

## Directorate for Engineering Advisory Committee Members

### Linda Abriola

**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 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.**

### Ilesanmi Adesida

**Dr. Ilesanmi Adesida received his B.S., M.S., and Ph.D. degrees in electrical engineering from the University of California, Berkeley in 1974, 1974, and 1979, respectively. From 1979 to 1984, he worked in various capacities at what is now known as the Cornell Nanofabrication Facility and the School of Electrical Engineering, Cornell University, Ithaca, NY. He was the Head of the Electrical Engineering Department at Tafawa Balewa University, Bauchi, Nigeria, from 1985 to 1987. Dr Adesida then joined the University of Illinois at Urbana-Champaign, where he is currently the Donald Biggar Willett Professor of Engineering, Professor of Electrical and Computer Engineering, Professor of Materials Science and Engineering, Director of the Center for Nanoscale Science and Technology and the Dean of the College of Engineering. Also, he previously served as the Director of the Micro and Nanotechnology Laboratory and the Associate Director for Education of the NSF Engineering Research Center for Compound Semiconductor Microelectronics from 1990 to 1997.**

**Dr. Adesida's research interests include nanofabrication, nanoelectromechanical systems, and ultra-high speed optoelectronics. In collaboration with colleagues, his efforts led to the award of the NSF Nanoscale Center for Chemical-Electrical-Mechanical-Manufacturing Systems to the University of Illinois in 2003. He has chaired many international conferences including serving as the Program Chair of the International Symposium on Electron, Ion and Photon Beams and Nanofabrication and the General Chair of the Electronic Materials Conference. Dr. Adesida is a Fellow of the Institute of Electrical and Electronic Engineers (IEEE), the American Association for the Advancement of Science (AAAS), the American Vacuum Society (AVS), and the Optical Society of America. He is a member of the Executive Board of the ASEE Engineering Deans Council and he is serving as the Chair of its Public Policy Committee for 2009/2010. He is a past President of the IEEE Electron Devices Society and a member of the National Academy of Engineering.**

**Dr. Adesida served as the Chair of the External Advisory Board of the NSF Science and Technology Center on Bio-nanotechnology at Cornell University. He is a current member of the NRC Board of Army Science and Technology. He was a Co-Founder of Xindium Technologies and has served as a consultant to many companies including current service as a member of the Board of Directors of a Fortune 500 company.**

### Steven Castillo

*Dr. Steven Castillo is the Provost and Executive Vice President of the Colorado School of Mines. In addition, he is a professor in the Engineering Division at CSM. Prior to his current position he was the Dean of the College of Engineering and a Regent's Professor at New Mexico State University. In 1991, early in his research career, Dr. Castillo received the National Science Foundation's Presidential Young Investigator Award, a highly competitive award that goes to some of the nation's best young scientists and engineers.*

*Dr. Castillo received his Bachelor's Degree in Electrical Engineering at NMSU, and his Master's and Ph.D. at the University of Illinois. His research focuses on computational electromagnetics and high-performance computing. He is a senior member of the Institute of Electrical and Electronic Engineers, a member of SWE, SHPE, Tau Beta Pi and Eta Kappa Nu. He currently serves on the Computational Science and Engineering Advisory Panel for Sandia National Laboratories and has also worked on the Department of Energy Hispanic Serving Institution Consortium initiative for STEM education.*

### Patrick Farrell

*Dr. Patrick Farrell earned a BSME degree at the University of Michigan, MSME at the University of California at Berkeley, and his Ph. D. at the University of Michigan.*

*Dr. Farrell has been at UW-Madison since 1982 as a member of the Department of Mechanical Engineering. He served as Director of the Engine Research Center from 1999-2001, and beginning in 2001, became the College of Engineering Associate Dean for Academic Affairs and was named Executive Associate Dean in 2005. He was Provost and Vice Chancellor for Academic Affairs at the University of Wisconsin-Madison from April 2006 to January 2009.*

