Air Force Studies Board

Committee

Arnold W. Bunch, Jr.

Chair

General Arnold W. Bunch, Jr., USAF (Ret.) is Superintendent of Hamblen County Schools, Tennessee, which includes eighteen schools (eleven elementary schools, four middle schools, two high schools and an alternative school) with approximately 10,000 students and 1,700 employees. He also currently consults for Oak Ridge National Laboratory, SwarmAero, and Lone Star, and he serves on the board of ATKearney. Gen Bunch retired from the United States Air Force after 38 years at the rank of General. In his final assignment, he served as the Commander of the Air Force Materiel Command, where he was responsible for installation and mission support, discovery and development, test and evaluation, life cycle management services and sustainment of virtually every major Air Force weapon system. The command employs approximately 89,000 and manages $60 billion of budget authority annually. Gen Bunch holds a BS in civil engineering from the United States Air Force Academy, MS in mechanical engineering from California State University Fresno, and MS in national security strategy from National War College. He is a graduate of the United States Air Force Test Pilot School. Gen Bunch retired as a Command Pilot with more than 2,500 flying hours in B-52s, B-2s, KC-135s, F-16s, T-38s and others.

Andrew G. Alleyne

Member

Dr. Andrew G. Alleyne (NAE) is the Dean of the University of Minnesota College of Science and Engineering (CSE). His research interests encompass the modeling, simulation, and implementation of control systems for complex systems and nonlinear systems. He has developed simulation tools for understanding and prediction the behavior of complex thermal systems and transitioned that to implementations of control systems for dynamic thermal management. In particular, he works at the interface of electrical and thermal power for mobile systems since many of the thermal management challenges arise from electrical power usage. He is a Fellow of the American Society of Mechanical Engineers (ASME), IEEE, and the American Association for the Advancement of Science (AAAS). He was a Fulbright fellow to the Netherlands and has held visiting Professorships at TU Delft, University of Colorado, ETH Zurich, and Johannes Kepler University. Dr. Alleyne received his B.S. in mechanical and aerospace engineering from Princeton University and an M.S. and Ph.D. in mechanical engineering from the University of California, Berkeley.

Christopher P. Azzano

Member

Major General Christopher P. Azzano, USAF (Ret.) is vice president and program manager at Northrop Grumman Corporation. Most recently, he served as vice president and aviation business leader at Booz Allen Hamilton. He possesses expertise in military strategy, all-domain operations, test and evaluation, applied research, and advanced technology development and integration. Maj Gen Azzano retired after 31 years on active duty as the Commander of the Air Force Test Center, Edwards Air Force Base, CA, where he was responsible for a wide spectrum of science and technology mission areas, from basic and applied research to advance technology integration and developmental test of major defense acquisition programs. He led 18,000 people, executed a $3.2 billion budget, and provided stewardship for $32 billion in test, range, and installation infrastructure. Maj Gen Azzano commanded five Air Force units, including a squadron, group, two wings, and the Air Force Test Center, and served as a Legislative Fellow on Capitol Hill. Maj Gen Azzano received the Jerome F. O'Malley Award, the Lt. Gen. Bobby Bond Memorial Aviator Award, the Air Force Distinguished Service Medal, and numerous other military accolades. He earned a B.S. in Aeronautical and Astronautical Engineering from Purdue University, an M.S. in Aeronautics and Astronautics from Stanford University, a Masters in Strategic Studies from Air University, and graduate certificates from George Washington University and Georgetown University. He is a graduate of the United States Air Force Test Pilot School and Air War College, and is a member of the Society of Experimental Test Pilots.

