

# **A PARTIAL LIST OF RECENT HONORS AND AWARDS, WITH CITATIONS, OF INVESTIGATORS PRESENTLY FUNDED BY MATERIALS AND ENGINEERING PHYSICS PROGRAM SINCE 1998**

## **Alexander von Humboldt Foundation**

### **Awards**

Prof. Kit H. Bowen, Jr. Johns Hopkins University, was awarded the Senior Humboldt Research Award, 1999, in recognition of distinguished accomplishments in chemical physics and cluster research.

Prof. Hayden Chen, University of Illinois, was awarded the Senior Humboldt Research Award, 2000, in recognition of his contribution to x-ray diffraction study of materials.

Prof. Joachim Heberlein, University of Minnesota, was awarded the Alexander von Humboldt Research Prize, 2001, in recognition of his being a pioneer in the application of thermal plasma processing to chemical vapor deposition, in particular of new hard coatings.

Dr. Gary S. Grest, Sandia National Laboratories, was awarded the Humboldt Research Award for Senior U.S. Scientist, 2003, in recognition of his past research and achievements in polymer science.

Dr. Ricardo Schwarz, Los Alamos National Laboratory, received the 2003 Humboldt Research Award for Senior U.S. Scientists in recognition of his accomplishments in materials science research and teaching.

## **American Academy of Arts and Sciences**

### **Elected Fellows**

Prof. William D. Nix, Stanford University, for his work leading to the understanding of the mechanical behavior of materials, his role in helping to develop nano-indentation into a broadly useful technique for the study of thin film mechanical properties, and his role in educating a large number of Ph.D. students, many of whom now hold faculty positions at major universities, 2002.

Prof. Morris E. Fine, Northwestern University, for initiating the first materials science department in the United States at Northwestern University in the 1960's, 2003.

Prof. Julio Ottino, Northwestern University, for work involved with the mixing and segregation of granular solids, the competition between mixing processes and coalescence and breakup as well as fragmentation and dispersion of granular solids in viscous flows, and the fluid mechanics of mixing and dispersion processes, 2003.

## **American Association for the Advancement of Science**

### **Elected Fellows**

Dr. Tom Picraux, Sandia National Laboratories- New Mexico/ currently at Arizona State University, for his national leadership in materials science and for pioneering contributions to ion beam analysis and modification of materials, 2000.

Prof. Thomas W. Eagar, Massachusetts Institute of Technology, for advancements in welding and joining of metals, ceramics, and electronic materials, and alternate manufacturing processes and for leadership in curriculum review and teaching, 2002.

Prof. Arunava Majumdar, University of California, Berkeley, for major contributions to the field of nanoscale science and engineering, including pioneering research in important areas ranging from heat transfer and tribology to emerging fields of nanoengineering and microelectromechanical systems, 2002.

Dr. Jeffrey Wadsworth, formerly from Lawrence Livermore National Laboratory, and soon to be at Oak Ridge National Laboratory, for distinguished contributions in developing advanced materials and superplasticity and in determining the origins and history of Damascus and other steels and for broad scientific leadership supporting national security, 2002.

Prof. Victor E. Henrich, Yale University, for research advances in the chemistry and physics of surfaces, particularly in complex oxide materials, and for outstanding service to students and the profession, 2002.

Prof. Chris J. Jacobsen, State University of New York, for seminal contributions to X-ray microscopy and its application to biological materials, 2002.

Dr. Jack Houston, Sandia National Laboratories, for his research advances, particularly the development and exploitation of Interfacial Force Microscopy, leading to fundamental understanding of the interaction of solid surfaces with the environment, 2003.

## **American Ceramic Society**

### **Elected Fellows**

Prof. Linn W. Hobbs, Massachusetts Institute of Technology, 1999. Professor Hobbs is the author of more than 200 papers on radiation effects in non-metals, oxidation of metals, electron microscopy, biomaterials and the structure of glass, and holds one patent. He is the author or editor of six books.

Prof. Himanshu Jain, Materials Science and Engineering at Lehigh University, 1999. Professor Jain is the author or co-author of more than 120 research papers, editor of four books, and holds two patents.

Dr. William J. Weber, Pacific Northwest National Laboratory, 2000. Dr. Weber's major research achievements are in the areas of interaction of radiation with solids, defects and defect processes in solids, solid-state radiation effects, ion-beam modification of materials, and electronic and ionic transport.

Prof. Alastair Cormack, Alfred University, 2001. Prof. Cormack's major research achievements are in the areas of atomic scale physics and chemistry of materials, particularly ceramics and glass. He uses computers to model the way in which atoms are arranged in solids, and how that arrangement of atoms affects their properties.

Dr. Kathleen B. Alexander, Los Alamos National Laboratory, 2001. Dr. Alexander's major research achievements are in the area application of analytical electron microscopy in the study of oxidation of metals and intermetallic compounds.

Prof. Alexandra Navrotsky, University of California, Davis, 2001. Prof. Navrotsky's research interests have centered about relating microscopic features of structure and bonding to macroscopic thermodynamic behavior in minerals, ceramics, and other complex materials. She has made significant contributions to mineral thermodynamics; mantle mineralogy and high pressure phase transitions, silicate melt and glass thermodynamics, order-disorder in spinels, framework silicates and other oxides, ceramic processing, oxide superconductors, nitrides, zeolites nanomaterials and the general problem of structure-energy-property systematics.

Prof. Wai-Yim Ching, University of Missouri, Kansas-City, 2002. Prof. Ching, a theoretical physicist, is the author or co-author of more than 280 scientific papers, and has successfully applied the ab-initio self-consistent orthogonalized linear combination of atomic orbitals method based on density functional theory to calculate the electronic structures of complex ceramic materials.

