Strategies to Enable Assured Access to Semiconductors for the Department of Defense

Committee

Liesl Folks

Chair

Liesl Folks, Ph.D., M.B.A., FNAI, is Senior Vice Provost for Academic Affairs and Provost, and Professor of Electrical and Computer Engineering, at the University of Arizona. Previously, she performed fundamental research and development on nanoscale magnetic materials and devices in support of the data storage industry for 16 years in California's Silicon Valley, at IBM Almaden Research Center, Hitachi San Jose Research Center, Hitachi GST Advanced Development and Western Digital. Folks is an internationally recognized expert in the fields of magnetic materials and devices, nanoscale metrology, and spin-electronic devices. Her research and inventions have centered on (i) dynamics in magnetic materials, (ii) magnetic devices for data storage and random access memory applications, and (iii) semiconductor devices for application as magnetic field sensors. She holds 14 U.S. patents and authored more than 60 peer reviewed journal articles resulting in more than 12,000 citations. She has long been a leader in expanding inclusion in STEM. She holds a PhD degree in Physics from the University of Western Australia and an MBA from Cornell University. She served as President of the IEEE Magnetics Society from 2013-2014 and co-chaired the congressionally-mandated 2020 Review of the National Nanotechnology Initiative for the National Academies. She is a Fellow of the National Academy of Inventors.

Mark T. Bohr

Member

Mr. Mark Bohr retired from Intel Corporation as an Intel Senior Fellow in February 2019. He was rehired by Intel as a part time consultant in March 2021 and continued to work in that capacity until he retired in February 2024. He originally joined Intel in 1978 and worked as an integrated circuit process development engineer in the Logic Technology Development group for his entire career. While a member of LTD, he worked on the development of 20 generations of logic and memory technologies up to Intel's 5nm generation logic technology. He is an IEEE Fellow, recipient of the 2003 IEEE Andrew S. Grove Award, recipient of the 2012 IEEE Jun-ichi Nishizawa Medal, and a member of the U.S. National Academy of Engineering. He holds 98 patents in the area of integrated circuit processing and has authored or co-authored 51 published papers. Mr. Bohr received his BS degree in Industrial Engineering in 1976 and MS degree in Electrical Engineering in 1978, both from the University of Illinois, Urbana-Champaign.

William B. Bonvillian

Member

William B. Bonvillian is a Lecturer at the Massachusetts Institute of Technology, in MIT's Science Technology and Society Department, teaching courses on innovation and on science and technology policy. He is a Senior Director for Special Projects at MIT's Office of Open Learning, conducting research projects on workforce education and innovation projects. Previously, he directed MIT's Washington Office, coordinating MIT's work on national R&D and technology policy issues with R&D agencies and Congress. Prior to MIT, he served for over fifteen years as a senior policy advisor in the U.S. Senate working on innovation issues. He has testified before Congress and written extensively on science and technology policy issues in numerous journals. He is the coauthor of five books, on technology policy, advanced manufacturing, DARPA and workforce education. He is on the National Academies of Sciences' Board on Materials and Manufacturing, its standing committee for the Science Policy Forum and has served on eight other Academies' committees. Mr. Bonvillian chaired the AAAS standing Committee on Science, Engineering and Public Policy (COSEPP) between 2017 and 2021, is a member of the Babbage Forum on industrial innovation policy at Cambridge University, is on the GAO's Polaris Council on Science and Technology and is on the board of the Information Technology and Innovation Foundation. He has degrees from Columbia, Yale and Columbia Law School.

Patricia Campbell

Member

Patricia Campbell is a professor at the University of Maryland Carey School of Law, where she serves as director of the Intellectual Property Law Program and director of the Maryland Intellectual Property Legal Resource Center. Her research interests include trademark law and counterfeiting, technology policy, history of technology, and patent law, including university ownership and commercialization of inventions. Professor Campbell recently completed a Counterfeit Microelectronics Policy Analysis for the Defense Microelectronics Activity (DMEA), U.S. Department of Defense, as part of a larger Machine Vision Pilot Program in collaboration with researchers from the School of Engineering, University of Maryland, College Park. She presented on policy considerations regarding counterfeit electronic parts at the NSF Workshop on Enterprise Network Models for Counterfeit Supply Chains in 2021 and at the CALCE/SMTA Symposium on Counterfeit Parts and Materials in 2020. Her work has been published in the William & Mary Business Law Review, the North Carolina Journal of Law & Technology, and others. Professor Campbell received her B.A. in history from Carnegie Mellon University and her M.A. in history from the University of Pittsburgh. She then received her J.D. from the University of Pittsburgh School of Law in 1989 and her LL.M. in Intellectual Property Law from Santa Clara University School of Law in 2004.

