

**NSF Directorate for Engineering  
Advisory Committee Member Biographies  
Spring 2013**



**LINDA ABRIOLA** is Dean of the School of Engineering and Professor of Civil and Environmental Engineering at Tufts University. Dean Abriola also holds a courtesy appointment in the Department of Chemical and Biological Engineering. She received her Ph.D. and master's degrees from Princeton University and a bachelor's degree from Drexel University, all in civil engineering. Dean Abriola is a Fellow of the American Geophysical Union and a member of both the American Academy of Arts and Sciences and the National Academy of Engineering (NAE). She is currently an elected member of the NAE governing Council and served on the executive board of the American Society of Engineering Education's Engineering Deans Council. An author of more than 130 refereed publications, Dean Abriola is an expert on the multiphase transport, fate, and recovery of contaminants in the subsurface. She has been the recipient of a number of awards, including the Association for Women Geoscientist's Outstanding Educator Award, the National Ground Water Association's Distinguished Darcy Lectureship, designation as an ISI Highly Cited Author in Ecology/Environment, and the Strategic Environmental Research and Development Program Project of the Year Award in Remediation.

**LANCE COLLINS** is currently the Joseph Silbert Dean of Engineering at Cornell University. He served as the S.C. Thomas Sze Director of the Sibley School of Mechanical & Aerospace Engineering from 2005-2010, and he was the Director of Graduate Studies for Aerospace Engineering from 2003-2005. Over the past year, he served on Cornell's Strategic Plan Advisory Council that wrote the university's strategic plan.

Dr. Collins joined Cornell in 2001, following 11 years as Assistant Professor, Associate Professor and Professor of Chemical Engineering at Pennsylvania State University. Since 1999, he has held a joint appointment in the Mechanical & Nuclear Engineering Department at Penn State, and in 1998 he was a visiting scientist at the Laboratoire de Combustion et Systemes Reactifs (a National Center for Scientific Research Laboratory in Orleans, France) and at Los Alamos National Laboratory.

Dr. Collins' research combines simulation and theory to investigate a broad range of turbulent flow processes, including the motion of aerosol particles in turbulence (with applications to cloud processes and global climate modeling), mixing and chemical reactions in turbulent flames, turbulent breakup of drops and drag reduction due to polymer additives. In 1997 he received the Best Paper Award from the American Institute of Chemical Engineers, and in 2007 he was elected a fellow of the American Physical Society. He chairs the U.S. National Committee on Theoretical & Applied Mechanics under auspices of the National Academies.

Dr. Collins received his B.S.E. degree from Princeton University. He also earned his M.S. and Ph.D. degrees from the University of Pennsylvania under Chemical Engineering.

**PETER T. CUMMINGS** is the John R. Hall professor of chemical engineering at Vanderbilt University. He also holds the position of Principal Scientist in the Center for Nanophase Materials Sciences (CNMS) at Oak Ridge National Laboratory, as well as founding director of the Nanomaterials Theory Institute, the theory program within the CNMS. His research interests include statistical mechanics, molecular simulation, computational materials science, computational and theoretical nanoscience, and computational biology. He is the author of over 330 refereed journal publications and the recipient of many awards, including the 1998 Alpha Chi Sigma award given annually to the member of the American Institute of Chemical Engineers (AIChE) with the most outstanding research contributions over the previous decade, the 2007 AIChE Nanoscale Science and Engineering Forum Award, the 2010 AIChE Founders Award for Outstanding Contributions to the Field of Chemical Engineering in recognition of his “outstanding contributions through research, service to the Institute, and national leadership on behalf of the profession,” and the 2012 Yeram S. Touloukian Award from the American Society of Mechanical Engineers. He has been elected fellow of the American Physical Society, of the American Association for the Advancement of Science (AAAS), and of the American Institute of Chemical Engineers.

**PATRICK FARRELL** joined Lehigh University as provost and vice president for academic affairs in July 2009. As provost, Dr. Farrell serves as the university’s chief academic officer. His responsibilities include leading efforts to attract, recruit and retain highly-talented individuals to Lehigh, as well as playing a central role in working to ensure the success of institutional goals over the next decade.

Before coming to Lehigh, Dr. Farrell served on the faculty in Mechanical Engineering at the University of Wisconsin-Madison, beginning in 1982, and as Provost and Vice Chancellor for Academic Affairs at the University of Wisconsin-Madison from 2006 until December 2008.

