

**CONNECTICUT ACADEMY OF SCIENCE AND ENGINEERING
2017 NEW MEMBER SUMMARY**

BOWES, KENNETH B.		Vice President of Engineering, Eversource Energy
Education:	University of New Hampshire, 1984, BS, Electrical Engineering; Rensselaer Polytechnic Institute, 1990, MS, Electrical Engineering	
Professional Area:	Engineering activities for the safe operation of the electric system and delivery of power to 149 Connecticut towns including distribution planning, distribution engineering and design, substation engineering, protection and control engineering, telecommunications engineering, geographic information systems, reliability, asset management and system resiliency, distributed generation, micro-grid, new technology and R&D activities	
Citation:	For his technical and management leadership and results in the design, construction, operation and maintenance of the Connecticut electric power grid system, including distribution planning, distribution engineering and design, substation engineering, protection and control engineering, telecommunications engineering, reliability, asset management, system resiliency, distributed generation, micro-grid, new technologies and R&D activities.	

BRUNO, CLAUDIO		Research Professor, Mechanical Engineering, University of Connecticut
Education:	University of Rome - Italy, 1965, M.Eng.; Princeton University, 1970, MA, and 1977, PhD, Aerospace and Mechanical Sciences	
Professional Area:	Gas-dynamics; thermochemistry and chemical kinetics; compressible turbulence; turbulent combustion and catalytic combustion; chemical and nuclear space propulsion; gas turbine engines; solid and liquid rocket engines; catalytic recombination during orbital re-entry; high temperature metal oxidation and combustion; hypersonics; high energy density matter	
Citation:	Internationally known for outstanding innovation in the physics of energy conversion, including combustion and emissions predictions, its computational simulation, and novel applications to hypersonics, military and commercial aeroengines and space propulsion	

CARTER, DAVID, B.		Senior Vice President, Engineering, Pratt & Whitney
Education:	University of Virginia, 1979, BS, Mechanical Engineering, and 1981, MS, Mechanical Engineering	
Professional Area:	David Carter is Vice President, Engineering at Pratt & Whitney, a world leader in the design, manufacture and service of aircraft engines. He directs a workforce of over 4000 engineers. His responsibilities include product and technology development for the PW gas turbine engines, including the geared turbofan commercial engines and the F135 military engine.	
Citation:	For outstanding contributions to aerospace technologies, including the product development, airworthiness, life management, product improvement and technology insertion for engines and components for front-line military & state-of-the-art commercial aircraft.	

COHAN, FREDERICK M.		Professor of Biology and Environmental Studies, Biology Department, Wesleyan University
Education:	Stanford University, 1975, BS, Biological Sciences; Harvard University, 1982, PhD., Organismic and Evolutionary Biology	
Professional Area:	Microbial ecology, evolutionary theory, speciation processes in bacteria and macroorganisms, origins of bacterial diversity, simulation modeling, molecular systematics and gene cluster analysis, infectious disease ecology and evolution, global change ecology, horizontal genetic transfer, bacterial transformation.	
Citation:	For development of a comprehensive new theory for the origin, maintenance, and evolutionary dynamics of bacterial species diversity that integrates ecological and genetic criteria; and for initiating and co-developing associated software tools allowing microbiologists to identify distinct bacterial species from DNA sequence data.	

DARLING, ROBERT M.		Principal Research Scientist, United Technologies Research Center
Education:	University of British Columbia, Vancouver, Canada, Chemical Engineering (Co-op), 1993, BASc., University of California - Berkeley, 1998, PhD, Chemical Engineering (advisor: Prof. John Newman)	
Professional Area:	Dr. Darling is a Principal Research Engineer at UTRC, the innovation center for United Technologies. Rob works on advancing electrochemical technologies including fuel cells, batteries, and novel devices for a variety of applications including grid energy storage and transportation vehicles. Rob also makes important contributions to corrosion and dendrite modeling, analysis of frictional heating, and traditional chemical engineering issues.	
Citation:	For extraordinary contributions to electrochemical science and technology including his role in the seminal discovery of basic mechanisms affecting the performance and durability of electrochemical devices. His contributions in understanding the decay mechanisms during the start and stop of fuel cells, is recognized across the world as the fundamental body of work that has furthered commercialization.	

