

Panel on Review of the Center for Neutron Research at the National Institute of Standards and Technology

Committee

Peter F. Green

Chair

PETER F. GREEN is the Vincent T. and Gloria M. Gorguze Professor of Engineering and Chair of the Materials Science and Engineering Department at the University of Michigan, Ann Arbor. He is Director of the DOE Energy Frontier Research Center in the Center for Solar and Thermal Energy Conversion (CSTEC). Professor Green is also the Editor-in-Chief of MRS Communications (Cambridge University Press). He also serves on the advisory board of the ACS Petroleum Research Fund and is a member of the U.S. liaison group for the International Union of Pure and Applied Physics (IUPAP). Dr. Green was the 2006 President of the Materials Research Society (MRS). He is a former Chair of the National Research Council (NRC) Solid State Sciences Committee (currently known as the Condensed Matter and Materials Research Committee), former Chair of the Panel for Neutron Research and former member of the Board on Physics and Astronomy (BPA) and the Board on Army Science and Technology (BAST). Dr. Green's current research interests include: understanding fundamental properties of organic materials and organic/inorganic hybrid materials at the nano-scale, particularly for functional coatings, sensors and energy conversion applications. His specific interests include: transport processes, optical properties, interfacial phenomena, phase transitions, self-assembly and pattern formation. He is a fellow of the American Physical Society, the Royal Society of Chemistry (London) and of the American Ceramic Society. He received his B.A. in Physics from Hunter College and his M.S. and Ph.D. in Materials Science and Engineering from Cornell University.

Frank S. Bates

Member

FRANK S. BATES, NAE is Regents Professor and Head of the Chemical Engineering and Materials Science Department at the University of Minnesota, Minneapolis. Dr. Bates conducts research on a range of topics related to polymers, with a particular focus on the thermodynamics and dynamics of polymers and polymer mixtures. He was previously a Distinguished Member of the technical staff at AT&T Bell Laboratories. He received the Dillon Medal and the Polymer Physics Prize, both from the American Physical Society where he is a fellow. Dr. Bates was elected to the National Academy of Engineering and he was also elected a fellow of the American Association for the Advancement of Science. He received his B.S. in Mathematics from SUNY Albany and his S.M. and Sc.D. degrees in Chemical Engineering from MIT.

Paul A. Fleury

Member

PAUL A. FLEURY, NAS/NAE, is the Frederick William Beinecke Professor of Engineering and Applied Physics in the Department of Applied Physics and Professor of Physics at the Yale Institute for Nanoscience and Quantum Engineering (YINQE). He is the founding director of the Yale Institute for Nanoscience and Quantum Engineering. He served as Dean of Engineering at Yale from 2000 until January 2008. Prior to joining Yale, Dr. Fleury was Dean of the School of Engineering at the University of New Mexico, following 30 years of research and management at AT&T Bell Laboratories. During 1992 and 1993 he was Vice President of Research and Exploratory Technology at Sandia National Laboratories. He is a member of the National Academy of Engineering and the National Academy of Sciences and a Fellow of the American Academy of Arts and Sciences. He received his B.S. and M.S. degrees from John Carroll University, and his Ph.D. from the Massachusetts Institute of Technology.

