Organic Electronics and Photonics: Transport

DMP/FIAP/GERA

B29 ..... Focus Session: Thermoelectrics I: Recent Concepts
J29 ..... Focus Session: Thermoelectrics II: Dirac, Bi2Te3 & Nanostructures
P29 ..... Focus Session: Thermoelectrics III: IV-VI & Nanostructures
Q29 ..... Focus Session: Thermoelectrics IV: Group IV & Nanostructures
W29 ..... Focus Session: Thermoelectrics V: III-V & Nanostructures
Y29 ..... Focus Session: Thermoelectrics VI: Oxides, Measurements, Devices

DMP/GERA

B25 ..... Focus Session: Electric-to-Light Conversion and Optics in Semiconductors I
J25 ..... Focus Session: Electric-to-Light Conversion and Optics in Semiconductors II

DMP/GMAG

Z36 ..... Focus Session: Bulk Properties of Complex Oxides — 4d and 5d Systems
P36 ..... Focus Session: Bulk Properties of Complex Oxides — Cobaltites
D36 ..... Focus Session: Bulk Properties of Complex Oxides — Cobaltites and Vanadates
Q36 ..... Focus Session: Bulk Properties of Complex Oxides — Fe-Based Multiferroics
Y36 ..... Focus Session: Bulk Properties of Complex Oxides — General Multiferroics
T36 ..... Focus Session: Bulk Properties of Complex Oxides — Layered Manganites and Theory
B36 ..... Focus Session: Bulk Properties of Complex Oxides — Manganite Multiferroics
Focus Sessions

X36 ..... Focus Session: Bulk Properties of Complex Oxides — Novel Systems
A36 ..... Focus Session: Bulk Properties of Complex Oxides — Perovskite Manganese
W37 ..... Focus Session: Complex Oxide Thin Films — BiFeO3 Multiferroics
P37 ..... Focus Session: Complex Oxide Thin Films — Conductivity and Metal-Insulator Transition I
Q37 ..... Focus Session: Complex Oxide Thin Films — Conductivity and Metal-Insulator Transition II
A37 ..... Focus Session: Complex Oxide Thin Films — Conductivity at Oxide Interfaces
T37 ..... Focus Session: Complex Oxide Thin Films — Interfaces and Superlattices
B37 ..... Focus Session: Complex Oxide Thin Films — LaAlO3/SrTiO3 Interfaces
D33 ..... Focus Session: Complex Oxide Thin Films — Magnetic Oxides
H37 ..... Focus Session: Complex Oxide Thin Films — Manganites
V37 ..... Focus Session: Complex Oxide Thin Films — Multiferroics and Tunneling
D37 ..... Focus Session: Complex Oxide Thin Films — Oxide 2DEGs and Devices
Q33 ..... Focus Session: Complex Oxide Thin Films — Oxide/Semiconductor Interfaces and Defects
B14 ..... Focus Session: Electrodynamics of Metamaterials
P34 ..... Focus Session: Frustrated and Low-D Magnetism — Antiferromagnets on the Triangular Lattice
V34 ..... Focus Session: Frustrated and Low-D Magnetism — Quantum Magnetism I
Y34 ..... Focus Session: Frustrated and Low-D Magnetism — Quantum Magnetism II
Z34 ..... Focus Session: Frustrated and Low-D Magnetism — Quantum Magnetism III
H34 ..... Focus Session: Frustrated and Low-D Magnetism — Spin Chains and Ladders
W36 ..... Focus Session: Frustrated and Low-D Magnetism — Spin Ice
Q34 ..... Focus Session: Frustrated and Low-D Magnetism — Spins, Orbitals, and Phonons
L34 ..... Focus Session: Frustrated and Low-D Magnetism — Strongly Frustrated Antiferromagnets in 2D
W34 ..... Focus Session: Nanomagnetism — Atomic Size Structures
J36 ..... Focus Session: Nanomagnetism — Domain Dynamics
B34 ..... Focus Session: Nanomagnetism — Exchange & Multiferroics
X37 ..... Focus Session: Nanomagnetism — Molecules
Y37 ..... Focus Session: Nanomagnetism — Nanoparticles I
Z37 ..... Focus Session: Nanomagnetism — Nanoparticles II
A34 ..... Focus Session: Nanomagnetism — Nanostructured Films
D34 ..... Focus Session: Nanomagnetism — Nanowires & Thermal Effects
H36 ..... Focus Session: Nanomagnetism — Spin Torque
L36 ..... Focus Session: Nanomagnetism — Tunnel Junctions
J37 ..... Focus Session: Novel Magnetic Devices - Spin Torque I
L37 ..... Focus Session: Novel Magnetic Devices: Spin Torque II

DMP/GSNP/DPOLY

P32 ..... Focus Session: Tribophysics — Adhesion and Friction
L32 ..... Focus Session: Tribophysics — Sliding Friction

DPOLY

Q17 ..... Focus Session: Glass Transition in Thin Films II
X18 ..... Focus Session: Polymer Network Mechanics II
B18 ..... Focus Session: Crystallization in Confined Geometry I
D18 ..... Focus Session: Crystallization in Confined Geometry II
L17 ..... Focus Session: Dillon Medal Symposium
T17 ..... Focus Session: Dynamics of Polymers and Complex Fluids I
V17 ..... Focus Session: Dynamics of Polymers and Complex Fluids II
W17 ..... Focus Session: Dynamics of Polymers and Complex Fluids III
P17 ..... Focus Session: Glass Transition in Thin Films I
J19 ..... Focus Session: Hierarchically and Templated Ordered Systems I
L19 ..... Focus Session: Hierarchically and Templated Ordered Systems II
H19 ..... Focus Session: Long Range Order in Polymeric Structure and Morphology I
L18 ..... Focus Session: Long Range Order in Polymeric Structure and Morphology II
P19 ..... Focus Session: Physics of Polymer Nanocomposites I
Q19 ..... Focus Session: Physics of Polymer Nanocomposites II
Z19 ..... Focus Session: Polymer Brushes
X19 ..... Focus Session: Polymer Colloids: Particle Interactions and Assembly
W18 ..... Focus Session: Polymer Network Mechanics I
T19 ..... Focus Session: Polymer-Nanoparticle Interactions I
FOCUS SESSIONS

V19.....Focus Session: Polymer-Nanoparticle Interactions II
A17.....Focus Session: Relaxation Dynamics of Polymeric Glasses I
H17 ....Focus Session: Relaxation Dynamics of Polymeric Glasses II
B19.....Focus Session: Thin Films Copolymers I
D19 ....Focus Session: Thin Films Copolymers IIDPOLY/DBP

