News of MRS Members/Materials Researchers

Kristin A. Bennett, a nationally recognized expert in materials science and a leader in nanotechnology, has joined The Implementation Group, a consulting firm that helps clients win and successfully carry out Federal grants and contracts.

Harry Bhadeshia has been named the inaugural Tata Steel Professor of Metallurgy at the University of Cambridge, United Kingdom, in recognition of his distinguished work on the physical metallurgy of steels.

Roald Hoffmann, Nobel laureate and Frank H.T. Rhodes Professor Emeritus of Humane Letters and professor of chemistry at Cornell University, has been selected to receive the **National Science Board 2009 Public Service Award** for his extensive, broad-reaching and diverse contributions to increasing public understanding of science and, more specifically, fostering appreciation of the relevance of chemistry to culture.

Christopher K. Ober, Cornell University's Francis Bard Professor of Materials Science and Engineering, has been named to serve as interim dean of the College of Engineering, beginning January 1, 2009.

Mildred S. Dresselhaus to Receive 2009 Vannevar Bush Award

Mildred S. Dresselhaus, 2009 Vannevar Bush Awardee (Credit: Michael Duncan, MIT)

Once dubbed the "Queen of Carbon Science" as one of the country's foremost experts in the multifaceted field of carbon science, longtime Massachusetts Institute of Technology (MIT) Institute Professor Mildred S. Dresselhaus has been named the National Science Board's 2009 Vannevar Bush Awardee.

"Every morning before 6 a.m. for the past 40 years when I arrive at work, I pass a massive photograph of Vannevar Bush at his milling machine," said Dresselhaus, whose office is in the Vannevar Bush building at MIT. "When I see his smiling face, I get charged up for my day's adventure with the endless frontier of science and for my work with students and collaborators worldwide who will be enjoying the excitement of my adventures with me."

Each year, the National Science Board (NSB), the policy-making body for the National Science Foundation (NSF), presents the Vannevar Bush Award to an individual who, through public service activities in science and technology, has made an outstanding "contribution toward the welfare of mankind and the nation."

The NSB will honor Dresselhaus for her leadership through public service in science and engineering, her perseverance and advocacy in increasing opportunities for women in science, and for her extraordinary contributions in the field of condensed-matter physics and nanoscience.

Over the course of her career, Dresselhaus's research has covered a wide range of topics in condensed matter and materials physics. She is best known for her work on carbon science and carbon nanostructures, and is also credited for being one of the researchers who caused the resurgence of the thermoelectrics research field 15 years ago by moving the field in the direction of nanostructures.

Her investigations into superconductivity, the electronic properties of carbon, thermoelectricity and the new physics at the nanometer scale have led to numerous scientific discoveries. She served as president of the American Physical Society, president of the American Association for the Advancement of Science, and treasurer of the National Academy of Science, the Academy's first woman officer. In 1970, she co-founded the Women's Forum at MIT. In addition, she has been the doctorate supervisor of about 75 graduate students, and has had a special interest throughout her career in mentoring young people and in expanding the opportunities for women in science and engineering.

NSB members agreed that Dresselhaus is especially deserving of the Vannevar Bush Award for her outstanding contributions to both her scientific field and to the scientific community at large. She has received the National Medal of Science; the Buckley Prize for Condensed Matter Physics from the American Physical Society; the L'Oreal-UNESCO North American Laureate for Women in Science; the Founders Medal of the IEEE; the Heinz Award for Technology, the Economy, and Employment; the Oersted Medal for Physics Education from the American Association for Physics Teachers; and 25 honorary doctorates worldwide.

"We feel that the Vannevar Bush Award is an excellent and appropriate addition to this list," said NSB Chair, Steven Beering.

Dresselhaus received her undergraduate education at Hunter College. After a year at Cambridge and another at Harvard, she completed her doctorate at the University of Chicago. Her thesis in 1958 explored the subject of microwave properties of superconductors in a magnetic field that could not be explained by the BCS fundamental theory of superconductivity, which came in 1957, many years after the discovery of superconductivity (1911).

Following her doctoral studies, Dresselhaus spent two years at Cornell as an NSF postdoctoral fellow, and then seven years as a staff member of the MIT Lincoln Laboratory in the Solid State Physics Division. She joined the MIT faculty in the Department of Electrical Engineering and Computer Science in 1967, and the Department of Physics in 1983, and in 1985 was named Institute Professor, the highest honor the university bestows on its faculty. She served as the director of the Office of Science at the U.S. Department of Energy from 2000 to 2001, and as the chair of the Governing Board of the American Institute of Physics from 2003 to 2008.

The **International Centre for Diffraction Data® (ICDD®)** Ludo Frevel Crystallography Scholarship Committee has selected the following recipients for the **2009 Scholarship Program**:

Tobias Beck (Goettingen University, Germany) for "Learning From Metal Sites in Proteins: Crystallography Studies on Biomimetics";

Olaf Borkiewicz (Miami University, USA) for "The Role of Precursor Formation on Actinide and Heavy Metals Sequestration and Retention in Low Temperature Growth of Apatite";

Dejan-Krešimir Bučar (University of

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Iowa, USA) for "Metallosupramolecular Capsules with Nanometer-Sized Cavities Derived From a Template-Directed [2+2] Photodimerization in the Solid State";

Amado Guloy (Northwestern University, USA) for "Low Dimensional Charge Density Wave (CDW) Materials for Thermoelectric Applications";

