DMP NEWSLETTER
Division of Material Physics

A Division of the
American Physical Society

January 1998

In this Issue ...

This newsletter announces the 1998 Adler Award winner. Enclosed also is your ballot for the 1998 elections to the DMP Executive Committee. Biographies of the candidates are given. Terms of service are three years. For the listing of the DMP's session topics for the upcoming March Meeting, refer to our August newsletter

NSF Program Solicitation

The National Science Foundation recently announced a new program solicitation for Science and Technology Centers (STC): Integrative Partnerships. Information can be found on the NSF website at [http://www.nsf.gov/od/osti].

Visit the DMP Homepage

[www.aps.org/units/dmp]
Our Homepage on the World Wide Web contains all types of Divisional information, including current and back issues of the DMP Newsletter. Our growing library of "Images of Materials" brightens up our homepage and simultaneously provides a valuable visual statement that helps to describe us as a scientific community. Thanks to all

Joe Greene Wins Adler Award

Joseph E. Greene of the University of Illinois, Urbana-Champaign has been selected to receive the 1998 David Adler Lectureship Award. His citation reads: "For outstanding research and lecturing on the physics and chemistry of thin films." The award presentation will be made at the 1998 APS March Meeting in Los Angeles. Joe will present his Adler Lecture at a DMP Focus Session at that March Meeting as well. The purpose of the award is to recognize an outstanding contributor to the field of materials physics who is noted for the quality of his/her research, review articles and lecturing. The lectureship was originally endowed in 1988 by contributions from friends of the late Professor David Adler of MIT. Joe Greene will be the 11th annual recipient of the award.

APS Joins Congressional Call for a "Decade of Investment

Sen. Phil Gramm (R-Texas) and Sen. Joseph I. Lieberman (D-Conn.) have recently introduced legislation "to invest in the future of the United States by doubling the amount authorized for (civilian) basic scientific, medical, and precompetitive research (over the next ten years)."

At the same time, the American Physical Society, joined by more than 100 other scientific and technical organizations, issued a Unified Statement on Research calling for a "decade of investment," doubling the U.S. research budget to secure the nation's quality of life and economic prosperity.

The National Research Investment Act of 1998 (S.1305) would reverse recent declines which have occurred in the research budgets of almost all federal agencies. As a result, federal R&D investments as a fraction of Gross Domestic Product have dropped to about half what they were 30 years ago.

Senators Gramm and Lieberman are currently seeking co-sponsors for their bipartisan bill and, at a later date, will seek to have similar legislation introduced in the House. Separate future action is planned to support Department of Defense basic research.

The Unified Statement on Research was signed by 106 professional societies representing more than 3 million scientists, engineers and mathematicians. It stresses the importance of investments in research to the nation's

of our contributors. Send your comments and contributions to Sam Bader, DMP Sec./Treas.

Recruit New DMP Members

Encourage a colleague or friend to affiliate with DMP. The annual cost is $6 in addition to regular APS membership dues. As we build our membership base, we increase the visibility of the materials physics presence as a vibrant part of APS, and we also strengthen the impact of our numerous outreach efforts, such as to Washington and to related Societies. Instructions on how to become a member of DMP (or any other APS unit) appear on our homepage, or call (301) 209-3280 with your APS membership number (from the mailing label of a recent publication sent to you) and a credit card for the $6/year dues. Or fax (301) 209-0867 or mail the information to APS at:

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productivity and economic growth, standard of living, quality of life, and security. Economic analyses show that more than half of all economic growth since the end of World War II can be attributed to technology. Science provides the underpinning for technological progress, and economists estimate annual rates of return on investments in basic research to be 20 percent or more.

The complete statement and further information can be accessed from the APS homepage at /public_affairs/popa/decade.cfm.

Elections to the Executive Committee

The present officer list (with expiration dates that follow the March Meeting) includes (full addresses appear on the DMP homepage):

Past Chair	G. Slade Cargill III	98 gsc3@lehigh.edu
Chair	James B. Roberto	98 robertojb@ornl.gov
Vice Chair	James W. Davenport	98 daven@bnl.gov
Chair Elect	Frances Hellman	98 fhellman@ucsd.edu
Sec./Treas.	Samuel D. Bader	99 bader@ANL.gov
Councillor	Howard K. Birnbaum	99 FAX: (217) 244-2278

Members at Large include:

Patricia M. Mooney	98	mooney@watson.ibm.com
Shirley Chiang	99	chiang@physics.ucdavis.edu
Robert B. Laibowitz	99	laibow@watson.ibm.com
David Long Price	99	price@anlpns.pns.anl.gov
Max Lagally	00	lagally@neep.engr.wisc.edu
Julia M. Phillips	00	jmphill@sandia.gov

According to our By-laws, at the end of the March APS meeting, the present Chair moves to Past Chair, the Vice Chair becomes Chair and the Chair Elect becomes the Vice Chair. All nominees must be members of the DMP on the June before election.