Jack L. Blackhurst

Member

Mr. Jack Blackhurst is a senior executive and Colonel (Ret.), USAF, with over 45 years of United States Air Force research and development (R&D) experience, including executive leadership and management of complex major R&D organizations, as well as direction of human systems, space, plans and programs, small business, and domestic and international partnerships. He has extensive experience managing USAF science, technology, engineering and math programs, USAF small business programs, workforce development/talent management, studies and analyses, and senior mentoring. He also possesses proven expertise in program management, technology management, science and technology (S&T) current and future planning, policy development, academic engagement, training programs, future studies, and organizational change and transformation. Mr. Blackhurst previously served as the Executive Director of the Air Force Research Laboratory (AFRL), where he managed the Air Force's $6 billion science and technology program, led 6000 active duty and civilian workforce, supported the Defense Innovation and Marketing initiative, significantly improved independent research and development (IRAD) communication with industry partners, chaired the Federal Aviation Authority (FAA) Human Systems Panel, established the first Department of Defense Community of Interest for Human Systems, and established first Human Systems cohort at the National Defense Industrial Association (NDIA). Mr. Blackhurst received a M.A. in industrial psychology from St Mary's University and a B.A. in psychology from Allegheny College. He has a Level III acquisition certification in program management from the Defense Acquisition University.

Victoria Coleman

Member

Dr. Victoria Coleman (NAE) is Associate Provost for the Berkeley Space Center, and a professor in the Department of Electrical Engineering and Computer Sciences at the University of California, Berkeley. In her role as Associate Provost, she serves as a champion for a broad portfolio of interdisciplinary research. In her capacity as a faculty member, she intends to continue an active research group in next-generation aerospace technologies with a focus on autonomy, resilience and sustainability. Dr. Coleman previously served as CEO of Acubed, Airbus' Silicon Valley research and innovation center, and Airbus' head of research and technology for North America. Before joining Acubed, she served as the 37th Chief Scientist of the U.S. Air Force and the 22nd Director of the Defense Advanced Research Projects Agency. As Chief Scientist of the U.S. Air Force, she led initiatives to accelerate the transition of research and development into manufacturing, laying the groundwork for the $2 billion microelectronics commons program. Under her leadership, the Air Force launched a $300 million initiative to advance mission autonomy in air and space systems and a $60 million University Affiliated Research Center led by Howard University in Washington, D.C., the first such Air Force center led by a historically Black college or university (HBCU). Dr. Coleman holds a B.S. and M.S. in computer science from the University of Salford, England, and a Ph.D. in computer science from the University of Manchester.

Daniel A. DeLaurentis

Member

Dr. Daniel A. DeLaurentis is Executive Vice President for Research and Bruce Reese Professor of Aeronautics and Astronautics at Purdue University, where he leads university-wide strategic research initiatives, promotes interdisciplinary collaboration across colleges, manages research compliance and sponsored programs, and advances technology transfer in partnership with the Purdue Research Foundation. Dr. DeLaurentis also previously served as chief scientist of the DoD's Systems Engineering Research Center (SERC) UARC, working to understand the systems engineering research needs of the defense community (primarily) and translating that to research programs that are then mapped to the nation's best researchers and students in the SERC network of 25 universities. He is a senior research fellow at the Krach Institute for Tech Diplomacy at Purdue, Fellow of the International Council on Systems Engineering (INCOSE), and was recently elected Fellow of the American Institute of Aeronautics and Astronautics. Dr. DeLaurentis earned a B.S. in aerospace engineering from the Florida Institute of Technology, and his M.S. and Ph.D. in aerospace engineering from the Georgia Institute of Technology.

Bonnie J. Dunbar

Member

Dr. Bonnie J. Dunbar (NAE) is a retired NASA astronaut, engineer, researcher, and educator. She is a professor in the Department of Aerospace Engineering at Texas A&M University, where she performs research related to human systems integration into space systems and two-phase fluid physics in partial gravity environments. Dr. Dunbar previously worked for Rockwell International, where she served on the team responsible for building the Space Shuttle Columbia. Her expertise is on thermal protection systems and previously worked for 27 years at NASA as a flight controller, an astronaut (five flights), and in the NASA Senior Executive Service (SES). Her SES assignments included leadership for university research; Deputy Director for Flight Crew Operations; Associate Director for ISS Mission Operations, and NASA headquarters' deputy associate administrator for the Office of Life and Microgravity Sciences and Applications. Dr. Dunbar is a member of the National Academy of Engineering and Fellow of the American Ceramic Society, the American Institute of Aeronautics and Astronautics, and the Royal Aeronautical Society. She has been awarded the NASA Space Flight Medal, the NASA Exceptional Leadership Medal, the NASA Distinguished Service Medal, and recently received the Sigma Xi McGovern Medal. She holds B.S. and M.S. in ceramic engineering from the University of Washington and a Ph.D. in mechanical engineering from the University of Houston.

