POTOMAC INSTITUTE FOR POLICY STUDIES

2024 ANNUAL REPORT

WWW.POTOMACINSTITUTE.ORG

TABLE OF CONTENTS

FROM THE CHAIRMAN AND CHIEF EXECUTIVE OFFICER

Despite the challenges of the lingering effects of COVID, national administration policy shifts, and changes in personnel, this year, the Potomac Institute for Policy Studies continued to develop meaningful policy options and recommendations and ensured their implementation at the intersection of business and government.

The Potomac Institute remains a think tank focused on national security and science and technology (S&T) public policy issues. We strongly value our position as an independent, non-partisan, trusted source of expertise on science, technology, and national security issues.

An essential component of this relationship is our network. I'm proud of the scholars we have on staff, our boards, and our fellows. Last year we doubled the Institute's outreach to the community through our education program. We are building a strong future for the Institute, fulfilling our mission to support the nation by being a trusted advisor to policymakers and addressing critical S&T policy challenges.

This Annual Report provides an update on the Institute's leadership team, areas we've impacted, and funding profile.

Jennifer Buss, PhD
Chairman and Chief Executive Officer
Potomac Institute for Policy Studies

LEADERSHIP

View full profiles
at potomacinstitute.org

Jennifer Buss, PhD
Chairman and
Chief Executive Officer

Curtis Pearson
Vice President

Robert Hummel, PhD
Chief Scientist

Suzann (Zan) Riester
Vice President of Contracts
and Administration

After 22 years of devoted service, Gail Clifford retired as Chief Financial Officer in February 2024. Gail played a vital role at the Institute and her experience was unmatched. The Institute thanks her for the contributions and dedication that made a tremendous impact on our successes.

POTOMAC INSTITUTE FOR POLICY STUDIES

OUR PHILOSOPHY

The Potomac Institute for Policy Studies provides non-partisan, practical, and practicable analysis of science and technology policy to leaders in government, industry and academia. Our studies and policy reviews inform government officials in a manner that carries on the legacy of the former Office of Technology Assessment (OTA) in the U.S. Congress, after which the Institute is modeled. The Institute follows two basic principles. First, we fiercely maintain objectivity and credibility, remaining independent of any federal or state agency, and owing no special allegiance to any political party or private concern. Second, we seek extensive collaboration with similar organizations, as well as with industry, academia, and all levels of government. We believe that the study of today's complex issues demands a wide variety of contributions from various perspectives. We are proud to call ourselves "fiercely objective" as a result of our track record in divorcing political issues from policy changes.

STATEMENT OF INTEGRITY

The Potomac Institute is strictly **non-partisan**. Partisan political opinions will not influence findings of fact and recommendations in the Institute's publications and presentations. The Institute will not advocate for political positions but will instead be driven by data and a balanced analysis of alternative outcomes from the status quo as determined from data. Science and technology policy, in all forms, is in public service to benefit society, and not a partisan activity.

The Potomac Institute will always **distinguish between facts and opinions**. Opinions of experts may be gathered as part of the research process, but will be presented as opinions, and attributed in a way that indicates potential sources of bias. Further, a balance of countervailing opinions will be considered as part of the research and presented with analysis.

Findings and recommendations will be based on **rigorous data and analysis** and **will identify levels of uncertainty** that might occur due to sample bias, group think, measurement errors, or other sources of uncertainty. Science and technology policy often involves assessments of potential developments, future breakthroughs, and applications that might develop from technology advances. The Potomac Institute will fairly assess such possibilities with an understanding of the degree of uncertainty, as determined from multiple opinions, consultation with experts, and sound scientific judgement.

The Potomac Institute is **fiercely independent**. The Institute will not accept financial support or other influences for purposes other than in service to the Institute mission. The outcome of studies, recommendations, and Institute publications will not be based on predetermined positions or desired outcomes by sponsors. The Institute will regularly solicit frank information from sources with guarantees that the source will not be attributed. This is done to obtain accurate information that is not biased by interests imposed on sources. Outcomes of studies and conclusions reached by the Institute will reflect truths and analysis decoupled from financial interests of individuals and individual businesses, personal interests, fads, and hype. Institute advice and recommendations will be determined by Institute review processes, reflecting considered analysis, best available science, and judgements from multiple senior-level advisors.

