The National Academies of
SCIENCES • ENGINEERING • MEDICINE

Committee on Science, Engineering, Medicine, and Public Policy

Member Biographies

Chair:

Alan I. Leshner (NAM) is the Chief Executive Officer Emeritus of the American Association for the Advancement of Science, concluding his service on 17 February 2015 after 13 years. Before coming to AAAS, Dr. Leshner was the Deputy Director and Acting Director of the National Institute of Mental Health (NIMH) and then the Director of the National Institute on Drug Abuse (NIDA). He came to NIMH from the National Science Foundation (NSF), where he held a variety of senior positions, focusing on basic research in the biological, behavioral and social sciences, science policy and science education. Dr. Leshner is the author of a textbook on the relationship between hormones and behavior, and has published extensively for both the scientific and lay communities on the biology of behavior, science and technology policy, science education, and public engagement with science. He received an undergraduate degree in psychology from Franklin and Marshall College, and MS and PhD degrees in physiological psychology from Rutgers University. He is a current member of the National Science Board. He is a member the National Academy of Medicine.

Ex-officio Members:

Victor J. Dzau is the President of the National Academy of Medicine (NAM), formerly the Institute of Medicine (IOM). In addition, he serves as Chair of the IOM Division Committee of the National Academies of Sciences, Engineering, and Medicine. Dr. Dzau has made a significant impact on medicine through his seminal research in cardiovascular medicine and genetics, pioneering the discipline of vascular medicine, and leadership in health care innovation. In his role as a leader in health care, Dr. Dzau has led efforts in health care innovation. His vision is for academic health sciences centers to lead the transformation of medicine through innovation, translation, and globalization. In addition to his work with the IOM, Dr. Dzau is currently a member of the Board of Directors of the Singapore Health System, Governing Board of Duke-National University of Singapore Graduate Medical School, and Senior Health Policy Advisor to Her Highness Sheikha Moza (Chair of the Qatar Foundation). He is also on the Board of Health Governors of the World Economic Forum and chaired its Global Agenda Council on Personalized and Precision Medicine. He is Chancellor Emeritus for Health Affairs and James B. Duke Professor of Medicine at Duke University and the past President and CEO of the Duke University Health System. Previously, Dr. Dzau was the Hersey Professor of Theory and Practice of Medicine and Chairman of Medicine at Harvard Medical School's Brigham and Women's Hospital, as well as Chairman of the Department of Medicine at Stanford University.

Marcia McNutt (NAS) is a geophysicist and president of the National Academy of Sciences. From 2013 to 2016, she served as editor-in-chief of the Science family of journals. Prior to joining Science, she was director of the U.S. Geological Survey (USGS) from 2009 to 2013. During her tenure, the USGS responded to a number of major disasters, including earthquakes in Haiti, Chile, and Japan, and the Deepwater Horizon oil spill. McNutt led a team of government scientists and engineers at BP headquarters in Houston who helped contain the oil and cap the well. She directed the flow rate technical group that estimated the rate of oil discharge during the spill's active phase. For her contributions, she was awarded the U.S. Coast Guard's Meritorious Service Medal.

Before joining the USGS, McNutt served as president and chief executive officer of the Monterey Bay Aquarium Research Institute (MBARI), in Moss Landing, California. During her time at MBARI, the institution became a leader in developing biological and chemical sensors for remote ocean deployment, installed the first deep-sea cabled observatory in U.S. waters, and advanced the integration of artificial intelligence into autonomous underwater vehicles for complex undersea missions.

Dr. McNutt began her academic career at the Massachusetts Institute of Technology (MIT), where she was the E.A. Griswold Professor of Geophysics and directed the Joint Program in Oceanography/Applied Ocean Science & Engineering, jointly offered by MIT and the Woods Hole Oceanographic Institution. Her research area is the dynamics of the upper mantle and lithosphere on geologic time scales, work that has taken her to distant continents and oceans for field observations. She is a veteran of more than a dozen deep-sea expeditions, on most of which she was chief or co-chief scientist.

