

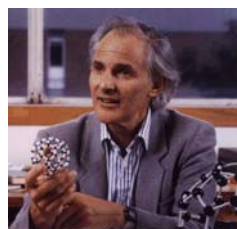
NNIN Advisory Board

Dr. Samuel D. Bader

Associate Director, Materials Science Division
Argonne National Laboratory



Samuel D. Bader received a B.S. in 1967 and Ph.D. in 1974 from the University of California, Berkeley. He then joined Argonne's superconductivity group, and in 1977 became a staff member specializing in surface science and thin-film magnetism. He is a Senior Physicist and Group Leader of the Magnetic Films Group and an Associate Division Director of Argonne's Materials Science Division. Presently, he also serves as Scientific Director of Argonne's new Center for Nanoscale Materials. He coordinates the Nanocomposite Magnetism thrust of the DOE Center for Excellence in Synthesis and Processing and has participated in NSF- DARPA- and ONR-sponsored materials research initiatives. He is co-author of over 300 publications and appears in the ISI 1981-97 "most cited physicists" listing. He is a Fellow of the AVS and the American Physical Society. In 1992 he was co-recipient of the DOE-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. In 2001 he received the AVS John A. Thornton Memorial Award, cited for "seminal contributions to the atomic-level understanding of surface and thin film magnetism." In 2002 he was made an Adjunct Professor of the Department of Materials Science and Engineering at the University of Illinois at Urbana-Champaign, and a Senior Fellow of the University of Chicago-Argonne Consortium for Nanoscience Research. He is an editor of the *Journal of Magnetism and Magnetic Materials* and an associate editor of *Applied Physics Letters*. He is chair of the Scientific Advisory Committee of the Advanced Light Source (ALS) at Lawrence Berkeley National Laboratory in California, and serves on the ALS Science Policy Board. He also serves on the Scientific Advisory Committee of the Center for Functional Nanomaterials at Brookhaven National Laboratory in New York. He presently also is chair of the Division of Materials Physics of the American Physical Society.



Prof. Harold Kroto

Frances Eppes Professor of Chemistry and Biochemistry
The Florida State University

Harold Kroto was born in 1939 in Wisbech, Cambridgeshire, and brought up in Bolton, Lancashire. He graduated in Chemistry at the University of Sheffield in 1961 and in 1964 received his PhD there for research with R N Dixon on high resolution electronic spectra of free radicals produced by flash photolysis. After two years postdoctoral research in electronic and microwave spectroscopy at the National Research Council in Ottawa, Canada, he spent one year at Bell Laboratories NJ studying liquid phase interactions by Raman spectroscopy and he also carried out studies in Quantum Chemistry. He started his academic career at the University of Sussex (Brighton) in 1967, where he became a professor in 1985 and in 1991 he was made a Royal Society Research Professor.

The research programme at Sussex has covered several interdisciplinary areas. One area focused on the creation and spectroscopic characterisation of new molecules, in particular, unstable species and reaction intermediates which contained labile multiple bonds. This work led to the production of the first molecules with a carbon phosphorus double bonds as well as the development of the first analogues with carbon phosphorus triple bonds. Since these pioneering studies the presently extremely active field of phosphalkene and phosphalkyne chemistry has developed. Laboratory synthetic and spectroscopic work on cyanopolynes led to the surprising discovery, by Radioastronomy, that of very long carbon chain molecules were relatively abundant in interstellar space. During a project which explored the possible source of these carbon chains in space, laboratory experiments which simulated the chemical reactions in the shells of red giant carbon stars were carried out which serendipitously uncovered the existence of C₆₀ Buckminsterfullerene. In follow-up investigations of this original discovery the molecule was

isolated independently at Sussex and structurally characterised.

The presently active research programme derives directly from the earlier work on C60 and focuses on the implications of the discovery for several areas of fundamental chemistry as well as the way in which it has revolutionised our perspective on carbon based materials. The research encompasses the basic chemistry of the fullerenes, fundamental studies of carbon and metal clusters as well as carbon microparticles and nanotubes. Work on various aspects of interstellar and circumstellar molecules and dust is also in progress. Some parts of the research have been successful due to their interdisciplinary nature and this has been the result of synergistic collaborations involving primarily: colleagues J F Nixon, R Taylor and D R M Walton at Sussex, T Oka at NRC (Canada), and R F Curl and R E Smalley at Rice University (Texas).