DPOLY/DBP
P18.....Focus Session: Biological-Synthetic Hybrid Materials I
T18 .....Focus Session: Biological-Synthetic Hybrid Materials III
W19....Focus Session: Synchrotron X-ray and Neutron Techniques in Soft Matter and Biological FEEd

DPOLY/DCOMP
Y19.....Focus Session: Polymer Colloids: Dynamics

DPOLY/DMP
A18.....Focus Session: Multiscale Modeling in Polymer and Soft Matter Physics

DPOLY/GERA/DMP
Q16 ....Focus Session: Polymers and Energy: Fuel Cells and Batteries
J16 .....Focus Session: Polymers and Energy: Photovoltaics I
L16 .....Focus Session: Polymers and Energy: Photovoltaics II

FED
A42.....Focus Session: Physics Teacher Preparation: Effective Strategies, National Models, and Challenging Issues
H42 ....Focus Session: Research in Mathematics Education and Mathematics in Physics Education FEd/DCOMP

FIAP
A30.....Focus Session: Carbon Nanotubes: Chirality-Controlled Growth of Carbon Nanotubes and Nanostructures
H30 ....Focus Session: Frontiers in Computational Thermodynamics of Materials
L29 .....Focus Session: Interface Controlled Organic Thin Films for Enhanced Device Performance
Y14 .....Focus Session: Nanostructures and Plasmonics
Q41 ....Focus Session: Phonons and Electron Correlations in High Tc Superconductors

GIMS
B15 .....Focus Session: Advances in Scanned Probe Microscopy I: Novel AFM, MRFM, and Acoustic Microscopy
J15 ......Focus Session: Advances in Scanned Probe Microscopy II: Optical Techniques
Q15 ....Focus Session: Advances in Scanned Probe Microscopy III: Spectroscopic Techniques at Low Temperatures
V15 .....Focus Session: Novel Instrumentation and Measurements for Medical and Biological Systems
D15 ....Focus Session: X-ray and Neutron Instruments and Measurement Science I
L15 .....Focus Session: X-ray and Neutron Instruments and Measurement Science II

GMAG
J33......Focus Session: Spin Dependent Physics in Organic-Based Materials I
L33 .....Focus Session: Spin Dependent Physics in Organic-Based Materials II
P33 .....Focus Session: Spin Dependent Physics in Organic-Based Materials III

GMAG/DMP
A33.....Focus Session: Magnetization and Spin Dynamics I
H33 .....Focus Session: Magnetization and Spin Dynamics II

GMAG/DMP/FIAP
V35 .....Focus Session: Spins in Semiconductors — Carbon-Based Systems
W35....Focus Session: Spins in Semiconductors — DMS: III-V and Devices
Z35 .....Focus Session: Spins in Semiconductors — DMS: II-VI and Group IV
H35 ....Focus Session: Spins in Semiconductors — DMS: Nitrides and Oxides
P35 .....Focus Session: Spins in Semiconductors — GaMnAs Electronic Structure
A35 .....Focus Session: Spins in Semiconductors — Hyperfine Interactions
B35 .....Focus Session: Spins in Semiconductors — Quantum Dots
Y35 .....Focus Session: Spins in Semiconductors — Qubits and Quantum Wires
Q35 ....Focus Session: Spins in Semiconductors — Spin Device Physics
X35 .....Focus Session: Spins in Semiconductors — Spin
Dynamics

<table>
<thead>
<tr>
<th>Session Code</th>
<th>Session Title</th>
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<tbody>
<tr>
<td>L35</td>
<td>Focus Session: Spins in Semiconductors — Spin Injection</td>
</tr>
<tr>
<td>J35</td>
<td>Focus Session: Spins in Semiconductors — Spin Orbit Effects and Spin Relaxation</td>
</tr>
<tr>
<td>D35</td>
<td>Focus Session: Spins in Semiconductors — Topological Insulators</td>
</tr>
<tr>
<td>T35</td>
<td>Focus Session: Spins in Semiconductors - Spin Hall Effect and Spin Currents</td>
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GQI

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<th>Session Code</th>
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<tbody>
<tr>
<td>X33</td>
<td>Focus Session: Foundations of Quantum Theory</td>
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<tr>
<td>A26</td>
<td>Focus Session: Recent Progress in Quantum Algorithms and Computational Complexity</td>
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<tr>
<td>D26</td>
<td>Focus Session: Semiconductor Qubits - Silicon</td>
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<tr>
<td>B26</td>
<td>Focus Session: Semiconductor Qubits - Silicon and III-Vs</td>
</tr>
<tr>
<td>V26</td>
<td>Focus Session: Superconducting Qubits</td>
</tr>
<tr>
<td>J26</td>
<td>Focus Session: Topological Quantum Computing</td>
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GSNP

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<tr>
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<td>Focus Session: Complex Networks I</td>
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<td>D13</td>
<td>Focus Session: Complex Networks II</td>
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<tr>
<td>H11</td>
<td>Focus Session: Extreme Mechanics I</td>
</tr>
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<td>L11</td>
<td>Focus Session: Extreme Mechanics II</td>
</tr>
<tr>
<td>P11</td>
<td>Focus Session: Extreme Mechanics III</td>
</tr>
<tr>
<td>V13</td>
<td>Focus Session: Jamming I</td>
</tr>
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<td>Focus Session: Jamming II</td>
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<td>X13</td>
<td>Focus Session: Jamming III</td>
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GSNP/DBP

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<tr>
<td>Q13</td>
<td>Focus Session: Stochastic Processes in Biology I</td>
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<tr>
<td>T13</td>
<td>Focus Session: Stochastic Processes in Biology II</td>
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GSNP/DMP

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<tr>
<td>H32</td>
<td>Focus Session: Tribophysics — Fracture and Plasticity</td>
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Oregon Convention Center • Exhibit Hall CO

Poster sessions will be held on Monday, Tuesday and Wednesday.

Posters will be on display from 10:00 am to 5:00 pm on Monday and Tuesday, and from 9:00 am to 4:00 pm on Wednesday. Authors should be in attendance at the times listed below. Please remove your poster at the end of the session. APS is not responsible for poster materials that are left in the exhibit hall after the session is over. No A-V is allowed in posters sessions. A wine and cheese reception will be held in Exhibit Hall A on Monday and Tuesday from 4:00 pm to 5:00 pm.

