

Dates to Remember

Thursday August 31, 2006

Deadline for submitting invited speaker suggestions for DMP Focus Topics

Monday November 20, 2006

APS Abstract deadline submitted via the web at <http://abstracts.aps.org>

Monday March 5 to Friday March 9, 2007

(note also tutorials etc on March 4)

APS March Meeting in Denver, Colorado

Abstract Deadline

All contributed abstracts must be submitted via the official APS web site at <http://abstracts.aps.org/> by Monday, November 20, 2006. If you intend for your abstract to be part of a Focus Topic, be sure to choose the Sorting Category Code associated with that Focus Topic.

Invited abstracts are due on the same date. Authors of invited abstracts will be instructed where to submit their abstracts in the official APS invitation letter.

Call for Invited Speaker Suggestions

With this issue of the Newsletter, the Division of Materials Physics announces the program of DMP Focus Topics for the 2007 APS March Meeting (Denver, CO, March 5-9, 2007). A Focus Topic generally consists of a series of sessions, each of which is typically seeded with one invited talk, the remainder of the session being composed of contributed presentations.

DMP members are encouraged to make suggestions for invited speakers for these Focus Topics. The deadline for submitting such suggestions is August 30, 2006. Suggestions can be made in either of two ways: (1) by emailing the suggestion directly to the appropriate focus topic organizers who are listed after the Focus Topic descriptive paragraphs, or (2) by using the web-based form on the APS website at <http://www.aps.org/units/dmp/invited.cfm>.

If you send your suggestion by direct email, please provide the following information:

- The nominator's name, affiliation, phone number and e-mail address.
- The suggested speaker's name, affiliation, address, phone number, fax, and e-mail.
- The title of the suggested talk.
- A brief justification of the nomination (880 character limit).

The web-based nomination form contains fields for all of these items. If you use the web-based form, your invited speaker nomination will be sent automatically to the appropriate Focus Topic organizers when you push the "submit" button at the end of the process. However, it is advisable to send an email to the first-listed organizer asking for confirmation that the nomination has been received.

Finally, note that the contents of this Newsletter will be available electronically on the DMP website at <http://www.aps.org/units/dmp>. In case of any need for corrections or updates, these will also be posted at this location.

02.8.1 Spin-Dependent Phenomena in Semiconductors (GMAG/DMP/FIAP)
[see 06.11.5]

3.8.1 (09.9.1) Dielectric, Ferroelectric, and Piezoelectric Oxides (DMP)

This topic will focus on fundamental advances in the growth, characterization, and experimental as well as theoretical understanding of dielectric, ferroelectric, pyroelectric, and piezoelectric oxides in bulk, thin-film, superlattice, and nanostructured forms. Contributions on functional oxides of all structure types are encouraged, including perovskites, distorted fluorite (high-K dielectrics), wurtzite (ZnO), etc. Areas of interest include the physics of structural and ferroelectric phase transitions, lattice dielectric properties, the impact of disorder on cooperative behavior, progress in theory approaches to ferroelectricity and relaxor behavior, as well as understanding of synthesis and growth mechanisms. A major thrust will be to explore how bulk dielectric, ferroelectric, and piezoelectric properties are modified in thin-film, superlattice, or other nanoscale geometries, for example by the effects of strain, surfaces and interfaces, chemical environment and electrical boundary conditions.

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04.14.4 (16.12.10) Organic Electronics, Photonics, & Magnetics (DMP/DPOLY)

Organic- and polymer-based materials are being actively investigated for a wide range of electronic, photonic, magnetic physics and device applications. This focus topic covers the latest developments in these fields. Contributions are solicited in the areas of organic- and polymer-based conductor, semiconductor, and magnet physics (e.g., electronic structure, charge transport, optical properties, photonic crystals, NLO, magnetism, light induced magnetism, and spin transport studies) and device physics (e.g., electric and magnetic field effects, FETs, LEDs, photovoltaics, lasers, spin valves, and sensors). Both theoretical and experimental papers will be presented. Studies at the nano- and meso-scale are welcome.