### **Awards**

Prof. Andreas M. Glaeser, Lawrence Berkeley National Laboratory, was honored as a recipient of the Richard M. Fulrath Award, 1999. He was recognized as an "Outstanding academic and industrial ceramic engineer/scientist...45 years of age or younger at the time of the presentation." Professor Glaeser is the author or coauthor of more than 100 publications, and holds three patents.

Mr. Sam Canzone, formerly at Sandia National Laboratories- New Mexico, was awarded the Norbert J. Kreidl Award for Young Scholars for his work on the "Development of Phosphate Glass Microspheres for Medical Applications, 2000.

Prof. C. Barry Carter, University of Minnesota, and his student received the Roland B. Snow Award, 2000, for the best of show in the annual Ceramographic Competition.

Prof. Yet-Ming Chiang, Massachusetts Institute of Technology, was the recipient of the Richard Fulrath Award, 2000, and was a co-recipient of the Ross Coffin Purdy Award, 2001, for the most valuable contribution to the ceramic technical literature. Prof. Chiang's major research achievements are in the areas of design, synthesis, and characterization of advanced inorganic materials and related device technologies,

including new electrode materials and electrode structures for lithium ion batteries, and the compositional development, growth and characterization of high strain piezoelectric crystals and fibers for electromechanical actuation.

Prof. Nigel D. Browning, University of California, Davis and Lawrence Berkeley National Laboratory, was awarded with the 2003 Robert L. Coble Award for Young Scholars for his exceptional work on the correlation between atomic scale defect structure and electronic, chemical, and mechanical properties of ceramics.

Prof. Dawn A. Bonnell, University of Pennsylvania, was awarded the Ross Coffin Purdy Award for 2003 for her pioneering work on scanning impedance microscopy.

## **American Chemical Society**

### **Awards**

Dr. George A. Samara, Sandia National Laboratories- New Mexico, was awarded the Earle B. Barnes Award, 2000, for his visionary leadership in managing research in the national interest at the frontiers of materials science.

Dr. Timothy Boyle, Sandia National Laboratories – New Mexico, was awarded the John Dustin Clark Medal, 2003, from the Central New Mexico Section of the American Chemical Society for his significant contributions to chemistry in the state through technical activities, leadership, and teaching.

Prof. Ralph Nuzzo, University of Illinois, Urbana-Champaign, was awarded the 2003 Arthur W. Adamson Award for his seminal work demonstrating the self-assembly of stable, highly-organized, organic monolayers that has led to entire new areas of surface chemistry with extensions into physics, biology, and materials, and with numerous applications ranging from sensors to molecular electronics. (considered on Bill's side?)

## **American Institute of Chemical Engineers**

### **Award**

Prof. Julio M. Ottino, Northwestern University, was awarded the William H. Walker Award, 2001, for excellence in contributions to the Chemical Engineering Literature. His major research achievements are in the areas of modeling of complex systems; fluid mechanics of mixing; chaotic processes; computational studies of three-phase dispersions; granular materials; mixing of polymers, dispersion of solids in viscous fluids, fragmentation and erosion of solids.

## **American Physical Society**

### **Elected Fellows**

Prof. Joseph Greene, University of Illinois, Urbana-Champaign, 1998, for original contributions to the experimental development, modeling, and understanding of Si, Ge, and Si(1-x)Ge(x) atomic-layer epitaxy and gas-source molecular-beam epitaxy.

Dr. Norman C. Bartelt, Sandia National Laboratories- California, 1999, for his pioneering work on the theory of thermal fluctuations and dynamic surface structure.

Prof. Puru Jena, Virginia Commonwealth University, 1999, for his pioneering contributions to the understanding of electronic structure, equilibrium geometries, stability, electronic & magnetic properties of Atomic Clusters.

Dr. Su-Huai Wei, National Renewable Energy Laboratory, 1999, for contributions to the understanding of electronic structures and stabilities of compounds, alloys, interfaces, superlattices and impurities using first-principles calculations and for development of the methods for such calculations.

Prof. Murray Daw, formerly at Sandia National Laboratories- California, Clemson University, 2000, for his original contributions to the atomic scale modeling of the properties of solids, surface, interfaces and defects.

Prof. Maria Tamargo, City College of New York, 2000, for significant original contributions to the development and understanding of the growth and properties of novel semiconductor materials and heterostructures, in particular, in the field of wide bandgap II-VI compounds.

Prof. Robert S. Averback, University of Illinois, Urbana-Champaign, 2001, for his research on the fundamental interactions between energetic ions and solids and the kinetic response of materials far from equilibrium.

Dr. Nghi Quoc Lam, Argonne National Laboratory, 2001, for dedicated service to the community as Editor of Applied Physics Letters, whereby he improved the journal as a vital communications instrument via higher standards of quality and timeliness.

Prof. Laurence D. Marks, Northwestern University, 2001, for contributions to quantitative imaging and diffraction methods for determining the atomic structure of surfaces and bulk materials.

Prof. Hermann Riecke, Northwestern University, 2001, for pioneering work on pattern formation in nonlinear non-equilibrium systems, especially in Taylor-vortex flow, binary-mixture convection, and electro-convection in nematics.

Dr. Frances M. Ross, formerly at Lawrence Berkeley Laboratory, IBM T.J. Watson Research Laboratory, 2001, for her pioneering contributions to in-situ studies of materials processes in the electron microscope.

Dr. Masaki Suenaga, Brookhaven National Laboratory, 2001, for pioneering studies of the properties that control the critical current density of both low and high temperature superconductors.