**C1: POSTER SESSION I • MONDAY, MARCH 15**

Authors in Attendance from 2:00 pm to 5:00 pm

| 1 - 81 | Polymer and Softer Matter Physics I |
| 82 - 103 | Fluids and Soft Matter I |
| 104 - 133 | Artificially Structures Materials |
| 134 - 141 | Physics Education |
| 142 - 166 | Statistical and Nonlinear Physics |
| 167 - 212 | Semiconductors |
| 213 - 227 | Metals |
| 228 - 231 | Quantum Fluids and Solids |
| 232 - 234 | Physics of Beams |
| 235 - 239 | High Pressure Physics |
| 240 - 281 | Biological Physics |
| 282 - 296 | Energy Research and Applications |

**K1: POSTER SESSION II • TUESDAY, MARCH 16**

Authors in Attendance from 2:00 pm to 5:00 pm

| 1 - 18 | Undergraduate Research (Including Society of Physics Students) |
| 19 - 20 | History of Physics |
| 21 - 41 | Phase Transitions and Strongly Correlated Systems |
| 42 - 65 | Instrumentation and Measurements |
| 66 - 98 | Atomic, Molecular and Optical Physics |
| 99 - 129 | Superconductivity |
| 130 - 150 | Surfaces, Interfaces, and Thin Films |
| 151 - 229 | Complex Structured Materials |
| 230 - 249 | Fluids and Soft Matter II |
| 250 - 295 | Chemical Physics |

**S1: POSTER SESSION III • WEDNESDAY, MARCH 17**

Authors in Attendance from 1:00 pm to 4:00 pm

| 1 - 77 | Polymer and Softer Matter Physics II |
| 78 - 133 | Magnetism |
| 134 - 152 | Insulators and Dielectrics |
| 153 - 155 | Public Policy |
| 156 - 171 | Quantum Information, Concepts, and Computation |
| 172 - 197 | General Theory |
| 198 - 229 | Applications |
| 230 - 237 | Fluids and Soft Matter III |
| 238 - 241 | Supplemental |
| 242 - 295 | Post-Deadline Abstracts |
PROGRAM TIME-BLOCKS

Contributed and invited sessions at APS general meetings are three hours in length — three sessions per day at 8:00am, 11:15am, and 2:30pm. The time-blocks are designated in alpha order beginning with time-block “A” on Monday at 8:00am, and ending with “Z” designating the 11:15 time-block on Friday.

SESSION CODES

The number following the alpha that designates the time-block represents the sequential numbering of the sessions within the time-block. Session A1 is one of several sessions taking place in parallel in the first time-block on Monday. The number following the decimal in the session code represents the sequence of the papers to be presented in that session. For example: B3 4 = Time-block B (Monday at 11:15am); Session 3 (of several) within that time-block; and the 4th paper to be presented in that session.

POSTER CODES

The poster sessions will take place on Monday, Tuesday, and Wednesday in the Exhibit Hall. A breakdown of the topics presented in each category is listed on page 26.

Monday poster session (2:00–5:00pm) = Sessions C1
Tuesday poster session (2:00–5:00pm) = Sessions K1
Wednesday poster session (1:00–4:00pm) = Sessions S1

Each poster presentation (board) within each poster session is numbered sequentially.

GUIDELINES FOR SPEAKERS

Oral Presentations

Please arrive at least 15 minutes prior to the scheduled time of your talk. Contributed papers are allocated 12 minutes each — 10 minutes for presentation and 2 minutes for questions from the audience, unless otherwise specified. Invited papers are allocated 36 minutes — 30 minutes for presentation and 6 minutes for questions from the audience.

Note: Occasionally (and unfortunately) the chair for a session may not appear, in which case we ask that the first presenter serve as chair of the session.

Poster Presentations

If you are presenting a poster, please be sure to have your poster up beginning at 10:00 am on the day of your poster presentation to which you have been assigned, and taken down immediately at the end of the day. You must be on hand at the beginning of the poster session (see page 26 for times). APS will not be responsible for posters left up after the end of each poster session. No A-V is allowed in the poster sessions. Posters will be on display between the hours of 10:00am to 5:00pm Monday, Tuesday; 9:00 am to 4:00 pm, Wednesday. Consult the Poster Session Schedule for exact times and a breakdown of poster topics (page 26).

GUIDELINES FOR SESSION CHAIRS

• Prior to the session, check the Corrigenda distributed with the Bulletin, as well as the Program-Changes Board in the registration area to see if any papers in the session you are chairing have been withdrawn.
• Arrive at the meeting room about 15 minutes prior to the start of the session and familiarize yourself with the controls for lights, microphones, A-V equipment and the timer. Technicians will be on hand to assist. If you encounter problems, you should immediately alert the Meetings Manager and/or the A-V specialist.
• Start the session on time. Briefly introduce yourself, announce the first paper and author, and start the timer.
• Please adhere to the time schedule listed in the Bulletin, so that simultaneous sessions are as closely synchronized as possible. Many attendees move from session to session in order to hear specific papers. Note: any time used by the speaker and/or technicians to set up laptops for LCD (Powerpoint) presentations is deducted from the time allocated for the talk.
• The allotted time for contributed papers is 12 minutes; for invited papers — 36 minutes. If you are chairing a session that includes both contributed and invited papers please be aware of the different times allocated for each and set the timer as follows:

Contributed papers - set timer for 8 minutes to give initial warning, then set the final bell to go off 2 minutes later. When this time is up, allow 2 additional minutes for questions relating to the paper, thank the speaker and promptly introduce the next paper and speaker.

Invited papers - set timer for 25 minutes for initial warning, and the final bell to ring 5 minutes later. Then set the timer for 6 additional minutes for questions from the audience.

Explain the timing system to the audience prior to the start of the session, and as often during the session as you think necessary.

• The By-Laws of the Society request that speakers be asked to stop when their allotted time is up in a courteous but firm manner. Keep in mind that the session must end on time, and that the last speaker has just as much right to an audience as does the first speaker.
PROGRAM FORMAT

• Should a speaker fail to appear, you must wait 12 minutes before going on to the next speaker. At the end of the session, call again for the regularly scheduled paper, if time allows.

• When two or more papers are submitted by an author, only one of these will be assigned a scheduled presentation time within that session. It is assumed that the first author listed in the abstract is the person who will present the paper at the meeting. A second abstract submitted by the same author is automatically assigned to a poster.

• If any problems arise that you are unable to handle relative to successfully chairing the session, please inform the A-V tech in the room, or go immediately to the APS registration desk to alert APS staff.

GENERAL A-V POLICY

In keeping with our legally binding contract with our A-V vendor, speakers are not permitted to bring their own projection equipment for use at the meeting.

Standard A-V in All Sessions

The standard A-V package consists of an LCD projector, overhead projector, screen, laser pointer and 2 lapel microphones – one for the chair and one for the speakers. Any additional A-V equipment must be rented by the speaker directly through APS’s designated A-V provider located in Room D132. The speaker is responsible for the cost of renting any additional equipment.

Policy and Guidelines on Use of LCD Projectors

The responsibility for a smooth, technically trouble-free presentation ultimately rests with the presenter. Speakers who plan to use LCDs must do the following:

• Bring your own laptop computer, power cord, and any proprietary cords required for your computer. Do not bring your own projector to the meeting. NOTE: APS is not responsible for the security of personal laptop computers.

