DMP NEWSLETTER
Division of Materials Physics

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DATES TO REMEMBER:

Sept. 3, 1999	Suggestions for Invited Speakers to organizers
Dec. 3, 1999	Abstracts Due at APS Headquarters
March 20-24, 2000	March Mtg. in Minneapolis, MN

DMP Membership

The resources available to DMP for its various activities depend directly on the number of APS members who are affiliated with DMP. Therefore, we urge that you continue your affiliation with DMP and recruit your colleagues who may not yet be DMP (or APS) members to join.

Call for Invited Speaker Suggestions

Please find below the Division of Materials Physics Focused Session program for the 2000 APS March Mtg. (Minneapolis, MN; March 20-24, 2000). Focused Sessions consist of typically 1 invited speaker per session, with the rest of the session consisting of contributed presentations. If you would like to make suggestions for invited speakers, please contact the appropriate Session organizers (listed below) by Friday, Sept 3, 1999, also, send a copy to Frances Hellman, chair of DMP (fhellman@ucsd.edu, Fax: 858-534-0173). The format for your suggestions is free-style, but please include a title, a brief descriptive paragraph, and the name, address, telephone and fax number of both the proposed speaker and the nominator. Contributed (and invited speaker) abstracts are due Dec. 3, 1999 at APS; contributors are welcome to send a duplicate copy to the Session organizers listed below, but please be sure to send the original to APS, on time, being sure that abstract conforms to APS regulations.

LIST OF SESSIONS AND SORTING CATEGORIES

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9.9.1 Phase Transitions in Ice (DMP)

9.9.2 Ferroelectrics: Phase Transitions, Properties and Applications (DMP)

10.9.1 Biological/Biomimetic materials (Joint DMP/DBP)

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13.9.1 Nanoparticles and Nanoparticle Systems (DMP)

14.9.1 Surfaces, Interfaces, and the Growth of Thin Films (DMP)

14.9.2 Laser Applications in Materials Physics (DMP)

14.9.3 Tribology (DMP)

15.9.3 High Pressure Physics: Primarily Experimental (DMP)

16.9.2 Materials Theory and Computation for Industrial Problems (Joint DMP/FIAP)

17.9.1 Materials Theory: High Pressure (DMP)

17.9.2 Multiscale Modeling of Materials: from Atoms to Devices (DMP)

DMP 2000 MARCH MEETING FOCUSED SESSION PROGRAM & CALL FOR ABSTRACTS

10.9.1 Biological/Biomimetic materials Joint focus session with DBP

This session focuses on the characterization, properties and applications of biological and biomimetic materials. This includes the study of the structure and dynamics of these materials, as well as their biophysical and mechanical properties. Talks describing biomedical, biotechnical and industrial applications are also encouraged. The session covers a wide variety of biological and biomimetic materials including, but not limited to, phospholipids and other self-assembling systems, Langmuir-Blodgett films, inorganic functional groups, DNA, and natural and synthetic biopolymers and biomaterials.

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16.9.2 Materials Theory and Computation for Industrial Problems Joint FIAP-DMP Focused Session

These sessions will highlight applications of materials theory and computation to problems that are of practical interest in the design, use, and understanding of technological materials. One of the major challenges in this area is identifying tractable problems that provide significant insights into highly complex materials and phenomena. Abstracts are welcome in all areas of materials technology and involving all forms of theory and computation. Of particular interest are applications to chemical (e.g., catalysts, batteries, sensors) , electronic, magnetic, optical, and structural materials and to practical issues involved in their processing, performance, and durability. Topics considered may involve bulk materials, surface and interfacial phenomena (e.g., growth, friction, corrosion) , or aspects of nanotechnology. Methodologies employed may be either well established or novel, and may focus on either a single or multiple length scales (i.e., quantum, atomistic, mesoscopic, continuum). All contributors are encouraged to stress the technological motivation for the work performed and significance of the results obtained.

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15.9.3 High Pressure Physics: Primarily Experimental

This focused session will be devoted to high pressure science. Topics will include, but are not limited to; optical and transport properties, electronic structure, phase transitions and novel phases, high temperature and molecular fluids, experimental techniques and instrumentation, materials of the earth, chemical behavior and material synthesis, mechanical properties (deformation, strain rate, plasticity, EOS)

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4.9.6 Organic Electronic Materials and Devices

This focused session will be devoted to conjugated polymers and other organic materials for electronic and photophysical applications. Both the fundamental science and applications of these materials will be addressed. Topics to be covered include, but are not limited to: characterization of the fundamental excitations; transport and other electrical properties; optical properties; new materials; applications such as light-emitting diodes, photodetectors, solar cells, lasers, and thin-film transistors; and materials issues such as contacts, defects and mechanisms of aging and failure.