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05.11.1 MgB₂ & Other Novel Superconductors (DMP)

The discovery of superconductivity in MgB₂ has again demonstrated the potential of non-cuprate superconductors both in terms of high critical temperatures, currents and field, and in terms of fundamentally new superconducting states. Despite considerable theoretical and experimental progress, superconductivity in MgB₂ is still not understood in all details. This focus topic will cover both theory and experiment on diborides and related compounds. In the five years since the discovery of superconductivity in MgB₂, a number of other non-cuprate superconductors have been discovered, with exciting and not fully understood properties. Examples include PuCoGa₅, a heavy fermion superconductor, CaC₆, an intercalated graphite, Li, an elemental superconductor, and Ag₅Pb₂O₆, a free electron superconductor, each of them having a record T_c (by up to an order of magnitude) in their respective class of materials. These and other novel non-cuprate superconductors are the subject of this focus topic.

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06.11.1 Theory & Simulation of Spin-Dependent Effects & Properties (DCOMP/DMP/GMAG)

This focus topic centers on recent advances in the theory and simulation of spin dependent properties including spin transport and dynamic magnetization processes, exchange coupling, spin relaxation, magnetic anisotropy and other spin and orbital polarization induced effects. We welcome contributions emphasizing new levels of understanding and/or predictions of spin transport effects (spin momentum transfer, anomalous Hall and Nernst effects, finite bias transport) and magnetic properties of nano-magnets (reduced dimension systems ranging from 0D-nano-particles to 1D and 2D systems such as nano-wires and interfaces) including spin and orbital polarization induced effects. Methods include materials specific modeling approaches based on ab-initio techniques (including methods going beyond LDA) and approaches to couple these methods with methods suitable to larger scale systems in order to bridge various length and time scales. The approaches and topics might include, but are not limited to, atomic scale effective spin Hamiltonians, Monte-Carlo, Langevin dynamics, micro-magnetic and hybrid modeling for proximity effects, interlayer magnetic coupling, exchange spring, exchange bias, magnetic quantum confinement, hysteresis modeling, and other spin dependent phenomena. We especially encourage contributions showing benefits of cross-coupling between theoretical and computational methods for topics such as the Berry phase, topology, DMFT, statistical coarse-graining, Wannier functions and large-scale DFT techniques for explaining and/or predicting specific experimental results and materials systems.

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6.11.2 (13.6.5) Magnetic Nanostructures: Materials and Phenomena (DMP/GMAG)

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

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06.11.3 (07.8.2 & 09.9.2) Complex Oxides (DMP/GMAG)

This topic will explore recent advances in the fundamental physics and potential technological applications of complex oxide materials. Various intriguing phenomena associated with structural, magnetic, and electronic properties of transition-metal oxides result in large part from the complexity of their electronic structures and the close competition of multiple interactions. Fine-tuning of these factors can lead to large responses to external stimuli and the occurrence of striking phenomena. Sessions will focus on phenomena of current interest, such as colossal magnetoresistance, multiferroic behavior, electronic phase separation, and orbital and charge ordering, as well as specific materials classes that are receiving increased attention, including manganites, cobalt oxides (perovskites and the sodium cobaltates), and ruthenates. Both theoretical and experimental papers on complex oxides in bulk, thin-film, artificial-superlattice, and interface form are encouraged.

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06.11.4 (16.12.11) Spin Transport & Magnetization Dynamics in Metal-Based Systems (GMAG/DMP/FIAP)

This topic will focus on experimental and theoretical investigations that elucidate and/or utilize the transport and transfer of spin, as well as magnetization dynamics, in metal-based magnetic systems. Topics of interest include all aspects of spin-dependent transport and scattering, in the diffusive, ballistic, tunneling and hot electron transport regimes as evidenced, for example, in giant magnetoresistance (GMR), tunneling magnetoresistance (TMR), tunneling spectroscopy of spin states, spin filtering and related effects. Furthermore, a main focus will be magnetization dynamics in confined geometries investigated both in the time and frequency domain. Also of particular interest are studies of the interplay between non-equilibrium carriers and magnetization dynamics in magnetic nanostructures. Additional topics include, but are not limited to, spin-charge-separation in transport processes including spin-diffusion and spin-relaxation, interfacial spin transport, spin injection and detection, mechanisms for magnetic damping, especially in magnetic nanostructures, spin-current-driven magnetization and domain wall dynamics, and studies in ferromagnetic — normal metal and ferromagnetic — superconductor systems. Studies that emphasize spin phenomena in semiconductor systems will be covered in a separate focus topic.