• Visit the Speaker-Ready room located in Room D131 to run through the presentation to ensure a smooth and technically trouble-free talk. Testing your presentation in the Speaker-Ready room prior to your presentation is strongly recommended to minimize equipment compatibility difficulties. Remember that time used to set up equipment reduces the time you have to make your presentation.

• Bring a back-up vu-graph presentation in case there are set-up difficulties with the LCD equipment.
2010 PRIZES AND AWARDS

DAVID ADLER AWARD
Session W3
Patricia Thiel
Iowa State University
For seminal contributions to surface structure and dynamics of complex metallic alloys, including quasicrystals and kinetically limited growth and relaxation of nanostructures in thin metal films.

LEROY APKER AWARD
Session D1
Kathryn Greenberg
Mount Holyoke College
Thermal Coupling and Lensing in Arrays of Vertical Cavity Surface Emitting Lasers.

Bilin Zhuang
Wellesley College
Thermodynamics of Ising Systems on the Triangular Kagome Lattice and Small-Model Approximations to Geometrically Frustrated Systems.

OLIVER BUCKLEY PRIZE
Session T1
Dov Levine
Technion, Israel Institute of Technology

Alan Mackay
Birkbeck College, Emeritus

Paul Steinhardt
Princeton University
For pioneering contributions to the theory of quasicrystals, including the prediction of their diffraction pattern.

DAVIE HEINEMAN PRIZE
Session L4
Michael Aizenman
Princeton University
For his development of the random current approach to correlations which has had an impact on a wide variety of problems, especially his rigorous non-perturbative proof of the triviality of $\phi^4$ field theory.

DANNIE HEINEMAN PRIZE
Session Z1
Duncan Steel
University of Michigan
For seminal contributions to nonlinear optical spectroscopy and coherent control of semiconductor heterostructures.

FRANK ISAKSON PRIZE
Session D1
Alessandra Lanzara
University of California, Berkeley
For high-resolution angle-resolved photoemission spectroscopy and imaging studies of the cuprate superconductors and graphene that elucidate their electronic properties.

JOSEPH F. KEITHLEY AWARD
Session T4
Eugene Ivanov
University of Western Australia
For advances in microwave interferometry, ultra-low phase noise microwave oscillators and high resolution noise measurement and for elucidation of noise mechanisms affecting the fidelity of optical to microwave frequency transfer.

JOSEPH F. KEITHLEY AWARD
Session T1
David Campbell
Boston University

Shlomo Havlin
Bar-Ilan University
For pioneering new approaches to the study of complex systems, using the complementary approaches of nonlinear dynamics and statistical physics, and for communicating the excitement of this new field to diverse audiences.

OLIVER BUCKLEY PRIZE
Session T1

Julius Edgar Lilienfeld Prize
Session T1

Alessandra Lanzara
University of California, Berkeley
For high-resolution angle-resolved photoemission spectroscopy and imaging studies of the cuprate superconductors and graphene that elucidate their electronic properties.

Maria Goeppeert Mayer Award
Session D1

Alessandra Lanzara
University of California, Berkeley
For high-resolution angle-resolved photoemission spectroscopy and imaging studies of the cuprate superconductors and graphene that elucidate their electronic properties.
2010 PRIZES AND AWARDS

**JAMES C. MCGRODDY PRIZE**
Session W3
Sang-Wook Cheong
*Rutgers University*

Ramamoorthy Ramesh
*University of California, Berkeley*

Nicola A. Spaldin
*University of California, Santa Barbara*

For leadership of the first International Conference on Women in Physics that changed the visibility of women in physics, and her commitment to supporting and encouraging women in physics around the world.

**DWIGHT NICHOLSON MEDAL**
Session B3
Marcia C.B. Barbosa
*Universidade Federal do Rio Grande do Sul*

For leadership of the first International Conference on Women in Physics that changed the visibility of women in physics, and her commitment to supporting and encouraging women in physics around the world.

**LARS ONSAGER PRIZE**
Session L4
Daniel Friedan
*Rutgers University*

Stephen Shenker
*Stanford University*

For seminal work on the classification and characterization of two-dimensional unitary conformal field theories of critical states.

**ABRAHAM PAIS PRIZE**
Session D5
Russell McCormmach
*University of Oregon, Emeritus*

For the study of German science in the 19th and 20th centuries and a major biography of Henry Cavendish (with Christa Jungnickel, his late wife), and for founding the journal Historical Studies in the Physical Sciences.

**GEORGE E. PAKE PRIZE**
Session W3
Robert A. Frosch
*Harvard University*

For original research in marine geophysics, exceptional leadership and innovative management of the General Motors Research Laboratory, and sustained contributions to national science policy.

**EARLE K. PLYLER PRIZE**
Session J23
Lester Andrews
*University of Virginia*

For vibrational spectroscopy in cryogenic matrices that combined with quantum calculations, has led to the identification and characterization of many molecules, ions, and complexes across the periodic table.

**POLYMER PHYSICS PRIZE**
Session H4
Michael Rubinstein
*University of North Carolina*

For his leadership in the field of structure and dynamics of polymer liquids, interfaces and gels.

**PRIZE TO A FACULTY MEMBER FOR RESEARCH IN AN UNDERGRADUATE INSTITUTION**

Enrique Galvez
*Harvey Mudd College*

For his contributions to quantum optics, his enthusiastic inclusion of undergraduates in a significant way in his research, and his contributions to the wider physics community.

**NICHOLAS METROPOLIS AWARD**

Kenneth Kamrin
*Harvard University*

For synthesizing the essential physics and mathematics of elastic-plastic flow of granular materials into a numerically tractable computation, and for performing continuum-level calculations for dynamic processes in granular materials.
MARCH MEETING 2010 EXHIBITORS & SHOW GUIDE

APS Exhibit Hours
- Monday, March 15 .......................... 10:00am–5:00pm
- Tuesday, March 16 .......................... 10:00am–5:00pm
- Wednesday, March 17 ...................... 10:00am–5:00pm

The following is a list of exhibitors participating in the March Meeting 2010. Please take time during your meeting to visit the exhibits. You must wear your badge to be admitted to the exhibits.