Dr. Boyd W. Veal, 2001, Argonne National Laboratory, for significant contributions to photoemission studies of transition and actinide metal compounds and for seminal studies and innovations within the YBCO family of cuprate high-temperature superconductors.

Dr. Eicke R. Weber, Lawrence Berkeley National Laboratory, 2001, for his pioneering studies of defects in semiconductors, in particular his research on the microscopic properties and gettering behavior of transition metal impurities.

Dr. Shengbai Zhang, National Renewable Energy Laboratory, 2001, for contributions to the understanding of semiconductor defects, impurities, surfaces, interfaces, and high-pressure phases using first-principles calculations.

Dr. J. Thomas Dickinson, Washington State University, 2002, for his pioneering and innovative work in basic bond breaking mechanisms, and the forces on particles at solid surfaces during mechanical or radiative stimulation.

Dr. Karl A. Gschneidner, Iowa State University, 2002, for contribution to the scientific understanding and applications of rare earth elements, their alloys and compounds.

Prof. Karin Rabe, Rutgers University, 2002, for fundamental contributions to the development and application of theoretical and computational methods for the study of structural phase transitions in solids.

Dr. Thomas G. Thundat, Oak Ridge National Laboratory, 2002, for pioneering work in developing micromechanical sensor platform for bimolecular detection and the elucidation of the fundamental physical principles underlying the adsorption-induced forces.

Dr. Rodney A. McKee, Oak Ridge National Laboratory, 2003, for heteroepitaxy of crystalline oxides on semiconductors.

Prof. Darrell G. Schlom, Pennsylvania State University, 2003, for pioneering contribution to the science of crystalline multicomponent oxide thin films on semiconductors.

Prof. Bruce Warren Wessels, Northwestern University, 2003, for seminal contributions to understanding of defect structure and dopant behavior in epitaxial semiconductor and ferroelectric oxide thin films and heterostructures.

## Awards

Prof. Joseph Greene, University of Illinois, Urbana-Champaign, was awarded the David Adler Award for outstanding research and lecturing on the physics and chemistry of thin films, 1998.

Prof. Eugene E. Haller, Lawrence Berkeley National Laboratory, was awarded the McGroddy Prize for outstanding achievement in the science and application of new materials, 1999.

Prof. Howard Brenner, Massachusetts Institute of Technology was awarded the APS Fluid Dynamics Prize for his outstanding and sustained research in physical-chemical hydrodynamics, the quality of his monographs and textbooks, and his long-standing service to the fluid mechanics community, 2002.

Prof. Andrea Prosperetti, Johns Hopkins University, was awarded the 2002 Otto LaPorte Award for breakthroughs in the theory of multiphase flows, the dynamics of bubble oscillations, underwater sound, and free-surface flows and for providing elegant explanations of paradoxical phenomena in these fields.

## **ASM International (American Society for Materials)**

### **Elected Fellows**

Prof. Mike Kassner, Oregon State University, for contributions to development and application of aluminum, zirconium and titanium alloys and for leadership in materials science in universities and government, 1998.

Dr. Wendy Cieslak, Sandia National Laboratories- New Mexico, for achievement in the research, development and application of materials for long-life, high-reliability lithium batteries, 1998.

Prof. David Srolovitz, Princeton University, for contributions to computer modeling and simulation of microstructural evolution phenomena in materials, 1998.

Prof. Mike Mills, Ohio State University, for contributions to structure and behavior of crystalline defects such as dislocations, grain boundaries and interfaces, and the relationship between defects and the mechanical, electrical and optical properties of materials, 1999.

Dr. Kathi Alexander, Los Alamos National Laboratory, for contribution to oxidation effect in metals and intermetallic compounds, 2000.

Dr. John Vitek, Oak Ridge National Laboratory, for contributions to a fundamental understanding of solidification behavior and phase stability in welds, 2000.

Dr. Charles W. Allen, Argonne National Laboratory, for contributions to micro-structural characterization of irradiation effects and for education on materials activities, 2000.

Dr. Elizabeth A. Holm, Sandia National Laboratories- New Mexico, for significant contributions in computational modeling of microstructural evolution in polycrystalline materials during processing and service, 2002.

Prof. Tresa M. Pollock, University of Michigan, for seminal contributions to the understanding of deformation behavior and solidification processes in nickel-based superalloys and intermetallics, and for outstanding contributions to the education of materials engineers, 2002.

Dr. John W. Elmer, Lawrence Livermore National Laboratory, 2003, for development and application of synchrotron-based, in-situ, spatially resolved X-ray diffraction techniques to permit quantitative understanding of phase transformation kinetics during fusion welding.

Dr. Gene E. Ice, Oak Ridge National Laboratory, 2003, for developing powerful new materials characterization methods that are used at synchrotron radiation facilities around the world, and that have led to new insights into materials phenomena.

Prof. Erland M. Schulson, Dartmouth College, 2003, for seminal contributions to the flow and fracture of ice and intermetallics.

### **Awards**

Mr. Todd A. Palmer, a Ph.D. student of Professor T. DebRoy at Penn State University/ currently at Lawrence Livermore National Laboratory, was awarded the 1999 ASM International Graduate Student Paper Contest for Best Research Paper in recognition of his paper entitled "A study of nitrogen dissolution into the weld metal during arc welding."

Prof. Gareth Thomas, Lawrence Berkeley National Laboratory, was awarded the 2001 Gold Medal from ASM International in recognition of an outstanding contribution to the materials community, industry or research. He was cited "for outstanding scientific research linking microstructure to properties and leading to a rational design approach for advanced materials as illustrated in his work on high performance steels, magnetic materials, and structural ceramics."