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6.11.5 (02.8.1 & 16.12.12) Spin-Dependent Phenomena in Semiconductors (GMAG/DMP/FIAP)

Recent advances in understanding the physics of spin-dependent phenomena in semiconductors have come from the mutual influence of research on fundamental optical and transport properties, materials physics, and devices. This focus topic solicits abstracts that explore a fundamental understanding of spin-dependent processes in magnetic and non-magnetic structures incorporating semiconductors.

Topics include 1) spin transport and dynamics in nonmagnetic semiconductors, including spin transport in mesoscopic systems, electrical or optical spin injection, manipulation, and detection, optical and electronic control of spin coherence, and hyperfine effects; 2) growth, characterization, electrical, optical and magnetic properties, and control of magnetic properties in ferromagnetic semiconductors and hybrid ferromagnet-semiconductor structures and devices; and 3) developments in related fields, such as quantum dots, nanocrystals, nanowires, organic semiconductors, and quantum computing, that relate to spin-dependent phenomena in semiconductors.

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07.8.1 Carbon Nanotubes & Related Materials (DMP)

Broad interest in the fundamental properties of carbon nanotubes and their exploitation in a wide range of applications continue at an increasing pace, due in large part to their unique chemical, mechanical, thermal, optical, opto-electronic and electrical properties. This focus topic concerns recent developments in (1) the fundamental understanding of nanotube and graphene nanoribbon properties, including synthesis, processing, purification, electrical, optical, opto-electronic, thermal, mechanical, and chemical properties and (2) on potential applications, such as nanosensors, nanoprobe, field emitters, display devices, field-effect transistors, composite materials, and high surface area storage media. Experimental and theoretical contributions are solicited in the following areas: 1) synthesis and characterization of doped and pure carbon, boron-nitride nanotubes, and nanohorns, 2) optical spectroscopy of carbon and boron-nitride nanotubes, 3) electrical and opto-electronic properties of carbon nanotubes and graphene nanoribbons, 4) thermal and magnetic properties of carbon nanotubes, 5) mechanical properties of nanotubes and their composites, 6) chemical functionalization, chemical and bio-sensing properties, and separation techniques 7) electrical transport and devices, 8) gas adsorption and storage, 9) field emission, 10) structure and properties of filled carbon nanotubes, and nanotube peapods 11) multifunctional nanotube composites and 12) other experimental and theoretical results from quasi-one dimensional systems which relate to carbon nanotubes, such as graphene nanoribbons.

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07.8.2 (09.9.2) Complex Oxides (DMP/GMAG)

[see 06.11.3]

07.8.3 (17.13.1 & 21.17.4) Computational Nanoscience (DMP/DCOMP)

When the size of the physical systems is reduced to the nanometer scale, many novel physical phenomena emerge. Computational studies can be used to interpret experimental observations of these phenomena, provide much-needed insight into their underlying physical origin, and thus design nanomaterials with desired properties. Recent advances in computational methodologies for studying nanoscale materials have made it possible to reliably predict many physical and chemical properties of nanostructures that span multiple time and length scales. This topic will provide a comprehensive overview of recent computational work in the field of nanoscale materials with particular emphasis on techniques that allow an efficient multi-scale integration from the micro- to the nanoscale. Subjects to be covered include, but are not limited to, computational studies of the growth, structural, mechanical, vibrational, electronic, opto-electronic and catalytic properties of nanoscale structures and materials and the interplay between functionality and local structural environment.