The Potomac Institute, in its publications and presentations, will **never claim credit** for content, words, phrases, or **ideas that belong to others**. Citation of sources will be used whenever feasible. When sources are derived from non-attributable interviews (e.g., when "off the record"), then the fact of such sources will be cited without individual identification. The Institute will never reveal sources when non-attribution was guaranteed.

2024 RESEARCH VISION

2023–2024

Thank you again to the Board of Regents and Senior Fellows who participated in another annual research design planning session. The 2023 Potomac Institute for Policy Studies Research Planning session expanded our research focus into bio-intelligence. The 2024 Research Vision guided the team in prioritizing resources for studies and events.

IMPACT AREAS 2024

Over the past 30 years, our work led us to identify the following eight focus areas for our team and experts. These interests closely align with our work for government clients to continue advancing important policy areas that will help ensure our nation can compete and lead in Science and Technology (S&T) across the world.

GLOBAL COMPETITION


page 8

- U.S. Position on the Global Stage
- Strategic Levers in the Grey Zone
- Strengthening Partnerships
- Work Force and Education

SPACE POLICY


page 10

- Commercial Systems Planning
- Enterprise-wide Integrated Mission
- Roles and Missions

ECONOMICS AND WARFARE


page 11

- Economics as a Diplomatic and Warfare Discipline
- The Role of Industrial Policy
- Supply Chains, Transportation, and Logistics Under Fire

SEMICONDUCTORS


page 12

- Realities of CHIPS
- Mission Needs Versus Economic Realities
- Re-shore/Near-shore Decision Making

STRATEGIC COMMUNICATIONS AND COGNITIVE SECURITY


page 13

- Reclaiming the Narrative
- Communicating Within and Without
- Truth and Public Diplomacy

HUMAN HEALTH AND PERFORMANCE


page 14

- Astronaut Health Risk Reduction
- Health Care Systems Enhancement
- NASA Systems Supporting Humanity
- DoD and Intelligence Community Support to Warfighting

MISSION ENGINEERING AND RISK MANAGEMENT


page 15

- Mission Level Enterprise and Risk Management
- Mission Integration and Acquisition
- Reliability of Commercial Capabilities

TECHNOLOGY FUTURES AND MISSION CAPABILITY


page 16

- Eliminating the Bureaucratization of Innovation
- Mission Operations Value of Technology
- DoD Stimulating the Industrial Base

Global Competition Project (GCP)

The Potomac Institute for Policy Studies established the Global Competition Project (GCP) in 2021 to help identify, elevate, and address some of the most vexing societal-level challenges facing the United States. Throughout 2024, the GCP team conducted a series of symposia and studies that contextualized the relevance of the Institute's unique science and policy-focused mission on vital policy debates. This year, GCP's work focused heavily on contemporary economic statecraft, industrial policy, and Pillar 2 of the AUKUS security partnership. The thought leadership driven by GCP's efforts at the intersection of prosperity and security influenced the adoption of policies and processes enabling the nation to flourish despite the complexities and challenges of the global landscape.

GLOBAL COMPETITION PROJECT

Visit the GCP online at:
potomacinstitute.org/index.php/centers/global-competition-project

Australia-United Kingdom-United States (AUKUS) Security Partnership

The GCP team hosted a roundtable of industry, academic, and government stakeholders focused on Pillar 2 of the Australia—United Kingdom—United States (AUKUS) security partnership. A natural intersection with the Institute's mission, Pillar 2 aims to enhance collaboration on security-focused S&T, research and development, and policy between the partners by leveraging joint development and interoperability of advanced capabilities. The roundtable sought to lay a foundation for action on Pillar 2, as earnest implementation remains elusive despite the mutual security and economic benefits the partnership will potentially deliver. The successful roundtable resulted in a paper outlining findings and recommendations. It also inspired several sessions over the following months to resolve specific roadblocks to Pillar 2 implementation.