Dr. McNutt received a BA in physics from Colorado College and her PhD in earth sciences at the Scripps Institution of Oceanography. Her honors include membership in the American Philosophical Society and the American Academy of Arts and Sciences. She holds honorary doctoral degrees from the Colorado College, the University of Minnesota, Monmouth University, and the Colorado School of Mines. In 1988, she was awarded the American Geophysical Union's Macelwane Medal for research accomplishments by a young scientist, and she received the Maurice Ewing Medal in 2007 for her contributions to deep-sea exploration.

Dr. McNutt served as president of the American Geophysical Union (AGU) from 2000 to 2002. She was chair of the Board of Governors for Joint Oceanographic Institutions, responsible for operating the International Ocean Discovery Program's vessel JOIDES Resolution and associated research programs. She is a fellow of AGU, the Geological Society of America, American Association for the Advancement of Science, and International Association of Geodesy.

John L. Anderson (NAE) was born September 29, 1945, in Wilmington, DE, where he attended Mount Pleasant High School. He received his undergraduate degree from the University of Delaware in 1967, and MS and PhD degrees from the University of Illinois at Urbana-Champaign in 1969 and 1971, all in chemical engineering.

He was most recently Distinguished Professor of Chemical Engineering and president (2007–2015) of the Illinois Institute of Technology (IIT). Before that he was provost and executive vice president at Case Western Reserve University (2004–2007), following 28 years at Carnegie Mellon University, including 8 years as dean of the College of Engineering. He began his career as a member of the Cornell University faculty (1971–1976).

Dr. Anderson was elected to the NAE in 1992 for contributions to the understanding of colloidal hydro- dynamics and membrane transport phenomena and has been actively involved since. He was elected an NAE Councillor in 2015 and served on the Executive Compensation Committee and Temporary Nominating Committee on Member Diversity. He has also served on the Membership Policy Committee, Nominating Committee (chair), Chemical Engineering Section (chair, vice chair, section liaison, member), Chemical Engineering Peer Committee (chair), and Committee on Membership (immediate past chair, chair, vice chair, peer committee chair). His service also includes numerous National Academies activities, such as the Committee on Determining Basic Research Needs to Interrupt the Improvised Explosive Device Delivery Chain (chair); Committee on Review of Existing and Potential Standoff Explosives Detection Techniques (chair); Organizing Committee for the National Security and Homeland Defense Workshop (cochair); Board on Chemical Sciences and Technology (cochair); and Ford Foundation Minority Postdoctoral Review Panel on Physical Sciences, Mathematics, and Engineering.

In addition to his NAE membership, Dr. Anderson is a fellow of the American Academy of Arts and Sciences and American Association for the Advancement of Science, and he was appointed to the National Science Board in 2014. He received the Acrivos Professional Progress Award from the American Institute of Chemical Engineers (AIChE) and an award from the Pittsburgh Section of AIChE for "Outstanding Professional Accomplishments in the Field of Academics," and he is listed on the Alumni Wall of Fame at the University of Delaware. In 2012 he received the National Engineering Award from the American Association of Engineering Societies. He has held visiting professorships at the Massachusetts Institute of Technology (fellow of the John Simon Guggenheim Foundation), University of Melbourne (Australia), and Landbouwuniversiteit Wageningen (the Netherlands). He has presented guest lectures at universities throughout the United States and is the author of numerous journal articles and book chapters.

Dr. Anderson is married to Patricia Siemen Anderson. They have two children and five grandchildren.

Members:

Claire D. Brindis (NAM), Dr. P.H., is Professor of Pediatrics and Health Policy, Department of Pediatrics and the Department of Obstetrics, Gynecology and Reproductive Health Sciences at the University of California, San Francisco (UCSF). She is Director of the Philip R. Lee Institute for Health Policy Studies (IHPS) at UCSF and holds the Caldwell B. Esselstyn Chair in Health Policy. Dr. Brindis is also Co-Director of the Adolescent and Young Adult Health National Resource Cente. She is also a Founding Director of the Bixby Center for Global Reproductive Health in the Department of Obstetrics, Gynecology and Reproductive Sciences and IHPS, UCSF.