*Dr. Farrell's research focuses on fluid mechanics, combustion and optical methods as they relate to engine design and function. He has authored or co-authored over 100 publications in this and related fields.*

### Alison Flatau

*Dr. 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.*

### **Pramod P. Khargonekar**

*Pramod P. Khargonekar received his B. Tech. degree in Electrical Engineering from the Indian Institute of Technology, Bombay, India in 1977, and M.S. degree in Mathematics, and Ph.D. degree in Electrical Engineering from the University of Florida in 1980 and 1981, respectively. After holding faculty positions in Electrical Engineering at the University of Florida and University of Minnesota, he joined The University of Michigan in 1989 as Professor of Electrical Engineering and Computer Science. He became Chairman of the Department of Electrical Engineering and Computer Science in 1997 and also held the position of Claude E. Shannon Professor of Engineering Science. In July 2001, he rejoined the University of Florida and served as Dean of the College of Engineering until July 2009. He is currently Eckis Professor Electrical and Computer Engineering at the University of Florida.*

*Dr. Khargonekar's research and teaching interests are centered on theory and applications of systems and control. His early work was on mathematical control theory, specifically focusing on robust control analysis and design. During the 1990's, he was involved in a major multidisciplinary project on applications of control and estimation techniques to semiconductor manufacturing. He has supervised 29 doctoral students and has co-authored more than 120 refereed journal publications, 170 conference publications, and 2 co-edited books.*

*During Dr. Khargonekar's tenure as Chair of EECS at Michigan, the department expanded computer science activities while enhancing traditional strengths in electrical engineering leading to a computer science degree in the College of Engineering. He is a recipient of the NSF Presidential Young Investigator Award, the American Automatic Control Council's Donald Eckman Award, the IEEE W. R. G. Baker Prize Award, the George Axelby Best Paper Award, the Hugo Schuck ACC Best Paper Award, the Japan Society for Promotion of Science Fellowship(s), and a Distinguished Alumnus Award from the Indian Institute of Technology, Bombay. Dr. Khargonekar is a Fellow of IEEE. He is on the list of Highly Cited Researchers from the ISI Web of Science. He has given numerous plenary and keynote presentations at major conferences. At the University of Michigan, he received a teaching excellence award from the EECS department, a research excellence award from the College of Engineering, and the Arthur F. Thurnau Professorship. At the University of Minnesota, he received the George Taylor Distinguished Research Award from the Institute of Technology.*

### **Tom Knight**

*Tom Knight is the Founder and CEO of Invistics, which opened in 1999. As Chief Strategy Officer, he has overall responsibility for the company's solution strategy. Prior to founding Invistics, Tom spent 10 years improving supply chains as a manufacturing executive at Alcoa and Siemens.*

*Tom has a B.S. and M.S. in Mechanical Engineering and an MBA from Massachusetts Institute of Technology (MIT). While at MIT, he conducted research on software to improve manufacturing planning and scheduling, receiving the Good year Prize in Manufacturing Management from the MIT Department of Mechanical Engineering.*

### **Bruce Logan**

***Dr. Bruce Logan is the Kappe Professor of Environmental Engineering at Penn State University, and also Director of the Engineering Energy & Environmental Institute (E3I). Dr. Logan's interests are currently focused on bioenergy production, with the goal of developing an energy sustainable global water infrastructure. His research examines the use of exoelectrogenic bacteria to generate current in different types of microbial fuel cells (MFCs). Using these technologies, it is possible to use waste biomass to: produce current for direct electrical power generation in MFCs; to electrochemically produce energy carriers at the cathode such as hydrogen or methane in microbial electrolysis cells; and to desalinate water without any external electricity input in microbial desalination cells. These technologies have the potential not only to power the water infrastructure, but to produce a net excess power for communities and industries.***

