

Directorate for Engineering (ENG) Advisory Committee Members
National Science Foundation
Fall 2016



TILAK AGERWALA is retired vice president, Systems, at IBM Research. He was responsible for developing the next-generation technologies for IBM's systems, from microprocessor architecture and design to commercial systems and supercomputers, as well as novel Supercomputing algorithms, systems software and applications. He currently leads TKMA Consulting. Agerwala joined IBM in 1979 at the T.J. Watson Research Center and has held executive positions at IBM in research, advanced development, development, marketing and business development. His research interests are in the area of high performance computer architectures and systems.

Agerwala is a founding member of the IBM Academy of Technology, and a Fellow of the Institute of Electrical and Electronics Engineers. He has given over 100 invited technical presentations and Keynote talks at conferences, universities, and National Laboratories worldwide. He received his B.Tech. in electrical engineering from the Indian Institute of Technology, Kanpur, India, and his Ph.D. in electrical engineering from Johns Hopkins University, Baltimore, Maryland.

PEDRO J. J. ALVAREZ is the George R. Brown Professor of Environmental Engineering in the department of civil and environmental engineering at Rice University, where he also serves as director of the NSF Engineering Research Center on Nanotechnology-Enabled Water Treatment (NEWT). He previously taught at the University of Iowa, where he also served as associate director for the Center for Biocatalysis and Bioprocessing and as Honorary Consul for Nicaragua. Alvarez's research focuses on environmental sustainability through bioremediation of contaminated aquifers, the fate and transport of toxic chemicals, the water footprint of biofuels, microbial-plant interactions, water treatment and reuse, and environmental implications and applications of nanotechnology. He received his bachelor's degree in civil engineering from McGill University and master's and doctoral degrees in environmental engineering from the University of Michigan.

Alvarez is the 2012 Clarke Prize recipient and also won the 2014 AAEES Grand Prize for Excellence in Environmental Engineering and Science. He is a diplomat of the American Academy of Environmental Engineers, a Fellow of AAAS, ASCE, IWA, WEF and the Leopold Leadership Foundation, and a founding member of the Nicaraguan Academy of Sciences, among numerous other achievements and honors. Alvarez currently serves as associate editor of *Environmental Science and Technology*. Additionally, he serves as honorary professor at Nankai University in Tianjin and the Chinese Academy of Sciences in Beijing, China, and as adjunct professor at the Universidade Federal de Santa Catarina in Brazil.

GILDA A. BARABINO is the dean of The Grove School of Engineering at The City College of New York (CCNY) and Berg Professor of Biomedical Engineering, Professor of Chemical Engineering and Professor of Biomedical Education. Prior to joining CCNY, she served as associate chair for graduate studies and professor in the Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech and Emory University. At Georgia Tech she also served as the inaugural Vice Provost for Academic Diversity. Prior to

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her appointments at Georgia Tech and Emory, she rose to the rank of full professor of chemical engineering and served as Vice Provost for Undergraduate Education at Northeastern University. She is a noted investigator in the areas of sickle cell disease, cellular and tissue engineering, and race/ethnicity and gender in science and engineering. She consults nationally and internationally on STEM education and research, diversity in higher education, policy, workforce development and faculty development.

Barabino received her B.S. degree in chemistry from Xavier University of Louisiana and her Ph.D. in chemical engineering from Rice University. She is a Fellow of the American Association for the Advancement of Science, the American Institute for Medical and Biological Engineering (AIMBE) and the Biomedical Engineering Society (BMES). She was the Sigma Xi Distinguished Lecturer for 2012–2014. She has an extensive record of leadership and service in the chemical and biomedical engineering communities. She is the immediate past-president of BMES and is the president-elect of AIMBE. Barabino has over a decade of experience in leading NSF initiatives for women and minority faculty and is the founder and executive director of the National Institute for Faculty Equity.

SUSAN BUTTS is an active member of the science and technology (S&T) policy community following her 31-year career in the chemical industry and related organizations. She currently works as an independent consultant in S&T policy and university-industry partnerships. Prior to this she worked for The Dow Chemical Company for three decades in various positions in the Research and Development organization. From 2001 through 2009 she served as Director of External Science & Technology Programs. In that capacity she was responsible for Dow's sponsored research programs at over 150 universities, institutes, and national laboratories worldwide and also for Dow's contract research activities with U.S. and European government agencies. In addition, she had responsibility for U.S. recruiting and hiring for R&D. She worked on issues related to science policy and government funding for research and development from Dow's office in Washington, D.C.