Dr. Brindis' research focuses on program evaluation and the translation of research into policy at the local, state, and national level. As a bilingual, bi-cultural researcher, her research and personal commitment focuses on ameliorating the impact of social, health, and economic disparities among ethnic/racial populations, with a particular focus on women, young adults, and adolescents and reproductive health. Dr. Brindis' policy research focuses on how disparities impact health outcomes, including access to quality care and health insurance coverage, as well as examining the impact of migration and acculturation, as well as social determinants of health, on Latinx. Research interests also include consumer engagement in health care system re-design, tracking the implementation of the Affordable Care Act (ACA) on adolescents, young adults, and women, including barriers encountered in enrolling these and other marginalized populations, assuring the delivery of confidential care in an era of electronic health care records, effective substance abuse treatment strategies, with a special lens on women's health, and research on the health and mental health needs of Dreamers (Deferred Action for Childhood Arrivals or DACA).

Dr. Brindis is past chair of the Population, Family Planning and Reproductive Health Section of the American Public Health Association (2003-2004) and the Board of Directors for Advocates for Youth, Washington D.C. (2003-2005). She has served on many expert panels, including the Institute of Medicine (IOM) Committee on Pediatric Health and Health Care Quality Measures, the Committee on Preventive Services for Women, the Committee on the Health and Well-Being of Young Adults, and the Committee on Neurobiological and Social-Behavioral Research on Adolescent Health. At UCSF, she is past chair of the Chancellor's Advisory Committee on the Status of Women. She is the recipient of numerous state and national awards, including the California Department of Health Services with the 2000 Beverlee A. Myers Award for Excellence in Public Health, the Association of Maternal and Child Health Programs, Washington, DC, with the annual 2001 John C. MacQueen Lecture Award, the 2005 Federal Maternal and Child Health Bureau Director's Award: "In recognition of Contributions Made to the Health of Infants, Mothers, Children, Adolescents & Children with Special Needs", the UCSF's Chancellor's Award for the Advancement of Women in 2009, election to the IOM (now National Academy of Medicine) in 2010 and elected to the NAM Council in 2019, the selection in 2012 as Alumni Hall of Fame awardee from the UCLA School of Public Health, the 2014 Carl Schultz Lifetime Achievement Award from the American Public Health Association, UCSF's Lifetime Achievement in Mentoring Award in 2016, and in 2019, selected as one of the UC Berkeley's School of Public Health's most influential alumni on the occasion of its 75th Anniversary of its establishment.

Katharine Frase (NAE) served as Vice President of Public Sector at International Business Machines Corporation. Dr. Frase also provided thought leadership for IBM and its customers on innovation and strategic transformation specific to government, education, life sciences, healthcare and cities, driving the creation of new solutions. Prior to this role, she served as Vice President of Industry Solutions Research, working across IBM Research on behalf of IBM clients, to create transformational industry-focused solutions, including the application of IBM Watson technologies to business applications and the realization of Smarter Planet solutions. Earlier roles included technical and business strategy for IBM's software business, corporate assignments on technology assessment and strategy, and roles in IBM Microelectronics in the management of process development, design/modeling methodology and production of chip carriers, assemblies and test. Dr. Frase received an AB in chemistry from Bryn Mawr College and a PhD in materials science and engineering from the University of Pennsylvania. She is a member of the IBM Academy of Technology and sits on numerous external committees and boards.

John G. Hildebrand (NAS), originally trained in chemistry and biology, is a neurobiologist whose research focuses on the neural mechanisms and behavioral roles of olfaction in insects including agricultural pests and disease vectors. Dr. Hildebrand has received many honors and awards, including election to the German National Academy of Sciences 'Leopoldina' (1998), the Norwegian Academy of Science and Letters (1999), the American Academy of Arts and Sciences (2001), the U.S. National Academy of Sciences (2007), the Royal Norwegian Society of Sciences and Letters Academy (2011), and the American Philosophical Society (2014). Following earlier faculty appointments at Harvard and Columbia Universities, he joined the University of Arizona in Tucson in 1985 as the founding head of its Department of Neuroscience. He is Regents Professor of Neuroscience and Professor of Chemistry and Biochemistry, Ecology and Evolutionary Biology, Entomology, and Molecular and Cellular Biology. Colleagues cite Dr. Hildebrand for his passionate advocacy for general education in STEM and for access to and success in scientific careers for women and minorities. He has been Foreign Secretary of the NAS since 2014.