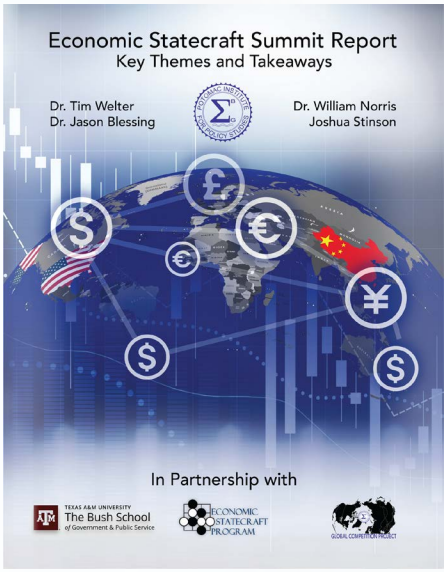
Challenges and Opportunities: Implementation of Pillar 2 of the Australia – United Kingdom – United States (AUKUS) Partnership – A Roundtable Summary
Dr. Tim Welter and
Dr. Jason Blessing

Operationalizing Pillar 2 of the Australia – United Kingdom – United States (AUKUS) Partnership: Issues in Electronic Warfare – A Roundtable Summary
Dr. Tim Welter and
Dr. Jason Blessing

Operationalizing Pillar 2 of the Australia – United Kingdom – United States (AUKUS) Partnership: Clearance and Classification Policy – A Roundtable Summary
Dr. Tim Welter and
Dr. Jason Blessing

Economic Statecraft Summit

In partnership with Texas A&M University's Bush School of Government and Public Service's Economic Statecraft Program, the GCP team hosted a summit on economic statecraft. The **increased weaponization of economics** has left key U.S. industries and markets vulnerable, reduced public trust in societal institutions, and endangered U.S. security and prosperity. Panelists from across government and industry shared views on adversarial economic practices, U.S. responses, and what would define success in the future. The summit aimed to establish a collaborative foundation for countering adversarial economic statecraft across the public and private sectors. The summit was a resounding success, and findings and recommendations were published in a comprehensive report, which informed provisions of the FY2025 National Defense Authorization Act.



Economic Statecraft Summit Report: Key Themes and Takeaways
Dr. Tim Welter, Dr. Jason Blessing, Dr. William Norris, and Joshua Stinson

Executive Courses on Economics and Warfare

The momentum of success enjoyed by the summit on economic statecraft, in conjunction with the executive course on industrial policy **(Industrial Policy and Global Competition)**, drove the GCP team to develop an executive course entitled **Economic Statecraft for VC & Business Executives: A 21st Century Reality**. The December course, co-hosted by Business Executive for National Security (BENS) and Texas A&M's Bush School, was exclusively designed for business executives and leaders working in private equity, venture capital, hedge funds, and alternative investment funds to explore current economic statecraft activities impacting the public and private sectors.

U.S. Industrial Policy: Then and Now – A Roundtable Summary
Dr. Tim Welter and
Dr. Jason Blessing

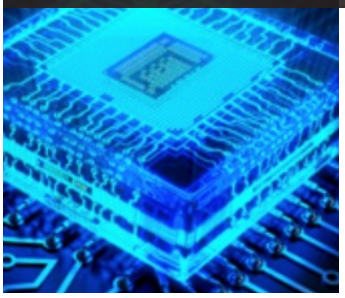
U.S. Space Force Strategy Development

Building off work conducted in 2022 and 2023, the Institute continued support to the U.S. Space Force's (USSF) Space Systems Command (SSC) in 2024. The Institute provided research and analysis focused on commercial space strategies and international partnerships and engagement for SSC. This effort culminated in the proposed USSF International Engagement Strategy, a strategic review of Department of Defense (DoD) and USSF Commercial Space strategies, and other works including the foundational *Space Theory of Success* paper. Other topics that explored commercial trends and engagement included space debris and implications for USSF, cybersecurity, and shaping international norms and behaviors in space. The work conducted helps support SSC leadership in "reoptimizing" the Department of the Air Force for great power competition and guides SSC in defining (and understanding) its unique role in the USSF.

