

# DMP NEWSLETTER

Division of Material Physics

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A Division of The American Physical Society

February 1996

## IN THIS ISSUE

This newsletter contains DMP news, in particular the announcement of recent APS Fellows from our Division and the 1996 Adler Award winner. Enclosed also is our ballot for 1996 elections to the DMP Executive Committee. Biographies of the candidates are given along with their terms of office. We also want to encourage your early submission of topics (with a brief description) for our 1997 Focused Sessions along with two suggested Chairpersons. This year we will have 20 separate session topics with 91 sessions and about 1100 papers including 66 invited talks leading off selected sessions.

### ARTICLES

- Brian Maple Wins Adler Award
- News and Events of Interest
- Submission of Topics
- DMP APS Fellows Elected
- Special Speaker Funds
- DMP Divisional Councillor to the APS
- Elections to the Executive Committee
- And the Nominees Are ...
- Biographical Summaries

## Brian Maple Wins Adler Award

This year's winner of the [Adler Award](#) is [Professor M. Brian Maple](#) of the University of California - San Diego, "For sustained impact in diverse areas including superconductivity, magnetism, high-pressure physics, and surface science. Not only has he developed many novel materials, but he is also highly respected as a teacher". Professor Maple will present the [Adler Award Lecture](#) in a joint DMP/DCMP Session, C25, on Monday afternoon, 2:30 p.m., March 18, in Room 123 of the Convention Center.

The David Adler Lectureship Award was established in 1988 by contributions from friends of David Adler. Its purpose is to recognize an outstanding contributor to the field of materials physics, who is noted for his or her research, review articles, and lecturing.

We continue to receive a number of excellent nominees for the Adler Award and invite your early submission of candidates for 1997. The new due date is July 1, 1996. All

nominations must include at least a nomination letter and complete resume and should be sent to Dr. G.S. Cargill, Chair of the DMP (1996-97). Supporting letters are, of course, very useful in evaluating candidates.

## **News and Events of Interest**

At the [March 1996 APS meeting](#) in St. Louis we will hold our annual Business Meeting on Monday, March 18 at 6:00 p.m. in Room 130 of the Convention Center. We urge you to attend because it is there that we discuss policy regarding Focused Sessions - \_ and their invited talks \_ as well as other DMP matters including relationships with the [DCMP](#), the [MRS](#) and the Federation of Materials Societies (FMS). It is also our ceremonial session where new APS Fellows are presented their certificates.

We also want to bring to your attention a Special Joint Symposium of the DCMP, DMP, and DHPP on Wednesday evening March 20 at 7:30 p.m. in the Convention Center. This Symposium, chaired by Robert C. Richardson of Cornell (current chair of the DCMP) is entitled "Reform of Science Funding and the Training of Scientists in the United States." The speakers will be:

Marye Anne Fox, University of Texas, Austin, on "Prioritization for Federal Funding" (National Academy Report)  
David Goodstein, Caltech, on "The Big Crunch" (related to overproduction of physicists)  
Shelia Tobias, Tuscon, Arizona, on "Rethinking Science as a Career" (recent study funded by NCR)

These talks will be followed by a panel discussion and an open conversation with the audience.

## **Submission of topics**

Submission of topics for the 1997 March Meeting Focused Sessions should be made to:

G.S. Cargill III, Chair, DMP (1996-97) Department of Materials Science and Metallurgy  
Columbia University New York, NY 10027

Please include a title, a brief descriptive paragraph and the names of the two suggested co-organizers with their addresses and telephone and FAX numbers.

## **DMP APS Fellows Elected**

We wish to congratulate the following scientists on their election to Fellowship in the APS through the Division of Materials Physics:

James Whitman Davenport  
Brookhaven National Laboratory  
Marcos Hugo Grimsditch  
Argonne National Laboratory  
Bretislav Victor Heinrich  
Simon Fraser University  
Warren Bruce Jackson  
Xerox Palo Alto Research Center  
Jeffrey S. Lanin  
Pennsylvania State University  
Charles M. Lieber  
Harvard University  
Carmen Ortiz  
IBM Almaden Research Center  
Ian Keith Robinson  
University of Illinois  
Jan Frederick Schetzina  
North Carolina State University  
Jeffrey Y. Tsao  
Sandia National Laboratories

As noted above, the Fellowship certificates will be awarded at the DMP Business Meeting on March 18, 1996. Nominations for Fellows for 1997 are currently being processed. The procedures for Fellowship nomination are the same for all divisions but the deadline dates vary. Ours is February 15 for each year and forms may be obtained from the APS headquarters or [online](#).