William Chappell

Member

Dr. William Chappell is the Vice President of Missions Systems and CTO for the Strategic Missions and Technology Division of Microsoft. Within the SMT team, he has developed the Azure Space and Spectrum team, as well as the strategic modeling and simulation, which includes silicon cloud design. Prior to Microsoft, he was the director of the Microsystems Technology Office (MTO) for the Defense Advanced Research Projects Agency of the Department of Defense. Serving in this position, he focused the office on three key thrusts important to national security. These thrusts included ensuring unfettered use of the electromagnetic spectrum, building an alternative business model for acquiring advanced DoD electronics that feature built-in trust, and developing circuit architectures for next-generation machine learning. MTO creates the MEMS, photonic, and electronic components needed to gracefully bridge the divide between the physical world in which we live and the digital realm where our information resides. Under Dr. Chappell's leadership, MTO developed the basic underpinnings of computation and sensing needed for an effective, information-driven society.

Prior to his work in government, Dr. Chappell was a professor at Purdue University specializing in electromagnetics. Dr. Chappell received his BS, MS, and PhD degrees in Electrical Engineering, all from the University of Michigan.

Microsoft recently acquired a semiconductor design start-up, which focuses on data center infrastructure.

Kenneth S. Flamm

Member

Dr. Kenneth Flamm is Professor Emeritus (formerly Professor and Dean Rusk Chair) at the LBJ School of Public Affairs, University of Texas at Austin. From 1993 to 1995, Dr. Flamm served as Principal Deputy Assistant Secretary of Defense for Economic Security and Special Assistant to the Deputy Secretary of Defense for Dual Use Technology Policy. Dr. Flamm, an applied microeconomist, is best known for his work on the economics of technological innovation and competition in high-tech industries. Dr. Flamm has written numerous widely cited articles and books on international competition in high technology industries. One current research topic is effects of a slowdown in semiconductor manufacturing innovation on industrial structure and downstream user industries, and broader strategic implications for national policy. Dr. Flamm holds a PhD in Economics from MIT and a BA (with Distinction) in Economics (Honors) from Stanford. Dr. Flamm has been a member of several other NASEM committees and panels, including vice-chair of the National Research Council's Panel on Comparative Innovation Policy and a member of its Science, Technology, and Economic Policy Board.

Dr. Flamm currently runs an economic advisory service specializing in the use of modern data science tools to analyze real-world tech industry data and has provided economic analysis to semiconductor company clients, including AMD, Micron, Texas Instruments, and TSMC in the past.

Kathleen N. Kingscott

Member

Kathleen Kingscott is currently Senior Strategic Advisor at the Alliance of Professionals and Consultants, Inc. in support of IBM Research. She recently retired as Vice President, Strategic Partnerships, IBM Research, where she was responsible for developing collaborative research partnerships between IBM, industry, academia and government. Ms. Kingscott served as IBM's alternate member of the Semiconductor Industry Association Board of Directors. Previously, Ms. Kingscott held the IBM Industry Chair at the Industrial College of the Armed Forces, National Defense University. Earlier roles include Director of Worldwide Innovation Policy for the IBM Corporation, responsible for worldwide public policy matters regarding innovation, science and technology. Her global team provided political and legislative support on innovation policy matters ranging from fundamental and applied multidisciplinary research to semiconductor and supercomputing technology policy. She also focused on innovation-based regional economic growth. She is a founder and served as co-chair of the Task Force on American Innovation, a coalition of 60+ companies, university and trade associations, and professional societies which supports federal investment in scientific research. Ms. Kingscott led IBM's policy work in developing the Trusted Foundry, a partnership between industry and government to develop specialized semiconductors for defense applications. She is a member of the Innovation Policy Forum of the National Academy of Sciences.
Ms. Kingscott is a member of the Board of Managers of the American Institute of Physics Publishing.

Bhavya Lal

Member

Bhavya Lal is the former Associate Administrator for technology, policy, and strategy within the office of the NASA Administrator, and responsible for providing evidence-driven advice to NASA leadership on internal and external policy issues, strategic planning, and technology investments. At the direction of the NASA Administrator, she also created and provided executive leadership and direction to the Office of Technology, Policy, and Strategy (OTPS). Lal also simultaneously served as the acting Chief Technologist of NASA, and was the first woman to hold the position in NASA's history.

Prior to her Associate Administrator role and in the first 100 days of the Biden Administration, Lal was the acting Chief of Staff at NASA and directed the agency's transition under the administration of President Biden. Before arriving at NASA, she was a member of the Presidential Transition Agency Review Teams for both NASA and the Department of Defense. For 15 years prior to that, Dr. Lal led strategy, technology assessment, and policy studies and analyses at the Institute for Defense Analyses (IDA) Science and Technology Policy Institute (STPI) for the White House Office of Science and Technology Policy (OSTP), the National Space Council, NASA, Department of Defense, and other federal departments and agencies. Before coming to IDA, Lal was Director of the Center for Science and Technology Policy Studies at Abt Associates, a global policy research and consulting firm based in Cambridge, MA.