**ALISON FLATAU** is the Associate Dean of Research for the Clark School of Engineering at the University of Maryland and a Professor in their Department of Aerospace Engineering. She is an active researcher in the fields of smart materials, bio-inspired sensing and actuation technologies and active flow control. Prof. Flatau’s research has been funded under a National Science Foundation Young Investigator Award, as well as grants from DARPA, the Army Research Laboratory, NASA, NSF and the Office of Naval Research. Her research and educational activities have also included collaborations with state agencies, both large and small corporations and she is currently the PI of an ONR MURI investigation on structural magnetostrictive alloys involving six other institutions. Dr. Flatau is recipient of the SPIE’s 2010 Smart Structures and Materials Lifetime Achievement Award. From 2004-2009, she was the Director of the Department of Aerospace Engineering Undergraduate Programs and their Honors Program and was also the faculty advisor to the AIAA student branch. She joined Maryland after serving as Program Director for the Dynamic Systems Modeling, Sensing and Control Program at the National Science Foundation from 1998-2002. Prior to that, she was on the Aerospace Engineering and Engineering Mechanics faculty at Iowa State University (1990-1998). Her experience also includes four years at the National Small Wind

Systems Test Center in Golden, CO where she was a Senior Research Engineer in the Test Program. Dr. Flatau's teaching and research interests are in dynamics of smart structures, with emphasis on actuator and sensor technologies and their application in noise, vibration and flow control applied to aerospace systems. Her current research activities include the development and application of magnetostrictive material and their use as actuators and sensors, and the application of smart materials in meso- and micro-systems, including synthetic jet design for active flow control and bio-inspired micro- and nano-sensors. As the author of over 60 archival journal articles, Dr. Flatau currently serves as an Assistant Editor for the Journal of Smart Structures and Materials (2008-present) and on the editorial board of the new International Journal of Smart and Nano Material.

**MARY JANE HAGENSON** served as Vice President of Research and Technology for Chevron Phillips Chemical Company from the company's formation in 2000 until her retirement in 2012. In that capacity she had responsibility for R&D in support of all business lines, Process Development & Engineering, and Licensing functions for the company. She previously served as Vice President of Specialty Chemicals and Plastics for Phillips Petroleum Company (now Conoco Phillips). She joined Phillips Petroleum Company as a Senior Research Scientist in the Biotechnology Division and held a number of technical and business management positions over her 27-year career with Phillips and subsequently Chevron Phillips. Dr. Hagenson received a B.S. Degree in Physics and Mathematics and M.S. and Ph.D. Degrees in Biomedical Engineering from Iowa State University, with graduate research performed at Los Alamos National Laboratory. She holds seven U.S. Patents and has authored more than 20 technical papers. In 2006 she was the recipient of the College of Engineering Professional Achievement Citation in Engineering (PACE) Award from Iowa State University. Hagenson is a member of the National Academies Board on Chemical Sciences & Technology and serves as Chair of the Iowa State University Chemical & Biological Engineering Department Industrial Advisory Council. She has served as a member and Chair of the College of Engineering Industrial Advisory Council at Iowa State University, a member of the Board of Directors of the Industrial Research Institute, and the Oklahoma State University Master of Engineering & Technology Management Advisory Committee.

**ENRIQUE J. LAVERNIA** returned to his post as dean of the College of Engineering, a position he previously held from 2002 to 2009, after serving as the provost and executive vice chancellor of the University of California, Davis, from January 2009 to December 2010. Prior to arriving at Davis, Lavernia served as Chair and Chancellor's Professor in the Department of Chemical Engineering and Materials Science at UC Irvine.

Dean Lavernia is a Fellow of the American Association for the Advancement of Science, the American Society of Mechanical Engineers, the ASM International and the Alexander von Humboldt Foundation. Named Presidential Young Investigator by the National Science Foundation, Lavernia also received a Young Investigator Award from the Office of Naval Research. In 2011 he received the Hispanic Engineer National Achievement Award (HEENAC) and the Society for the Advancement of Chicanos and Native

Americans in Science (SACNAS) Distinguished Scientist Award. Dean Lavernia is also the recipient of the 2013 Edward DeMille Campbell Memorial Lectureship, and the 2013 ASM International Gold Medal Award.

Dr. Lavernia holds a faculty appointment within the Department of Chemical Engineering and Materials Science at UC Davis, where he was promoted to Distinguished Professor in 2007. His research interests include synthesis and behavior of nanostructured and multi-scale materials; thermal spray processing of nanostructured materials; spray atomization and deposition of structural materials; high temperature-high pressure atomization processes; mathematical modeling of advanced materials and processes; and laser direct fabrication of metallic and ceramic structures.

Lavernia earned his B.S. with Honors in Solid Mechanics from Brown University, and his M.S. in Metallurgy and Ph.D. in Materials Engineering, both from the Massachusetts Institute of Technology.