Jeffrey L. Harrigian

Member

General (Ret.) Jeffrey L. Harrigian, USAF is a retired General with nearly 40 years of service. He is currently vice president of Strategic Campaigns for Aeronautics at Lockheed Martin, where he leads an integrated, cross-enterprise team to execute strategic business opportunities to capture and win strategic international opportunities. These strategic opportunities consider Air Power solutions in Joint/multi-domain environments and include multiple components of the Lockheed Martin portfolios. Gen Harrigian previously served in a variety of flying and Air Staff assignments, including as Deputy Director for Strategy, Plans and Assessments, U.S. Forces-Iraq, in support of Operation Iraqi Freedom and as Chief of the Joint Exercise Division at NATO's Joint Warfare Center, Stavanger, Norway. He flew combat missions in support of operations Just Cause, Desert Storm and Inherent Resolve. Gen Harrigian has also served as the Commander, U.S. Air Forces Central Command, Combined Force Air Component Commander U.S. Central Command. He retired as the Commander U.S. Air Forces in Europe-Air Forces Africa and NATO AIRCOM, Ramstein Air Base, Germany. He holds a bachelor's degree in political science from the U.S. Air Force Academy and a master's in aeronautical science from Embry-Riddle Aeronautical University.

Christopher T. Jones

Member

Dr. Christopher T. Jones (NAE) is Chief of Operations at the Leadership Compass. He is a recognized industry expert on aerospace sustainment and logistics technology. Previously, he served as president of the Technology Services sector at Northrop Grumman Corporation, where he led a complex organization of over 13,000 employees with annual revenues of more than $4 billion, and was responsible for supporting a diverse customer base, including the U.S. Departments of Defense, Energy, Homeland Security, State and Interior, NASA, and the U.S. Postal Service. In conjunction with his civilian career, Dr. Jones served as a communications and maintenance officer in the U.S. Air Force from 1986 until his retirement in 2012. He is a Fellow of the American Institute of Aeronautics and Astronautics and is a member of the National Academy of Engineering. Dr. Jones earned a B.S. in aerospace engineering from the Georgia Institute of Technology, M.S. degrees in aerospace engineering and in engineering management from the University of Dayton and a Ph.D. in aerospace engineering from the University of Maryland, College Park.

Valerie M. Manning

Member

Dr. Valerie M. Manning is an independent consultant and former Chief Commercial Officer (CCO) of Overair, an electric vertical takeoff and landing (eVTOL) company in the advanced air mobility sector. In this role, Dr. Manning led development and execution of the business, including product and performance requirements, business development and strategy, government affairs, mobility operations and in-service support and services. Prior to joining Overair, Dr. Manning served in several global senior executive leadership roles at Airbus in Europe, including senior vice president of Training and Flight Operations, senior vice president of Customer Support, and vice president of Upgrade Services. A retired USAF officer and former McKinsey & Company consultant, Dr. Manning is an active instrument-rated commercial pilot and flight instructor, with an Airbus A320 type rating and an EASA Air Transport Pilot License. She currently serves on the Board of Advisors of the Organization of Black Aerospace Professionals (OBAP) and the Board of Governors of the Wings Club, and has served on the National Academies Aeronautics and Space Engineering Board. Dr. Manning received her B.S in mechanical and aerospace engineering from Princeton University and a M.S. and a Ph.D. in aeronautics and astronautics from Stanford University.