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17.9.1 Materials Theory: High Pressure

Pressure as a thermodynamic dimension has the same fundamental importance as temperature and composition, yet our knowledge of high pressure behavior is limited. Because of the difficulty of high-pressure experiments, theory can play an important role in helping to understand and even predict behavior of materials under pressure. Pressure may help answer fundamental materials questions, since more than one model may explain zero pressure behavior, but predict different behavior under pressure. Key questions include: Can an understanding of different classes of pressure-induced insulator/metal transitions provide insight into fundamental states of condensed matter at zero pressure? How is magnetism affected by pressure? How do defect, transport, and optical properties vary under pressure? Can novel phases and materials that form under pressure guide the search for new materials with useful properties? Can these new materials be quenched into usable forms? In what ways can theoretical high-pressure research contribute to the fields of geophysics, planetary sciences, and mineral physics? This session will address all aspects of theory of materials under pressure, ranging from equations of state to superconductivity, with the objectives of delineating current progress and identifying future directions.

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6.9.2 Magnetoresistive Oxides

Over a range in compositions, manganese based perovskite oxides exhibit large resistivity changes in applied magnetic fields. This behavior is just one of a complex of phenomena associated with the interplay between lattice, spin, charge and orbital degrees of freedom. This focused session will address the fundamental aspects of the various ordering phenomena in doped manganite oxides, as well as related phenomena in Mn pyrochlores, cobaltates, nickelates, ruthenates, and spinels. Contributions will be encouraged dealing with such fundamental issues as spin dynamics, charge and orbital ordering, polaron formation, field-induced phase transitions, phase separation and effects of dimensionality. Theoretical reports focusing on the mechanisms underlying those effects, as well as fundamental studies of doped insulators, will be elicited. Papers reporting progress in incorporating these materials into transport geometries suitable for application are welcomed. This session will bring together the broad effort in understanding the properties of this class of materials, combining a focus on microscopic mechanisms and the prospects for applications

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14.9.3 Tribology

New tools for probing friction, lubrication, and wear at the molecular and mesoscopic levels have accelerated progress in the science of tribology. Examples include scanned probe microscopes, surface forces apparatus, ultra-low load indentation, quartz crystal microbalance, optical surface probes, and computer simulations. Experimental and theoretical papers on all aspects of fundamental tribology are solicited. Possible topics include mechanisms of energy dissipation, stick-slip motion, tribochemistry and tribofilm formation, lubrication by nanoscale films or at high pressures, the nature of contact between macroscopically rough surfaces as well as its time evolution, micromachines, new approaches for measurements at molecular length and time scales, and application of fundamental concepts toward improved materials and technological design.

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7.9.1 Combinatorial Materials Science

High-throughput synthesis and measurement techniques can accelerate the process of discovery of new materials and optimization of known ones, potentially benefiting both science and technology. These techniques can also be used to explore structural and electronic phase diagrams with exquisite resolution and control, potentially leading to new insights in condensed matter physics. Workers in this nascent field have already reported significant results in catalysts, dielectrics, and colossal magnetoresistance and luminescent materials. The development of techniques for parallel synthesis and high-throughput screening is central to the success of this approach. Topics of interest include, but are not limited to: Combinatorial and phase-spread methods used for the discovery or exploration of new electronic materials, catalysts, or other materials; Parallel synthetic techniques; Combinatorial processing techniques; Parallel or high-throughput characterization techniques, including strategies for identification of promising candidates, and techniques for refined characterization of small samples

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9.9.2 Ferroelectrics: Phase Transitions, Properties and Applications

The past decade has seen a surge of activity in the area of ferroelectrics, especially relaxor ferroelectrics where the length scale of interaction may range from atomic to nano-scale. Ferroelectric and piezoelectric properties can now be calculated from first principles and many phenomena have been explained. Basic atomic level interactions are beginning to be understood, particularly in terms of the experimentally determined local atomic structure. Ferroelectric thin films and their preparation are currently of interest and are being investigated to grow thin films with high dielectric constants and low losses for device applications. This session will focus on recent research on these and other related phenomena. Topics include, but are not limited to: Phase transitions in regular ferroelectrics, relaxor ferroelectrics and dipolar glasses. Ferroelectric thin films and ferroelectric liquid crystals. Defects and loss mechanisms. Sample preparation techniques and characterization methods. Theoretical first principles models and calculations for specific materials. Abstracts that link fundamental ferroelectric behavior with possible applications are particularly encouraged.