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FINN, ALAN M.		Research Fellow, Systems Department, United Technologies Research Center
Education:	Rensselaer Polytechnic Institute, 1977, BS, Mathematics, and 1977, BS, Electrical Engineering; Cornell University, 1980, M.Eng, Electrical Engineering, and 1983, PhD, Electrical Engineering	
Professional Area:	Model-based image and video analytics for surveillance systems, forensics, and automating human inspection using statistical parameter estimation and Bayesian inference; Compressive Sensing (l1-regularized optimization); Digital Signal Processing, and Embedded Computer Architecture, particularly optimizing algorithm to architecture mapping for array processors.	
Citation:	For outstanding technical contribution in multiple fields including fault-tolerant flight control systems, cryptographically secure remote keyless entry systems, automated machinery diagnostics, and image and video analytics for surveillance, forensics, and automation of human visual inspection through the development and application of mathematical techniques, especially l1-regularized optimization.	
GALVANI, ALISON P.		Burnett and Stender Families Professor of Epidemiology (Microbial Diseases) and Professor of Ecology and Evolutionary Biology; Director of the Center for Infectious Disease Modeling and Analysis (CIDMA), Yale School of Public Health
Education:	University of Oxford, 1998, First class BA (Honors, with Distinction) in Biological Sciences, and 2002, PhD	
Professional Area:	Infectious disease epidemiology; mathematical modeling; policy analysis	
Citation:	Dr. Galvani has developed mathematical models of disease transmission that use information from epidemiology, ecology, clinical medicine, economics, and psychology. Her work spans the range from the epidemiological repercussions of host/pathogen heterogeneity to policy-ready assessments of the impact of human self-interest and risk perception on the success of collective infection-control policies.	
GAO, PUXIAN		Professor, Materials Science and Engineering, University of Connecticut
Education:	Xiangtan University, China, 1997, BE, Mechanical Engineering; Beijing University of Aeronautics and Astronautics, China, 2000, MS, Materials Science; Georgia Institute of Technology, 2005, PhD, Materials Science & Engineering	
Professional Area:	Nanomaterials Science and Engineering for Energy, Environment and Biomedical Applications: 1) Engineered nanomaterials synthesis, manipulation, and scalable manufacturing; 2) Nanocatalysis for energy and environmental applications; 3) Nanoscale chemical, physical, and biological sensors and actuators; 4) Energy harvesting and storage; 5) Electronics and optoelectronics; 6) Biofluidics and Cell-nanomaterials interfaces	
Citation:	For seminal contribution to the fundamental understanding of engineered nanomaterials assembly and scalable manufacturing; establishment of nanostructure array integrated catalysis and sensing technology paradigm for various mobile and stationary energy systems; pioneer research and development of nano-array based catalytic converters and harsh environmental sensors.	
HOWARD, JONATHON		Eugene Higgins Professor, Molecular Biophysics & Biochemistry, Yale University
Education:	Australian National University, Canberra, 1979, BSc (Hons) Pure Mathematics (1st Class Honours); Australian National University, 1983, PhD, Neurobiology (advisors S.B. Laughlin, A. Snyder); University of Bristol, UK, 1984, Postdoctoral Dept. Physiology (advisor: Jonathan Ashmore); University of California-San Francisco, 1985-87, Postdoctoral Dept. Physiology (advisor: A.J. Hudspeth)	
Professional Area:	The Howard laboratory focuses on the mechanisms of force generation in cells and how biomolecules such as proteins, lipids and nucleotides self-assemble into cells and tissues of a predetermined size, shape and composition. These questions are addressed by a combination of biophysics, molecular biology, mathematical modeling, and theory development.	
Citation:	For seminal contributions in understanding the molecular properties of motor proteins, especially in deciphering how these evolutionarily conserved proteins operate as molecular machines to drive motion and regulate the growth and shrinkage of microtubules critical for biological processes such as mitosis and cellular motion.	
JAWOROWSKI, MARK R.		Fellow, Physical Sciences Department, United Technologies Research Center
Education:	University of Connecticut, 1983, BS, Chemical Engineering, 1989, MS, Metallurgy, and 1998, PhD, Metallurgy	
Professional Area:	Dr. Jaworowski is an expert in the areas of corrosion science and the application of Green Chemistry principles to industrial process development	
Citation:	Dr. Jaworowski is widely recognized by the aerospace industry for fundamental achievements in the understanding of corrosion of metals and development and implementation of environmentally safe and effective corrosion inhibitors as substitutes for hexavalent chromium compounds used extensively in critical aerospace material applications.	