And the Nominees are ...

The Nominees to fill 1998 vacancies are listed below followed by brief biographical summaries.

Vice Chair (Vote for one)

John J. Rush (NIST) Patricia Mooney (IBM Watson Research Center)

Member-at-Large (Vote for one)

Dan Pierce (NIST) Jerry Tersoff (IBM Watson Research Center)

Ballots must be received by S.D. Bader no later than **February 1, 1998**. Please vote and return your ballot promptly either by mail or by FAX: (630) 252-9595. Be sure to include your name and signature.

Meet the Candidates: Biographical Summaries/Statements

Vice-Chair:

JOHN J. RUSH

Jack Rush is Leader of Neutron Condensed Matter Science Research at the NIST Center for Neutron Research and a Senior Research Fellow of the National Institute of Standards and Technology. He received his MA and PhD in Chemistry from Columbia University. After three years at Argonne National Laboratory, he joined the NIST (then NBS) research staff in 1966.

His personal research efforts have been in studies of the fundamental properties of hydrogen isotopes in metals and metal hydrides by neutron scattering and related techniques and of the structure, dynamics and phase transformation of molecular solids and complex oxides, including catalysts, fullerenes and fuel cell materials. His group at NIST covers a wide range of materials research in magnetic materials and superconductors, ceramics and alloys, thin films and magnetic multilayers, molecular materials and polymers. He has received the NIST Stratton Award and a Commerce Department Gold Medal for his fundamental research on hydrogen in metals and molecular materials. He is a Fellow of the American Physical Society.

Jack Rush has also been actively engaged in many committees and panels dealing with materials research and large research facility issues. He is currently a member of the NAS/NRC Solid State Science Committee and on the National Science and Technology Council subcommittee on U.S. Research Infrastructure.

During the last 15 years, he has been a chairman, vice-chairman or a member of a number of NAS or DOE panels and committees, for example, the NRC Panel on Neutron Research and Facilities in the U.S., the Seitz-Eastman Committee on Major Materials Research Facilities, the Kohn panel on U.S. Neutron Sources, and the DOE (BESAC) Panel on Synchrotron Radiation Research and Facilities.

Statement: First of all the Materials Physics Division must continue its excellent efforts to foster and plan focused APS symposia and sessions on the physics of an ever-increasing range of materials - from semiconductors to functional oxides and macromolecules. Also, as we approach the millenium, the Division and its close allies in the APS Condensed Matter Physics Division and in the MRS must continue and enhance their cooperative efforts to articulate and project the materials research enterprise as a key component of U.S. science and technology. The soon-to-be-completed NRC study on Condensed Matter and Materials Physics offers a clear opportunity for our division to play a key role in helping to disseminate and articulate present and future highlights and opportunities in materials research fields. Support for other encouraging initiatives to improve educational outreach, e.g. the new Gordon Conference on "Education in Materials Science" is also essential. In my view the Division of Materials Physics should also play a key role in addressing the needs of the materials community for new or improved large facilities and in helping to assure an appropriate balance with the growing needs of laboratory - based experimental and theoretical research.

PATRICIA M. MOONEY

Patricia M. Mooney is a Research Staff Member at the IBM T.J. Watson Research Center. She received her PhD in solid state physics from Bryn Mawr College in 1972. Before joining IBM in 1980, Dr. Mooney was Assistant Professor of Physics at Hiram College (1972-74) and at Vassar College (1974-80). She was a Research Associate in the Physics Department at the State University of New York at Albany (1977-78), and a Visiting Scientist at the Groupe de Physique des Solide de l'ENS, Universit, de Paris VII (1979-80) and at the Fraunhofer Institut fur Angewandte Festkorperphysik (1987-88). Dr. Mooney's research has focused on the fundamental properties of defects and impurities in semiconductors and their effects on the

electronic and optical properties of semiconductors and various semiconductor devices. She has studied radiation- and process-induced defects in Si, Ge and GaAs, and impurities in epitaxially-grown III-V semiconductor films, most notably the DX center in AlGaAs. Recently she has studied strain relaxation and dislocation formation mechanisms in lattice mismatched semiconductor erostructures. Her current work is on dislocation- related electronic states in epitaxial SiGe/Si heterostructures and the characterization of SiGe/Si and Si structures for electronic devices. Dr. Mooney is the author of more than 100 publicatons, including six review articles, a monograph and two book chapters. She has received two Outstanding Technical Achievement Awards from the IBM Corporation.