## **Special Speaker Funds**

The DMP has continued its policy of reserving of funds to cover our Focused Session invited speakers who, while domestic, do not normally attend the March meeting or who come from abroad with limited support. These funds include travel support and waiver of registration fees and consideration will be made on a case-by-case basis. All session organizers are encouraged to avail themselves of these funds but usually no more than one per focused session can be approved.

## **DMP Divisional Councillor to the APS**

Dr. Howard Birnbaum of the University of Illinois is our recently elected DMP Councillor for a term of four years through December, 1999. He will replace Dr. Bill Appleton of the ORNL. The principal function of the Councillor is in the representation of DMP interests within the larger APS context.

## **Elections to the Executive Committee**

The present officer list, with expiration dates is:

Past Chair - P.S. Percy, March 1996  
Chair - J.M. Gibson, March 1996  
Vice Chair - G.S. Cargill III, March 1996  
Vice Chair Elect - J.B. Roberto, March 1996  
Secretary/Treasurer - S.C. Moss, March 1996  
Councillor - Howard Birnbaum, 1999

Members at Large:

M.H. Grabow, March 1996  
J.R. Chelikowsky, March 1996  
G.W. Rubloff, March 1996  
A. Zangwill, March 1997  
L.E. Rehn, March 1997  
F. Hellman, March 1998  
P.M. Mooney, March 1998

According to our By-laws, at the March APS meeting, the Chairperson moves to Past Chair, the Vice Chair becomes Chair and the Vice 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 for this year are listed below followed by brief biographical summaries.

### **Vice-Chair Elect (Vote for one)**

[Jim Davenport](#) (Brookhaven National Laboratory)  
[John Weaver](#) (University of Minnesota)

### **Secretary/Treasurer (Vote for one)**

[Samuel D. Bader](#) (Argonne National Laboratory)  
[Bruce Harmon](#) (Iowa State University)

**Member-at-Large (Vote for three)**

[Shirley Chiang](#) (UC Davis)  
[Murray Daw](#) (Clemson University)  
[Robert Laibowitz](#) (IBM, T. J. Watson Research Division)  
[Karl Ludwig](#) (Boston University)  
[David Price](#) (Argonne National Laboratory)  
[Brian Tonner](#) (University of Wisconsin-Milwaukee)

Ballots must be received by S.C. Moss no later than Friday, March 8, 1996. Please vote and return your ballot promptly either by mail or by FAX: (713) 743-3589. Be sure to include your name and signature.

## **Biographical Summaries**

### **Vice Chair Elect**

#### **James W. Davenport**

James Davenport chairs the Department of Applied Science at Brookhaven National Laboratory. He holds degrees in Electrical Engineering from Brown and Princeton and received his Ph.D. in Physics from the University of Pennsylvania in 1976.

He worked at RCA Laboratories and spent one year at Chalmers University of Technology, Goteborg, Sweden before coming to Brookhaven in 1978. He was a member of the Condensed Matter Theory Group from 1978-1994, Group Leader from 1986-1994, Associate Chair of the Physics department from 1993-1994, and has been Chair of Applied Science since 1994. He is a Fellow of the APS and he served on the Executive Committee of the Division of Materials Physics from 1991-1994, the Executive Committee of the Surface Science Division of the American Vacuum Society from 1989-1991, and a board member of the Physical Electronics Conference from 1983-1988. He is also a member of the AAAS and American Chemical Society.

His research interests include the electronic structure of surfaces, adsorbates, metals, alloys, and oxides. In recent years he has concentrated on first principles calculations of high temperature structural materials (aluminides), and polytetrahedral order in aluminum-magnesium alloys.