Bruce D. Gaulin

Member

BRUCE D. GAULIN is director of the Brockhouse Institute for Materials Research (BIMR), the Brockhouse Chair of Physics and Materials and a Professor in the Department of Physics and Astronomy at McMaster University. Dr. Gaulin specializes in experimental condensed matter physics. His work centers on neutron and x-ray scattering studies of new magnetic and superconducting materials. Dr. Gaulin's neutron scattering efforts have recently focused on new time-of-flight neutron scattering infrastructure at the Spallation Neutron Source at Oak Ridge National Laboratory, ISIS in the United Kingdom, and the National Institute of Standards and Technology in Gaithersburg, MD. He also built up the first optical floating zone image furnace laboratory in Canada for the production of large high-quality single crystals of superconducting and magnetic oxides. Much of his recent work has been directed toward understanding novel spin liquid, spin ice, and spin glass states in new magnets at low temperatures. Before joining the faculty at McMaster, Dr. Gaulin worked for two years as a Staff Scientist in the Solid State Division of the Oak Ridge National Laboratory in Tennessee. He has also spent time as a Guest Scientist at Brookhaven National Laboratory in New York State. Dr. Gaulin is currently Past-President of the Neutron Scattering Society of America (NSSA), having served from 2008-2012 as its President. He was, and remains, the only NSSA President elected from an institution outside of the U.S. He previously served 6 years as President of the Canadian Institute for Neutron Scattering (CINS). He holds a B.Sc. from McGill University and a Ph.D. in Physics from McMaster University.

Julia S. Higgins

Member

JULIA S. HIGGINS, NAE is Senior Research Investigator and Professor (Emeritis) of Polymer Science in the Department of Chemical Engineering and Chemical Technology at the Imperial College London. Her research focuses on the behavior of complex materials, particularly polymers, in terms of their molecular structure, organization and motion and the application of neutron scattering techniques to such problems. She currently focuses on mixtures of polymers. Some binary mixtures are miscible at a molecular level but only over a limited range of temperature and composition and one research area focuses on understanding these miscibility limits in terms of the molecular components and their interactions, studying the process of separation into two co-existing phases when these limits are exceeded, and in studying the effect of flow on the limits and the phase separation process. Another research area is the study of interfaces between polymers - either observing the interdiffusion as they form in order to understand bonding and adhesion of composites, or looking at the activity of copolymer additives as interfacial agents to improve properties of blends of thermodynamically immiscible polymers. Dr. Higgins earned a B.A. in Physics from Somersville College in Oxford and a D. Phil in Physical Chemistry from the University of Oxford.

Hubert King

Member

HUBERT KING is Senior Research Associate at ExxonMobil Research and Engineering Company. Building on his background in high-pressure science, Dr. King studies a wide variety of materials and phenomena, including investigations of viscosity and the glass transition. Working in the field of crystal growth inhibition, Dr. King's work contributed to products for gas hydrate inhibition in sub-sea pipelines and wax crystal modifiers that are now standard additives to diesel fuel. Dr. King earned a B.S. degree in Geology from the University of Kentucky, and a Ph.D. in Crystallography from Stony Brook University.

Janos Kirz

Member

JANOS KIRZ is a Scientific Advisor at Advanced Light Source with Lawrence Berkeley National Laboratory, a Consultant at Sigray, Inc. and Distinguished Professor, Emeritus, at Stony Brook University. He has been a pioneer in X-ray optics, microscopy and instrumentation for the past 40 years. He led the development of scanning X-ray microscopes and their applications in the biomedical field in the 1980s and 90s, and the development of coherent diffraction imaging using X-rays between 1998 and 2008. He served as Consultant to XRADIA, Inc. during the formative years of the company. During the past decade he worked primarily in senior management at the Advanced Light Source, Lawrence Berkeley National Laboratory. He earned his B.A. and Ph.D. in Physics from the University of California, Berkeley.

Roger A. Leach

Member

ROGER A. LEACH is Research Manager at the Corporate Center for Analytical Sciences at Dupont Central Research and Development Experimental Station. His interests include applications of analytical chemistry, polymer science, and materials science. He leads efforts at DuPont to apply synchrotron radiation to polymer research and to develop specialty polymer commercial applications. Dr. Leach received his Ph.D. in Physical/Analytical Chemistry from the University of Utah.

V. A. Parsegian

Member

V. ADRIAN PARSEGAN is the Robert L. Gluckstern Chair in Physics and Professor of Physics in the Department of Physics at the University of Massachusetts, Amherst. Known internationally for his scholarship in biological physics, Dr. Parsegian was formerly Chief of the Laboratory on Physical and Structural Biology at the National Institutes of Health. He was the founding editor of Biophysical Discussions, Chief Editor of the Biophysical Journal, President of the Biophysical Society and among other honors, has received two NIH Director's Awards and the Distinguished Service Award of the Biophysical Society. Dr. Parsegian received his A.B. in Physics from Dartmouth College and his Ph.D. in Biophysics from Harvard University.

