NSF Directorate for Engineering
Advisory Committee Member Biographies
Fall 2014

KAREN BUTLER-PURRY is the associate provost for graduate and professional studies and professor of electrical and computer engineering at Texas A&M University. During her years at Texas A&M University, Butler-Purry has served at all faculty levels, beginning with an initial appointment as visiting assistant professor of electrical engineering in 1994. In addition, she was assistant dean for graduate programs in the College of Engineering during 2001–2004 and associate department head in the electrical and computer engineering department during 2008–2010. Further she has served in many capacities on committees for the college, university, and professional societies.

Butler-Purry developed a successful research program with funding from federal agencies such as NSF and ONR, and industry funding from electric utility companies. She has supervised and funded over 40 graduate and 65 undergraduate research students. Also she has been involved in fellowship and education program projects with NSF and the Department of Education and directed several of these programs that target recruitment, retention and advancement of pre-college, college, and graduate students in STEM fields.

Lastly Butler-Purry has received numerous teaching and service awards including National Science Foundation Faculty Early Career Award (1995), Office of Naval Research Young Investigator Award (1999), and the 2005 American Association for the Advancement of Science (AAAS) Mentor Award for efforts to mentor students from underrepresented groups and for leadership in promoting Ph.D. careers for them in electrical engineering and computer sciences. She is a member of IEEE, IEEE PES, ASEE, NSBE and SWE. Also she is a registered professional engineer in the states of La., Tex., and Miss.

CURTIS CARLSON, SRI President and CEO since 1998, 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.

ROBERT CHAU is an Intel Senior Fellow and director of Transistor Research and Nanotechnology in the Technology and Manufacturing Group at Intel Corp. Chau is responsible for directing research and development in advanced transistors and gate dielectrics, novel electronic materials, process modules and technologies, and silicon integrated processes for microprocessor and System-on-Chip (SoC) applications. He is also responsible for leading research efforts in emerging nanotechnology for future nanoelectronics applications.

Chau joined Intel in 1989, became an Intel Fellow in 2000 and an Intel Senior Fellow in 2005. During his career at Intel he developed nine generations of Intel gate dielectrics, including the high-K/metal-gate technology, along with many transistor innovations and process technologies used in various Intel manufacturing processes and microprocessor products. He also introduced many new process modules and novel device nanotechnologies for Intel's future logic and SoC processes.

Chau has earned seven Intel Achievement Awards, including one for the research and development of the Tri-gate transistor technology. He was the co-recipient of the 2008 SEMI Award for North America for the development of Intel's 90nm strained silicon technology, and the 2008 EDN (Electronics Design, Strategy, News) "Innovator of the Year" award for the development of Intel's 45nm high-K metal gate transistor technology. Chau received the 2012 IEEE Jun-ichi Nishizawa Medal for "sustained leadership in developing innovative transistor technologies for advanced logic products."

Chau received his bachelor's and master's degrees and Ph.D. in electrical engineering from The Ohio State University. He holds more than 270 issued U.S. patents and has been elected an IEEE Fellow. In April 2010 he was recognized by the newspaper The Oregonian as the most prolific inventor in the State of Oregon. In 2013 Chau was elected a member of the U.S. National Academy of Engineering.

ANDRES F. CLARENS is an assistant professor of civil and environmental engineering at the University of Virginia and the director of the Virginia Environmentally Sustainable Technologies Laboratory. He is an author or coauthor on over 30 archival papers focused broadly on anthropogenic carbon flows and the ways that CO2 is manipulated, reused, and sequestered in engineered systems. The results of his work are important for developing efficient strategies for mitigating the emissions that are driving climate change and for understanding how infrastructure systems must be adapted to meet these changes.

For his work, Clarens has received a variety of awards including the National Science Foundation CAREER award and the American Chemical Society Petroleum Research Fund Young Investigator Award. He received a B.S. in chemical engineering from the University of Virginia and an M.S.E. and Ph.D. in environmental engineering from the University of Michigan. In his spare time, Clarens also enjoys running, backpacking, fly-fishing, and traveling.

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 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. 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. 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.

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. 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.

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.

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 2008 Outstanding Engineer in North Carolina award from the NC Society of Engineers, the Industrial and Systems Engineering Alumni Leadership Award from the University of Florida in 2009, and the Institute of Industrial Engineers' UPS Award for Minority Advancement in Industrial Engineering in 2010. He is a past president of IIE, a member of the Pan American Academy of Engineering and the HENACC Hall of Fame, and was named as one of the 100 Most Influential Hispanics in the US by Hispanic Business magazine in 2007.

Martin-Vega serves as the 2013-15 chair of the American Society for Engineering Education (ASEE) Engineering Deans Council Executive Board. And in 2014 he was invited to serve on 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. He is a registered professional engineer in Florida and Puerto Rico.

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.

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.

ANN C. SAVOCA is Global Vice President, Technology & Innovation, at the Sealed Air Corporation. Before joining the company in July 2008, 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.

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, 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 UltrePET® 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.

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, 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.