Exhibitors
- AdSem, Inc.
- Advanced Research Systems, Inc.
- Agilent Technologies
- AJA International, Inc.
- American Institute of Physics
- American Magnetics Inc.
- American Physical Society
- Ames Laboratory, USDOE, Materials Preparation Center
- Amuneal Manufacturing Corporation
- Andeen-Hagerling, Inc.
- AR RF/Microwave Instrumentation
- Asylum Research
- attocube systems AG
- Blake Industries, Inc.
- Bruker AXS Inc.
- Bruker BioSpin Corporation, EPR Division
- Cambridge University Press
- Center for Nanoscale Science & Technology (NIST)
- ColdEdge Technologies, Inc.
- Computing in Science & Engineering (CISE)
- Cryo Industries of America, Inc.
- CRYOFAB, Inc.
- Cryogenic Control Systems, Inc.
- Cryogenic Limited
- Cryomagnetics, Inc.
- Cryomech Inc.
- DCA Instruments
- Diamond Detectors Ltd.
- DLH Industries/Cryocomp
- EasyLab Technologies LTD
- Elsevier
- GMW Associates
- High Precision Devices, Inc.
- Hinds Instruments, Inc.
- HORIBA Scientific
- ICE Oxford LTD
- IET Inspec
- Instrutech, Inc.
- IOP Publishing
- J micro Technology, Inc.
- J.A. Woollam Co., Inc.
- Janis Research Company, Inc.
- JILA/University of Colorado
- Jones & Bartlett
- Keithley Instruments, Inc.
- Kepco Inc.
- Kimball Physics, Inc.
- Kurt J. Lesker Company
- Lake Shore Cryotronics
- MacKichan Software
- Mad City Labs, Inc.
- Materials Research Society
- McAllister Technical Services
- MDC Vacuum Products, LLC
- MICOS USA
- MMR Technologies, Inc.
- MTI Corporation
- NanoAndMore USA, Inc.
- Nanomagnetics Instruments Ltd.
- Nanonics Imaging Ltd
- Nanosurf, Inc.
- Nanotec Electronica
- National High Magnetic Field Laboratory
- National Nanotechnology Infrastructure Network
- National Research Council of the National Academies
- Nature Publishing Group
- Nemal Electronics Inc.
- NIST CNST
- Nor-Cal Products, Inc.
- Novocontrol America, Inc.
- Oak Ridge National Laboratory
- Omicron Nanotechnology USA
- Optical Building Blocks Corporation
- OriginLab Corporation
- Oxford Instruments America
- Oxford University Press
- Park Systems, Inc.
- Pfeiffer Vacuum
- Physical Society of Japan
- Physics Today
- PNAS
- Princeton Scientific Corp.
- Princeton University Press
- Quantum Design
- QuantumWise A/S
- Radiant Technologies, Inc.
- Raith USA, Inc.
- RBD Instruments, Inc.
- RHK Technology, Inc.
- Rigaku Americas Corporation
- Royal Society Publishing
- RSC Publishing
- Sciencetech Inc.
- Scientific Computing & Modelling
- Scientific Instruments, Inc.
- Scientific Magnetics
- Signal Recovery
- Smithsonian/NASA ADS
- SPECS GmbH
- Springer
- Staib Instruments, Inc.
- Stanford Research Systems
- STAR Cryoelectronics
- Super Power, Inc.
- Taylor & Francis Group LLC - CRC Press
- Teachspin, Inc.
- ULVAC Technologies, Inc.
- Veeco Instruments
- VG Scienta, Inc.
- WaveMetrics, Inc.
- WebAssign
- Wiley-Blackwell
- Witec Instruments Corp.
- Wolfram Research
- World Scientific Publishing Company
- WVNano Initiative/West Virginia University
- XOS
- Zurich Instruments AG
AdSem, Inc. .......................................................... #209
www.adsem.com
AdSem, Inc. is developer and manufacturer of unique Si and Ge: 1) NTC Thermistors for high-, cryogenic and ultra-low temperatures (500oC-1mk), and, 2) High reflective mosaic monochromators for gamma-rays, X-rays and slow neutrons (0.5-50 arc minutes).

Advanced Research Systems, Inc......................................#300,302
www.arscryo.com
ARS manufactures its own Closed Cycle Cryocoolers and Helitran® Cryostats for material characterization. Cryostats are available for optical and non-optical (transport, XRD, Neutron Scattering, UHV & Microscopy) applications. The ARS (CCR) Cryocoolers have been redesigned for a temperature range of 1.5 to 300K or 3 to 800K. With <5 nm vibrations at the sample, it is the cryocooler of choice for laboratory cryogenic applications. The Helitran has Atomic Level Resolution which makes it ideal for STM. ARS offers a series of probe stations with Closed Cycle Cryocoolers and Flow Cryostats for sub micron vibration levels, and a temperature range of 3K to 400K.

Agilent Technologies ......................................................#200
www.agilent.com
Agilent Technologies offers high precision Atomic Force Microscope systems to meet your unique research needs. Agilent’s industry-leading environmental/temperature options and fluid handling enable superior control for materials & life sciences applications. Agilent will show their S500 & S600LS AFM with Scanning Microwave Microscopy (SMM), the exclusive mode for high spatial resolution of electromagnetic properties.

AJA International, Inc...................................................#301
www.aja.m.com
Sputtering and E-beam Systems for R&D and Pilot Production. Static and Rotating Magnetron Sputter Sources for HV and UHV, Substrate Holders with Rotation, RF Biasing, Heating and Cooling; Sputter Targets, Microwave, RF and DC Power Supplies, Microwave Components and Plasma Sources, RF Ion/Plasma Sources.

American Institute of Physics ...........................................#500
www.aip.org
Visit booth 500 to learn about AIP UniPHY, a first-of-its-kind professional networking platform for physical scientists. You’ll also learn about our highly respected family of journals (journals.aip.org), and those of our many prestigious publish partners. Join us at the joint APS/AIP Meet the Editors Reception, as well, Tuesday, March 16 from 4:00pm to 6:00pm.

American Magnetics Inc..................................................#311
www.americanmagnetics.com
For the past 40 years AMI has been offering superconducting magnet solutions to meet almost any requirement. These include cryogen free magnet systems, magneto-optic systems for spectroscopy, computer controlled vector field MAxes™ systems & other standard systems for condensed matter physics applications. Other products include cryogen level instruments, magnet power supplies, cryo-mechanical assemblies and vapor cooled current leads. For more details visit our website: www.americanmagnetics.com

American Physical Society .............................................#501
www.aps.org
The American Physical Society is the publisher of the world’s most prestigious and widely-read physics research publications: Physical Review, Physical Review Letters, Reviews of Modern Physics, PR-Special Topics-Accelerators and Beams, PR-Special Topics-Physics Education Research, PR Focus, PROLA, and Physics. Physics is a free online publication that features expert commentaries on selected papers in Physical Review and Physical Review Letters.

Ames Laboratory, USDOE, Materials Preparation Center ....#730
www.mpc.ameslab.gov
The Materials Preparation Center (MPC) is a U.S. Department of Energy BES specialized research center located at the Ames Laboratory. MPC is recognized by the research community for its capabilities in the preparation, purification, single crystal growth, and characterization of rare earth metals, alkaline-earth metals, and refractory metal materials.