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14.9.2 Laser Applications in Materials Physics

High-power laser beams lend themselves to fabrication of novel metastable materials involving surface modification and multilayer thin film heterostructures. The purpose of this focused session is to address fundamentals of laser-solid interactions and transient thermal and photon-assisted processing of materials, including laser diagnostics of thin film growth processes in solid state materials. Specific topical areas of interest include photon-solid interactions and transient phenomena, pulsed laser ablation and deposition, initial stages of thin film growth processes, photon-assisted deposition and etching, laser plume diagnostics and correlations with film properties, in-situ laser characterization of growth processes, deposition of multilayer and multicomponent thin film heterostructures, correlations between laser and substrate variables and thin film properties.

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6.9.3 Magnetic Nanostructures and Heterostructures

Artificial magnetic structures whose properties are controlled by reduced dimensions at the nanometer length scale is the theme of this focused session. This includes both experimental and theoretical advances in magnetic phenomena occurring in films, superlattices, multilayers, nanocomposites, heterostructures, wedges, and arrays of lower dimensional structures. The magnetic phenomena include low-dimensional physics, interlayer magnetic coupling, exchange bias, GMR, spring magnets, broadly defined spin transport, quantum confinement, magnetic semiconductors, and effects of structural disorder on magnetism. Of special interest are: fabrication of nanostructures with atomic-scale control, characterization methods including those with site and element specificity, novel deposition techniques for the creation of nanoscale magnetic features, and unusual physical phenomena present in these types of systems.

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12.9.1 Dynamic Deformation and Fracture: Microscopic to Macroscopic

The recently renewed interest in the dynamic deformation and fracture of materials has lead to an enhanced understanding of the underlying microscopic processes. An example is the capability of modeling the evolution of a large ensemble of dislocations and combined continuum-atomistic models. Despite this success, a clear path from the microscopic processes to traditional continuum models has not been worked out. The objective of this Focused Session is to enable experimental and theory / modeling researchers working on the dynamic deformation and fracture deformation of materials to present recent results and openly discuss the connection between microscopic processes and macroscopic materials behavior with emphasis on the macroscopic representation and observables. The Focused Session will include, but not be limited to, the following topics:

* elastic and anelastic behavior
* low and high strain-rate plastic deformation
* fracture and fragmentation
* nucleation and growth of microscopic damage

It is expected that contributed talks will foster interaction between different communities such as experimental/theory or microscopic/continuum mechanics and foster a unified approach to the understanding of the dynamic behavior of materials.

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2.9.1 Wide Bandgap Semiconductors

Wide bandgap semiconductors are important in a very large number of areas. When good bipolar conductivity can be achieved, they can provide, among others, light-emitting devices (laser diodes and light-emitting diodes) in the green, blue, and higher spectral ranges, detectors in these ranges, and high-temperature sensors and transistors. If the materials provide persistent photoconductivity, the can give an optical holographic system with a very high information storage density. Further, there is increasing work on insulating materials with large carrier mean free paths, to obtain improved radiation detection, including high sensitivity at room temperature. We invite submission of contributed papers on wide bandgap II-VI, III-V and group IV semiconductors. Papers can be in the areas of material characterization, material growth, defects, theory, electrical and optical characterization, as well as device properties and characterization.

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13.9.1 Nanoparticles and Nanoparticle Systems

When physical dimensions of homogenous phases fall below specific characteristic length scales, such as electron or phonon mean free paths, Debye wavelengths of charge carriers, or correlation lengths of ground state excitations, materials properties are altered in a dramatic and often times tunable manner. Implementation of this concept into nanoscience and nanotechnology has experienced explosive growth in recent years, owing in large part to parallel progress in the synthesis, processing and characterization of nanomaterials. This symposium focuses on new research on nanoparticles and nanoparticles assemblies. We invite experimental and theoretical contributions on the thermodynamics, kinetics and structures of nanoparticle systems of all classes of materials, as well as on their physical and chemical properties. Innovative methods for synthesizing, characterizing and utilizing these materials and assemblies also are of interest. Representative but not inclusive topics are the thermodynamics and structure of nanoparticle interfaces, mechanical, optical, electrical and magnetic properties of nanoparticles and nanocomposites, nanotubes, and processing by all methods including mechanical alloying, ion and cluster beams, inert and reactive gas condensation, and chemical methods.