Butts is past president of the University-Industry Demonstration Partnership, an organization in the National Academies that works to strengthen research collaborations between universities and industry, and past president of the Council for Chemical Research, a non-profit organization whose mission is to improve chemical innovation through collaboration and advocacy. She is also a member of the Council of the Government-University- Industry Research Roundtable in the National Academies and a member of the board of directors of the Alliance for Science and Technology Research in America. She is a Fellow of the American Association for the Advancement of Science (AAAS), and a member of the American Chemical Society (ACS) and Sigma Xi. She currently chairs the ACS Committee on Chemistry and Public Affairs and serves on the AAAS Committee on Science, Engineering & Public Policy.

Butts holds the degrees of B.S. in chemistry from the University of Michigan and Ph.D. in chemistry from Northwestern University. Before joining the External Technology group Butts held several other positions at Dow including Senior Resource Leader for Atomic Spectroscopy and Inorganic Analysis within the Global Analytical Sciences Laboratory, Manager of Ph.D. Hiring and Placement, Safety and Regulatory

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Affairs Manager for Central Research, and Principal Investigator on various catalysis research projects in Central Research.

CURTIS CARLSON is founder and CEO of the Practice of Innovation. He served as SRI President and CEO from 1998 to 2014 and is a world authority on creating value for customers through innovation. In 1973, he joined RCA Laboratories, which became part of SRI in 1987 as Sarnoff Corp. There, Carlson started and helped lead development of HDTV technology that became the U.S. standard. His book with William Wilmot, “Innovation: The Five Disciplines for Creating What Customers Want,” describes how SRI’s unique process for innovation can be applied to all types of government and commercial enterprises.

Carlson received his B.S. in physics from Worcester Polytechnic Institute and M.S. and Ph.D. degrees in atmospheric physics from Rutgers University. His honors include a lifetime achievement award from Rutgers University's School of Engineering and the Otto Schade Prize from the Society for Information Display.

REGINALD DESROCHES is the Karen and John Huff School Chair, and Professor of Civil and Environmental Engineering at the Georgia Institute of Technology. His primary research interests are in resilient systems and design of critical infrastructure under extreme loads. He has published over 250 articles in the general area of resilience and seismic risk assessment. DesRoches has served as chair of the ASCE Seismic Effects Committee (2006-2010), Chair of the executive committee of the Technical Council on Lifeline Earthquake Engineering (2010), and member of the Board of the Earthquake Engineering Research Institute (EERI). He is currently a member of the executive committee of the National Academy of Sciences Roundtable on Risk, Resilience, and Extreme Events, and is a member of the National Academies Board on Army Science and Technology (BAST).

DesRoches has received numerous awards, including the Presidential Early Career Award for Scientists and Engineers (PECASE) in 2002, the 2007 ASCE Walter L. Huber Civil Engineering Research Prize, the Georgia Tech Outstanding Doctoral Thesis Advisor Award (2010), and the Georgia Tech ANAK Award (2008). Most recently, he is a recipient of the 2015 ASCE Charles Martin Duke Lifeline Earthquake Engineering Award. He was inducted into the Academy of Distinguished Alumni from Civil & Environmental Engineering at UC Berkeley in 2015.

DEBASISH (DEBA) DUTTA joined Purdue University in 2014 as executive vice president for academic affairs and provost, with a faculty appointment as a professor of mechanical engineering. He received his PhD from Purdue in 1989 and is a fellow of the American Association for the Advancement of Science, a fellow of the American Society of Mechanical Engineers and a scholar in residence at the National Academy of Engineering, where he leads studies on educating for innovation and on lifelong learning for engineering professionals.

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From 2009 to 2014, Dutta was associate provost and dean of the Graduate College at the University of Illinois at Urbana-Champaign, and Edward and Jane Marr Gutgsell Professor of Mechanical Science and Engineering. He also served as interim vice chancellor for research, chaired the Board of Directors of Illinois at Singapore PTE, a multimillion-dollar research enterprise in Singapore, and in 2010 chaired the steering committee for a university-wide reorganization process.

During 2004-2007, he served at NSF as acting director of the Division of Graduate Education, as IGERT program director and as advisor in the Office of Assistant Director, Education and Human Resources. He chaired the Learning and Workforce Development subcommittee during the development of NSF's Cyberinfrastructure Strategy (Vision for 21st Century Discovery).

During 1989-2009, Dutta was a professor of mechanical engineering at the University of Michigan where he was the founding director of InterPro, an innovative interdisciplinary academic unit in the College of Engineering that catalyzed new interdisciplinary graduate programs.

HOSSEIN HAJ-HARIRI is an Educational Foundation Distinguished Professor, and Dean of the College of Engineering and Computing at the University of South Carolina, which he joined in January of 2016. For the prior 27 years he was on the faculty of mechanical and aerospace engineering at the University of Virginia, where he was chair from 2005 through 2015. He was also concurrently the associate vice president for research during 2014-2015, and the co-director of the K-12 Engineering Design Laboratory since 2013. He holds a Ph.D. and S.M. in mechanical engineering (in applied mechanics), and also an S.B. in civil engineering, all from MIT.