Amuneal Manufacturing Corporation ................................#629
www.amuneal.com
Custom Magnetic Shielding. Amuneal Manufacturing Corporation designs and fabricates custom magnetic shield components and assemblies for both room temperature and cryogenic applications, and is a world leader in providing cost-effective shielding solutions to the applied physics community. From design and attenuation calculations to 3D modeling, we work with you to provide the best shield for your specific application. All Amuneal fabricated magnetic shields are hydrogen annealed in our in-house heat treat center for maximum shielding properties.

Andeen-Hagerling, Inc ....................................................#305
www.andeen-hagerling.com
Andeen-Hagerling (AH) manufactures the world’s most precise capacitance/loss bridges and capacitance standards. AH bridges are fully automatic and resolve sub-attofarad measurements. Loss (dissipation factor) is measured down to 1.5x10-8 tan delta.

AR RF/Microwave Instrumentation ....................................#409
www.ar-worldwide.com
AR RF/Microwave Instrumentation manufacturers broadband, high-power amplifiers from dc 45 GHz, 1 - 50,000 watts; and are primarily used for radiated and conducted susceptibility testing, but are suitable for general laboratory use. Available test accessories include antennas, directional couplers, field monitoring equipment, EMC test software and more.

Asylum Research ..........................................................#508
www.AsylumResearch.com
The AFM/SPM technology leader will demonstrate Cypher™, the world’s highest resolution AFM, combining the accuracy and control of closed loop with atomic resolution for the most accurate images and measurements possible today. Featured are SpotOn™ automated laser and photodiode alignment, >10X faster AC imaging with cantilevers smaller than 10um, integrated acoustic/vibration isolation, and thermal control for image and measurement stability. Also shown is Asylum’s MFP-3D™ family of AFMs, including the MFP-3D-BIO, Stand Alone and NanoIndenter. The MFP-3D family offers compatibility with commercial inverted optical microscopes for large and small samples, sample viewing from both top and bottom, and long-range and low-noise force measurements. Also featured are Ztherm Modulated Thermal Analysis and award winning adaptive Band Excitation local energy dissipation mapping.
attocube systems AG................................. #631
www.attocube.com
attocube systems AG manufactures and distributes a complete line of
easy-to-use scanning probe microscopes and nanopositioning systems
for temperatures in the range from 300 K down to 10 mK! The innovative
nanopositioners are also compatible with ultra high vacuum environments
as well as high magnetic fields up to 31 Tesla.

Blake Industries, Inc................................. #229
Blake Industries is a leader in supplying high precision x-ray and neutron
instrumentation to research labs, university and synchrotron beam lines
worldwide. We are the exclusive distributors for Huber instruments in the
U.S., Mexico and Canada with multiple installations at all the North American
Synchrotrons and have been supplying x-ray users for over 40 years.

Brucker AXS Inc........................................... #308
www.brucker-axs.com
Brucker AXS provides analytical systems using X-ray diffraction (XRD) and
atomic force microscopy (AFM). XRD determines sample parameters like
layer thickness, roughness, composition, texture and stress. AFMs include
advanced modes such as spreading resistance, surface potential, scanning
capacitance, and Raman. Ask us about Brucker Training Central training
courses and webinars.

Brucker BioSpin Corporation, EPR Division.................... #310
www.brucker-biospin.com
Brucker highlights spin counting without a standard reference sample. The
new Xenon EPR Software coupled with new hardware make it work. Also
featured are the EMXmicro and EMXplus series for routine measurements.
The Exelys series provide the ultimate in CW, Pulse-EPR, DEER, High-
Frequency, and ENDOR instrumentation.

Cambridge University Press............................. #709
www.cambridge.org/us
Cambridge University Press publishes high-quality textbooks and
monographs by world-class authors in condensed matter physics.
Recent titles on display include: Cross & Greenside’s Pattern formation
and Dynamics in Nonequilibrium Systems; Ferry et al. ’s Transport in
Nanostructures (2nd edition); Moore et al. ’s Building Scientific Apparatus
(4th edition); Nazarov & Blanter’s Quantum Transport.

ColdEdge Technologies, Inc............................ #328
www.coldedgetech.com
Provides <3K to 1000K temperature range cryostats for materials research,
spectroscopy, superconductor studies, UHV, device testing, astronomy,
cryogenic detector cooling, magnetic properties, chemistry, bio, electrical
experiments and many other applications. Liquid Helium free closed
cycle systems with sample in vacuum or cold vapor available. Interface
customization is our specialty. Send us your sketch.

Computing in Science & Engineering (CISE).................. #506
www.cise.aip.org
CISE is the bimonthly magazine of computational tools and methods. APS
members can subscribe to CISE at a 40% discount. Stop by to pick up recent
issues. You’ll see that new algorithms and solutions in other disciplines can
help to solve problems you and your colleagues have encountered.

Cryo Industries of America, Inc.......................... #211
www.cryoindustries.com
With 26 years experience, Cryo Industries is a leading supplier of cryogenic
systems. We manufacture the very best in cryogenic equipment: standard or
custom, open or closed cycle, continuous flow or reservoir type, miniature,
hand held, large aerospace and superconducting magnet systems. Ask
about Cryo’s innovative closed cycle microscopy system!

CRYOFAB, Inc.............................................. #204
www.cryofab.com
Cryofab, Inc. is a manufacturer and service provider of cryogenic equipment
and accessories. Custom fabrications, OEM fabrications, and a full line of
standard containers, vessels and accessories, depict the product mix. In
house engineering can assist in product design and development for
meeting application requirements perfectly.

Cryogenic Control Systems, Inc.......................... #306
www.cryocon.com
Manufacturers of precision electronic instrumentation for both laboratory
and industrial process control applications. Cryo-con offers a full line of
cryogenic temperature controllers, monitors, cryogenic accessories
and temperature sensors. On display will be our newest addition to our
controller line, the Model 24, four channel temperature controller, plus
substantial upgrades to our line of temperature controllers. Stop by our
booth and demo our products.

Cryogenic Limited........................................ #623
www.cryogenic.co.uk
Cryogenic Limited has supplied hundreds of Cryogen Free Magnets to
the scientific community over the past 12 years. Cryogenic has over 40
years of experience in the design and engineering of superconducting
magnet systems. Eliminate the worry of the cost or availability of liquid
helium. Cryogen Free Magnets and Measurement Systems are available
with fields up to 18 Tesla. Configurations include solenoids, split pair, vector
and beam-line magnets. Our Turnkey systems require no liquid helium for
operation. Simply switch on the cryoooler compressor and the system
will be operational in 24-48 hours. The Cryogen Free Measurement System
has an integrated variable temperature insert which operates to 1.6K to
1000K. Interchangeable measurement options include: Vibrating Sample
Magnetometer, AC Susceptibility, Specific Heat, Resistivity and Hall Effect
probes with sample rotation. Cryogen Free Helium-3 (280mK) or Dilution
Refrigerator (50mK) Modules are available for experiments at lower base
temperatures. A 7 TesCryogen Free SQUID magnetometry system is available
for magnetic property measurements.