Dr. Lal is an active member of the space technology and policy community, having chaired, co-chaired, or served on six high-impact National Academy of Sciences (NAS) ad hoc committees. She served two consecutive terms on the NOAA Federal Advisory Committee on Commercial Remote Sensing (ACCRES), was an External Council Member of the NASA Innovative Advanced Concepts (NIAC) Program, and was selected to join the NASA Technology, Innovation and Engineering Advisory Committee (NAC/TIE). She co-founded and co-chaired the policy track of the American Nuclear Society's annual conference on Nuclear and Emerging Technologies in Space (NETS), and co-organized a seminar series on space history and policy with the Smithsonian National Air and Space Museum. She guest lectures at universities across the country including MIT, Georgetown University, Arizona State and others, and has testified multiple times to Congress and the National Space Council. Dr. Lal's analyses have been at the center of almost all space-relevant policies for the last decade. For her outstanding contributions to the development of astronautics, she was nominated and selected to be a Member "Academician" of the International Academy of Astronautics.

Dr. Lal holds bachelor's and master's degrees in nuclear engineering from the Massachusetts Institute of Technology (MIT), a second master's from MIT's Technology and Policy Program, and a Ph.D. in Public Policy and Public Administration from George Washington University. She is a member of both the nuclear engineering and public policy and public administration honor societies, and has published more than 50 papers in peer-reviewed journals and conference proceedings.

Omkaram Nalamasu

Member

Dr. Omkaram (Om) Nalamasu (NAE) is senior vice president and chief technology officer of Applied Materials, Inc. He leads the company’s R&D, innovation, value-added strategic partnerships with global academia, research institutes, customers, supply chain partners and government funding agencies. Prior to joining Applied Materials, Dr. Nalamasu served as an NYSTAR Distinguished Professor of materials science and engineering at Rensselaer Polytechnic Institute, where he also served as vice president of research. Prior to that, he held key research and development leadership positions at AT&T Bell Laboratories, Bell Laboratories/Lucent Technologies, and Agere Systems, Inc. Dr. Nalamasu has made seminal contributions to the fields of optical lithography and polymeric materials science and technology. He is an IEEE Fellow and has received numerous awards, authored more than 180 papers, review articles and books, and holds more than 120 worldwide issued patents. He serves on several national and international advisory boards including on the boards of The Tech Interactive in San Jose, GSA (Global Semiconductor Association), Global Corporate Venture Leadership Society Advisory Board and Singapore’s MTC IAP. He received his Ph.D. from the University of British Columbia, Vancouver, Canada in 1986 in Chemistry. He was elected to the U.S. National Academy of Engineering and is a board member of NMMB in DEPS.
Dr. Nalamasu is also the president of Applied Ventures, LLC, the venture capital fund of Applied Materials and serves on the board of directors of the Global Semiconductor Alliance.

Elias Towe

Member

Elias Towe is the Albert and Ethel Grobstein Professor at Carnegie Mellon University, where he teaches in the departments of Electrical and Computer Engineering, and Materials Science and Engineering. Towe's group pursues research in optical and quantum phenomena in semiconducting materials for applications in novel photonic devices and systems that enable a new generation of information processing systems for communication, computing, and sensing. Current research has been on heterogeneous integration of III-V semiconducting compounds on silicon and transition-metal dichalcogenides on silicon. His group has also been working on quantum computing, communications, and sensing. Prof. Towe was educated at the Massachusetts Institute of Technology in Cambridge, MA, where he received the S.B., S.M, and Ph.D. degrees from the Department of Electrical Engineering and Computer Science, where he was a Viton Hayes Fellow. He is a Fellow of the IEEE, American Physical Society, OPTICA (formally OSA), and the American Association for the Advancement of Science.

John VerWey

Member

John VerWey is an East Asia National Security Advisor at Pacific Northwest National Laboratory (PNNL). Before joining PNNL he worked for the U.S. Trade Representative, where he served as a Director for Investment and staff-liaison to the Committee on Foreign Investment in the United States (CFIUS). He has also served as a semiconductor industry analyst at the U.S. International Trade Commission (USITC) and an industry analyst at the U.S. Department of Commerce. In these roles he led investigations for the Executive branch and various congressional committees on economic competitiveness issues and co-led a multi-year assessment of the microelectronics defense industrial base. He has authored 15 reports on the microelectronics industry in recent years, including work published by the USITC, the Journal of International Commerce and Economics, IEEE-Computer, and Georgetown University’s Center for Security and Emerging Technology. He holds a graduate degree in international political economy from the London School of Economics and undergraduate degrees in Asian studies and history from Gonzaga University. Mr. VerWey has not previously served on any National Academies' committees. Mr. VerWey has published articles and social media posts on semiconductor supply chains and industry analysis, CHIPS Act implementation, and Chinese semiconductor industrial policy.

Jonlyn (Brystol) B. English

Staff Officer