Prof. William D. Nix, Stanford University, was awarded the Albert Easton White Distinguished Teacher Award, 2002, for his long tenure as an inspirational teacher of undergraduates and graduate students, and for significant contributions to the experimental and theoretical aspects of high temperature creep behavior of crystalline solids.

Prof. Mark Asta, Northwestern University, was awarded the Materials Science Research Silver Medal, 2002, in recognition of "individual and collaborative work that has had a major impact on the science of materials."

Prof. Reinhold H. Dauskardt, Stanford University, was awarded the Silver Medal, 2003, in recognition of individual and collaborative work that has had a major impact on the science of materials.

## **American Society of Mechanical Engineers**

### **Award**

Prof. Subhendu Datta, University of Colorado, was awarded the Best Paper by the Non-Destructive Evaluation Division for a paper entitled "Ultrasonic Guided Waves in Thin Orthotropic Layers: Exact and Approximate Analysis," 2000.

## **American Vacuum Society**

### **Elected Fellows**

Dr. Bruce D. Kay, Pacific Northwest National Laboratory, in recognition of novel applications of molecular beam techniques to inelastic and reactive gas-surface scattering, 2000.

Dr. Charles H. F. Peden, Pacific Northwest National Laboratory, for contributions to the understanding of heterogeneous catalytic processes on transition metal and metal-oxide surfaces, 2000.

Dr. Ivan Petrov, University of Illinois, Urbana-Champaign, for his seminal contributions in determining the role of low-energy ion/surface interactions for controlling microstructure evolution during low temperature growth of transition-metal nitride layers, 2002.

Dr. Donald R. Baer, Pacific Northwest National Laboratory, for creative research and professional efforts that have led to more accurate applications of surface analysis methods to complex problems, including an understanding of how impurities and defects influence the stability and interfacial properties of metals, oxides and minerals, 2002.

Dr. Gregory J. Exarhos, Pacific Northwest National Laboratory, for fundamental studies of charge transport phenomena in dielectric films and the use of spectroscopic methods to relate resident structure and chemistry to film properties, 2003.

### **Awards**

Dr. Terry Michalske of Sandia National Laboratories- New Mexico, was awarded the Distinguished Lecturer in 1998. The distinguished lectureship was set up to serve the educational and scientific needs of the AVS Chapters.

Dr. Gregory A. Hebner, Sandia National Laboratories, was awarded the Plasma Science and Technology Prize for his innovative development of diagnostics and insightful fundamental studies of low temperature plasmas, and their successful application to the advancement of plasma technologies, 2003.

Prof. Charles H. Ahn, Yale University, received the Peter Mark Memorial Award in 2003, for pioneering work on epitaxial complex oxide thin film heterostructures.

Mr. Ernest A. Sammann, University of Illinois, Urbana-Champaign, received the George T. Hanyo Award in 2003 for his maintenance, optimization, and development of a suite of complex analytical instruments at peak performance for hundreds of researchers.

Mr. Guangjun (David) Xu and Dr. Ken Bratland, University of Illinois, Urbana-Champaign, received the Dorothy M. and Earl S. Hoffman Scholarship and Award for projects on Etching, Roughening, and Patterning of Silicon by Halogens, supervised by Prof. John Weaver, and Mechanisms and Reaction Paths for Surface Roughening and Epitaxial Breakdown During Molecular Beam Epitaxy: Fundamental Limits, supervised by Prof. Joe Greene.

## **American Welding Society**

### **Elected Fellows**

Dr. John M. Vitek, Oak Ridge National Laboratory, in recognition of his outstanding achievements in advancing the scientific understanding of welding and his professional contributions to the welding industry, 1998.

Prof. Tarasankar DebRoy, Penn State University, in recognition of significant contributions to the quantitative understanding of weld metal geometry, chemical composition, and structure; for exhibiting eagerness and enthusiasm for welding research, his willingness to help students both inside and outside classroom, and for his natural ability to encourage and motivate others to excel, 1999.

Dr. John W. Elmer, Lawrence Livermore National Laboratory, in recognition of his outstanding professional contributions to the welding industry and the many accomplishments of this distinguished career, 2000.

### **Awards**

Drs. Stan David and Suresh Babu, Oak Ridge National Laboratory, were awarded the Warren F. Savage Memorial Award, 1998, for their paper entitled "Weld Metal Microstructure Calculations from Fundamentals of Transport Phenomena in the Arc Welding of Low Alloy Steels," which was published in the Welding Journal.

Dr. Zhishang Yang, Pennsylvania State University, Prof. Tarasankar DebRoy, Pennsylvania State University, Dr. John W. Elmer, Lawrence Livermore National Laboratory, and Dr. Joe Wong, Lawrence Livermore National Laboratory were awarded the 2001 William Spraragen Award, for their paper entitled "Evolution of Titanium Arc Weldment Macro and Microstructures- Modeling and Real Time Mapping of Phases," which was published in the Welding Journal.

Drs. Stan David and Suresh Babu, Oak Ridge National Laboratory, were awarded the 2002 McKay-Helm Award for their paper entitled "Inclusion Formation in Self-Shielded Flux Cored Arc Welds," which was authored by M. A. Quintana (Lincoln Electric Company), J. McLane (Eveready Battery Company), S. S. Babu and S. A. David (ORNL).

Drs. Stan David and Suresh Babu, and Dr. Ed Kenik, Oak Ridge National Laboratory, were awarded the 2002 Warren F. Savage Memorial Award for their paper entitled "Effect of Thermal Cycling on Friction Stir Welds of 2195 Aluminum Alloy," which was authored by G. Oertelt (University of Leoben, Austria), S. S. Babu, S. A. David, and E. A. Kenik (ORNL).