Since 1990 he has been chairman of the editorial board of the Chemical Society Reviews.



Prof. Hans Mooij

Chairman, Kavli Institute of Nanoscience
Delft University of Technology
THE NETHERLANDS

Hans Mooij was educated at Delft University of Technology where he received his Ph.D. in 1970. After two years at Shell, he rejoined Delft University where he became full professor in 1980. He was visiting associate professor at Stanford in 1978-79, Loeb Lecturer at the Harvard Physics Department in 1998 and visiting professor at MIT in the years 1998-2000. He is a fellow of the American Physical Society. Hans Mooij's research interest is focussed on quantum effects in superconducting nanosystems. In 2004 he received the Agilent Technologies Europhysics Award for the development of superconducting quantum bits.

Dr. Carl A. Kukkonen
CEO, ViaSpace Technologies

ViaSpace is led by Dr. Carl Kukkonen, CEO and founding partner of the company. Prior to founding ViaSpace, Dr. Kukkonen was Director of the Center for Space Microelectronics Technology (CSMT) and Manager of Supercomputing at the Jet Propulsion Laboratory in Pasadena, CA. At JPL, Dr. Kukkonen managed several technologies and technical teams, including the technical foundation of ViaSpace's operating subsidiaries. Among his major accomplishments, Dr. Kukkonen built the Center for Space Microelectronics into a 250 man operation from nothing over the course of his 14 year career with JPL.



Prior to his JPL experience, Dr. Kukkonen was at the Ford Motor Company, where he was Ford's leading expert on hydrogen as an alternative automotive fuel. He also led a team that developed Ford's first turbocharged intercooled direct injection diesel engine.

Kukkonen received a B.S. in physics from the University of California at Davis. He earned an M.S. and Ph.D. in physics from Cornell University and was a postdoctoral fellow at Purdue.

Prof. George M. Langford

Dean, College of Arts and Sciences
Syracuse University



Professor Langford received his Ph.D. degree in 1971 from the Illinois Institute of Technology, Chicago and his postdoctoral training at the University of Pennsylvania. Before joining the faculty at Dartmouth College, he spent most of the academic career on the faculty in the Department of Physiology, School of Medicine, University of North Carolina at Chapel Hill. In 1991 he joined the faculty at Dartmouth as the first Ernest Everett Just Professor of Natural Sciences. He is Professor of Biological Sciences and Adjunct Professor of Physiology, Dartmouth Medical School.

Professor Langford is a cell biologist who studies molecular motors and the cytoskeleton in nerve cells. His research program will help to understand how the brain remembers, and what makes it forget when a disease such as Alzheimer's takes hold. For most of these studies, he uses the nervous system of the squid, a marine organism. Squid nerve fibers, called giant axons, are several times larger than a human's and offer unparalleled opportunities for observation and experimentation.

In 1998, President Clinton appointed Professor Langford to the National Science Board, the governing board of the National Science Foundation (NSF). The NSF funds research in science, mathematics and engineering. Professor Langford is an activist on important social issues. He works to influence local, regional and federal policies on the scientific workforce and the recruitment of under represented minority students to science and engineering.



Dr. James C. McGroddy

Retired Senior Vice President, IBM

Jim McGroddy retired from IBM as a Senior Vice President, Research at the end of 1996, after leading its research laboratories from 1989 to 1995. During his tenure, which spanned the period of IBM's most difficult challenges, he led a major restructuring of its Research efforts, building a model and management system which is now widely emulated. One of the measures of success was the creation during this period of two new laboratories, one in Beijing and one in Austin Texas. His leadership was recognized by being awarded the Frederik Philips Medal of the IEEE and the George Pake Award of the American Physical Society. He is currently an advisor to several government agencies, a participant in a number of National Research Council groups, and serves as an advisor and a visitor at a number of universities in the US and Europe. McGroddy is the Chairman of the Board of MIQS, a company providing clinical information systems and electronic medical record capability aimed at improving the quality and cost-effectiveness of the care of the chronically ill. As Chairman of the Board of the Stellaris Healthcare Network in 2000 and 2001 and as former Chairman of the Board of Phelps Memorial Hospital Center he has been heavily involved in the restructuring of the local health care delivery system in Westchester County. He is a Director of Paxar Inc, a NYSE traded company, and Chairman of the Board of Advanced Networks and Services, Inc. He is also a Trustee of his alma mater, St. Joseph's University in Philadelphia as well as a member of the advisory boards of a number of startup firms and university departments.