Air Force Defense Industrial Base Risk Mitigation

In 2024, the Potomac Institute completed several studies for the Air Force about defense industrial base (DIB) engagement and market dynamics, with a focus on capacity constraint issues. The Institute drew on years of experience working with the Air Force and other DoD organizations and on the expertise and guidance of the Institute's Regents, scholars, and broad network of subject matter experts from the ranks of both government and industry. In support of acquisition strategies, the Institute provided research and mitigation strategies on the following three topics: the identification of challenges to the weapons acquisition roadmap; a novel method for measuring demand signal instability; and a framework for the characterization of DIB supply chain resilience.

SEMICONDUCTORS



The Institute has a long history of contributing to the policy conversation on **semiconductors**. This discussion sits squarely at the intersection of prosperity and security in today's globally competitive environment. Nations that control the design and manufacturing of semiconductors are uniquely postured with a strong competitive advantage, at least economically, for the future. This poses a particular challenge for the U.S. government, as it has diverse needs but only represents roughly 1% of the commercial semiconductors market and, therefore, is limited in the demand it can drive in that market. While the U.S. government recently made large investments in the semiconductors CHIPS Act, an action motivated mainly by supply chain concerns, guaranteed access is a long-term issue. The Institute's work in 2024 focused on continuing this discussion and identifying new and unique areas we could contribute to identifying gaps and solutions, most notably analysis on stockpiling approaches and securing the supply chain of the future for multiple government entities.

Microelectronics Stockpiling Strategy

Leveraging its years working in the semiconductor sector, the Potomac Institute performed a feasibility study on a microelectronics stockpile for the DoD. Supply chain resiliency and security were examined through a lens of existing stockpiles, risk management methodologies, and available government resources like programs, laws, and regulations. Findings informed the Office of the Undersecretary of Defense and Acquisition and Sustainment policy recommendations.

Executive Courses on Semiconductors

The Potomac Institute was also excited to launch our webinar series, **Semiconductor Industry Voices: Perspectives from Industry Leaders**, in conjunction with the Board of Regent's Mr. Brian Shirley. Mr. Shirley took the lead as our first speaker and discussed the Semiconductor Memory Industry. This series also featured esteemed guests Mr. Rick Cassidy, Chairman of TSMC Arizona, and Mr. Marco Chisari, EVP and Head of SSIC and U.S. Foundry, Samsung Electronics. This series provided valuable insights into the challenges and opportunities in the global semiconductor industry and continues in 2025. **Bloomberg highlighted Mr. Cassidy's presentation.**

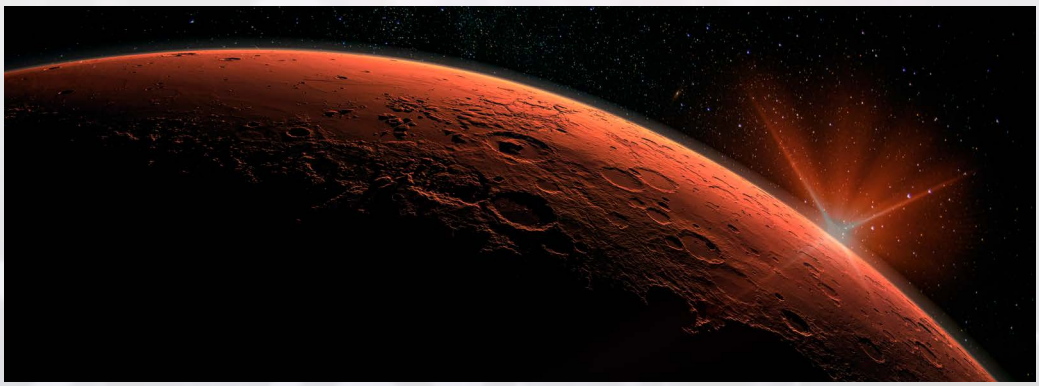
Indian Head Restructure

It is pivotal when businesses reorganize that they explain what is new and different to the internal workforce and external partners alike. Potomac Institute helped develop a Restructure Communications Strategy for the Naval Surface Warfare Center Indian Head Division (NSWC IHD). The strategy included an initial communication plan with engagement timelines so the command could effectively convey information regarding the restructuring and its benefits to IHD's internal and external stakeholders. The team organized and managed several leadership sessions with the workforce, during which the leadership team shared their implementation vision for the reorganization.