Dr John W. Elmer and Alan T. Teruya of Lawrence Livermore National Laboratory were awarded the 2002 Davis Silver Medal Award for their paper entitled "An Enhanced Faraday Cup for the Rapid Determination of the Power Density Distribution in Electron Beams," which was published in the Welding Journal.

## **Benjamin Franklin Institute**

### **Award**

Prof. Alexandra Navrotsky, University of California, Davis, was awarded the 2002 Benjamin Franklin Medal in Earth Science for her accomplishments in crystal chemistry that have established, convincingly, the identity of materials at hundreds of kilometers of depth in the Earth that otherwise are inaccessible to direct observation.

## **Böhmische Physical Society**

### **Elected Fellow**

Dr. William J. Weber, Pacific Northwest National Laboratory for his original research contributions in the field of irradiation effects in ceramics, 2000.

### **E.O. Lawrence Award**

Dr. C. Jeffrey Brinker, Sandia National Laboratories- New Mexico / University of New Mexico, was awarded the E.O. Lawrence Award by the U.S. Department of Energy, 2002, for his innovations in sol-gel chemistry to create nanostructured materials that have applications to energy, manufacturing, defense, and medicine.

### **Institute of Physics, London**

#### **Award**

Dr. Stephen Pennycook of Oak Ridge National Laboratory was awarded the Thomas Young medal and prize, 2000, for his pioneering work in the development of atomic-resolution scanning transmission electron microscopy (STEM).

### **International Solar Energy Society**

#### **Award**

Prof. Roland Winston, University of Chicago, was awarded the Farrington Daniels Award, 2001, for his outstanding intellectual leadership in renewable energy. Professor Winston has been responsible for developing and applying the science of non-imaging optics to engineering systems such as flat panel light emitting displays, microwave telescopes, and concentrating flat panel non tracking solar collectors.

### **Iron and Steel Society**

#### **Award**

Dr. Todd A. Palmer, Penn State University, now at Lawrence Livermore Laboratory, was awarded the Geoffrey Belton Award in Fall 2001 for best doctoral thesis submitted during 1999-2000. His Ph.D. thesis in the Department of Materials Science and Engineering at Penn State is entitled "Nitrogen in Plasmas and Steel Weld Metal."

### **Japan Fine Ceramic Association**

#### **Award**

Prof. David Payne, University of Illinois, Urbana-Champaign, received the 2001 International Prize in recognition of a lifetime of achievement in ceramic science. The citation notes his leading role and outstanding achievements in the processing of electronic ceramics including the atomic scale characterization of piezoelectric and dielectric materials and the development of ceramic thin film synthesis by sol-gel methods

### **Japan Society for the Promotion of Science**

#### **Award**

Prof. Kit H. Bowen, Jr., Johns Hopkins University, was awarded the Invitation Fellowship Program for Research in Japan, 1999.

### **Materials Research Society**

#### **Awards**

Prof. William L. Johnson, California Institute of Technology was awarded the 1998 Materials Research Society Medal for Outstanding Recent Discovery in 1998 for the development and fundamental understanding of bulk metallic glass forming alloys.

Prof. Joseph Greene, University of Illinois, Urbana-Champaign, was awarded the 1999 Turnbull Award for contributions to the use of non-thermal methods in the growth of thin films and the engineering of their phase, composition, and microstructure; and for excellence in teaching and writing."

Dr. Alan J. Hurd, Sandia National Laboratories- New Mexico/ currently at Los Alamos National Laboratory, was awarded the 1999 Woody Award for outstanding service and dedication to the MRS.

Dr. Hongyou Fan, Sandia National Laboratories- New Mexico, was awarded the Silver Medal, Graduate Research Awards, for fundamental investigations of self-assembling mesoporous ceramics, 2000.

Prof. George W. Scherer, Hang-Shing Ma, and Jean-H. Prevoist, Princeton University, were awarded the best poster at the Spring 2001 MRS meeting for their poster entitled, "Modeling of Sol-Gel Transition with Loop Network Formation and its Implications on Mechanical Properties."

Dr. Norman C. Bartelt, Sandia National Laboratories- California, was awarded the 2001 Materials Research Society Medal in recognition of his contributions to the statistical mechanics of materials surfaces.

Mr. Chris Palenik and Prof. Rod Ewing, University of Michigan, were awarded the Best Paper Award at the Materials Research Society symposium, "Scientific Basis for Nuclear Waste Management" for the paper entitled, "Microanalysis of Radiation Damage Across a Zoned Zircon Crystal", 2002.

Dr. C. Jeffrey Brinker, Sandia National Laboratories, received the 2003 MRS Medal for pioneering the application of principles of sol-gel chemistry to the self-assembly of functional nanoscale materials.

Prof. Ivan Schuller, University of California, San Diego, received the 2003 MRS Medal for his innovative studies of exchange bias in magnetic heterostructures and nanostructures.

Prof. Julia Weertman, Northwestern University, received the 2003 Von Hippel Award for her life-long exceptional contribution to understanding the basic deformation processes and failure mechanisms in a wide class of materials, from nanocrystalline metals to high-temperature structural alloys, and for her inspiring role as an educator in materials science.

## **Microscopy Society of America**

### **Awards**

Dr. Chuck Echer of the National Center for Electron Microscopy at Berkeley Lab was awarded the 1998 Microscopy Society of America Outstanding Technologist Award for the Physical Sciences.

Dr. Nestor Zaluzec, Argonne National Laboratory, was awarded the Morton D. Maser Distinguished Service Award, 1998, for his outstanding service to the society and the electron microscopy community.

Dr. Ian Anderson, Oak Ridge National Laboratory, was awarded the Burton Medal Award, 1998, in recognition of his outstanding research in analytical transmission electron microscopy.