Frances S. Ligler (NAE) is the Lampe Distinguished Professor of Biomedical Engineering at NC State University and UNC-Chapel Hill and an elected member and Councillor of the National Academy of Engineering. Before 2013, she was the Senior Scientist for Biosensors and Biomaterials at the US Naval Research Laboratory. View full

Currently working in the fields of biosensors, tissue-on-chip, and microfluidics, Ligler has over 34 issued US patents, with associated PCT patents and more applications under review. The corporate licensees of her patents have produced eleven commercial biosensor products. She is a Fellow of the National Academy of Inventors and a 2017 inductee into the U.S. National Inventors Hall of Fame. Her ability to convert ideas from the lab to usable biosensor systems has been recognized by the National Drug Control Policy Technology Transfer Award, the NRL Technology Transfer Award, and the Christopher Columbus Foundation Homeland Security Award.

Juanita L. Merchant (NAM), M.D., Ph.D., joined the faculty at the University of Arizona College of Medicine – Tucson in July 2018 as a professor of medicine in the UA Department of Medicine, chief of the UA Division of Gastroenterology and Hepatology and a member of the Cancer Biology Research Program at the UA Cancer Center.

In 2008, Dr. Merchant was elected to the National Academy of Medicine and appointed a member of the National Institutes of Health Council of Councils. In 2016, she also joined the Board of Scientific Counselors for the National Institute of Diabetes and Digestive and Kidney Diseases, a unit of the NIH.

She grew up in Los Angeles and attended Stanford University for her undergraduate studies, later earning her medical degree and a doctorate at Yale University School of Medicine. Afterward, she did her internship and residency in internal medicine as well as a clinical and research fellowship at Boston's Massachusetts General Hospital, before completing a gastroenterology fellowship at the University of California Los Angeles. Prior to coming to the UA, she had been on faculty at the University of Michigan since 1991. She is board certified in internal medicine and gastroenterology.

She has written or co-written more than 75 peer-reviewed research publications and is editor or co-editor of two books and several book chapters.

Richard A. Meserve (NAE), JD, Harvard Law School; PhD (Applied Physics) Stanford University; BA, Tufts University, is President Emeritus of the Carnegie Institution for Science. Before assuming the Carnegie presidency in April 2003, he was Chairman of the U.S. Nuclear Regulatory Commission (NRC), having served since October 1999. Before joining the NRC, Dr. Meserve was a partner in the law firm of Covington & Burling LLP, where he now serves on a part-time basis as a Senior Of Counsel. He devoted his legal practice to technical issues arising in environmental and toxic tort litigation, counseling scientific societies and high-tech companies, and nuclear licensing. Early in his career, he served as legal counsel to the President's science advisor, and was a law clerk to Justice Harry A. Blackmun of the United States Supreme Court and to Judge Benjamin Kaplan of the Massachusetts Supreme Judicial Court. He is a member of the National Academy of Engineering and the American Philosophical Society; a Fellow of the American Academy of Arts and Sciences, the American

Association for the Advancement of Sciences, and the American Physical Society; and a Foreign Member of the Russian Academy of Sciences. He currently serves as Chairman of the International Nuclear Safety Group, chartered by the International Atomic Energy Agency, and Co-Chairman of the Department of Energy's Nuclear Energy Advisory Committee. He was formerly President of the Board of Overseers of Harvard University and now serves as a member of the Council of the National Academy of Engineering and of the American Academy of Arts and Sciences. He has previously served on numerous committees and boards of the National Academies. Dr. Meserve also serves on the boards of PG&E Corporation and TriAlpha Energy Corporation. He wrote the amicus briefs on behalf of the National Academy of Engineering in the *Kumho* case and on behalf of the National Academy of Sciences in the *Daubert* case. These landmark cases established the basis for admitting expert testimony into court.