Through his research efforts, Haj-Hariri has guided more than 35 research scientists, postdocs, and graduate students, as well as over 50 undergraduate students in their research, and published over 100 research papers, through over \$30M of sponsored research funding.

Haj-Hariri's area of research has spanned a broad subset of computational and theoretical applied mechanics: theoretical aero-acoustics, hydrodynamic stability, linear and nonlinear waves, singular perturbations, microgravity fluid mechanics, interfacial phenomena, fluid solid interactions, fluid mechanics of swimming, and passive thermal management. He holds several patents in the areas of thermal management and carbon-fiber composites.

KENNETH R. LUTCHEN is dean of the College of Engineering and professor of Biomedical Engineering at Boston University. He received his B.S. from the University of Virginia and Ph.D from Case Western Reserve University. He has published over 135 peer-reviewed journal articles. Lutchen was chair of Biomedical Engineering from 1998-2006 over which the department ranking improved from 18th to 6th in the nation. Lutchen is Past-President of the American Institute of Medical and Biological Engineering (AIMBE). Since becoming Dean, the College's Graduate Ranking in US News and World Report has improved from 54th to 35th, the largest improvement of any school in the top 54 over that time. He has

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orchestrated the creation of a new Division of Materials Science and Engineering and a new Division of Systems Engineering and Masters programs in Robotics, Cybersecurity and Data Analytics. Recently, he oversaw the creation of a new 20,000 sq.ft. Engineering Product Innovation Center (EPIC) instill interdisciplinary design for engineering education and student open-innovation. Lutchen's focus is to transform engineering education to create the Societal Engineer™, an individual who combines their engineering foundation with empowering attributes to address society's challenges regardless of their career paths. He also drove the creation of a unique Technology Inspiration Ambassador program that trains Engineering students to inspire K-12 students to pursue Engineering. In four years this program has reached 17,000 K-12 students in 26 states. In 2016, Lutchen is on the Board of Directors of the Wyss Institute at Harvard and is a member Advisory Committee to the Directorate for Engineering of The National Science Foundation. Lutchen has been the recipient of the AIMBE Pierre Galletti Award, AIMBE's highest honor, and the College of Engineering's Professor of the Year Award and the Biomedical Engineering Professor of the Year Award — twice.

LOUIS A. MARTIN-VEGA joined North Carolina State University as Dean of the College of Engineering in 2006. Prior to joining NC State, he spent nearly five years as professor and dean of engineering at the University of South Florida. He has also held several prestigious positions at the National Science Foundation, including acting head of its Engineering Directorate and director of its Division of Design, Manufacture and Industrial Innovation. His research and teaching interests are in the areas of industrial engineering, manufacturing, logistics and distribution, operations management and production and service systems.

Martin-Vega is a Fellow of the Institute of Industrial Engineers (IIE) and the Society of Manufacturing Engineers and a member of INFORMS, ASEE, Tau Beta Phi, Alpha Pi Mu and Sigma Xi. His numerous awards include the 2000 HENACC-Hispanic Engineering National Education Achievement Award, the 2007 National Hispanic Scientist of the Year Award from the Museum of Science and Industry, the 2009 Industrial and Systems Engineering Alumni Leadership Award from the University of Florida, and the 2010 Institute of Industrial Engineers' UPS Award for Minority Advancement in Industrial Engineering. He is a past president of IIE and a member of the Pan American Academy of Engineering and the HENACC Hall of Fame.

Martin-Vega served as the 2013-2015 chair of the American Society for Engineering Education Engineering Deans Council Executive Board. In 2014 he joined the NSF Committee on Equal Opportunities in Science and Engineering. He has also served as vice chair of the ASEE Engineering Deans Council Executive Board and as chair of the Public Policy Colloquium for 2011-2013. He currently serves on the executive board of the National GEM Consortium.

Martin-Vega holds a B.S. in industrial engineering from the University of Puerto Rico at Mayaguez, an M.S. in operations research from New York University, and M.E. and Ph.D. degrees in industrial and systems engineering from the University of Florida. He is a registered professional engineer in Florida

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and Puerto Rico.

DARRYLL PINES has served as Dean and Nariman Farvardin Professor of Aerospace Engineering at the Clark School since January 2009. He arrived at the Clark School in 1995 as an assistant professor and then served as chair of the department of aerospace engineering from 2006 to 2009.