Prof. Jianmin Zuo, University of Illinois, Urbana-Champaign, Burton Award, 2001, in recognition of his outstanding research toward the development of quantitative microscopy including his use of experiment and theory in the direct observation of d-holes and Cu d-d bonding in cuprites to reveal the shape of d-orbital holes with unsurpassed clarity.

## **National Academy of Engineering**

### **Elected Members**

Prof. William L. Johnson of California Institute of Technology, Pasadena, for the development of bulk metallic glasses as structural materials, 1999.

Prof. Paul A. Libby, University of California, San Diego, for contributions as a researcher, author, and educator who advanced knowledge of fluid dynamics, turbulence, and combustion through theoretical analyses, 1999.

Dr. U. Fred Kocks, Los Alamos National Laboratory, Los Alamos, NM, for advancements in the theory of strength, kinetics of plasticity of metals, and texture analysis, 2000

Prof. Robert O. Ritchie, Head, Structural Materials, Materials Science Division, Lawrence Berkeley National Laboratory for his contributions to the fatigue fracture and failure of engineering structures, 2001.

Prof. Gerald B. Stringfellow, Dean, College of Engineering, University of Utah, for his leadership in the development of III/V semiconductor alloys, including the organo-metallic vapor phase epitaxy (OMVPE) growth technique, for modern electronic and photonic devices, 2001.

Prof. C. Jeffrey Brinker, Sandia National Laboratories- New Mexico and University of New Mexico, for outstanding contributions to the science of sol-gel processing, and for the invention of porous materials with controlled structure, 2002.

Prof. J. David Embury, McMaster University, for outstanding contributions to fundamental structure/mechanical property relations of materials and their applications, 2002.

Prof. Subra Suresh, Massachusetts Institute of Technology, for his development of mechanical behavior theory and experiment for advanced materials and applications, and for demonstrating fruitful new avenues for structural study, 2002.

Prof. Joseph E. Greene, University of Illinois, Urbana-Champaign, for his pioneering studies in the synthesis and characterization of epitaxial and highly ordered polycrystalline materials, 2003.

Prof. David K. Matlock, Colorado School of Mines, Golden, for fundamental and applied contributions in the uses of advanced steels, including the development of micro-alloyed steels for critical vehicle applications, 2003.

Prof. Gregory N. Stephanopoulos, Massachusetts Institute of Technology, for pioneering contributions in defining and advancing metabolic engineering and for leadership in incorporating biology into chemical engineering research and education, 2003.

Prof. R. Bruce Thompson, Iowas State University, for outstanding contributions to nondestructive evaluation, materials processing, and life-cycle management, and for the development of novel ultrasonic technology, 2003.

## Award

Professor Chang-Lin Tien of University of California, Berkeley, was awarded the 2001 Founders Award for his pioneering contributions in gas thermal radiation, thermal insulation, and microscale heat transfer, as well as his leadership in education for youth around the world.

## **National Academy of Science**

### Elected Members

Prof. Thomas J. Hanratty; emeritus, University of Illinois, Urbana-Champaign, 1999.

Prof. William D. Nix, Stanford University, in recognition of his distinguished and continuing achievements in original research, 2003.

## **National Medal of Science**

Prof. Andreas Acrivos, City University of New York, was awarded the National Medal of Science in Engineering by the National Science Board, 2001, for his contributions to the modern theory of fluid mechanics and convective heat and mass transfer.

## **Royal Academy of Engineering, UK**

### Elected Fellows

Prof. Terence G. Langdon, University of Southern California, 2002, for his extensive research on high temperature creep, superplasticity and fracture of metals, ceramics and composite materials. Distinguished for elegant scientific work applied to the behavior of materials at high temperature and the engineering problems of shaping components.

Prof. Robert O. Ritchie, Lawrence Berkeley National Laboratory, 2002, for being a world expert in the fatigue and fracture of engineering materials. His expertise encompasses both the basic science of the phenomena and application of knowledge to engineering problems in service.

## **The Minerals, Metals & Materials Society (TMS)**

### Elected Fellows (no more than 100)

Prof. Richard J. Arsenault, University of Maryland, for fundamental studies on strength of metal matrix composites, deformation, and interstitial element strengthening on bcc metals and for computer simulations of dislocation-produced deformation, 1998.

Dr. Siegfried S. Hecker, Los Alamos National Laboratory, for outstanding contributions to the understanding of the formability and path dependent plastic deformation of metals, the mechanical and physical metallurgy of plutonium and its alloys and compounds, and national and international leadership in materials science, 1998.

Prof. Ryoichi Kikuchi, presently with the University of California at Berkeley, for conceiving and developing the cluster variation and the path probability statistical theories for describing both static and kinematic atomic processes in materials, 1998.

Prof. Vaclav Vitek of University of Pennsylvania for being a 30 year pioneer in atomistic modeling of crystal defects, like dislocation cores and grain boundaries, 1999.

Prof. Subhash Mahajan, formerly at Carnegie-Mellon University and now at Arizona State University for seminal contributions in understanding the origins of growth- and processing-induced defects in semiconductors and their influence on device behavior, 1999.

Dr. Stan A. David, Oak Ridge National Laboratory, for significant advancement of welding science and technology through pioneering and definitive research and continued leadership and service to the materials joining community worldwide, 2001.

Prof. Carl C. Koch, North Carolina State University, for contributions to the understanding of mechanical alloying and mechanical attrition for the preparation of amorphous and nanostructured alloys, 2001.

Prof. John W. Morris, Lawrence Berkeley National Laboratory, for broad and outstanding contributions to metallurgy and materials science, including phase transformations, cryogenic steels and superalloys, electromigration, and joining in electronic packaging, 2001.