McGroddy originally joined IBM in its Research Division in 1965 after receiving a PhD in Physics from the University of Maryland. He earned his BS in Physics from St. Joseph's University in Philadelphia in 1958. In his first years at IBM he focused on research in solid state physics and electronic devices, and as a result of achievements in these areas was named a Fellow of both the Institute of Electrical and Electronic Engineers and of the American Physical Society. In the 1970-71 academic year he was a Visiting Professor of Physics at the Danish Technical University. Returning to IBM, he served in a number of management positions in research, development and manufacturing before being named IBM's Director of Research in 1989. He is a member of the U.S. National Academy of Engineering. Married to Sheree Wen, he is the father of four daughters and one son. The family resides in Briarcliff Manor NY.

Paul S. Percy

Dean, College of Engineering
University of Wisconsin-Madison



Paul S. Percy became Dean of the University of Wisconsin-Madison College of Engineering September 1, 1999. In his position, Percy guides a highly ranked engineering college with more than 3,500 undergraduate and 1,500 graduate students and an annual budget of approximately \$150 million. Under his leadership, the college has set annual records for both research funding and patent disclosures by engineering faculty and staff.

Prior to accepting this position in September 1999, he was President of SEMI/SEMATECH, a non-profit technical R&D consortium of more than 160 U.S. owned and operated companies that comprise the equipment and supplier infrastructure for the U.S. semiconductor industry. He assumed full-time responsibility in this position in August 1995.

Before serving as President of SEMI/SEMATECH, Percy was Director of Microelectronics and Photonics at Sandia National Laboratories in Albuquerque, New Mexico. This Directorate contained Sandia's silicon, compound semiconductor, and sensor R&D activities.

Percy's personal research spanned several areas of solid state and materials physics and engineering, including ferroelectricity, Raman and Brillouin scattering studies of solids, ion-solid interactions, laser-induced phase transformations, microelectronics and photonics, and solid state devices. He is the author or co-author of more than 180 technical papers, co-editor of several books, and holds two patents.

Percy is also active in professional organizations. He was a Councilor of the AAAS and the American Physical Society (APS), Past Vice President and Board Member of the Materials Research Society, past Chairman of the Division of Materials Physics of the APS and a Member of the National Research Council Board on Manufacturing and Engineering Design. Percy is a Member of the National Academy of Engineering, Fellow of the IEEE, APS, and AAAS and serves of the External Advisory Boards of various Universities and Federal Laboratories. He also serves as a member of the Wisconsin Technology Council and on the Board of Directors of Meriter Management Services, Meriter Hospital, and Meriter Health Services, Mason-Wells, and Sonic Foundry.



Dr. Kurt Petersen

Entrepreneur

Kurt Petersen received his B.S. degree cum laude in EE from UC Berkeley in 1970. In 1975, he received a Ph.D. in EE from the Massachusetts Institute of Technology. Dr. Petersen established a micromachining research group while at IBM from 1975 to 1982. Since 1982, Dr. Petersen has co-founded three successful companies in micromachining technology, Transensory Devices Inc. in 1982, NovaSensor in 1985, and Cepheid in 1996. All of these companies have become technical and commercial leaders in the field of MEMS devices and applications. Most recently, Cepheid was established with the mission of commercializing advanced MEMS techniques and other technologies for miniaturized, biomedical and microfluidic systems and instruments, particularly in the area of fast, portable, automated nucleic acid (DNA) analysis for diagnostic applications in the biomedical, environmental, and food industries as well as for bio-warfare defense. Cepheid has become a recognized industry leader in rapid DNA purification, detection, and analysis. Dr. Petersen has published over 100 papers, and has been granted over 20 patents in the field of micromachining. In 2001 he was awarded the IEEE Simon Ramo Medal for his contributions to MEMS. Dr. Petersen is a member of the National Academy of Engineering and is a Fellow of the IEEE in recognition of his contributions to "the commercialization of MEMS technology".