John Root

Member

JOHN ROOT serves as Chair on the Board of Directors at the Sylvia Fedoruk Canadian Centre of the University of Saskatchewan for Nuclear Innovation and as Director of the Canadian Neutron Beam Centre (CNBC), which is comprised of six neutron spectrometers, supported by a team of expert researchers and technicians, and is managed as an international user facility. Users of the CNBC need access to its specialized facilities and expertise to advance their knowledge of materials at the molecular and nano-scale, for applications such as transportation safety, manufacturing competitiveness, lifetime management of infrastructure, market development, fundamental scientific understanding and education. In 2011, Dr. Root established the Sylvia Fedoruk Canadian Centre for Nuclear Innovation, a not-for-profit subsidiary of the University of Saskatchewan with the purpose of placing Saskatchewan among global leaders of nuclear research, development and training through investment in partnerships with universities and industries for maximum societal and economic benefit. Previously he worked for Atomic Energy of Canada Limited (AECL), where he developed a method to map stresses inside materials using a beam of neutrons from the NRU reactor at Chalk River Laboratories. This method has been copied at neutron-beam laboratories around the world, and is applied to help industries improve their products, and expand their businesses. He received his Ph.D. from the University of Guelph.

Ram Seshadri

Member

RAM SESHADRI is a Professor in the Materials Department, and Department of Chemistry and Biochemistry at the University of California, Santa Barbara. He is also Co-Director of the Materials Research Laboratory at the National Science Foundation's Materials Research Science and Engineering Centers. His research efforts are focused on the theme of developing structure-composition-property relations in functional inorganic materials. Contributions include the development of solvothermal routes for a variety of inorganic nanomaterials, understanding the role that lone pairs of non-bonding electrons in ions such as Pb^{2+} and Bi^{3+} play in inducing polar and ferroic (including multiferroic) behavior, understanding the effects of structural topology in frustrating phase transitions in polar compounds, developing template-free routes to porous and composite inorganic materials, developing new multifunctional magnets, understanding frustrated magnetism, and revealing the importance of oxide-stabilized noble metal ions in oxidation catalysis, with the concurrent development of model compounds thereof. Dr. Seshadri earned a B.Sc. in Delhi University in India, and an M.S. in Chemistry and Ph.D. in Solid State Chemistry from the Indian Institute of Science in Bangalore, India.

Sunil K. Sinha

Member

SUNIL K. SINHA is Distinguished Professor of Physics in the Department of Physics at the University of California, San Diego. His research is concerned with studying the structure and dynamics of condensed matter using the techniques of X-Ray and Neutron Scattering. His group has ongoing programs in both hard and soft condensed matter. His research in the hard condensed matter area includes novel magnetic and superconducting materials, in particular, magnetic films and multilayers, Giant Magnetoresistance (GMR) devices and Exchange Biased systems, artificially nanostructured magnetic materials such as magnetic dot and hole arrays, the so-called Colossal Magnetoresistance (CMR) compounds, and High-Temperature Superconductors. He studies properties such as their magnetic and chemical structure, the existence of polarons and other types of combined lattice/electronic effects, such as charge density waves or orbital ordering. In the soft condensed matter area, his research is concerned with molecular liquid films, polymer films and interfaces in polymeric systems, which are very relevant at the molecular level, to properties such as adhesion, lubrication and coatings. He uses X-rays and neutrons to study the fluctuations on the surfaces of polymer films to determine how interactions with the substrate affect these surfaces, and in particular how such fluctuations freeze out as the glassy state is approached. Dr. Sinha received a Ph.D. in Physics from Cambridge University.