**L. GARY LEAL** is the Warren and Katharine Schlinger Distinguished Professor of Chemical Engineering at UCSB. He also holds courtesy appointments in the Materials and Mechanical Engineering Departments. He has been on the faculty at UCSB since 1989, and served as chair of the Department of Chemical Engineering for 14 years. Prior to that he was a faculty member at Caltech, where he held the position of Chevron Distinguished Professor. His research interests are in the general areas of fluid mechanics and rheology, with a focus on complex fluids such as polymeric liquids, emulsions and immiscible blends, colloidal dispersions and self-assembling amphiphilic systems such as lipid bilayer vesicles. The primary application of this work is materials processing and the optimization of material properties. He is one of the two co-editors of *Physics of Fluids*. He is also the author of the text book "Advanced Transport Phenomena", published by Cambridge University Press. His work and that of his more than 50 PhD students has been recognized by many awards including election to the National Academy of Engineering in 1987, The American Academy of Arts and Science, the Colburn and Walker Awards of the AIChE, the Fluid Dynamics Prize of the APS, and the Bingham Medal of the Society of Rheology.

**BRUCE LOGAN** is an Evan Pugh Professor, the Stan & Flora Kappe Professor of Environmental Engineering in the Department of Civil and Environmental Engineering, and Director of the Engineering Energy & Environmental Institute at Penn State University. His main research is in renewable energy production for the development of an energy-sustainable water infrastructure. He is developing various microbial electrochemical technologies that use naturally occurring exoelectrogenic bacteria to directly generate electricity. Using these microorganisms in microbial fuel cells, for example, it is possible to produce electrical power from domestic and industrial wastewaters, while at the same time accomplishing treatment. He is developing microbial electrolysis cells for fuel production (hydrogen or methane gases), and microbial systems for water desalination. He is also investigating technologies to produce electrical power from artificial salinity gradients produced using low-grade, waste heat sources. These energy technologies have the potential not only to provide electrical power for the water infrastructure, but to produce additional energy for surrounding communities.

Dr. Logan is the author or co-author of over 340 refereed publications and several books (>21,000 citations, h-index=79; Google Scholar). He is a fellow of the International Water Association and the Water Environment Federation, and he has received several awards including the Clarke Prize (2009) and the Water Environment Research Foundation Paul L. Busch Award (2004). Dr. Logan is also an Investigator with the King Abdullah University of Science & Technology (KAUST) in Saudi Arabia; and a visiting professor at Newcastle University (England), Tsinghua University, Harbin Institute of Technology, and Dalian University of Technology (China). He received his BS and MS degrees from Rensselaer Polytechnic Institute, and his PhD in 1986 from the University of California, Berkeley. Prior to joining the faculty at Penn State in 1997, he was on the faculty at the University of Arizona in the Department of Chemical and Environmental Engineering.

**ANN C. SAVOCA** is Global Vice President, Technology & Innovation, at the Sealed Air Corporation. Before joining the company in July 2008, Dr. Savoca was Vice President, Technology, of the Specialty Polymers Group of Akzo Nobel, a manufacturer of paints, coatings and specialty chemicals from January 2008 through May 2008, and prior to that was Vice President, Technology, of National Starch and Chemical Company, a manufacturer of specialty chemicals and starches for use in industrial and commercial applications from January 2003 through December 2007. She received her Ph.D. in organic chemistry from the Massachusetts Institute of Technology.

**MICHAEL B. SILEVITCH** is currently the Robert D. Black Professor of Electrical and Computer Engineering at Northeastern University in Boston and an elected fellow of the IEEE. His training has encompassed both physics and electrical engineering disciplines. An author/co-author of over 65 journal papers, his research interests include laboratory and space plasma dynamics, nonlinear statistical mechanics, and K-12 science and mathematics curriculum implementation. Of particular interest is the study of the Aurora Borealis, one of nature's most artistic phenomena. Avocations include long distance hiking and the study of 17th Century clocks and watches.

Prof. Silevitch is also the Director of the Bernard M. Gordon Center for Subsurface Sensing and Imaging Systems (Gordon-CenSSIS), a graduated National Science Foundation Engineering Research Center (ERC). Established in September of 2000, the mission of Gordon-CenSSIS is to unify the methodology for finding hidden structures in diverse media such as the underground environment or within the human body. More recently the CenSSIS multidisciplinary enterprise helped lay the foundation for the research and education programs in the Homeland Security Center of Excellence for Awareness and Localization of Explosives Related Threats (ALERT). This Center was funded in 2008 and is Co-Directed by Prof. Silevitch.