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09.9.1 Dielectric, Ferroelectric, & Piezoelectric Oxides (DMP) [see 03.8.1]

09.9.2 (07.8.2) Complex Oxides (DMP/GMAG)

[see 06.11.3]

09.9.3 (13.6.6 & 14.9.3) Surfaces & Interfaces of Correlated Electron Systems (DMP)

Correlated Electron Systems exhibit a wide range of intellectually challenging and potentially technologically important electronic properties, including magnetism (often with high spin polarization), high temperature superconductivity, metal-insulator transitions and novel forms of charge and orbital ordering. This DMP Focus Topic explores the fundamental question “how do the characteristic correlated electron properties change near surfaces and interfaces or with dimensional confinement?” It aims to provide a scientific context for work in basic and applied physics, materials science and chemistry related to growth of films, superlattices, and nanoparticles and more complex nanostructures of transition metal oxide, organic, heavy fermion and other correlated electron compounds, to development and application of experimental probes of surfaces and buried interfaces, to creation of new theoretical techniques for studying these systems, and to the design, fabrication and properties of novel devices.

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12.7.1 Friction, Fracture, & Deformation (DMP/GSNP)

This topic will explore recent developments in the areas of friction, fracture, and deformation in materials-research areas. It will cover all length scales from the nanoscale to tectonic scales. Topics of interest include tribochemistry, nanoscale mechanics including AFM indentation phenomena, dislocation patterns, grain boundary and interface effects, fracture initiation, crack propagation, the tribology of smooth and rough surfaces including fractal interfaces, and material deformation under applied stress including cutting. We welcome experimental, computational, and analytical studies of atomistic, mesoscopic, continuum, statistical, and multiscale aspects of deformation, friction, and fracture instabilities in various classes of solids, including granular, crystalline, amorphous, micro-fabricated, and nano-structured solid systems of metallic, silicon-based, ceramic, glassy, or polymeric type.

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13.6.1 Optical Properties of Nanostructures (DMP)

Tremendous advances in the fabrication and optical characterization of nanoscale systems have been made in recent years. Increasingly precise control of nanostructure geometry, composition and size is possible. Multicomponent structures, nanostructures with internal structure, and arrays of nanostructures can be made. Individual nanostructures can be probed and characterized. Atomistic theory of these systems is possible. This focus topic is devoted to techniques to predict and understand the optical properties of materials at the nanoscale. The emphasis will be on current topics. Contributions from both experiment and theory are encouraged. Areas of interest include semiconductor nanocrystals and nanowires formed by chemical means, metallic nanoparticles, quantum dots self-assembled during MBE growth or formed by lithography after growth, hybrid structures combining metallic and semiconductor nanostructures, arrays of structures, linear and nonlinear optical spectroscopy and dynamical response of these nanosystems, spectroscopy of individual nanosystems, quantum optics of these structures, plasmonics in these systems, and theory, including the full range of approaches from empirical to ab initio needed to describe these systems.

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13.6.2 (14.9.2) Fundamental Challenges in Transport Properties of Nanostructures (DMP)

This focus topic will address issues which are critical to the understanding, characterization, and control of electrical transport phenomena in nanostructures, including single-molecule devices, self-assembled monolayers, point contacts, semiconductor and metallic nanowires, quantum dots, nanoparticles, and other novel structures. Contributions are solicited in the following areas: (1) experimental studies of electrical transport through nanoscale structures; (2) proximal sensing related to transport through nanoscale structures; (3) theoretical advances in modeling electrical transport characteristics or proximal sensing of nanoscale systems, including ab initio materials approaches and many-body theory, and (4) controlled fabrication of nanoscale devices including synthesis, self assembly, and other bottom-up approaches, novel lithographic and other top-down techniques, and especially integration with contacts. Note that other focus topics are organized more specifically on: carbon nanotubes; organic electronics, photonics, and magnetics; and thermal, thermoelectric, and mass transport at the nanoscale.