***Dr. Logan has authored over 250 refereed journal publications and books on environmental transport processes and microbial fuel cells. He has received numerous awards including the National Water Research Institute (NWRI) Athalie Richardson Irvine Clarke Prize (2009), Water Environment Research Foundation Paul L. Busch Award, Association of Environmental Engineering and Science Professors (AEESP) inaugural Research Frontiers Award, and the Penn State Engineering Society (PSES) Premier Research Award. In 1993 he was a Fulbright Scholar at the University of Constance (Germany) and in 2003 a Leverhulme fellow at the University of Newcastle upon Tyne (England). Dr. Logan is a visiting professor at Newcastle University (UK), Harbin Institute of Technology and Dalian University of Technology (China); and he is an Investigator with the King Abdullah University of Science & Technology (KAUST) in Saudi Arabia. He received his Ph.D. 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.***

### **Lueny Morell**

***Lueny Morell is Program Manager in the Strategic Innovation and Research Services Office of Hewlett Packard Laboratories in Palo Alto, California. She is part of the team facilitating co-innovation with government, partners and universities. From 2002-2008, she was in charge of developing engineering/science curriculum innovation initiatives worldwide in support of HPL research and technology areas and former director of HPL University Relations for Latin America and the Caribbean in charge of building research and education collaborations with universities throughout the region. Before joining HP, Lueny was full professor of Chemical Engineering at the University of Puerto Rico – Mayagüez Campus where she held various positions including associate dean of engineering and director Campus R&D. Recipient of the 2006 US National Academy of Engineering Bernard M. Gordon award for innovations in the engineering curriculum and the 2010 Latin America and the Caribbean Consortium of Engineering Institutions Academic Award, her work in curriculum, research, accreditation and economic development activities has been published in more than 80 papers, book chapters and journals. She is a licensed engineer, an ASEE Fellow, an ABET reviewer and member of various national and international boards including the US National Science Foundation International Science and Engineering Advisory Committee, Past President of the International Federation of Engineering Education Societies, engineering expert of the OECD AHELO project and Co-Director of the International Institute for Developing Engineering Academics (IIDEA). Together with colleagues, Lueny has offered more than 65 engineering education, curriculum/learning environments innovation workshops around the world.***

### Margaret Murnane

*Dr. Margaret Murnane is a Fellow at the Joint Institute for Laboratory Astrophysics and a member of the Department of Electrical and Computer Engineering and the Department of Physics at the University of Colorado. She received her B.S and M.S. degrees from University College Cork, Ireland, and her Ph.D. degree in physics from the University of California at Berkeley in 1989, and joined the faculty of physics at Washington State University in 1990. In 1996, Dr. Murnane moved to the University of Michigan, and in 1999 she moved to the University of Colorado. She runs a joint research group and a small laser company with her husband, Dr. Henry Kapteyn. Dr. Murnane's research interests have been in ultrafast optical and x-ray science. She is a Fellow of the American Physical Society and the Optical Society of America. She was recognized as the Maria Goeppert-Mayer Award of the American Physical Society and a John D. and Catherine T. MacArthur Fellow. She was elected to the National Academy of Sciences and is a Fellow of the American Academy of Arts and Sciences.*

### Tresa Pollock

*Dr. Tresa Pollock is the L.H. and F.E. Van Vlack Professor of Materials Science and Engineering at the University of Michigan, Ann Arbor, MI. She graduated with a B.S. from Purdue University in 1984, and a Ph.D. from MIT in 1989. Dr. Pollock was employed at General Electric Aircraft Engines from 1989 to 1991, where she conducted research and development on high temperature alloys for aircraft turbine engines. She was a professor in the Department of Materials Science and Engineering at Carnegie Mellon University from 1991 to 1999. Dr. Pollock has received the ASM International Research Silver Medal Award, the Bradley Stoughton Award, the Carnegie Mellon Ladd Research Award and an NSF-NYI Award. She was elected to the National Academy of Engineering in 2005, is a Fellow of ASM International, Associate Editor of Metallurgical and Materials Transactions and has been the 2005-2006 President of The Minerals, Metals and Materials Society.*