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7.9.2 Fullerenes, Nanotubes and Related Materials

This symposium will focus on recent progress in fullerenes, nanotubes and related materials. It will highlight, but will not be limited to: 1) Materials synthesis, processing and characterization; 2) Theory and simulation of growth mechanisms and physical properties; 3) Physical and chemical properties of individual nanotubes and nanotube solids; 4) Structure and properties of new fullerene compounds including endohedral fullerenes and intercalated fullerides; 5) Potential technological applications such as electron field emission, nano-devices, micro-probes, nanocomposites, and energy storage.

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14.9.1 Surfaces, Interfaces, and the Growth of Thin Films

Novel electronic, optoelectronic, and magnetic materials are often created by thin-film growth techniques. Recent advances in growth techniques have made it possible to epitaxially integrate dissimilar materials and to atomically engineer exotic low-dimensional and nanoscale structures. New generations of surface/interface probes and development of supercomputer and computational algorithms have also allowed the characterization of the atomic, electronic, magnetic, and optical properties of surfaces, interfaces, and thin films, with an unprecedented precision. The aim of this focussed session is to bring together researchers who share their common interests in this exciting field. It provides a forum for discussion among researchers whose work covers the fundamental mechanisms of thin film growth and the correlation between structural, electronic, magnetic, and optical properties of surfaces, interfaces and thin film materials. Experimental and theoretical contributions are solicited in the following areas:

1) Microscopic mechanisms of growth and sublimation: Initial growth stages, adsorption, diffusion and nucleation. Surface mass transport. Composition modulation. Strain relaxation mechanisms. Formation mechnisms of nanostructures. Quantum-size effects in thin-film growth.

2) Surface/interface structure and thermodynamics: Energetics of surface defects, steps, facets. Interface stability, interdiffusion, defects. Surface phase transitions, roughening, order-disorder transitions. High-resolution surface microscopies with elemental or chemical sensitivity, surface/interface composition mapping, adsorbate identification. High-resolution spectroscopy of heterostructures and interfaces.

3) Surface and growth modification: Ion, electron, photon beam induced surface modification. Fundamental mechanisms of growth modifications by energetic beams, control of film texture and roughness. Role of surfactants in thin film growth

4) Electronic, magnetic, optical, and transport properties of thin films and interfaces: Interface and grain boundary transport. Transport and optical properties of nanostructured thin-film materials. Electronic and magnetic properties of defects. Structural and electronic properties of thin oxides.

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5.9.1 The Effect of Disorder on the Vortex Phase Diagram and Tailoring of the Critical Currents in High Temperature Superconductors

This session will focus on exploring the rich variety of liquid and solid vortex phases emerging from the different types and dimensionality of defects in high temperature superconductors, with emphasis on enhancing and tailoring the critical currents across the various phases. The types of disorder may include defects induced by substitution or irradiation, and grain boundaries and texturing which can substantially alter the critical current behavior in single crystals, bulk samples, coated conductors, and thin films. Abstracts are solicited on (i) experiments to probe the various liquid and solid vortex phases and the transitions between these phases by altering the types of defects and their concentration in single crystals, (ii) theoretical and computational analysis to understand the vortex phase diagram, (iii) exploring critical current enhancements within the various vortex solid states in bulk and thin film samples and (iv) critical current behavior in monolithic melt textured YBCO samples. Abstracts focusing on vortex pinning behavior in the liquid state and on tailoring of critical currents utilizing novel pinning sites like magnetic and nano-sized particles are strongly encouraged.

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2.9.2 Group-IV Semiconductor Alloys: Materials, Processes, Devices Joint with FIAP

After more than ten years of materials research, group-IV semiconductor alloys (such as SiGe and SiGeC) are entering the microelectronics market, particularly for wireless communication applications. This session will bring together scientists working on different aspects of this important materials systems (normally dispersed among the APS meeting), allowing a coherent and interdisciplinary treatment of this topic. Abstracts are sought in the following areas: Group-IV materials growth, properties, characterization, devices (CMOS and bipolar) ; theory of SiGeC alloys, equipment and process simulation, materials reliability. Issues related to SiGeC process integration (e.g., oxidation, silicides, implantation, annealing and diffusion, etc.) will also be welcome.