*Statement: Issues, with which we must deal, include the plight of young people in physics, the collapse of industrial research in the U.S. and the need for physicists to move into new areas such as ceramics, solid state synthesis, and biomaterials.*

*Physicists have much to offer in these areas and DMP can help by conveying the value of basic research to the industrial community and the excitement of applied research to the physics community.*

## **John H. Weaver**

John H. Weaver is Professor of Materials Science at the University of Minnesota. He completed his Ph.D. in solid state physics at Iowa State University/Ames Laboratory USDOE in 1972. After postdoctoral experience in far infrared spectroscopy, he joined the Synchrotron Radiation Center at the University of Wisconsin-Madison. In 1982, he moved to the University of Minnesota, serving as Director of Graduate studies in his department from 1983 until 1992. His research activities have focused on the physics and chemistry of surfaces and interfaces, as well as fullerenes and related nanostructures. He shares a synchrotron radiation beamline at the Wisconsin Synchrotron Radiation Center.

Weaver is author of ~415 refereed papers, including 16 chapters and monographs on valence state photoemission, metal/semiconductor interfaces, high temperature superconductors, and fullerenes, and feature articles in *Scientific American*, *Physics Today*, and *Science*. He is Head of the Electronic Materials Group at Minnesota, is a Fellow of the American Physical Society, has had appointments with the Ames Laboratory and Argonne National Laboratory, and has been a visiting professor at the University of Brasilia. In 1994, he was University Professor at Tohoku University (Institute for Materials Research) and he received an Alexander von Humboldt Senior Research Award to work at the Fritz-Haber-Institute in Berlin. In 1995, he was awarded the Royal Society Kan Tong Po Professorship at the University of Hong Kong.

Weaver has been active with several scientific societies, in addition to serving on numerous NSF and DOE panels. Within the American Vacuum Society, he has served on the executive committees for the Electronic Materials and Processing Division and the Surface Science Division [chair of the Surface Science program committee (1988) and Division (1989)]. He served on the AVS Board of Directors (1990-91) and was Program Chair for the 1992 National Symposium. During 1995, he was President of the AVS. Within the American Physical Society, he co-organized the March Meeting postdeadline fullerene session in 1991. Within the Materials Research Society, he has co-organized symposia (1988, 1993) and chairs the MRS Medal Award Committee.

Weaver served on the Steering Committee for the Advanced Photon Source and co-chaired the first Users Meeting. He has served on Editorial Boards for the *Journal of Vacuum Science and Technology*, *Journal of Materials Research*, *Chemistry of Materials*, *Journal of Electron Spectroscopy and Related Phenomena*, *Surface Science Letters*, *Fullerene Science & Technology*, and *Chemistry and Physics of Surfaces and Interfaces*.

He has been a Principal Editor of the Journal of Materials Research and an Associate Editor for Surface Science Spectra and Nanostructured Materials.

*Statement: The leadership of DMP has two primary functions. First, it must assure that the scientific needs of the members of the Division are well served. It does this very well through meetings, symposia, and other communications. Second, it must represent the members to those outside the Division, notably the federal science establishment. Such representation has been increased in the last few years, and every effort must be made to continue to do so during the turbulent times ahead.*

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## **Secretary/Treasurer**

### **Samuel D. Bader**

Samuel D. Bader is a senior physicist and group leader of the magnetic films group in the Materials Science Division at Argonne National Laboratory. He received his B.S. (1967) and Ph.D. (1974) from the University of California at Berkeley, where he worked on f-electron superconductivity and magnetism. He then joined Argonne's superconductivity group as a post-doc, and in 1977 became a staff member in the area of surface science and magnetism. Bader is a participant in the DOE Center for Synthesis and Processing, and in an NSLS undulator beamline team, and has participated in NSF and ONR sponsored materials research initiatives. He serves on the program committee of the Conference on Magnetism and Magnetic Materials, and is a former chair of the publications committee of the American Vacuum Society. He also served on the American Institute of Physics publishing policy committee. Bader is a Fellow of the American Physical Society, and held a member-at-large post in the APS Division of Materials Physics (1992-95). In 1992 he was co-recipient of the Department of Energy \_ Basic Energy Sciences Award for Outstanding Achievement in Solid State Physics for work on coupled magnetic layers. In 1994 he received the University of Chicago Award for Distinguished Performance at Argonne. He is an advisory editor of the Journal of Magnetism and Magnetic Materials and an associate editor of Applied Physics Letters.