**DAVID SPENCER** founded wTe Corporation in 1981 and served as its CEO for 27 years, now serving as Chairman and CTO. Educated at Lafayette College (B.S. 1967) and MIT (Sc.D. 1971), he invented the Rheocasting® / Thixocasting® processes as part of his doctoral thesis, a new casting technology deployed

worldwide for high performance metal castings. Prior to forming wTe, Dr. Spencer was a co-founder of Raytheon Corporation's Resource Recovery Business where from 1971-1981 he managed the development and operation of large 1000-2000 ton per day resource recovery and recycling technologies producing energy and recovering materials from municipal solid waste and sewage sludge. At wTe he developed novel plastics recycling projects for PET, polystyrene, polyethylene and poly-vinyl chloride working for the world's largest petroleum and plastics producers. wTe is focused on ownership and operation of recycling facilities for metals and plastics. Its UltePET® operations are ranked among the largest recycled PET re-claimers in the world turning old bottles into new for companies such as Coke and Pepsi. Its automobile shredding and metal recycling operations are ranked among the largest in New England. With funding from the NSF SBIR program, NIST ATP and NIST TIP programs the company has been developing patented high-speed automated metal sorting technologies, called Spectramet® and Melt Cognition®, to automatically sort metals by type in milliseconds. Dr. Spencer was nominated for Entrepreneur of the Year by Arthur Young and Venture Magazine in 1988 and was selected as a Finalist for Entrepreneur of the Year in 1990 by Ernst & Young, Inc. Magazine and Merrill Lynch. He served on the editorial board of Elsevier Press' Journal of Solid Waste Management and authored over 60 technical papers including the Recycling Chapters of McGraw-Hill's award-winning Handbook of Solid Waste Management. He serves on the Board of Directors of several privately held companies, and also serves on the NSF AdCom for the SBIR Program. He served on NSF's AC/GPA for five years -- the highest level AdCom within NSF assessing overall agency performance, the last two years as Chair. Recently, Dr. Spencer was also appointed to serve on the Executive Committee of the Government University Industry Research Roundtable (GUIRR) which is an outgrowth of the National Academies of Science, Engineering and Medicine. He is a member of several honorary and professional organizations including Tau Beta Pi, Sigma Xi, Sigma Mu, ASM International, TMS, AIME, among others.

**MEHMET TONER** received a BS degree from Istanbul Technical University and a MS degree from the Massachusetts Institute of Technology (MIT), both in Mechanical Engineering. Subsequently he completed his PhD degree in Medical Engineering at Harvard-MIT Division of Health Sciences and Technology in 1989. Currently, he is the Helen Andrus Benedict Professor of Bioengineering at the Massachusetts General Hospital, Harvard Medical School, and Harvard-MIT Division of Health Sciences and Technology. Dr. Toner co-founded both the Center for Engineering in Medicine at MGH and the Biomedical Engineering Research and Education Program, a unique two-year fellowship program for physician fellows to perform research in biomedical engineering, in 1995. In 2004, Dr. Toner established the BioMicroElectroMechanical Systems (BioMEMS) Resource Center at the MGH to explore the applications of nano/micro-technologies in basic biology and clinical medicine, and serves as its founding Director. Dr. Toner has served on many national and international panels and review boards, including National Institutes of Health (NIH), National Science Foundation (NSF), Defense Advanced Research Projects Agency (DARPA), Alberta Cancer Board, Italian Ministries for Universities and Research, Science Foundation of Ireland, The Canadian Institute of Health Research. He served on the editorial board of various scientific journals including Journal of Biomechanical Engineering (Associate Editor), Cryo-Letters, Cryobiology (Associate Editor), Cell Preservation Technologies (Associate Editor), Nanomedicine,

Integrated Biology, Journal of Assisted Reproduction and Genetics, and Annual Review of Biomedical Engineering. Dr. Toner serves on the scientific advisory board of Tissue Engineering Research Center (TERC) at Tufts and Columbia Universities, Resource for Synthesis and Bulk Characterization of Polymer Biomaterials (RESBIO) at Rutgers University, Institute of Engineering and Medicine at University of Minnesota, Center for Biomedical Engineering at Brown University, and he is a member of the Board of Trustees of Ozyegin University in Istanbul. In 1998, Dr Toner was selected to become a “Fellow of the American Institute of Medical and Biological Engineering,” and in 2007, he became a “Fellow of the American Society of Mechanical Engineers.” He was recognized by the 2008 Breakthrough Innovation Award of the magazine “Popular Mechanics.” Dr. Toner is known for his scientific and technical work in cryobiology and biopreservation of cellular systems, in tissue engineering and bioartificial organs, and in micro/nano-technology and clinical medicine.