### Michael Silevitch

*Michael B. Silevitch received the BSEE, MSEE, and PhD from Northeastern University in 1965, 1966, and 1971, respectively. He joined the faculty of Northeastern in 1972, and was appointed to the Robert D. Black Endowed Chair in Engineering at Northeastern in 2003, the same year that he was elected an IEEE Fellow for leadership in advanced subsurface sensing and imaging techniques. Dr. Silevitch is Director of the Bernard M. Gordon Center for Subsurface Sensing and Imaging Systems, a National Science Foundation Engineering Research Center that is focused on development of a unifying framework for discerning hidden objects or structures. He is also co-Director of Awareness and Localization of Explosives Related Threats (ALERT), a Department of Homeland Security Center of Excellence focused on explosives detection, mitigation and response.*

*Dr. Silevitch has also contributed his efforts toward improving the education of young scientists and engineers. From 1987-1996, he served as the director of the Center for the Enhancement of Science and Mathematics Education (CESAME), funded by grants from NSF and the Noyce Foundation, which developed a systematic mechanism to implement a statewide network of exemplary K-12 mathematics and science curricula, and as principal investigator for IMPACT, a \$5 million grant from NSF that resulted in the implementation of exemplary curricula in 500 school districts throughout the New England region*

*In Dr. Silevitch's professional area of expertise, space plasma physics, he served as principal investigator for multiple Air Force-funded projects, focusing on problems such as the structure of the earth's radiation belts, the formation of the aurora borealis and the nature of wave-particle interaction in space plasma. He has authored over 65 publications and 90 presented papers spanning several research disciplines including collaborations with scientists from the United States, France, Sweden, Finland and Austria.*

### David Spencer

**Dr. 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<sup>®</sup> / Thixocasting<sup>®</sup> processes as part of his doctoral thesis, a new casting technology deployed worldwide for high performance metal castings. Prior to forming wTe, Dave 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<sup>®</sup> 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<sup>®</sup> and Melt Cognition<sup>®</sup>, to automatically sort metals by type in milliseconds. Dave 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, Dave 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.**

### Matthew Tirrell

**Professor Matthew Tirrell is the Arnold and Barbara Silverman Professor and Chair of the Department of Bioengineering at the University of California, Berkeley. Prior to his current position at UCB, Professor Tirrell served as Dean of the College of Engineering and Professor of Chemical Engineering and Materials at the University of California, Santa Barbara between 1999 and 2009. He received his undergraduate education in Chemical Engineering at Northwestern University and his Ph.D. in 1977 in Polymer Science from the University of Massachusetts. From 1977 to 1999 he was on the faculty of Chemical Engineering and Materials Science at the University of Minnesota, where he served as head of the department from 1995 to 1999. Professor Tirrell's research has been in polymer surface properties including adsorption, adhesion, surface treatment, friction, lubrication and biocompatibility. He has co-authored over 280 papers and one book and has supervised over 70 Ph.D. students.**

**Professor Tirrell has been a Sloan and a Guggenheim Fellow, a recipient of the Camille and Henry Dreyfus Teacher-Scholar Award and has received the Allan P. Colburn, Charles Stine and the Professional Progress Awards from AIChE, as well as delivering its Institute Lecture in 2001. He is a member of the National Academy of Engineering, a member of the Indian Academy of Engineering, a Fellow of the American Academy of Arts and Sciences, a Fellow of the American Institute of Medical and Biological Engineers, a Fellow of the American Association for the Advancement of Science, and a fellow of the American Physical Society. In 2003, Professor Tirrell concluded more than two years of service as co-chair of the steering committee for the National Research Council report "Beyond the Molecular Frontier: Challenges for Chemistry and Chemical Engineering" published by the National Academy Press. He currently serves on the Board of Directors of the Cottage Health System.**

**Mehmet Toner**

**Professor 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.**