C. Paul Robinson (NAE), a U.S. Ambassador, experimental physicist and nuclear arms control negotiator, is former President and Labs Director of Sandia National Laboratories (Sandia).

For the last 50 years, Dr. Robinson has made significant contributions to U.S. national security, arms control, proliferation prevention, and the peaceful uses of nuclear energy throughout the world. After earning a PhD in Physics from Florida State University in 1967, he joined the Experimental Test Division at Los Alamos National Laboratory. He later led all of the laboratory's programs in nuclear weapons: R&D, defense support, and verification technologies. At the end of 1985, he joined an industrial firm Ebasco Services in New York, where he led, as Senior VP, the Advanced Technology sector, including the redesign and reconfiguration of a number of U.S. nuclear power plants, and other power systems worldwide.

In 1987 he was appointed by President Ronald Reagan to be the U.S. Ambassador and Chief Negotiator for the Nuclear Testing Talks in Geneva, Switzerland, also serving in this post under President George H.W. Bush. He completed the Threshold Test Ban Treaty and the Treaty on Explosions for Peaceful Purposes, both of which were unanimously ratified by the U.S. Senate in 1990, and remain in force today between the U.S. and the inheritor states of the former Soviet Union. His work then with the Russian laboratories, including the Joint Verification Experiment of 1988, laid the foundations for U.S. – Russia Lab to Lab technical cooperation thereafter.

Dr. Robinson joined Sandia in 1990 and became its President and Director in 1995. Under his leadership at Sandia from 1995 to 2005, he led the strategic expansion of the laboratory's work in counter-terrorism and security, including major R&D support for the defense and intelligence communities. Dr. Robinson organized several working sessions between 15 U.S. and Russian nuclear laboratories to examine nuclear technology advances and opportunities for cooperation in improving the safety, performance, and utilization of nuclear energy worldwide. While serving as Sandia President, Dr. Robinson pioneered innovative strategies for creating partnerships between national laboratories and the U.S. industry.

J. Sanford (Sandy) Schwartz (NAM), MD, is the Leon Hess Professor of Medicine and Health Management and Economics at the University of Pennsylvania Perelman School of Medicine and The Wharton School, Senior Fellow at the Leonard Davis Institute of Health Economics and Senior Scholar at the Center for Clinical Epidemiology and Biostatistics. He was LDI's Executive Director from 1989-1998. Dr. Schwartz is a clinically oriented health services researcher focusing on assessment of medical interventions and practices, medical decision making and the adoption and diffusion of medical innovation.

Dr. Schwartz has served as advisor and consultant to a wide range of public and private sector groups, including federal and international agencies, non-profit groups, pharmaceutical, insurance and managed care organizations, and several state health departments and regulatory agencies. He was founding Director of the American College of Physicians' Clinical Efficacy Assessment Project, president of the American Federation of Clinical Research and the Society for Medical Decision Making, founding editor of the American Journal of Managed Care, associate editor of the Journal of General Internal Medicine and on the editorial board of Medical Decision Making.

Christopher A. Sims (NAS) is the John F. Sherrerd ’52 University Professor of Economics at Princeton University. His work focuses on econometric theory for dynamic models and macroeconomic theory and policy. In 2011, together with Thomas J. Sargent, he was awarded the Nobel Memorial Prize in Economic Sciences. The award cited their "empirical research on cause and effect in the macroeconomy." He received his BA and PhD from Harvard University. Dr. Sims is a Fellow of the Econometric Society, a member of the American Academy of Arts and Sciences, and a member of the National Academy of Sciences.