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13.6.3 (23.8.5) Materials Issues for Quantum Computing & Quantum Engineering (DMP)

Over the last few years it has become increasingly important to define and assess the quality of the materials systems used in producing new solid state quantum devices. The engineering of the quantum circuits alone (such as RF-SETs, quantum bits or nanomechanical resonators) does not necessarily guarantee proper coherent operation. This focus topic is aimed at discussing ways to measure, characterize, and understand the relationship between the physical properties of the materials systems used in fabricating quantum devices and the coherent behavior of these devices themselves. Abstracts for solid state materials systems ranging from Josephson junction-based quantum devices, quantum dots, to electrical or nanomechanical quantum systems are encouraged.

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13.6.4 (16.12.5) Thermoelectric Materials & Phenomena (FIAP/DMP)

Applications of thermoelectric materials in energy conversion have attracted a great deal of attention recently. The development of novel materials and new synthesis strategies, combined with emerging phenomena is providing exciting opportunities to tune the material's thermoelectric properties over a broad range of length scale and degrees of freedom. This focus topic intends to examine the latest research of thermoelectric phenomena in materials, which include electrical and thermal transport properties at macroscopic, microscopic and nanometer scales. One of the emphasized areas will be the impact of nano-scale substructure, chemical tuning, and electron correlation on thermoelectric properties. Theoretical studies of electron and phonon transport, band structure and crystal chemistry of materials, thermodynamic analysis and energy transferring processes will also be highlighted. Comprehensive understanding of thermoelectric phenomena is critical for guiding the design of novel materials for advanced thermoelectric cooling and energy conversion applications.

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13.6.5 (06.11.2) Magnetic Nanostructures: Materials & Phenomena (DMP/GMAG)

13.6.6 (9.9.3 & 14.9.3) Surfaces & Interfaces of Correlated Electron Systems (DMP)

13.6.7 (14.9.1) Controlled Self-Organization of Functional Thin Film Nanostructures (DMP)

14.9.1 (13.6.7) Controlled Self-Organization of Functional Thin Film Nanostructures (DMP)

Exploiting growth and kinetic instabilities to form surface nanostructures and patterns with desirable functionality has emerged as a key element in strategies for nanoscale fabrication. The success of this approach depends on fundamental understanding of the evolution of thin-film morphology, atomic composition, and electronic structure. This focus topic will highlight recent experimental and theoretical developments associated with the formation and stability of nanostructures, surfaces, interfaces, and thin films, of hard and soft condensed matter, with particular emphasis on tailoring their functional (i.e., mechanical, electrical, optical and magnetic) properties. Novel hybrid nanostructures with potential relevance to biology, catalysis, and energy research will also be addressed.

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14.9.2 Fundamental Challenges in Transport Properties of Nanostructures (DMP)

[same as 13.6.2]

14.9.3 Surfaces & Interfaces of Correlated Electron Systems (DMP) *[same as 9.9.3 & 13.6.6]*

16.12.5 Thermoelectric Materials & Phenomena (FIAP/DMP) *[same as 13.6.4]*

16.12.6 Hydrogen Storage: Materials, Measurements, & Modeling (FIAP/DMP)

Developing safe, cost-effective, and practical means of storing hydrogen is crucial for the advancement of hydrogen and fuel-cell technologies. The current focus is on solid-state materials allowing low-pressure storage, including absorption on high surface area materials like Carbide-Derived Carbons (CDC), absorption in metal hydrides, such as the sodium alanates; and hydrogen binding in chemical compounds such as sodium borohydrides. Despite tremendous advances in recent years, the current hydrogen storage materials/concepts do not meet goals in terms of storage capacity, absorption-desorption temperatures, and hydrogen charging-releasing rates that are required for practical applications. This focus topic will bring researchers together to discuss current developments in state-of-the-art hydrogen storage materials, measurements, modeling and theory. Contributions are solicited in which include:

- Novel concepts and materials,
- New adsorbents such as metal-organic frameworks and metal-carbon complexes, B-C-N, aerogels, and polymer materials
- Optimizing hydrogen storage materials by doping, scaffolding, and alloying
- Novel synthesis methods of hydrogen storage materials
- Nanoscale phenomena and its effect on the thermodynamics and kinetics
- Advanced characterization and measurement techniques
- Theory and Modeling
- Atomistic understanding of hydrogen-metal bonding and hydride stability
- Fundamental thermodynamic and kinetic issues
- Catalyst mechanism and effects
- High-throughput/combinatorial approaches in hydride and catalyst discovery
- Hydrogen bulk and surface diffusion and dynamics