Laura J. McGill

Member

Ms. Laura J. McGill (NAE) is Deputy Laboratories Director and Chief Technology Officer at Sandia National Laboratories, where she leads nuclear weapons modernization, stockpile programs and systems integration. She previously served as Deputy Vice President-Engineering at Raytheon Missiles & Defense, where she directed the work of 15,000 engineers and scientists. Prior, she was VP-Engineering for Raytheon Missile Systems, leading 7,800 engineers and scientists developing and producing weapons for the U.S. military and Department of Defense. Ms. McGill was responsible for systems performance, technical execution, test and flight operations, technology investment, engineering career development and capital investments. She was previously chief engineer of the $2 billion Air Warfare Systems portfolio, including Tomahawk cruise missiles, air-to-air combat systems and precision strike weapons. She was also chief engineer for Tomahawk cruise missiles from 2004-2006. Ms. McGill was elected President of the American Institute of Aeronautics and Astronautics (AIAA) in 2022 and inducted into the National Academy of Engineering in 2019. She was named Raytheon Principal Fellow in 2010 and elected as Lifetime Fellow of the AIAA in 2007. Ms. McGill served as adjunct faculty member at John Hopkins University Whiting School of Engineering, where she taught graduate courses in systems engineering. Ms. McGill earned her B.S. in aeronautical and astronautical engineering from the University of Washington and her M.S. in aerospace systems from West Coast University.

Mark Chris Nowland

Member

Lieutenant General (Ret.) Mark “Chris” Nowland, USAF is a strategic advisor with more than 20 years of executive leadership experience in global business management and air and space operations. Prior to his retirement as Lieutenant General from the United States Air Force, he served as the Deputy Chief of Staff for Operations, Headquarters U.S. Air Force, where he was responsible to the Secretary of the Air Force and the Chief of Staff for formulating policy supporting air, space, cyber, and irregular warfare, counter proliferation, homeland security and weather operations. As the Air Force operations deputy to the Joint Chief of Staff, he was also responsible for determining operational requirements, capabilities, and training necessary to support national security objectives and military strategy. Lt Gen Nowland previously commanded at the squadron, wing and numbered Air Force levels, and served on the Joint Staff, U.S. Southern Command and two Air Force major command staffs. He has flown combat operations in support of operations Southern Watch and Iraqi Freedom and is a command pilot with more than 3,600 flying hours. Lt Gen Nowland received his B.S. in electrical engineering from the U.S. Air Force Academy and a Master of Aviation Sciences degree from Embry-Riddle Aeronautical University.

Ellen M. Pawlikowski

Member

General (Ret.) Ellen M. Pawlikowski, USAF (NAE) is an independent consultant providing expertise to industry and academia on strategic planning, program management, acquisition and logistics, and research and development. She is a retired general from the United States Air Force. Her interest and expertise lies in the leadership and management of large technical programs and organizations successfully transitioning technology for applications in national security. She serves on the public boards of the Raytheon Company, RPM International, Inc., and Velo3D, and the nonprofit board of Stanford Research Institute (SRI) International. In her last military assignment, she served as commander of Air Force Materiel Command (AFMC) at the Wright-Patterson Air Force Base in Ohio. The command employs some 80,000 people and manages $60 billion annually, executing the critical mission of warfighter support through research and development, life cycle systems management, test and evaluation, installation support, depot maintenance and supply chain management. General Pawlikowski's career has spanned a wide variety of technical management, leadership and staff positions. She commanded five times as a general officer, commanding the Military Satellite Communications Systems Directorate (MILSATCOM) Systems Wing, the Air Force element of the National Reconnaissance Office, Air Force Research Laboratory, the Space and Missile Systems Center, and AFMC. She also served as the program director and program executive officer for several multibillion-dollar weapon system acquisitions. General Pawlikowski is nationally recognized for her leadership and technical management acumen. She is a fellow of the American Institute of Aeronautics and Astronautics and a member of the National Academy of Engineering. She remains active in the science and technology community. She has a Ph.D. in chemical engineering from the University of California, Berkeley and a B.S. in chemical engineering from the New Jersey Institute of Technology, Newark.

Bindinganavle Raja Suresh

Member

Dr. Bindinganavle "Raja" Suresh is an independent consultant in military technologies. Previously, he was the Managing Director of Arizona State University Research Enterprise, Director of Research at General Dynamics Mission Systems, Sensors and Signal Processing Technology Director at ATK (now part of Northrop Grumman), and Section Head at Honeywell Systems & Research Center. His expertise spans sensor systems, signal and image processing, artificial intelligence, multi-agent autonomy, C4ISR systems, software defined systems, open architecture systems and distributed systems of systems. He is a life senior member of IEEE and has served as an advisor on special study groups for the DoD, Canada Department of National Defence (DND) and the North Atlantic Treaty Organization (NATO). He is also a member of the Minnesota national security ecosystem to establish a strong defense research base in Minnesota. Dr. Suresh has taught at the University of Minnesota and has served as an advisor to the University of Minnesota, University of Arizona, and Arizona State University. He has received several awards for leadership in personnel recruiting and development, incubating innovation within the organization and for customer service to the DoD. Dr. Suresh earned his B.S. in electrical communication engineering from the Indian Institute of Science, and a M.S. and Ph.D. in electrical engineering from the University of Minnesota.