### **Bruce N. Harmon**

Bruce Harmon is currently deputy director of the Ames Laboratory, program director for the condensed matter physics division, and Distinguished Professor of Physics at Iowa State University. He received his B.S. in Physics from IIT, and his Ph.D. in Physics from Northwestern University in 1973 and is a Fellow of the American Physical Society since 1987 and associate editor of the Journal of Phase Equilibria since 1995. He has spent research sabbaticals at Riso, Denmark; Karlsruhe, Germany; and ESRF, Grenoble, France. Research interests include magnetism, lattice dynamics, martensitic phase transformations, superconductivity, electronic structure, and computational materials science. He has published over 160 papers and given over 81 invited talks in 16 countries.

He has organized conferences on magneto-optics, condensed matter theory and xrays, electronic structure, and martensitic transformations. He has served on the NRC committee for materials science, on several NSF review panels, and on review panels for other laboratories.

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## **Member-at-Large**

### **Shirley Chiang**

Shirley Chiang is a Professor of Physics at the University of California at Davis, 1994-present. Education: A.B. (1976) in physics, Harvard University; M.S. (1978) and Ph.D. (1983) in physics, University of California, Berkeley. Professional Experience: Research Staff Member, IBM Almaden Research Center, San Jose, CA, 1983-1994. Research Interests: Ultrahigh vacuum scanning tunneling microscopy (STM) and atomic force microscopy (AFM) for atomic resolution imaging of small molecules on metals, structural studies of heteroepitaxial metal-on-metal epitaxial systems, and fabrication of small structures on surfaces. Low energy electron microscopy (LEEM) for studying thin magnetic films. She was elected Fellow, American Physical Society in 1994 and her other activities include: Vice-Chair, Nanometer Science and Technology Division (NSTD), American Vacuum Society (AVS) (1995-96); Program committee for NSTD of AVS (1995); Organized DCP session of APS March meeting, 1995; Executive committee of Surface Science Division of AVS (1992-93); Organizing Committee for the National Academy of Sciences Third and Fourth Annual Symposia on Frontiers of Science (1991-92); International Advisory committee for the Fourth International Conference on Structure of Surface (1991-93).

### **Murray S. Daw**

Murray Daw obtained his Ph.D. in theoretical solid state physics from CalTech in 1981, where he did his thesis on vacancies in semiconductors. After joining the materials physics group at Sandia National Labs in California, he began work on the theory on mechanical properties of metals, with special emphasis on the applications of molecular dynamics to materials problems. He was promoted to Distinguished Member of Technical Staff in 1990, and was the lead investigator of the materials theory group. In 1994, he moved to his present position in the Physics Department at Clemson. His current focus is on dynamics of dislocations in intermetallics, from atomic scale processes to macroscopic dynamics, as well as the structure of glasses. Professor Daw has helped to organize several focused sessions at APS and MRS meetings. His career has helped him to appreciate the role of pure physics in areas with real potential applications. The move to a university has brought a new appreciation of the importance of physics education, both for the specialist and for the general public.

