

Horizon Scanning and Emerging Technology for Department of War Standing Committee

Committee

David A. Honey

Co-Chair

Dr. David Honey is a retired national security senior executive. Following his retirement from the US Air Force, in which he served as a pilot and research scientist, he went on to hold R&D leadership positions in government and industry. During his career, Dr. Honey was responsible for the planning, execution and oversight of a wide variety of national security technology investments in both the Department of War and the Intelligence Community. As a Senate confirmed Presidential Appointee, he routinely advised the congress on important scientific matters. Dr. Honey received a B.S. in Photographic Science from the Rochester Institute of Technology, a M.S. in Optics from the University of Arizona, a M.S. in Engineering Physics from the Air Force Institute of Technology and a PhD in Solid State Science from Syracuse University. Dr. Honey sponsored a number of National Academy activities while serving in the Office of the Director of National Intelligence.

Karen E. Willcox

Co-Chair

Karen E. Willcox is Director of the Oden Institute for Computational Engineering and Sciences, Associate Vice President for Research, and Professor of Aerospace Engineering and Engineering Mechanics at The University of Texas at Austin. She is also External Professor at the Santa Fe Institute. Before joining the Oden Institute in 2018, she spent 17 years as a professor at the Massachusetts Institute of Technology, where she served as the founding Co-Director of the MIT Center for Computational Engineering and the Associate Head of the MIT Department of Aeronautics and Astronautics. Prior to joining the MIT faculty, she worked at Boeing Phantom Works with the Blended-Wing-Body aircraft design group. Willcox's research has produced scalable computational methods for design of next-generation engineered systems, with a particular focus on scientific machine learning, reduced-order modeling, uncertainty quantification, and predictive digital twins. Willcox is a Fellow of the Society for Industrial and Applied Mathematics, Fellow of the American Institute of Aeronautics and Astronautics, Fellow of the US Association for Computational Mechanics, and member of the National Academy of Engineering. She received the 2023 J.T. Oden Medal and the 2024 Theodore von Karman Prize. Willcox holds a Bachelor of Engineering Degree from the University of Auckland, New Zealand, and master's and PhD degrees from MIT.

Angela M. Belcher

Member

Angela Belcher is a biological and materials engineer with expertise in the fields of biomaterials, biomolecular materials, organic-inorganic interfaces and solid-state chemistry and devices. Her primary research focus is evolving new materials for energy, electronics, the environment, and medicine. She holds the James Mason Crafts Professor at the Massachusetts Institute of Technology (MIT). She is faculty in the Department of Biological Engineering, Materials Science and Engineering and the Koch Institute of Integrative Cancer Research. She is a member the American Academy of Arts and Sciences, National Academy of Engineering, National Academy of Inventors, National Academy of Sciences, and in 2024 she was presented the National Medal of Science. She founded the following companies: Cambrios Technologies, Inc., Siluria Technologies, Inc., Cision Vision, Gensaic Therapeutics, and 6x6 Biotechnologies. She currently serves as a member of the National Security Commission of Emerging Biotechnologies (NSCEB) through the U.S. Senate. She has worked with the Department of Defense for 25 years receiving the Four-Star General Recognition Award for significant contribution to U.S. Army transformation. She also is an alumni of the Defense Study Group. She is the recipient of many notable awards and was named Research Leader of the Year by Scientific American, and is a MacArthur Fellow, a Packard Fellow, an Alfred P. Sloan Fellow, and a Bose Fellow. She received her B.S. in Creative Studies from UCSB. She earned a Ph.D. in inorganic chemistry at UCSB and her postdoctoral research in electrical engineering at UCSB.