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KURTH, ANN E.		Dean & Linda Koch Lorimer Professor, School of Nursing, Yale University
<u>Education:</u>	Princeton University, 1984, AB, magna cum laude, Development Studies (minor: African Studies); Columbia University School of Public Health, 1987, MPH, Division of Population and Family Health/Maternal and Child Health; Yale University School of Nursing, 1990, MSN, Maternal-Newborn Division: Nurse-Midwifery; University of Washington School of Public Health, Seattle, 2003, PhD, Epidemiology	
<u>Professional Area:</u>	HIV/sexual and reproductive health prevention, screening and care Global health system strengthening, using information and communication technologies Health intervention implementation and workforce training.	
<u>Citation:</u>	Internationally recognized epidemiologist and clinically-trained nurse-midwife. She has made major contributions to HIV/sexual and reproductive health prevention, screening and care, and to global health system strengthening in the US and internationally.	
LEVCHENKO, ANDRE		John C. Malone Professor & Director, Yale Systems Biology Institute, Yale University
<u>Education:</u>	Moscow Institute of Physics and Technology, Moscow, Russia, 1992 MS, Biophysics; Columbia University, 1995, MS, Bioengineering, and 1999, Eng. ScD, Bioengineering	
<u>Professional Area:</u>	Systems Biology; Signal Transduction and Cell-Cell Communication; Cell Decision Making; Microfluidic Devices; Micro-, Nano-Fabrication Techniques; Information Theory; Stem Cell Engineering; Cancer Systems Biology	
<u>Citation:</u>	For outstanding innovation and impact in the field of Systems Biology, specifically for introducing novel technical approaches and quantitative methods to elucidate dynamic signaling networks that control both individual and collective cellular responses to diverse chemical and mechanical cues.	
LI, BAIKUN		Professor, Civil and Environmental Engineering, University of Connecticut
<u>Education:</u>	Harbin Institute of Technology (China), 1992, BS, Environmental Engineering, and 1995, MS, Environmental Engineering; University of Cincinnati, 2002, PhD, Environmental Engineering.	
<u>Professional Area:</u>	Self-sustained Wastewater Treatment Technology, Biomass Energy Production from Wastes, Bioelectrochemical systems, Biosensors and Bioelectronics, Real-time Water Quality Monitoring	
<u>Citation:</u>	For outstanding contribution to new renewable energy technologies for achieving an energy sustainable water infrastructure, including the national first pilot-scale wastewater-to-electricity systems, and new real-time in situ sensor technologies for enhancing biochemical processes' efficiency through intelligent energy-saving methodology.	
MAJEWSKI, ALEXANDER J.		Fellow, UTC Aerospace Systems
<u>Education:</u>	Fordham University, 1989, BS, Physics; CUNY City College, New York, 1991, MA, Physics; Stevens Institute of Technology, 2001, PhD, Physics	
<u>Professional Area:</u>	Dr. Majewski is known world-wide for his expertise in the area of sensors; principally for his leading and developing sensors for chemical sensing applications as well as other electro-optical sensors. He is a well-recognized innovator with numerous inventions related to sensors. His career is punctuated through his application of physics, optics, photonics, and spectroscopy solutions to hard technical problems.	
<u>Citation:</u>	For significant contributions to electro-optical sensors, imaging systems, and applied science directly related to our National Security Systems. Specifically, his ground breaking work in Terahertz Technology using optics and photonics technologies for chemical detection phenomenology is widely recognized within industry and academia alike.	
MALONEY, MICHAEL J.		Manager, Structural Alloys, Hot Section Materials and Coatings, Pratt & Whitney
<u>Education:</u>	University of Illinois: BS, 1983, Metallurgy; MS, 1984, Metallurgical Engineering; Massachusetts Institute of Technology, 1989, PhD, Materials Science and Engineering	
<u>Professional Area:</u>	Materials Science and Engineering, Metallurgy, Ceramics, High-temperature Oxidation and Corrosion, High-temperature Coatings	
<u>Citation:</u>	For development of advanced high-temperature coating systems that significantly contribute to the ability to design turbine engines with decreased fuel consumption, decreased noise and increased durability. He has been awarded 42 Patents that relate to high-temperature turbine materials.	
<u>Link to Google Scholar:</u>	https://scholar.google.com/scholar?hl=en&q=mj+maloney+pratt+%26+whitney&as_sdt=1%2C7&as_sdtp=&oq=mj+maloney	
<u>Nominator:</u>	NOMINATED BY COUNCIL RULE: Elected Member, National Academy of Engineering (2016)	