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12.9.2 Multiscale Phenomena in Smart Materials and Martensites

This session is focused on physical phenomena that involve multiple length scales (such as twinning, hierarchical microstructure and locally ordered structures) and multiple time scale phenomena (such as structural response to electric, electromagnetic, thermal and acoustic excitations) . These multiscale phenomena appear in many smart materials, e.g. ferroelectrics, shape memory alloys, martensites, magnetoelastics, and their composites both in the form of bulk and thin films. The formation of these structures is a consequence of either phase transitions or excitations of external fields, and is controlled by the system size as well as boundary conditions. Some of these microscopic and mesoscopic structures are hierarchical and often intrinsically correlated among several different scales. Recent advances in high resolution (scanning and transmission) electron microscopies, local structure and microstructure characterization probes (pair distribution function analysis, neutron scattering with high-intensity pulsed sources, x-ray scattering with advanced photon sources, resonant ultrasound, etc.) as well as developments in new ways of modeling these materials have provided deeper understanding on these multiscale phenomena. This can lead to better control over various key functionalities and produce new materials with enhanced functional properties. Topics in this session include but are not limited to: domain observations using various scattering techniques (neutron, X-ray, etc.) and microscopies (such as ROM, TOM, SEM, ESEM, TEM, SFM, EOIM, etc.) ; experimental and theoretical studies on martensitic, ferroelectric and ferroelastic phase transitions and the formation of microscopic and mesoscopic structures; relationship between multi-scale structures and physical properties; and the effects of size and dimensionality. Theoretical studies include microscopic and continuum modeling, Ginzburg-Landau phenomenology as well as simulations.

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6.9.4 Materials Theory: Magnetic Properties and Phenomena

Research in magnetic materials is proliferating with new materials, applications, and phenomena, while concomitant advances in fundamental theory, modeling, and simulation are creating resurgent activity and opportunities. It is an opportune time for a focused session seeking participation across a wide range of theoretical studies dealing with the magnetic properties of materials. Abstracts are invited for all aspects of magnetism across the following broad categories:

Fundamental Theory and Methods: First principles approaches [DFT, LDA, LDA+U, fundamental approaches for exchange and correlation, quantum Monte Carlo]; model Hamiltonians; micromagnetics; methods for bridging length and time scales between microscopic and macroscopic; order N-methods, parallel algorithms; spin dynamics; response functions. Phenomena: Non-collinear ground states; finite temperature magnetism; phase transitions; spin dependent transport, GMR, CMR, and spin dependent tunneling; magneto-optical effects in the infrared, visible, or x-ray regions; magnetic anisotropy; domain wall structure, interactions and motion; exchange bias; technical properties of magnets [permeability, remanence, and coercivity]; interplay of magnetism with phase stability, mechanical, superconducing, or other physical properties; spin coherence and quantum computing.

Materials: Transition metals and alloys; lanthanide and actinide metals and their alloys; layered transition metal oxides; small magnetic molecules and clusters; surface and interface magnetism; bulk amorphous metals.

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3.9.1 Fundamentals of Semiconductor/Thin Dielectric Structures

Nanoscale device technology is stimulating intense study of very thin dielectric layers on semiconductors. Fundamental new issues have emerged, and old ones re-emerged. Alternative dielectrics, such as Si_3N_4 and Ta_2O_5, are contenders for the role once solely dominated by SiO_2. Composite dielectric stacks exploit attributes of each component, but introduce unresearched interfaces and problems. Tunneling, charging and breakdown reflect new and unsettled moieties and causes. Passivation of non-silicon semiconductors has shown recent promise, but offers a poorly understood rival for Si÷SiO_2 structures. In this session, we encourage both experimental and theoretical contributions on interface physics, bulk and interface characterization, bulk and surface defects, structural, electrical, and optical phenomena, and other topics relevant to the physics of these new semiconductor/thin-film dielectric systems.