David M. Van Wie

Member

Dr. David M. Van Wie (NAE) is the ninth director of the Johns Hopkins Applied Physics Laboratory (APL). As director, Dr. Van Wie leads the nation's largest university affiliated research center, which performs research and development on behalf of the DoD, the Intelligence Community, NASA, and other federal agencies. Prior to becoming director, Dr. Van Wie led APL's Air and Missile Defense Sector, where he was responsible for strategic planning, execution, and performance of over 1,500 staff advancing the ability of the nation to defend our homeland, deployed forces, allies, and partners against adversarial threats. In this role, he championed new types of kinetic interceptors, novel approaches to sensing and data fusion, deployable artificial intelligence capabilities, and innovative non-kinetic effectors. Dr. Van Wie also previously served as mission area executive for Precision Strike, focusing on advanced weapon development, electromagnetic spectrum dominance, and novel long-range detection and targeting systems through revolutionary application of technologies in the areas of hypersonics, adaptive coordination of discrete kinetic and non-kinetic systems, and upstream data fusion. He is a fellow of the American Institute of Aeronautics and Astronautics (AIAA) and is a recipient of the Air Force Award for Meritorious Civilian Service. He was awarded the honor of presenting the AIAA 2021 Theodore von Kármán Lecture in Astronautics. Dr. Van Wie earned his B.S. (summa cum laude), M.S., and Ph.D. in aerospace engineering from the University of Maryland and an M.S. in electrical engineering from Johns Hopkins University.

Shery L. Welsh

Member

Dr. Shery L. Welsh is Executive Director of the Aerospace Center at the University of Texas at El Paso, where she leads advanced aerospace research, national security partnerships, and workforce development aligned with DoD priorities. She brings more than 37 years of distinguished service to the DoD and retired as a member of the Senior Executive Service. Dr. Welsh served in senior leadership roles across the Air Force, Space Force, and Missile Defense Agency (MDA). As Director of the Air Force Office of Scientific Research (AFOSR), she managed portfolios exceeding $500 million and oversaw the Air and Space Force global basic research enterprise. She served as Director of the Directed Energy Directorate at the Air Force Research Laboratory and held senior roles at the MDA, including Director of Science and Technology, Chief Scientist, and Chief Engineer. Dr. Welsh has also advised senior DoD leadership and interagency partners on science and technology strategy, future force design, and emerging threats, and is recognized for bridging government, academia, and industry to advance innovation, talent development, inclusive excellence, and evidence-based defense policy. She received her B.S. and M.S. in materials science and engineering from Wright State University, and a Ph.D. in materials science from the University of Alabama.

Ellen Chou

Director

Ms. Ellen Y. Chou is the director of the Air Force Studies Board and the Naval Studies Board, where she is responsible for directing all program and research activities conducted under the auspices of these boards. Prior to joining the National Academies, she worked as a program director in the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics in the Department of Defense, where she provided strategic leadership on the Department's acquisition efficiency and improvement initiatives and directed industry relations. She previously worked for more than 15 years in industry as a program manager, responsible for technical, financial, and contractual oversight of multiple professional services contracts in support of the United States Air Force and the Department of Defense. She also worked at the Center for Strategic and International Studies as an economist focused on U.S.-China trade issues and the George Washington University's Office of the Vice President for Academic Affairs. She earned her Master of Arts degree in security policy studies with honors from the Elliott School of International Affairs at the George Washington University and Bachelor of Arts degrees with honors in public policy studies and economics from the University of Chicago. She is DAWIA level II certified in program management, certified as a Contracting Officer Representative (COR), and has completed executive-level education in national and international security at Harvard University's Kennedy School.