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16.12.7 Materials & Applications for Solar Energy (FIAP/DMP)

New materials, in particular nanostructured ones, are promising for a wide range of solar energy conversion devices, as well as efficient collection of heat generated by solar concentrators. For example, nanostructured architectures which efficiently absorb the full solar spectrum offer the potential to increase conversion efficiencies to nearly the thermodynamic limit. In addition, nanocomposite materials with simultaneous high electrical conductivity and low thermal conductivity offer great promise for significant enhancement in thermophotovoltaic conversion efficiency. This focus topic is on the materials issues and opportunities associated with solar and thermal energy conversion. We anticipate that the topic will bring together theoreticians and experimentalists from disciplines including physics, chemistry, chemical engineering, materials science, and electrical engineering, in order to address both fundamentals and device applications. Possible areas include the design and processing of materials to enable enhanced performance photovoltaics and thermophotovoltaics.

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16.12.11 Spin Transport & Magnetization Dynamics in Metal-Based Systems (GMAG/DMP/FIAP)

[see 06.11.4]

16.12.12 (02.8.1) Spin-Dependent Phenomena in Semiconductors (GMAG/DMP/FIAP)

[see 06.11.5]

17.13.1 (21.17.4) Computational Nanoscience (DMP/DCOMP) [see 7.8.3]

17.13.2 Theory & Simulation of Magnetism & Spin Dependent Properties (DCOMP/DMP/GMAG)

[see 6.11.1]

19.3.1 Earth & Planetary Materials (DMP/DCOMP)

This focus topic on Earth and Planetary Materials will highlight new experimental, computational, and theoretical approaches for understanding a variety of naturally occurring materials, from the core to the surface of solar and extra-solar planets. The main interest lies in the exploration of ices, fluids, minerals, and liquids and related complex and/or imperfect materials over the wide range of relevant thermodynamics conditions. Recent advances in theoretical and experimental techniques have led to breakthroughs in our understanding of the physical and chemical properties of Earth and planetary materials that were deemed inconceivable only a few years ago. For example, progress in laser-based spectroscopy, the second- and third-generation synchrotron sources, static and dynamic compression techniques, and advanced theoretical methods combined with rapidly increasing computer power has fundamentally altered how we investigate these materials and their interaction with the environment. This focus topic also encompasses advances in shock-wave techniques, diagnostics, and computation on all classes of materials. Of particular importance is that we now have in situ methods capable of determining the properties and behavior of materials under conditions ranging from the pressures and temperature of giant planetary interiors to ambient conditions. The goal of these sessions will be to explore the science and the technological advances that inspire research in this area.

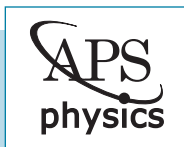
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21.17.4 (17.13.1) Computational Nanoscience (DMP/DCOMP) [see 07.8.3]

23.8.5 Materials Issues for Quantum Computing & Quantum Engineering (DMP) [see 13.6.3]



List of DMP-Sponsored or Co-Sponsored Focus Topics and Sorting Categories for the 2007 APS March Meeting

01. Metals

02. Semiconductors

- 02.8.1 Spin-Dependent Phenomena in Semiconductors (GMAG/DMP/FIAP) [see 06.11.5]

03. Insulators and Dielectrics

- 03.8.1 (9.9.1) Dielectric, Ferroelectric & Piezoelectric Oxides (DMP)

04. Polymeric and Organic Materials

- 04.14.4 (16.12.10) Organic Electronics, Photonics, & Magnetism (DMP/DPOLY)

05. Superconductivity

- 05.11.1 MgB₂ & Other Novel Superconductors (DMP)