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9.9.1 Phase Transitions in Ice

Overview: The balance between ice and water controls the habitability of an important fraction of the globe and influences the majority of the world's population. Although one of the most common first-order phase transformations in the natural environment is the water to ice conversion, a complete understanding of microscopic processes and their influence on macroscopic behavior still eludes us. Recent advances show that the microscopic interfacial structure of ice is central to pattern formation during ice crystal growth, the adhesion of ice, the evolution of the polycrystalline fabrics of the great ice sheets, and the underlying dynamics of frost heave. Current research focuses on, inter-alia, consequences of microphysics in the scavenging of atmospheric pollutants by snow, the role of stratospheric ice in ozone destruction, the mechanism of charge transfer driving thunderstorm electrification, the effects of frost heave on engineered structures, and natural ice sheets. Although understanding these phenomena involves the talents of many disciplines, important advances in understanding the microscopics rely on modern techniques of the physical and mathematical sciences. An important duality is that ice acts as a testing ground for basic aspects of the phase behavior of materials, and that this behavior is relevant to a myriad of important environmental problems. This focused session describes our emerging understanding of the materials physics of ice, its implications for the basic principles of melting, and their environmental consequences.We are soliciting contributions that focus on thermodynamics and kinetics of the ice to water conversion that will guide the participants in the session from the underlying mechanisms of the nucleation of ice, to the evolution of the crystals long after their formation. This includes theory, simulation and experimentation in homogeneous and heterogeneous nucleation and growth of ice, both in a laboratory setting and in the environmental context. Because the subsequent growth of crystals depends sensitively on the microscopic surface structure, we solicit papers on surface phase transitions in ice, including surface roughening, kinetic roughening and surface, interfacial and grain boundary melting. Emphasis here is on novel experimental methods and recent computational and theoretical advances.

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17.9.2 Multiscale Modeling of Materials: From Atoms to Devices

The manufacturing of electronic, photonic, and magnetic devices, the deposition of hard coatings, the prediction of aging and performance of complex materials, and similar activities can benefit enormously from advances in modeling. Accurate models can reduce the cost of designing new processes and devices, but constructing such models requires a range of skills and techniques which is seldom found in one institution. The goal of these sessions is to bring together researchers from several disciplines and who employ a variety of methods, and to stimulate collaborations. We encourage contributions on topics that span the range from research on the fundamental mechanisms of materials processing to applications that demonstrate, for example, real savings in the cost of manufacturing. Abstracts are solicited from the following areas:

-Models of thin film deposition; in particular studies of the influence of processing conditions on surface roughening, stress, clustering and void formation, grain boundary microstructure, and incorporation of point and line defects.

-Simulation studies of the sensitivity of structure to model parameters for atomic interaction energies and rate constants.

-Models to predict the results of radiation by energetic particles, both on thin film deposition and mass transport, and on electronic, mechanical, and other properties of bulk materials.

-Methods to link molecular dynamics (classical and quantum), Monte Carlo, and continuum models.

-New mathematics for applications to surface evolution, surface and interface mass transport, and atomistic modeling.

-Experiments which can extract atomic level information to test the parameterization of models, and experiments which can validate specific model predictions.

-Methods to model the dynamics of dislocations in solids at the microscale and their application to plastic deformation and fracture at low and high strain rates.

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National Research Council Report on Physics in the New Era:

In the spring of 1996 the National Research Council's Board on Physics and Astronomy established the Committee on Condensed-Matter and Materials Physics (CMMP) to prepare a scholarly assessment of the field as part of the new survey of physics, Physics in a New Era, that is now in progress. This assessment has five objectives:

1. Identify future opportunities and priorities in the field.
2. Articulate the fundamental scientific challenges in the field.
3. Assess related infrastructure, institutional, resource, and educational issues.
4. Provide evidence of the societal impact of the field.
5. Provide a forum for coordinated community-wide communications with federal agencies, policy makers, and the public.

The report of the CMMP committee has just been published by the National Academy Press. In addition to an Overview chapter, there are six chapters outlining some of the technical highlights of the decade as well as challenges, priorities, and frontiers for the future:

* Electronic, Optical, and Magnetic Materials and Phenomena: The Science of Modern Technology
* New Materials and Structures
* Novel Quantum Phenomena
* Nonequilibrium Physica
* Soft Condensed Matter: Complex Fluids, Macromolecular Systems, and Biological Systems
* New Tools for Research

There are also two other chapters, one examining changes in the R&D landscape, and the other looking forward to the coming decade.

The whole report is accessible from:

http://pompeii.nap.edu/catalog/catalog.cfm?record_id=6407

The earlier brochure entitled the "Physics of Materials" is available at:

http://pompeii.nap.edu/catalog/catalog.cfm?record_id=9090

Both of these documents also can be accessed from the DMP homepage at:

http://www.aps.org/units/dmp/

DMP ROSTER

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