E-Wen Huang (University of Tennessee, Knoxville, USA) for "Mechanical Behavior Studies of a Nano-Particle Strengthened Nickel-Based Alloy Using *In situ* Neutron Diffraction and Small-angle Neutron Scattering Methods";

Andrey Ivankin (Illinois Institute of Technology, USA) for "Determining the Role of Cholesterol in Cell Membrane Physicochemical Properties: An Insight from Synchrotron X-ray Scattering";

Hui Li (Chinese Academy of Sciences, China) for "Study of GaN and AlN Based Diluted Magnetic Semiconductor and Superconductor";

Christian Long (University of Maryland, USA) for "Rapid Identification of Structural Phases in Combinatorial Thin-Film Libraries Using X-Ray Diffraction and Non-Negative Matrix Factorization";

Mary Louie (California Institute of Technology, Pasadena, USA) for "Crystallographic Compatibility and Phase Transformation Hysteresis in Solid Acid Compounds"; and

Anna-Gay Nelson (Auburn University, USA) for "Understanding the Structural Chemistry of Actinide Phosphonates: Precursors to Advanced Waste Forms for Storing Radionuclides."

The **National Research Foundation (NRF)** in Singapore has selected the following recipients for the **2009 NRF Research Fellowship**:

Chi Yonggui Robin (University of California, Berkeley, USA), to develop novel chemical strategies for the controlled modification of proteins, a major need in modern biomedical research and drug discovery;

Chen Xiaodong (Nanyang Technological University, Singapore), to design and fabricate novel nanostructure-biomaterials hybrid systems, which will be incorporated into electronic circuits to study the electronic signal transport through the biological matrix;

Hilmi Volkan Demir (Bilkent University, Turkey), to develop and demonstrate nanostructured white light-emitting diodes integrated with nanocrystal quantum dot emitters;

Naohiko Yoshikai (University of Tokyo, Japan), to research rational design and development of a highly efficient and selective catalytic process that features a synergistic effect of transition metal and main group metal centers through the interplay of computation and experiments;

Tang Chuanbing (University of California, Santa Barbara, USA), to work on thin film nanoengineering of functional polymers toward applications for photovoltaics and nanoelectronics; and

Qihua Xiong (Harvard University, USA), to extend his research into the emergent field of nanobiotechnology.

The **U.S. National Academy of Engineering (NAE)** has elected the following members and foreign associates into the academy:

Kristi S. Anseth (University of Colorado, Boulder) for pioneering the rational design of biomaterials for tissue engineering, drug delivery, and biosensing applications;

Yet-Ming Chiang (Massachusetts Institute of Technology) for contributions to the understanding of new energy storage materials and their commercialization;

Arthur J. Coury (Coury Consulting, Boston) for contributions to the design and commercialization of pacemakers, biodegradable biomaterials, and implantable devices;

Brian L. Eyre (University of Oxford, UK) for the understanding of neutron irradiation-induced damage in materials, and for developing technologies and policies for the U.K. nuclear industry;

Andrew Jackson (ExxonMobil Research and Engineering Co., Annandale) for contributions to tribology and research in elastohydrodynamic lubrication, fatigue, machine efficiency, automotive emissions, and synthetic lubricants;

Kanti Jain (University of Illinois, Urbana-Champaign) for contributions to the development of high-resolution, deep-ultraviolet excimer lithography for microelectronic fabrication;

Mark S. Lundstrom (Purdue University) for leadership in microelectronics and nanoelectronics through research, innovative education, and unique applications of cyberinfrastructure;

Robert D. Miller (IBM Almaden Research Center, San Jose) for inventions of polymeric materials for lithography, porous dielectrics, and processes in microelectronics;

Chad Alexander Mirkin (Northwestern University) for development of DNA programmable inorganic materials and dip pen nanolithography;

Umesh K. Mishra (University of California, Santa Barbara) for contributions to development of gallium-nitride electronics and other high-speed, high-power semiconductor electronic devices;

Edward I. Moses (Lawrence Livermore National Laboratory) for outstanding scientific and engineering leadership of the National Ignition Facility;

Charles Noelke (DuPont, Fayetteville) for development and commercialization of green chemistry and processes, especially for CFC [common chlorofluorocarbons] alternatives and fluoropolymers;

Matthew O'Donnell (University of Washington, Seattle) for contributions to biomedical ultrasonics and real-time ultrasound imaging technologies;

George A. Olah (University of Southern California, Los Angeles) for contributions to the development of chemical technologies for environmentally favored and carbon-neutral energy conversion;

James F. Pankow (Portland State University) for contributions to understanding the chemical thermodynamics of organic particulate matter in urban air and the global atmosphere;

Stuart S.P. Parkin (IBM Almaden Research Center, San Jose) for contributions to development of spin-engineered magnetic heterostructures for magnetic sensors and memory devices;

Howard A. Stone (Harvard University) for the development of fundamental concepts and novel applications in microfluidics and for improving the understanding of small-scale, viscous-flow phenomena;

Richard Marker Swanson (SunPower Corp., San Jose) for invention of the point-contact solar cell for increased efficiency of commercial solar energy;

Edwin L. Thomas (Massachusetts Institute of Technology) for development of novel photonic materials and determination of the morphology of block copolymers; and

Mark W. Verbrugge (General Motors Research & Development and Strategic Planning, Warren) for the development and application of electroanalytical methods for advanced batteries, supercapacitors, and fuel cells for hybrid and electric vehicles. □

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