Professor Vivian Weil

Director, Center for the Study of Ethics in the Professions
Illinois Institute of Technology



Vivian Weil is Director of the Center for the Study of Ethics in the Professions at the Illinois Institute of Technology. She received her A.B. and M.A. from the University of Chicago and her Ph.D. from the University of Illinois, Chicago. During the academic year 1990-1991, she served as Director of the Ethics and Values Studies Program of the National Science Foundation. Weil is a philosopher by training, working on theoretical problems of human action and responsibility and specializing on issues of professional responsibility, primarily in engineering and science. She is author of numerous publications, including a Report on Engineering Ethics in Engineering Education, and work on normative issues of data sharing, secrecy and openness with respect to the dissemination of scientific and technical information -- in the context of intellectual property and national security restrictions integrating professional ethics in professional education, and ethics and biotechnology. Her recent public lectures and panel presentations have dealt with ethical issues in research, intellectual property in graduate science education, conflicts of interest involving university scientists, educating scientists and engineers concerning professional responsibility, mentoring and ethical issues in biotechnology.

Weil is a Fellow of the American Association for the Advancement of Science, the Governing Board of the National Institute for Engineering Ethics, the Executive Committee of the Association for Practical and Professional Ethics, and a former member of the Committee on Computer Use in Philosophy of the American Philosophical Association. She serves on the editorial boards of Teaching Philosophy, The International Journal of Applied Philosophy, Science, Technology and Human Values, Science and Engineering Ethics, and Science Communication (formerly Knowledge). She is co-editor of the Rutgers University Press volume, *Owning Scientific and Technical Information: Ethics and Value Issues* and the editor of *Beyond Whistleblowing: Defining Engineers' Responsibilities*, published by CSEP under an NSF grant.

Dr. Weil is a Fellow of the American Association for the Advancement of Science, the Governing Board of the National Institute for Engineering Ethics, the Executive Committee of the Association for Practical and Professional Ethics, and a former member of the Committee on Computer Use in Philosophy of the American Philosophical Association. She serves on the editorial boards of Teaching Philosophy, The International Journal of Applied Philosophy, Science, Technology and Human Values, Science and Engineering Ethics, and Science Communication (formerly Knowledge). She is co-editor of the Rutgers University Press volume, *Owning Scientific and Technical Information: Ethics and Value Issues* and the editor of *Beyond Whistleblowing: Defining Engineers' Responsibilities*, published by CSEP under an NSF grant.

Dr. Thomas N. Theis

Director, Physical Sciences
IBM T.J. Watson Research Center



Dr. Thomas Theis received a B.S. degree in physics from Rensselaer Polytechnic Institute in 1972, and M.S. and Ph.D. degrees from Brown University in 1974 and 1978, respectively. A portion of his Ph.D. research was done at the Technical University of Munich, where he completed a postdoctoral year before joining IBM Research in 1979.

Dr. Theis joined the Department of Semiconductor Science and Technology at the IBM Watson Research Center to study electronic properties of two-dimensional systems. He also collaborated in research on surface enhanced Raman scattering, light emission from tunnel junctions, and conduction in silicon dioxide. The latter work helped to lay the basis for the present understanding of conduction in wide band-gap materials. In 1982 he became manager of a group studying growth and properties of III-V semiconductors. He published extensively on the DX-center, a donor-related defect which limits the digital performance of some III-V transistors.

In 1989 he was named Senior Manager, Semiconductor Physics and Devices. In 1993, he was named Senior Manager, Silicon Science and Technology, where he was responsible for exploratory materials and process integration work bridging between Research and the IBM Microelectronics Division. While in this position, he was the principal author of IBM's successful contract proposal for the DARPA Low Power Electronics Program. This fifteen million dollar, three year, industry-university-SEMATECH joint program significantly advanced silicon-on-insulator materials, devices, and design techniques for low-power, high-performance microelectronics. Also while in this position, Dr. Theis coordinated the transfer of copper interconnection technology from IBM Research to the IBM Microelectronics Division. The replacement of aluminum chip wiring by copper was an industry first, the biggest change in chip wiring technology in thirty years, and involved close collaboration between research, product development, and manufacturing organizations. Dr. Theis assumed his current position, Director, Physical Sciences, in February 1998.

Dr. Theis is a member of the IEEE, and a Fellow of the American Physical Society and currently serves on advisory boards for the American Institute of Physics Corporate Associates, the American Physical Society's Physics Policy Committee, the National Nanofabrication Users network, and the National Research Council's Board on Physics and Astronomy. He served as a Member of the Committee for the Review of the National Nanotechnology Initiative, sponsored by the National Research Council. He has authored or co-authored over 60 scientific and technical publications.