Cryomagnetics, Inc....................................... #407
www.cryomagnetics.com
Cryomagnetics offers a complete superconducting magnet system, related
electronic instrumentation, and cryogenic accessory line. We can also
offer dilution refrigerators through our company in France, Cryoconcept.
Our compact C-Mag cryogen-free superconducting magnet systems
are available in room temperature bore, optical, and integrated VTl
configurations. Cryomagnetics is committed to staying at the forefront
of superconducting magnet technology and welcomes the opportunity to
discuss your requirements.
Cryomech Inc. .................................................................#617,619
www.cryomech.com

Cryomech introduces the PT410 and PT415 Re-liquefiers with enhanced capacities which retrofit existing liquid helium cryostat dewars into zero boil off systems. Cryomech manufactures Liquid Helium Plants, producing 12-18 liters/day respectively from any room temperature helium source. Also exhibited will be Cryomech’s full line of cryocoolers and Liquid Nitrogen Plants.

DCA Instruments ..........................................................#533
www.dca.fi

Designs and manufactures a wide range of UHV deposition systems and components. The products include MBE, UHV sputtering, PLD and UHV cluster tools. These DCA deposition systems are suitable for deposition of thin films of semiconductors, magnetics, oxides, metals under UHV pressures.

Diamond Detectors Ltd. ....................................................#336
www.diamonddetectors.com

In 2008 BAE Systems purchased a 50% share in DDL to access current and future sensing capabilities. DDL design and manufacture resilient CVD Diamond based devices including resilient Radiation detectors and Electro-chemical / Bio sensors. DDL’s expertise includes world class diamond processing with surface roughness <1nm along, proprietary patented metallization and a range of manufacturing technologies required to process raw diamond from material to finished product. This includes Polishing Processes, Thinning Processes, Laser dicing/shaping, Metallization (e.g. DLC, Ti, Pt, Au, and Al), Neutron Scintillation Coating 6LiF, Lithography, Die Fabrication, Wire Bonding, Packaging, Device Characterization and Electronics Development. DDL owns a range of IP from sensor design through to manufacturing processes.

DLH Industries/Cryocomp ...............................................#337
www.cryocomp.com

Supplies cryogenic and vacuum components for commercial and laboratory applications.

Easylab Technologies LTD ...............................................#202
www.easylab.co.uk

easyLab: the de facto provider of instruments that enable science under pressure. easyLab design, develop, manufacture, supply and support scientific equipment that extend the boundaries of experimental science into the extreme condition of high pressures. Our products include diamond anvil and clamp cells, EDM micro-drillers, photoluminescence and Raman spectrometers for DACs and more.

Elsevier ........................................................................#729
www.elsevier.com

Elsevier is a leading publisher in Physics, offering over many highly-respected journals and numerous new books per year, including titles under the Academic Press imprint. Visit our booth #729 to review new and bestselling books, learn about our journals, and view our online products. We look forward to meeting you.

GMW Associates .............................................................#625
www.gmw.com

Fluxgate, Hall effect and NMR Magnetic Field Measuring Instruments covering field magnitudes from 1nT to 20T for field mapping, control and cancellation. High accuracy Current Measurement instruments for currents from μA to kA and frequencies from dc to 2Ghz. Permanent, Resistive and HTS Superconducting Magnet Systems for magnetic processing, magneto-optics, biological studies and the development and test of thin films, magnetic materials, and sensors.

High Precision Devices, Inc. ..............................................#224
www.hpdonline.com

High Precision Devices (HPD) will be exhibiting the popular Model 102 Denali Pulse Tube/ADR cryostat and introducing the new Model 103 Rainier Pulse Tube/ADR cryostat. Both of these cryostats incorporate Adiabatic Demagnetization Refrigerators (ADR) producing PT stage temperatures of 45K and 3K and ADR stage temperatures of 900mK and 45mK.

Hinds Instruments, Inc. .....................................................#231
www.hindsinstruments.com

Hinds instrument product line includes Stokes polarimeters, birefringence measurement tools (for research and process control), and an automated Polarization Extinction Ratio (PER) and Extinction Ratio (ER) system. Hinds components for researchers and OEMs includes optical choppers (20-84kHz), photoelastic modulators (for MOKE, ellipsometry, RAS, etc.), detectors, lock-in amplifiers, and a Pulse Delay Generator.

ICEoxford LTD .............................................................#433
Offering standard and tailor-made superconducting and cryogenic solutions. We design and manufacture cryogenic systems from liquid nitrogen temperatures down to <7 mK in liquid Helium cooled and cryogen free configurations. We will be exhibiting our standard dilution unit system and various 3He system inserts through our collaboration with Scientific Magnetics. Whether you require a simple a bath cryostat or a system with new or unusual features, you should be talking to us.

IET Inspec ......................................................................#725
www.theiet.org/inspec

Inspec, produced by the IET, is the leading English-language database with over 11 million records containing abstracts and subject indexing from 1898 to present covering the fields of physics, electrical engineering & electronics, computers & control, information technology, manufacturing & production engineering and more. Visit our website at www.theiet.org/inspec.

Instrutech, Inc. ...............................................................#230
www.instrutechinc.com

Instrutech’s core technologies are Convection and Ionization vacuum gauges, utilizing the most recent advances in vacuum gauge sensor and controller design. Vacuum measurement technologies include Convection Enhanced Pirani and Miniature Ionization vacuum gauges with built-in or remote displays providing a measurement range of 1 x 10-9 Torr to atmosphere.

IOP Publishing ..............................................................#701,722
www.publishing.iop.org

IOP Publishing is a not-for-profit, learned society publisher and world leader in scientific publishing and the electronic dissemination of peer-reviewed research. Stop by for a personal demonstration of IOPscience, our innovative new journals platform, and join us in celebrating the 20th Anniversary of Nanotechnology.
J micro Technology, Inc. ................................................................. #436
www.jmicrotechnology.com
Supplier of probing equipment and accessories for applied physics research and product development. Products include micro probe stations, positioners, microwave/low noise/shielded/kelvin/ probes, optics, camera systems and thermally controlled shielded device holders (chucks). Products are used by universities and industry/government worldwide.