06. Magnetism (Experiment, Theory, Applications)

- 06.11.1 (17.13.2) Theory & Simulation of Spin-Dependent Effects & Properties (DCOMP/DMP/GMAG)
- 06.11.2 (13.6.5) Magnetic Nanostructures: Materials & Phenomena (DMP/GMAG)
- 06.11.3 (07.8.2 & 09.9.2) Complex Oxides (DMP/GMAG)
- 06.11.4 (16.12.11) Spin Transport & Magnetization Dynamics in Metal-Based Systems (GMAG/DMP/FIAP)
- 06.11.5 (02.8.1 & 16.12.12) Spin-Dependent Phenomena in Semiconductors (GMAG/DMP/FIAP)

07. Complex Structured Materials

- 07.8.1 Carbon Nanotubes & Related Materials (DMP)
- 07.8.2 (09.9.2) Complex Oxides (DMP/GMAG) [see 06.11.3]
- 07.8.3 (17.13.1 & 21.17.4) Computational Nanoscience (DMP/DCOMP)

08. Fluids and Soft Matter

09. Phase Transitions and Strongly Correlated Systems

- 09.9.1 (03.8.1) Dielectric, Ferroelectric, & Piezoelectric Oxides (DMP)
- 09.9.2 (07.8.2) Complex Oxides (DMP/GMAG) [see 6.11.3]
- 09.9.3 (13.6.6 & 14.9.3) Surfaces & Interfaces of Correlated Electron Systems (DMP)

10. Biological Physics

11. Chemical Physics

12. Statistical and Nonlinear Physics

- 12.7.1 Friction, Fracture, & Deformation (DMP/GSNP)

13. Artificially Structured Materials

- 13.6.1 Optical Properties of Nanostructures (DMP)
- 13.6.2 (14.9.2) Fundamental Challenges in Transport Properties of Nanostructures (DMP)

- 13.6.3 (23.8.5) Materials Issues for Quantum Computing & Quantum Engineering (DMP)

- 13.6.4 (16.12.5) Thermoelectric Materials & Phenomena (FIAP/DMP)

- 13.6.5 Magnetic Nanostructures: Materials & Phenomena (DMP/GMAG) [see 06.11.2]

- 13.6.6 (14.9.3) Surfaces & Interfaces of Correlated Electron Systems (DMP) [see 9.9.3]

- 13.6.7 Controlled Self-Organization of Functional Thin Film Nanostructures (DMP) [see 14.9.1]

14. Surfaces, Interfaces, and Thin Films

- 14.9.1 (13.6.7) Controlled Self-Organization of Functional Thin Film Nanostructures (DMP)

- 14.9.2 Fundamental Challenges in Transport Properties of Nanostructures (DMP) [see 13.6.2]

- 14.9.3 (13.6.6) Surfaces & Interfaces of Correlated Electron Systems (DMP) [see 9.9.3]

15. Instrumentation and Measurements

16. Applications

- 16.12.5 Thermoelectric Materials & Phenomena (FIAP/DMP) [see 13.6.4]

- 16.12.6 Hydrogen Storage: Materials, Measurements, & Modeling (FIAP/DMP)

- 16.12.7 Materials & Applications for Solar Energy (FIAP/DMP)

- 16.12.11 Spin Transport & Magnetization Dynamics in Metal-Based Systems (GMAG/DMP/FIAP) [see 06.11.4]

- 16.12.12 (02.8.1) Spin-Dependent Phenomena in Semiconductors (GMAG/DMP/FIAP) [see 06.11.5]

17. General Theory (Theoretical Methods)

- 17.13.1 (21.17.4) Computational Nanoscience (DMP/DCOMP) [see 7.8.3]

- 17.13.2 Theory & Simulation of Magnetism & Spin Dependent Properties (DCOMP/DMP/GMAG) [see 6.11.1]

18. General

19. High Pressure Physics

- 19.3.1 Earth & Planetary Materials (DMP/DCOMP)

20. Quantum Fluids and Solids

21. Atomic, Molecular, & Optical (AMO) Physics

- 21.17.4 (17.13.1) Computational Nanoscience (DMP/DCOMP) [see 07.8.3]

22. Physics Education

23. Quantum Information, Concepts, and Computation

- 23.8.5 Materials Issues for Quantum Computing & Quantum Engineering (DMP) [see 13.6.3]