### **Robert B. Laibowitz**

Robert B. Laibowitz is a Research Staff Member at the IBM Research Center in Yorktown Heights, NY. He did his undergraduate work at Columbia College and Columbia University and received a Ph.D. in Applied Physics from Cornell University in 1967. In the mid 1970's he was a Visiting Scientist at the IBM Research Lab in Zurich, Switzerland. He is a Fellow of the APS and a Senior Member of the IEEE. His research and development interests encompass a broad range of materials related phenomena. His early work concerned the mechanical, electrical, and optical properties of silver and alkali halides. He has also devoted considerable effort into studies related to mesoscopic phenomena in ultra-small structures and the fractal aspects of percolating systems. He has worked extensively on superconducting phenomena in both low and high T<sub>c</sub> materials. His work in the perovskite, high T<sub>c</sub> materials resulted in the earliest high T<sub>c</sub> films and he is now focusing on developing high quality thin films and multilayers of the high T<sub>c</sub> materials and bringing the processing and materials science of these materials to a level suitable for applications. Presently his work is mainly concerned with semiconductors and, in particular, with developing insulating perovskite materials in thin film form for use as dielectrics in integrated circuits such as DRAMs. He has published extensively, given many invited talks, and organized symposia including focused sessions for the DMP on both high T<sub>c</sub> and high dielectric constant materials. He is also active in community affairs and is in his third, three year term as a member of the Board of Education in Montrose, NY where he has served on many committees. His present, most active assignment is to develop a K12 technology program for the district and to communicate the benefits of science and technology to the public.

## **Karl F. Ludwig**

Karl F. Ludwig is an associate professor of Physics at Boston University. He received his B.A. in Physics (1980) from Cornell University and his Ph.D. in Applied Physics (1986) from Stanford University. There he used the synchrotron-based technique of anomalous x-ray scattering to examine atomic arrangements in liquids. After graduating, Ludwig took a postdoctoral position in the Physical Sciences Department at IBM's T. J. Watson Research Center, using time-resolved x-ray scattering to investigate the kinetics of ordering and spinodal decomposition in metallic alloys. This continued to be the primary focus of his research after moving to Boston University in 1988. However, his group has also been actively studying supercooled liquids, kinetics in polymer systems, the structure of GaN and YB<sub>2</sub>Cu<sub>3</sub>O<sub>7-x</sub> thin films, and the kinetics of TiSi<sub>2</sub> and CoSi<sub>2</sub> formation in submicron-wide lines. Ludwig is a co-organizer of the March 1996 DMP focused session on Phase Transformations. For the past three years he has served as an Associate Chairman and Director of Undergraduate Studies for the Physics Department of Boston University.

## **David Long Price**

David Long Price is a Senior Physicist in the Materials Science Division at Argonne. His scientific career has been devoted to the study of the structure and dynamics of materials with neutron scattering techniques. He has served in several management positions, was

Director of the Solid State Science Division at Argonne from 1974 to 1979 and the first Director of the Intense Pulsed Neutron Source from 1979 to 1981. He has served on numerous national and international committees relating to neutron sources and research, and was vice-chairman of the Basic Energy Sciences Advisory Committee Panel on Neutron Sources ("Kohn Panel") in 1993. His current scientific activities focus on the relations between structure, dynamics and properties of disordered materials, and he is conscious of the need to obtain a balance between major national (especially neutron and x-ray) facilities and laboratory-scale investigations of materials properties. He is an Associate Editor of Applied Physics Letters and Adjunct Professor of Physics at the University of Illinois at Chicago.

## **Brian Tonner**

Brian Tonner is a Professor of Physics at the University of Wisconsin-Milwaukee. He received a B.Sc. with honors in Physics from Brown University in 1976, and a Ph.D. in Physics from the University of Pennsylvania in 1982, for research in the field of surface science. He served for four years as the Associate Director for Research of the Synchrotron Radiation Center, one of the national facilities funded by the Division of Materials Research of the National Science Foundation. His current research interests are in surface magnetism, ultrathin film growth, surface crystallography, electron spectroscopy, and x-ray microscopy. Through recent collaborations in x-ray microscopy, he has become involved in a wide range of materials physics projects, including the study of cell attachment to substrates, metal-matrix composites, and polymer interfaces. His research has benefited from partnerships with scientists in industry and national laboratories. He has been active in several scientific societies, including a three year term on the executive committee of the AVS Surface Science division, and a year as program chair in surface science. He is a co-chair of the Topical Conference on Magnetism of Surfaces, Interfaces and Nanostructures. He is particularly interested in fostering the timeliness and variety of the materials physics topics offered at the annual meeting.