Dr. Mooney is a Fellow of the American Physical Society and a member of the AAAS, the MRS and the TMS. She has organized numerous conferences including DMP focus sessions on Defects in Semiconductors at the 1992 March Meeting and, more recently, MRS Symposia on Defects and Interfaces in Lattice Mismatched Semiconductor Heterostructures (spring 1996) and Epitaxy and Applications of Silicon-Based Heterostructures (spring 1998). She serves on the editorial boards of Applied Physics Letters and The Journal of Applied Physics and of the Journal of Materials Science: Materials in Electronics. From 1995-98 Dr. Mooney was a Member-at-Large of the Executive Committee of the Division of Materials Physics of the APS and served on the DMP Fellowship Committee (1996), the DMP Nominating Committee (1995, 1996) and on the DMP Task Force on Prizes and Awards (1996-97).

Statement: Materials physics spans a spectrum of activities ranging from basic research on new materials to a wide variety of applications of materials in emerging technologies and includes teaching at the undergraduate through post-doctoral levels. The most important role of the Division of Materials Physics is to communicate new and exciting research results to our members and to the larger scientific community through APS meetings and publications, and also to communicate the importance of our work to the public and to those making decisions regarding funding for materials research. This is best done by coordinating our activities with other groups within the APS, e.g. the Division of Condensed Matter Physics, the Forum on Industrial and Applied Physics and the Topical Group on Magnetism, and also coordinating activities with other professional societies having common goals through the Federation of Materials Societies. We need to foster stronger links between research groups at universities, industrial labs and national labs, both to better use our resources and to benefit our students in their search for jobs. These links can be made more visible at APS meetings through Focus Sessions and jointly sponsored Symposia. Activities for the coming year will be to ensure that exciting developments in Materials Physics are well represented at the Centennial APS Meeting in 1999 and to secure new funding for the Adler Lectureship Award.

Member-At-Large:

DAN PIERCE

Dan Pierce is a physicist and NIST Fellow at the National Insititute of Standards and Technology. He received his PhD in Applied Physics from Stanford University in 1970. Before joining NIST, he spent three years at the ETH-Zurich using spin-polarized photoemission toinvestigate the spin dependent electronic structure of magnetic materials. At NIST his research has revolved around the magnetic and electronic properties of surfaces and thin films and how microscopic structure at surfaces and interfaces affects macroscopic properties. He has developed new measurement techniques involving unique sources and detectors of spin-polarized electrons and has recently been active in applying scanning tunneling microscopy to investigations of magnetic thin film growth. He has over 150 publications in these areas. He has been the recipient of several awards for this work including the Department of Commerce Gold Medal and the AVS Gaede-Langmuir Prize.He is a fellow of the APS and the AVS. Among numerous professional activities, he has chaired the Surface Science Division of the AVS, chaired the Gordon Conference on Electron Spectroscopy and served on the program committee for and as proceedings co-editor of several Conferences on Magnetism and Magnetic Materials.

Statement: Two top priorities of the Division of Materials Physics are 1) to organize sessions at APS meetings that ensure materials physics topics are well represented and that offer effective forums for communicating results to the scientific community, and 2) to communicate the value of materials physics research to society at large and thereby those in control of budgets, such as the Congress. As a research

area combining both fundamental physics and technological applications, materials physics is particulary well suited for communication to a broader audience. Making others aware of the value of our research is crucial to obtaining the support required to maintain the vitality of the field and to assure that there are good opportunities for younger scientists beginning their careers.

JERRY TERSOFF

Jerry Tersoff is a Research Staff Member at the IBM T. J. Watson Center. He received his BA in Physics from Swarthmore College in 1977, and his PhD from the University of California at Berkeley in 1982. He then spent two years as a post-doc at Bell Labs before joining IBM. He has worked in a variety of areas relating to materials physics, including theories of scanning tunneling microscopy, Schottky barriers, heterojunction band lineups, model interatomic potentials, stress effects at surfaces, strain relaxation in thin films and self-organization during epitaxial growth. Tersoff is a Fellow of the APS, and a member of the Materials Research Society and the American Vacuum Society. He has organized two DMP Focus Sessions and three Symposia at Materials Research Society meetings. His work has been recognized by the Peter Mark Award of the American Vacuum Society, the Materials Research Society Medal and the Davisson-Germer Prize of the APS.

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