William J. Dally

Member

Bill Dally joined NVIDIA in January 2009 as chief scientist, after spending 12 years at Stanford University, where he was chairman of the computer science department. Dally and his Stanford team developed the system architecture, network architecture, signaling, routing and synchronization technology that is found in most large parallel computers today. Dally was previously at the Massachusetts Institute of Technology from 1986 to 1997, where he and his team built the J-Machine and the M-Machine, experimental parallel computer systems that pioneered the separation of mechanism from programming models and demonstrated very low overhead synchronization and communication mechanisms. From 1983 to 1986, he was at California Institute of Technology (CalTech), where he designed the MOSSIM Simulation Engine and the Torus Routing chip, which pioneered “wormhole” routing and virtual-channel flow control. He is a member of the National Academy of Engineering, a Fellow of the American Academy of Arts & Sciences, a Fellow of the IEEE and the ACM, and has received the Benjamin Franklin medal, the Queen Elizabeth Prize for Engineering, the ACM Eckert-Mauchly Award, the IEEE Seymour Cray Award, and the ACM Maurice Wilkes award. He has published over 250 papers, holds over 160 issued patents, and is an author of four textbooks. Dally received a bachelor's degree in Electrical Engineering from Virginia Tech, a master's in Electrical Engineering from Stanford University and a Ph.D. in Computer Science from CalTech. He was a cofounder of Avici Systems, Velio Communications, and Stream Processors.

Chris Fall

Member

Chris Fall most recently served as the Vice President for Applied Sciences at the MITRE Corporation, where his team engineers, scientists, analysts, clinicians, and strategists solved problems for the U.S. government in life, physical, and health sciences; transportation; economics; acquisition; and enterprise strategy. Fall previously served as the Director of the Department of Energy Office of Science, as a Senior Advisor to the Undersecretary for Energy, and as Acting Director of ARPA-E. Fall moved to DOE from the Office of Naval Research, where he served as Acting Chief Scientist and Lead for the Research Directorate, Deputy Director of Research, Director of the International Liaison Office, and the ONR Innovation Fellow, and was assigned to the White House Office of Science and Technology Policy as Assistant Director for Defense Programs and then as Acting Lead for the National Security and International Affairs Division. Fall came to public service from academia, where his focus was basic neurobiology and bioengineering. Fall earned a Ph.D. in Neuroscience and a B.S. in Mechanical Engineering from the University of Virginia, and an MBA from Northwestern University.

Liesl Folks

Member

Dr. Liesl Folks is the Executive Dean, Faculty of Engineering, Architecture and Information Technology at the University of Queensland, Australia. Her research interests are in policy to advance resilience and security of the global semiconductor supply chain, nanotechnology, spin-electronic devices / spintronic phenomena, and magnetic materials and devices. Previously, she served the University of Arizona as Provost (2019 – 2023), the University at Buffalo as Dean of the School of Engineering and Applied Sciences (2013 – 2019), and the IEEE Magnetics Society as President (2013-2014). Prior to joining UB, Folks worked in research and development in support of the data storage industry in Silicon Valley, in roles at IBM Almaden, Hitachi, and Western Digital. She holds a BSc and PhD in Physics from the University of Western Australia and an MBA from Cornell University in New York. In 2024, she chaired the consensus panel which produced the National Academies report on ‘Strategies to Enable Assured Access to Semiconductors for the Department of Defense.’ Folks served as a member of the National advisory Board for the National Reconnaissance Office (2022 – 2024). She is a Fellow of the National Academy of Inventors and a Fellow of the American Association for the Advancement of Science.

Erica R. Fuchs

Member

Erica R.H. Fuchs is director of the Critical Technology Initiative (CTI) at Carnegie Mellon University (CMU) where she is a Kavcic- Moura Professor in the Department of Engineering and Public Policy. She is a research associate with the National Bureau of Economic Research. CTI@CMU is pioneering how advanced analytics can help policy-makers more smartly invest in and enact policies in technologies critical to national security, economic competitiveness, and the well-being of all citizens. As part of this effort, Fuchs catalyzed and served as director of the pilot National Network for Critical Technology Assessment, which brought together thought-leaders from 13 universities, industry, and government and culminated in the report, *Securing America's Future: a Framework for Critical Technology Assessment*. She was previously the founding Faculty Director of Carnegie Mellon's Manufacturing Futures Initiative. Fuchs currently serves on the Government Accountability Office Polaris Council; on M.I.T Corporation's Visiting Committee for M.I.T.'s Institute for Data, Systems, and Society; and on the Advisory Editorial Board for Research Policy. Dr. Fuchs completed her Ph.D. in Engineering Systems (2006), her Masters in Technology Policy (2003), and her Bachelor's in Materials Science and Engineering (1999), all from M.I.T.