Prof. Gregory B. Olson, Northwestern University, for advances in the physical metallurgy of steel, pioneering contributions to materials design, and application of design, 2001.

Dr. Ricardo B. Schwarz, Los Alamos National Laboratory, for outstanding contributions to the scientific understanding of amorphous metals, the thermodynamics and kinetics of alloys phases, dislocation dynamics, mechanical alloying and ultrasonics. 2002.

Dr. Man H. Yoo, Oak Ridge National Laboratory, for his elucidation of the mechanical properties of hexagonal metals, high temperature alloys and ordered intermetallics, through atomistic and continuum-scale modeling of plastic deformation and fracture, 2002.

Prof. William Johnson, California Institute of Technology, for significant contributions to the science and technology of metallic glasses, 2003.

Dr. Michael Baskes, Los Alamos National Laboratory, for development of the Embedded Atom Method as well as the Modified Embedded Atom Method and shaping the direction of modern materials modeling, 2004.

Dr. Tai-Gang Nieh, Lawrence Livermore National Laboratory, for his contributions to the understanding of superplasticity behavior of metals and ceramics, including high-strain-rate superplasticity and superplastic ceramics, 2004.

Prof. Robert Ritchie, University of California, Berkeley and Lawrence Berkeley National Laboratory, 2004.

## Awards

Prof. Ryoichi Kikuchi, University of California, Berkeley, was named the 1998 Sir William Hume-Rothery Medallist for his contributions in the development of Cluster Variation Method in the homogenous phase treatments and phase boundary studies.

Prof. Paul Shewmon, Emeritus, Ohio State University, and formerly Director of the Materials Science Division at Argonne National Laboratory, was the Institute of Metals Lecturer and Robert F. Mehl Medallist. His research achievements were in diffusion in solids, hard particle erosion, and hydrogen induced cracking. The title of his lecture was "Grain Boundary Fracture."

Prof. Subhash Mahajan, Arizona State University, was the recipient of the John Bardeen award for seminal contributions in understanding the origins of growth- and processing-induced defects in semiconductors and their influence on device behavior, 1998.

Prof. Robert F. Sekerka of Carnegie Mellon University was presented with the Bruce Chalmers award for seminal contributions to solidification processing including the development of morphological stability theory, which provides the basis for understanding the evolution of crystal morphology, 1998.

Dr. Daniel J. Branagan, Idaho National Engineering and Environmental Laboratory, was awarded the TMS Young Leader Intern's Award, 1999.

Prof. Y. Austin Chang, University of Wisconsin was awarded the 2000 John Bardeen Award for his seminal contributions to understanding of metal/compound semiconductor interactions.

Dr. Chain-Tsuan (C T) Liu, Oak Ridge National Laboratories, was awarded the 2001 Acta Metallurgica Gold Medal. Dr. Liu's research is at the forefront of developing the scientific basis for the design of the next-generation of materials for structural and functional uses.

Dr. Alex Zunger, National Renewable Energy Laboratory, was awarded the 2001 John Bardeen Award for his seminal contributions to the theoretical understanding and prediction of "spontaneous ordering," phase-stability, and electronic properties of semiconductor alloys; for the impact that this work has had on experimental studies of electronic materials, and for his continued leadership in the field.

Drs. Man H. Yoo and Chong Long Fu, Oak Ridge National Laboratory, were awarded the 2002 Champion H. Mathewson Award for their award winning paper entitled "Physical Constants, Deformation Twinning, and Microcracking in Titanium Aluminides" was published in "Metallurgical and Materials Transactions A" in January 1998.

Prof. Gareth Thomas, University of California, Berkeley, was awarded the 2002 Acta Metallurgica Gold Medal. Prof. Thomas' research has been devoted to understanding the fundamentals of structure property relations in materials for which he has also pioneered the development and applications of electron microscopy and microanalysis.

Prof. Jerry Stringfellow, University of Utah, was awarded the 2002 John Bardeen Award for his pioneering contributions to the science and technology of semiconductors and his technical leadership.

## **World Technology Network**

### **Elected Fellows**

Dr. C. T. Liu, Oak Ridge National Laboratory.

### **Other Honors and Awards**

Dr. Malcolm Stocks and colleagues at Oak Ridge National Laboratory, was awarded the Gordon Bell Prize, 1998, for best performance of a supercomputer application.

Dr. Jun Liu, formerly from Pacific Northwest National Laboratory, now at Sandia National Laboratories-New Mexico, R&D 100 Award, 1998, for Self-Assembled Monolayers on Mesoporous Supports (SAMMS), which is a new class of materials that can remove metals and radionuclides from aqueous and organic liquids and gaseous streams. Available in powder or bead forms, SAMMS has potential applications in soil and water cleanup at sites where mercury contamination is prevalent, as well as industrial waste water treatment and metal recovery.

Dr. Mike Nastasi was awarded the Laboratory Fellow by Los Alamos National Laboratory Fellow, 2000, in recognition of his co-authorship of a widely used textbook "Ion Beam Processing: Fundamentals and Applications", and development of a new method for surface modification of materials called Plasma Immersion Ion Processing (PIIP).

Prof. Puru Jena, Virginia Commonwealth University, was awarded the 2001 Outstanding Faculty Award by Virginia Governor James S. Gilmore III, on behalf of the State Council of Higher Education of Virginia for his outstanding contribution to teaching, research, and public service. This award is given annually to 11 of Virginia's 10,000 faculty in universities and colleges and constitutes the highest honor a faculty can receive in the state of Virginia.

Prof. Julio M. Ottino, Northwestern University, was awarded the Guggenheim Fellowship, 2001, by the John Simon Guggenheim Memorial Foundation for conducting research on the competition between chaos and order in complex systems of granular matter.