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PECCIA, JORDAN		Professor, Chemical and Environmental Engineering, Yale University
Education:	Montana State University at Bozeman, 1993, BS, Mechanical Engineering and 1995, MS, Environmental Engineering; University of Colorado at Boulder, 200, PhD, Environmental Engineering	
Professional Area:	Environmental biotechnology with emphasis on: human exposure to pathogens and allergens, microbiology of the built environment, indoor air quality, bioaerosols, integration of aerosol science with molecular biology-based methods for exposure analysis, human health impacts and microbial risk.	
Citation:	For national and international leadership in the study of building microbiomes, for contributions on how building design, operation, and occupancy impact human exposure to microbes, and for revealing new associations between building microbial diversity and asthma.	
RAYMOND, PETER A.		Professor of Ecosystem Ecology, Yale School of Forestry & Environmental Studies, Yale University
Education:	Marist College, 1993, BS, Environmental Chemistry with Minor in Biology; Virginia Institute of Marine Science, College of William and Mary, 1999, PhD, Marine Science, Physical Sciences Department (Advisor: James Bauer)	
Professional Area:	Biogeochemistry, oceanography, hydrology and global change science NOTE: Served as CASE Study Manager for a study on <i>Methods to Measure Phosphorus and Make Future Projections (2014)</i> conducted for the Connecticut Department of Energy and Environmental Protection	
Citation:	Professor Raymond has increased our knowledge of the natural and anthropogenic controls on inland water chemistry. Findings include the global transfer of CO ₂ between inland waters and the atmosphere, the age of carbon transported in water, and the impacts of land management on inland water chemistry.	
RUBIN, PHILIP E.		Senior Advisor to the President and Chief Executive Officer Emeritus, Yale University
Education:	Brandeis University, 1971, BA, Psychology and Linguistics; University of Connecticut, 1973, MA, Experimental Psychology, and 1975, PhD, Experimental Psychology	
Professional Area:	Dr. Rubin's research spans a number of disciplines, combining computational, engineering, linguistic, physiological, and psychological approaches to study the biological bases of speech and language. He is best known for articulatory synthesis (computational modeling of the physiology and acoustics of speech production), sinewave synthesis, signal processing, experimental phonetics, and perceptual organization.	
Citation:	For his scientific achievements in the areas of speech synthesis and analysis, which have led to over thirty years of research and technological developments around the world; and for his scientific leadership at Haskins Laboratories in New Haven, the National Science Foundation, the National Research Council, and the White House.	
RUSSELL, ALEXANDER C.		Professor and Director of Graduate Studies, Computer Science and Engineering Department, University of Connecticut
Education:	Cornell University, BS, 1991, Computer Science (cum laude and distinction), and 1991, BS, Mathematics (cum laude and distinction); MIT, 1993, MS, Electrical Engineering and Computer Science, and 1996, PhD, Applied Mathematics; University of California - Berkeley; Royal Institute of Technology (Sweden), 1996-1999, Post-Doctorate	
Professional Area:	Cryptography, focusing on "long horizon" security guarantees that protect data from tomorrow's threats; electronic voting technology; security and integrity; quantum computing, including the security of our cryptographic systems against quantum attacks; survivable distributed information and computational systems	
Citation:	For seminal contributions to cryptography, quantum computing, and security; his work has shaped development of modern cryptographic tools and guided security of electronic voting technology. As a co-director of the UConn Center for Voting Technology Research, he significantly contributed to the security and integrity of elections in Connecticut.	
SHAO, ZHONG		Professor, Computer Science, Yale University
Education:	University of Science and Technology of China, 1988, BS, Computer Science; Princeton University, 1991, MA, Computer Science, and 1994, PhD, Computer Science	
Professional Area:	Programming languages and operating systems, with a focus on language-based support for safety and security, certified system software, certified programming and compilation, formal methods and proof automation, concurrency and coordination, and type systems	
Citation:	For pioneering contributions to the development of novel programming languages, logics, and tools for building certifiably reliable and secure system software. His techniques led to the world's first mechanized proof of functional correctness of a complete, general-purpose concurrent operating-system kernel with fine-grained locking.	