J.A. Woollam Co., Inc. ................................................................. #509
www.jawoollam.com
J.A. Woollam Company offers a wide range of spectroscopic ellipsometers for nondestructive materials characterization, including thin film thickness (single and multilayer), optical constants, composition, and growth/etch rates, and more. Instruments available for research and manufacturing metrology covering spectral ranges from vacuum ultra-violet to far infrared. Offering table-top, in-line, and in-situ models.

Janis Research Company, Inc. .................................................. #601
www.janis.com
Visit Janis @ Booth 601 to receive information on our new Automated Gas Handling System for cryogen free dilution refrigerators. Janis Research offers a complete line of standard and customized cryogenic systems including dilution refrigerators, ADRs, He-3 & He-4 superconducting magnet systems, cryocoolers, VT cryostats, noble gas cold traps, micromanipulated probe stations, and more.

JILA/University of Colorado ................................................... #723
http://jila.colorado.edu
JILA/CU-Boulder will be showcasing the world’s first portable system for producing Bose-Einstein Condensates. This is one of many projects in ultracold matter currently pursued at the JILA Institute and CU-Boulder Physics Department. Prospective students, postdocs, and researchers are invited to stop by and learn more about our degree programs and research groups.

Jones & Bartlett ................................................................. #733
www.jbpub.com
Jones and Bartlett, an independent publisher headquartered in Sudbury, Massachusetts, is the seventh largest college publisher in the United States, publishing text, professional, and reference books and a variety of multimedia and online products.

Keithley Instruments, Inc. ..................................................... #603,
www.keithley.com
Keithley Instruments is a world leader in advanced electrical test instruments and systems. Our customers are scientists and engineers in the worldwide electronics industry involved with advanced materials research, semiconductor device development and fabrication, and the production of end products such as portable wireless devices.

Kepco Inc. ......................................................................... #228
www.kepcopower.com
Kepco is a manufacturer of electronic power supplies, both modular and instrument type. We specialize in four-quadrant, BOP power supplies which are optimized for driving inductive loads. A wide range of unipolar instrumentation grade, modular hot-swappable and OEM power supplies are also available.

Kimball Physics, Inc. .................................................................. #201
www.kimballphysics.com
Innovative electron and ion guns with matching power supplies ranging in energy from 1 eV to 100 keV, producing beams from small spots to floodbeams while incorporating high performance rugged cathodes. Compact UHV/HV vacuum chambers (Multi-CF™) and fittings with adaptable internal mounting apparatus (Groove-Grabber™) to enable complex instrument/experimental set-ups.

Kurt J. Lesker Company ...................................................... #615
www.lesker.com
Deposition systems and components for all vacuum applications, including: sputtering, e-beam evaporation, organics, and atomic layer deposition (ALD). Manufacturer/distributor of: vacuum chambers; subassemblies; standard and custom vacuum hardware; feedthroughs, valves, vacuum pumps. Manufacturers of next generation ferroelectric memory materials and N-type and P-type transparent conductive oxides as sputter targets and evaporation pellets.

Lake Shore Cryotronics .................................................... #401
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MacKichan Software ........................................................ #511
www.mackichan.com
Scientific WorkPlace 5.5 simplifies writing, sharing, and doing mathematics. A click of a button allows you to typeset in LaTeX. The integrated computer algebra system lets you solve and plot equations; animate 2D and 3D plots; rotate, move, and fly through 3D plots; create 3D implicit plots; and more.

Mad City Labs, Inc. .............................................................. #429
www.madcitylabs.com
Mad City Labs, Inc. manufactures innovative nanopositioning systems suitable for AFM, NSOM, SR microscopy, imaging, interferometry and astronomy. Features: long range motion, picometer precision, high stability, PicoQ™ sensors, closed loop control, imaging and automation software compatibility (e.g. Meta Morph, MatLab and LabView). New! high speed nanopositioning for particle tracking, high speed lens positioners, integrated motion solutions for AFM/SPM/NSOM.

Materials Research Society ............................................... #307
www.mrs.org
The Materials Research Society (MRS), renowned for its Spring and Fall Meetings, now offers its members FREE unlimited online access to both the MRS Bulletin and the MRS Online Proceedings Library over 50,000 proceedings papers covering a wide range of materials topics, from nanoscale and biomaterials, to semiconductors, polymers/organic materials; surfaces/interfaces/thin films, energy and more. Visit www.mrs.org/benefits for details.
McAllister Technical Services ................................................... #637
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MDC Vacuum Products, LLC ................................................... #604
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www.mmr.com

MMR Technologies manufactures temperature controlled systems - cryogenic cooling systems and wide temperature range thermal stages - which find application in materials research in chemistry, biology, electrical engineering, and physics. These systems operate over the temperature range of 10 K to 730 K. They are used for electrical resistivity, Hall effect, Seebeck effect, DLTS, MEMS, magnetoresistivity, and luminescence studies. They are also used in medical applications and the cooling and characterization of computer chips, electronic devices, laser diodes and thermal imaging devices as a function of temperature. A new addition to the product family is the ELAN2 Liquid Nitrogen Generator on tap liquid nitrogen out of thin air!

MTI Corporation ............................................................. #430
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Distributes Nanosensors, NanoWorld, BudgetSensors & nanotools AFM probes in North and South America. Extensive inventory - overnight delivery if needed. The company sells AFM supplies and scientific measuring equipment, including Digital Holographic Microscopes from Lyncée tec, Award winning inexpensive Digital Optical Microscopes, SPIP software, calibration standards, ESD stations, and more.

Nanomagnetics Instruments .................................................. #537
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Nanometrics Imaging Ltd .................................................... #309
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Nanosurf, Inc ................................................................. #331
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Nanotec Electronica .......................................................... #435
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National High Magnetic Field Laboratory ................................ #233
www.magnet.fsu.edu

The National High Magnetic Field Laboratory is the largest and highest-powered magnet laboratory in the world. Together a total of three institutions, Los Alamos National Laboratory in New Mexico, University of Florida in Gainesville and the NHMFL in Tallahassee operate the lab, collaborating in a unique interdisciplinary, advancing science, engineering and technology in the 21st century.

National Nanotechnology Infrastructure Network .................. #731
www.ninn.org

The National Nanotechnology Infrastructure Network (NNIN) is a network of 14 major university nanotechnology user facilities, offering user access to a broad range of nanotechnology instrumentation, process support, and project support. Access is available to university researchers, industry researchers, and government researchers on an open basis.
National Research Council of the National Academies ....... #434
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WVNano Initiative/West Virginia University .................. #718

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West Virginia University's WVNano Initiative is the institution's focal point for
discovery and innovation in nanoscale science, engineering and education
(NSEE). Elevated to a State-wide initiative in 2006 through award of an NSF
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XOS ............................................................... #431

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Zurich Instruments AG ........................................ #236

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