Drs. S. Penumella, V. Burada, K. Foston, J.A. Sekhar, Micropyretics Heaters International, Drs. J. VanVert, J. Penlington, R. DiLiddo, Amcast Corporation, and Drs. R. Bennet, P. Gros of EMTEC, co-funded by BES/SBIR, were awarded the R&D100 award, 2001, in recognition of the invention of the MOLYCAST Furnace. A system of new energy efficient heating elements was developed, which enabled the cost of aluminum manufacturing be dramatically reduced by cutting down energy usage and dross formation.

Prof. Rodney C. Ewing, University of Michigan, was awarded the Guggenheim Fellowship, 2002, by the John Simon Guggenheim Memorial Foundation. Prof. Ewing will use his Fellowship to provide partial support for the preparation of a book that will analyze the impact of the nuclear fuel cycle on the environment.

Dr. Stan David, Oak Ridge National Laboratory, was awarded the Yoshiaki Arata Award, 2002, by the International Institute of Welding. The award is given in recognition of outstanding achievements in fundamental research in welding science and technology, and its allied areas.

Dr. C.T. Liu, Oak Ridge National Laboratory, was elected member by the International Advisory Committee of the Shenyang National Laboratory (SYNL) for Materials Science in Shenyang, China, 2002. SYNL, the first national laboratory in China, was established in 2001 by the institute of Metal Research, Chinese Academy of Science. The advisory committee is expected to consult on research activities in SYNL, and evaluate new faculty appointments.

Dr. Jacob Barhen, Oak Ridge National Laboratory, was awarded the NASA Space Act Award, 2002, for his achievements relating to "Massively Parallel Algorithms for Signal Processing Applications Using Charge Domain Computing Devices".

Dr. Gregory Exarhos, Pacific Northwest National Laboratory, was appointed a 3 year term as North American Editor for Elsevier Science, Inc. journal "Vacuum", starting July 1, 2003. The journal focuses on developments in vacuum pumping and instrumentation, gas-surface interactions, surface analysis, nanometer-scale processing, ion implantation, and surface coatings.

Prof. John C. H. Spence, Arizona State University, was awarded the Frontiers of Electron Microscopy in Materials Science 2003 Distinguished Lectureship for his research that has led to a better understanding of the physical processes that govern electron-solid interactions.

Dr. Paul F. Becher, Oak Ridge National Laboratory, was appointed in 2003 to the National Materials Advisory Board (NMAB) of the National Academy of Sciences, which provides informed scientific, technological, and policy assessments of materials, processes, and applications for use by U.S. industry, government agencies, and universities.

Dr. Chun-Hway Hsueh, Oak Ridge National Laboratory, was appointed Associate Editor of the Journal of the American Ceramic Society in 2003.

Mr. J. Lian (Ph.D. candidate), University of Michigan, was presented the Distinguished Scholar Award by The Microbeam Analysis Society, 2002.

Prof. Rodney C. Ewing, University of Michigan, was awarded the Hawley Medal for 2002 from the Mineral Society of Canada for his paper, "The Design and Evaluation of Nuclear-Waste Forms: Clues from Mineralogy".

Prof. Emil Wolf, University of Rochester and University of Central Florida's School of Optics, was awarded the Esther Hoffman Beller Award in 2002, for numerous outstanding contributions as an educator, but

especially for the influence of his books, which have been educating optical scientists and engineers for more than forty years.

Dr. Stan David, Oak Ridge National Laboratory, was given the Yoshiaki Arata Award in 2002 by the International Institute of Welding, in recognition of outstanding fundamental research achievements in welding science and technology.

Drs. Chain Tsuan Liu, Rodney A. McKee, and Thomas George Thundat, Battelle Memorial Institute, were awarded as Distinguished Inventors in 2003 for having 14 or more patents.

Dr. Altaf Carim, Office of Basic Energy Sciences/Materials Sciences and Engineering Division, has joined the editorial board of *Materials Characterization* that is published in association with the International Metallographic Society.

Dr. Nestor Zaluzec, Argonne National Laboratory, received a 2003 R&D 100 Award for the invention of the Scanning Confocal Electron Microscope which permits the observation and characterization of sub-surface structures of thick, optically opaque materials at both nanometer level resolutions and large field of view.

Dr. Orlando Auciello, Argonne National Laboratory, in collaboration with four others, received a 2003 R&D 100 Award, for the development of the ultrananocrystalline diamond (UNCD<sup>TM</sup>) film technology and deposition system.

Dr. Sudarsanam Suresh Babu, Oak Ridge National Laboratory, received the 2003 Lidstone Medal in recognition of the most significant contributions to the advancement of welding technology, excluding consumables and equipment, during the preceding five years.

Prof. Pol D. Spanos, Rice University, received the von Karman Medal in 2003 for his contributions to innovative analytical and numerical tools for studying a wide spectrum of civil engineering systems that exhibit non-linear behavior and are subject to deterministic and stochastic loads.

Dr. Chun Hway-Hsueh, Oak Ridge National Laboratory, has been named associate editor of Composites Part B: Engineering.

Dr. Marvin Cohen, Lawrence Berkeley National Laboratory, was elected as Vice President of the American Physical Society in 2002.

Prof. Andrzej Wieckowski, University of Illinois, Urbana-Champaign, received the David C. Grahame Award from the Electrochemical Society for pioneering adaptation of solid state nuclear magnetic resonance to the *in situ* study of the metal solution interface of importance in electrocatalysis, 2003.

Drs. Marvin Cohen and Steven Louie, Lawrence Berkeley National Laboratory, received the 2003 Foresight Institute Feynman Prize for Theoretical Molecular Nanotechnology.