Robert F. Sproull (NAE) recently retired as Vice President and Director of Oracle Labs, an applied research group that originated at Sun Microsystems. Since undergraduate days, he has been building hardware and software for computer graphics: clipping hardware, an early device-independent graphics package, page description languages, laser printing software, and window systems. He has also been involved in VLSI design, especially of asynchronous circuits and systems. Before joining Sun Microsystems in 1990 (acquired by Oracle in 2010), he was a principal with Sutherland, Sproull and Associates, an associate professor at Carnegie Mellon University, and a member of the Xerox Palo Alto Research Center. He is a coauthor with William Newman of the early text, *Principles of Interactive Computer Graphics*. He is also an author of the book *Logical Effort*, which deals with designing fast CMOS circuits. He is a member of the National Academy of Engineering, a fellow of the American Academy of Arts and Sciences, and has served on the US Air Force Scientific Advisory Board and as a technology partner of Advanced Technology Ventures. He is currently a co-chair of the National Research Council’s Report Review Committee, a member of the National Academies of Sciences, Engineering, and Medicine’s Committee on Science, Engineering, Medicine, and Public Policy (COSEMPUP), and an adjunct professor of computer science at University of Massachusetts, Amherst.

James M. Tien (NAE) is Distinguished Professor and Dean Emeritus, College of Engineering, Department Electrical and Computer Engineering, University of Miami, Coral Gables, Florida. He received the SM, EE and PhD degrees from the Massachusetts Institute of Technology (MIT) and the B.E.E. degree from Rensselaer Polytechnic Institute (RPI). He joined the University of Miami as Dean of its College of Engineering in 2007 for two terms, until 2015. Tien previously served as the Yamada Corporation Professor at RPI, where he joined its Department of Electrical, Computer and Systems Engineering in 1977, became Acting Chair of the department, established a unique interdisciplinary Department of Decision Sciences and Engineering Systems as its founding Chair, and twice served as the Acting Dean of Engineering. He has also held leadership positions at the Bell Telephone Laboratories and at the Rand Corporation. Tien’s areas of research interest include informatics, decision-making and risk. He has published extensively and been honored with both teaching and research awards, including being elected a member of the prestigious U. S. National Academy of Engineering (NAE) in 2001. More recently, he has been involved in a number of National Academies of Sciences, Engineering, and Medicine activities, including serving on the Revitalizing Graduate STEM Education for the 21st Century Study Committee, the Committee on Science, Engineering, Medicine, and Public Policy (COSEMPUP), and other study committees.

Michael Witherell (NAS) is Vice Chancellor for Research at UC Santa Barbara and holds a University of California Presidential Chair in the Physics Department. He served as Director of Fermi National Accelerator Laboratory (Fermilab), which operated the world's largest accelerator for particle physics, from 1999 to 2005. He received the U. S. Secretary of Energy's Gold Award in 2004 for his service at Fermilab. Dr. Witherell was elected to membership in the National Academy of Sciences in 1998 for his research in particle physics. He has served as chair of the physics section at the Academy and is now chair of the Academy's Board on Physics and Astronomy.

Susan M. Wolf (NAM) Susan M. Wolf, JD, is the McKnight Presidential Professor of Law, Medicine & Public Policy; Faegre Baker Daniels Professor of Law; and Professor of Medicine at the University of Minnesota. She is Chair of the Consortium on Law and Values in Health, Environment & the Life Sciences and Founding Director of the Joint Degree Program in Law, Science & Technology.

Prof. Wolf is an elected member of the National Academy of Sciences' Institute of Medicine (IOM), an elected fellow of the American Association for the Advancement of Science (AAAS), an elected member of the American Law Institute (ALI), and an elected fellow of The Hastings Center, as well as a past-member of the

Fellows' Council. She has received numerous grants to support her research, including from the National Institutes of Health (NIH), National Science Foundation (NSF), and The Greenwall Foundation. From 2007-2010, Professor Wolf served as a member of the MacArthur Foundation Research Network on Law and Neuroscience. She served as a senior consultant to The Hastings Center to produce revised guidelines for end-of-life care, published by Oxford University Press in 2013 as part of a project funded by the Donaghue Foundation and Sussman Trust. In 2012, she received a Robert Wood Johnson Foundation (RWJF) Investigator Award in Health Policy Research to fund research in 2012-14.

Prof. Wolf teaches in the areas of health law, law and science, and bioethics.