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SIGWORTH, FREDERICK J.		Professor, Cellular and Molecular Physiology with joint appointments in Biomedical Engineering and Molecular Biophysics and Biochemistry, Yale University
<u>Education:</u>	California Institute of Technology, 1974, BS, Applied Physics; University of Washington, 1974-75, graduate study; Yale University, 1979, PhD, Physiology; Max Planck Institute for Biophysical Chemistry, Germany, 1980-84, Postdoctoral Research, Biophysics	
<u>Professional Area:</u>	Molecular biophysics and biochemistry; Structural biology; Cellular and molecular physiology: membrane biology, biophysics, protein structure; Neurobiology; Neurophysiology; Neural networks and neuropharmacology. Current research: structural biology of ion-channel proteins.	
<u>Citation:</u>	Dr. Sigworth's research unravels the workings of ion channel proteins, the "molecular machines" that switch on and off the electrical currents carried by ions across biological membrane proteins. He developed methods for recording and analyzing the single-molecule events underlying the switching of currents, and currently studies the structure of ion-channel proteins by electron cryo-microscopy.	
STEFFENS, DAVID, C.		Professor & Chair, Psychiatry, University of Connecticut School of Medicine
<u>Education:</u>	Rice University, 1984, BA, Biochemistry and Spanish; University of Texas Health Science Center at Houston, 1988, MD; Duke University Medical Center, 2000, MHS, Clinical Research	
<u>Professional Area:</u>	Geriatric psychiatry; Depression; Cognition; Dementia; Alzheimer's disease; Magnetic Resonance Imaging	
<u>Citation:</u>	Professor Steffens is a pioneer in the study of depression and risk of cognitive decline and dementia in the elderly. His research links clinical and neuropsychological assessment with neuroimaging technologies, genetics, and pharmacotherapy. He has made fundamental contributions to our understanding of the neurobiology and cognitive consequences of late-life depression.	
TAYLOR, HUGH S.		Anita O'Keeffe Young Professor of Women's Health & Chair, Department of Obstetrics, Gynecology and Reproductive Sciences, Yale School of Medicine & Yale-New Haven Hospital
<u>Education:</u>	Yale University, 1983, BA, Molecular Biophysics and Biochemistry; University of Connecticut School of Medicine, 1988, MD; Yale University, 2008, MA, Privatum	
<u>Professional Area:</u>	Obstetrics, Gynecology, Reproductive Sciences: IVF, infertility, endometriosis, implantation, menopause, uterine anomalies and DES exposure.	
<u>Citation:</u>	Dr. Taylor is a world renowned expert in reproductive sciences, with a focus on implantation, endometriosis, and menopause. His work has led to, among other insights, a better understanding of endometriosis, including the genetic cause and the role of stem cells in the disease.	
WOLIN, SANDRA L.		Professor of Cell Biology and Molecular Biophysics and Biochemistry; Director, Yale Center for RNA Science and Medicine, Yale University School of Medicine
<u>Education:</u>	Princeton University, 1978, AB, summa cum laude, Biochemical Sciences; Yale School of Medicine, 1985, MD and 1985, PhD, Molecular Biophysics and Biochemistry; University of California-San Francisco, 1985-1990, American Cancer Society and Helen Hay Whitney Postdoctoral fellowships	
<u>Professional Area:</u>	Gene expression, RNA function and decay, autoantigens, bacteria as model systems, stress responses	
<u>Citation:</u>	For pioneering studies of how cells recognize and degrade unneeded, damaged and harmful RNA molecules which could otherwise interfere with normal cellular function. Using a variety of organisms and approaches, Wolin has elucidated the functions of cellular machines that bind and destroy misfolded RNAs, including discovering a novel surveillance pathway.	