Laura M. Haas

Member

Laura Haas is a professor, and the former dean of the Manning College of Information and Computer Sciences at the University of Massachusetts Amherst. Previously, she was an IBM Fellow and held a series of leadership positions at IBM in Research and Software Development. Dr. Haas is a data management researcher, best known for her work on integration of heterogeneous data sources, especially in life sciences and healthcare applications. She is a member of the NAE, a fellow of the American Academy of Arts and Sciences and an ACM Fellow. She received her PhD in Computer Science from the University of Texas Austin, and her AB from Harvard. Dr. Haas is currently Chair of the NRC's Computer Science and Telecommunications Board, co-chaired a study on the undergraduate experience in data science, and has served on several other studies.

Robert W. Heath, Jr.

Member

Dr. Robert W. Heath Jr. is the Charles Lee Powell Chair in Wireless Communications and a Professor at the University of California, San Diego. Previously he was the Lampe Distinguished Professor at the North Carolina State University and the Cockrell Family Regents Chair in Engineering #7 at The University of Texas at Austin. He is the President and CEO of MIMO Wireless Inc. Heath is an expert in multiple antenna wireless communication systems, including cellular (2G through 5G and beyond), WiFi, and tactical communication systems. He also has worked on radar and joint radar and communications. He received the 2025 IEEE / RSE James Clerk Maxwell Medal. He is a Fellow of the IEEE, AAAS and the National Academy of Inventors. He is an elected member of the National Academy of Engineering. He received his BS and MS degrees in Electrical Engineering from the University of Virginia and the PhD from Stanford University.

Christopher T. Jones

Member

Dr. Christopher Jones worked in the defense industry for 25 years and retired in 2020 as the President of the Technology Services sector for Northrop Grumman Corporation. In this role, he led a global organization of 14,000 employees with annual revenues of more than \$4 billion. He was responsible for supporting a diverse customer base, including: the U.S. Departments of Defense, Energy, Homeland Security, as well as international militaries. Dr. Jones directed and oversaw engineering, technology development and integration into aircraft, avionics, and other aerospace systems. In conjunction with his civilian career, Dr. Jones served for 26 years in the US Air Force, primarily as a communications, engineering, and maintenance officer. He is a recognized industry expert on aerospace sustainment and logistics technology, and is a Fellow of the American Institute of Aeronautics and Astronautics and a member of the National Academy of Engineering. He serves on the Norfolk Southern Corporation Board of Directors and the Board of Trustees for both the University of Maryland and the Georgia Institute of Technology. Additionally, he is currently a member of the Air Force Studies Board, and was a member of the Aerospace Engineering Peer Committee and the NAE Annual Meeting Forum Planning Committee, at the National Academies. Dr. Jones has earned a PhD in aerospace engineering, an MS in aerospace engineering, a second MS in Engineering Management, and a BS in aerospace engineering.

Celia I. Merzbacher

Member

Dr. Celia Merzbacher is Executive Director of the Quantum Economic Development Consortium (QED-C), a global, industry-driven consortium managed by SRI International that aims to grow the quantum economy. Dr. Merzbacher has more than two decades of experience as a leader of large multidisciplinary partnerships and programs at the intersections of government, industry, and academia. Previously, she was Vice President for Innovative Partnerships at the Semiconductor Research Corporation and in 2003-2008 she was Assistant Director for Technology R&D in the White House Office of Science and Technology Policy. She is a member of the GAO Expert Network that advises Congress and has testified to Congress twice on the national investment in quantum science and technology. Dr. Merzbacher is a member of the U.S. Delegation to the NATO Transatlantic Quantum, Community and the G7 Quantum Working Group. Dr. Merzbacher is a fellow of the AAAS and served as Chair of the National Materials and Manufacturing Board at the National Academies of Science, Engineering, and Medicine and on the Board of Directors of ANSI. She holds MS and PhD degrees in Geochemistry and Mineralogy from The Pennsylvania State University and a BS degree from Brown University in Geological Sciences.