During a leave of absence from the University (2003-2006), Pines served as program manager for the Tactical Technology Office and Defense Sciences Office of DARPA (Defense Advanced Research Projects Agency). While at DARPA, Pines initiated five new programs primarily related to the development of aerospace technologies, for which he received a Distinguished Service Medal. He also held positions at the Lawrence Livermore National Laboratory (LLNL), Chevron Corporation, and Space Tethers Inc. At LLNL, Pines worked on the Clementine Spacecraft program, which discovered water near the south pole of the moon. A replica of the spacecraft now sits in the National Air and Space Museum.

Pines' current research focuses on structural dynamics, including structural health monitoring and prognosis, smart sensors, and adaptive, morphing and biologically-inspired structures, as well as the guidance, navigation, and control of uninhabited aerospace vehicles. He is a fellow of the Institute of Physics, the American Society of Mechanical Engineers and the American Institute of Aeronautics and Astronautics, and has received an NSF CAREER Award. Pines received a B.S. in mechanical engineering from the University of California, Berkeley. He earned M.S. and Ph.D. degrees in mechanical engineering from the Massachusetts Institute of Technology.

SARAH RAJALA is dean of the College of Engineering at Iowa State University. She is a former president of the American Society for Engineering Education and chaired the Global Engineering Deans Council. She was named 2016 national engineer of the year by the American Association of Engineering Societies, and received the 2015 national Harriett B. Rigas Award from the Institute of Electrical and Electronics Engineers Education Society honoring outstanding female faculty.

Rajala's previous leadership positions were at North Carolina State University as associate dean for research and graduate programs and associate dean for academic affairs in the college of engineering; and Mississippi State University as a department chair and dean of the Bagley College of Engineering. She had a distinguished career as a professor and center director prior to moving into administrative positions.

Rajala earned her bachelor's degree in electrical engineering from Michigan Technological University and master's and Ph.D. degrees from Rice University. She is a fellow of the American Association for the Advancement of Science, American Society for Engineering Education and the Institute of Electrical and Electronic Engineers.

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S. SHANKAR SASTRY is dean and Roy W. Carlson Professor of Engineering in the University of California–Berkeley College of Engineering. He is also faculty director of the Blum Center for Developing Economies. He has invested decades in technology research, spearheading projects to improve the nation’s cybersecurity and network infrastructure. His other research initiatives include robotics and hybrid and embedded systems.

In 1981, Sastry earned his Ph.D. in electrical engineering and computer sciences from Berkeley. Since joining the faculty in 1983, he has become known as one of Berkeley’s most distinguished professors, and for his energy, determination and commitment in both the classroom and the lab. He has held directorships of the Information Technology Office at DARPA and the Electronics Research Laboratory at Berkeley. He served as chair of the Electrical Engineering & Computer Sciences department at Berkeley from 2001 to 2004 and as director of the Center for Information Technology Research in the Interest of Society (CITRIS) from 2006 to 2008.

Sastry’s many honors include membership in the National Academy of Engineering, Fellow of the IEEE, the NSF Presidential Young Investigator Award and the Eckman Award of the American Automatic Control Council. He has also received the President of India Gold Medal, the IBM Faculty Development Award, an honorary degree from Harvard and a distinguished alumnus award from the Indian Institute of Technology. In 2010, he received the Asian Pacific Fund’s Chang-Lin Tien Education Leadership Award. He began his tenure as dean on July 1, 2007.

THOMAS SKALAK is the executive director for the Paul G. Allen Frontiers Group. The Frontiers Group seeks to explore new frontiers, re-invent fields in ways that reflect major societal challenges and fundamental scientific curiosity, and bring new knowledge to light with a wide array of partners, making a positive impact on the world.

Previously, Skalak was vice president for research and Professor of Biomedical Engineering at the University of Virginia, where he led research and innovation programs spanning biosciences, environmental sustainability, physical sciences, engineering and technology, arts, design, and humanities. Skalak led the launch of the OpenGrounds collaboration initiative, bringing people together across fields for ideation; the statewide i6 Virginia Innovation Partnership; and the Global Water Games, a participatory computer simulation game that improves the health of watersheds worldwide. Skalak joined the Paul G. Allen Family Foundation in 2015 as Executive Director, Science and Technology Programs.

Skalak’s personal research included biomechanics of the cardiovascular system, angiogenesis, systems biology, wound repair, and regenerative medicine. He is a past president of both the American Institute of Medical and Biological Engineering (AIMBE) and the Biomedical Engineering Society (BMES). Skalak is a frequent speaker on innovation and creativity at Fortune 500, venture capital, major art museum, and government partners, including The White House. He was the founder of the UVA-Coulter Foundation Translational Research Partnership and other proof-of-concept funds with corporate partners such as

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Johnson & Johnson and AstraZeneca. Skalak was educated as a bioengineer at The Johns Hopkins University (B.E.S. 1979) and at the University of California, San Diego (Ph.D. 1984), is a Fellow of the National Academy of Inventors.