Harshini Mukundan

Member

Harshini Mukundan leads the chemical and biological technologies program portfolio at Lawrence Berkeley National Laboratory; and is also a senior scientist and head of the department of Biomedical Sciences and Bioengineering. Harshi's programmatic leadership is focused on multi-disciplinary, innovative solution driven science at the convergence of technologies and disciplines, to drive mission needs. Before joining Berkeley Lab, Harshi worked at Los Alamos National Laboratory for 17 years, finally in the role of group leader for physical and applied spectroscopy. Her research is focused on agnostic diagnostics for point of care applications. She has authored more than 100 peer-reviewed papers; is an inventor on several patents; winner on 3 R&D 100 awards, recipient of the Fellows prize in Research, Women in Technology Recognition, and an AAAS fellow. She is also an IF/THEN STEM ambassador. Harshi has worked with several defense agencies, as a performer, program reviewer, advisor and judge/test and evaluation subject matter expert. Harshi is a non-resident fellow and affiliate faculty of the Berkeley Risks and Research Lab at UC Berkeley; and a member of the teaching team for biosecurity at Stanford University. She is a senior policy advisor for the Council on Strategic Risks.

Lisa J. Porter

Member

Lisa Porter is the Co-Founder and Co-President of LogiQ, Inc., a company providing high-end technical and strategic consulting services. She was previously the Deputy Under Secretary of Defense for Research and Engineering, and in that role, she shared responsibility with the Under Secretary for the research, development, and prototyping activities across the Department of Defense. In prior roles she served as Executive Vice President of In-Q-Tel (IQT) and Director of IQT Labs, the President of Teledyne Scientific & Imaging, the Founding Director of the Intelligence Advanced Research Projects Activity (IARPA) in the Office of the Director of National Intelligence (ODNI), the Associate Administrator for the Aeronautics Research Mission Directorate at NASA, and as a program manager and senior scientist at the DARPA. She holds a bachelor's degree in nuclear engineering from the Massachusetts Institute of Technology and a doctorate in applied physics from Stanford University, and she is a Fellow of the American Institute of Aeronautics and Astronautics (AIAA). She received the Office of the Secretary of Defense Medal for Exceptional Public Service, the NASA Outstanding Leadership Medal, the National Intelligence Distinguished Service Medal, the Presidential Meritorious Rank Award, and the Department of Defense Medal for Distinguished Public Service.

Arun Seraphin

Member

Dr. Arun A. Seraphin is the Executive Director of the Emerging Technologies Institute at the National Defense Industrial Association. In this role, he helps lead a nonpartisan institute focused on technologies that are critical to the future of national defense and provides research and analyses to inform the development and integration of emerging technologies and policies to support defense missions. He previously worked as a Professional Staff Member at the United States Senate Committee on Armed Services covering acquisition and technology issues; as the Principal Assistant Director for National Security and International Affairs at the White House Office of Science and Technology Policy (OSTP); and as a researcher in the Science and Technology Division of the Institute for Defense Analyses. He earned a Ph.D. in Electronic Materials from the Massachusetts Institute of Technology, where he performed research on silicon nanotechnology. He also holds bachelor's degrees in political science and engineering science from the State University of New York at Stony Brook.

Steven H. Walker

Member

Steve Walker is an independent consultant advising industry, academia and government on defense technology development and strategic innovation. He is also a Professor of Practice at the University of Notre Dame. Steve recently retired from his position as Vice President and Chief Technology Officer (CTO) of The Lockheed Martin Corporation and served on the Lockheed Martin Ventures investment committee. While in his CTO role, Steve stood up the Lockheed Martin AI Center (LAIC) to catalyze the application of AI in mission platforms and internal business practices. He also built strategic partnerships between Lockheed Martin and commercial companies including IBM, Google, Microsoft, and GM. His signature technology investments were in the areas of quantum information sciences, artificial intelligence, advanced design and manufacturing, autonomy, communications, command and control, and cybersecurity. Prior to his CTO tenure, Steve led the \$3.5B Defense Advanced Research Projects Agency (DARPA) from 2017-2020 and served as Deputy Director from 2013-2017. In these leadership roles at DARPA, Steve developed new commercial space technologies, next generation aircraft and missile prototypes, hypersonic glide and powered propulsion systems, mRNA vaccines and AI powered cybersecurity and spectrum dominance capabilities. He served as the Deputy Assistant Secretary of the Air Force for Science, Technology and Engineering from 2010-2012. Steve is a member of the National Academy of Engineering and a Fellow of the American Institute for Aeronautics and Astronautics. He received his PhD and Bachelor of Science in Aerospace engineering from the University of Notre Dame.