U.S. Navy/Ens. Sean Ianno

Reuse of Data for Strategic Insights

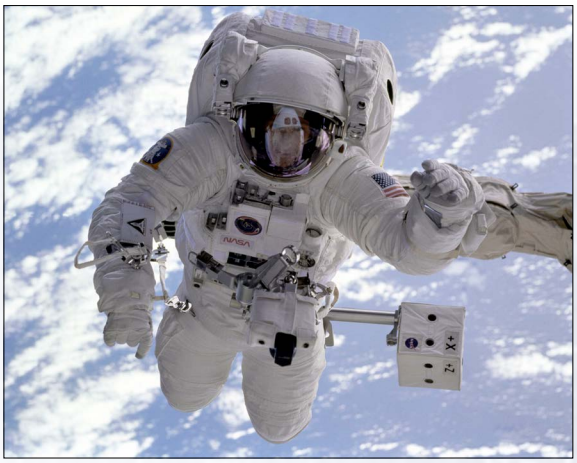
This year, the Institute helped the NASA Human Research Program (HRP) update a dated Data Management Strategy to a robust Data Strategy that aligns with emerging space travel needs. The HRP has funded data-driven research for the last 20 years. The program aims to reuse the previously collected data in larger data sets to gain new insights. This data mindset allows NASA to discover and leverage data more efficiently to mitigate the human risks of space flight. The Institute helps HRP meet its mission by using accurate and timely data to discover the best methods and technologies to support safe, productive human space travel to the Moon, Mars, and beyond.



Aerospace Medicine Core Competencies

Recent increases in commercial spaceflight have led to increased demand for medical personnel trained in aerospace medicine, specifically those specializing in space rather than aviation medicine. The physiological challenges associated with space travel require an astronaut to receive care during a mission and during their lifespan. Aerospace medicine providers supporting space missions can continue being trained in traditional aviation medicine but require supplemental training to recognize, diagnose, and treat space-related health issues associated with microgravity and higher radiation environments. The desire for space specialization has led to the proliferation of new training programs for aerospace medicine education, and recognition that clearly described core competencies will be essential for ensuring standards for the future of aerospace medicine.

The Potomac Institute conducted a study for the National Aeronautics and Space Administration (NASA) Chief Health Medical Officer to review existing aerospace medicine training competencies and highlight new ones. The study included extensive interviews with current and former flight surgeons with experience at NASA, the commercial space industry, and the U.S. military. It outlined a comprehensive description of the essential skill and knowledge requirements for space medicine practitioners. The results have been shared with the aerospace medicine community and other nations for consideration in their programs.



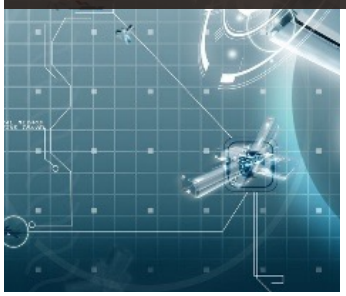
Leveraging Human Research Data for Long Range Space Flights

The Human Research Program collects data from model organisms, humans on earth in simulated space (confined) environments, and astronauts on the International Space Station to prepare for long range space flight. Immense amounts of data are collected and must be integrated to derive insights for long range space flight to Mars and beyond. The Institute wrote strategies for NASA to leverage the wealth of data collected across the different programs within the agency in hopes of helping to reduce the risk of spaceflight to future astronauts. Data sharing best practices are fundamental in the ability to gain useful knowledge. The Institute has impacted more than five of the thirteen flight risks with the research and analysis performed by our scholars.

Biometric Technology

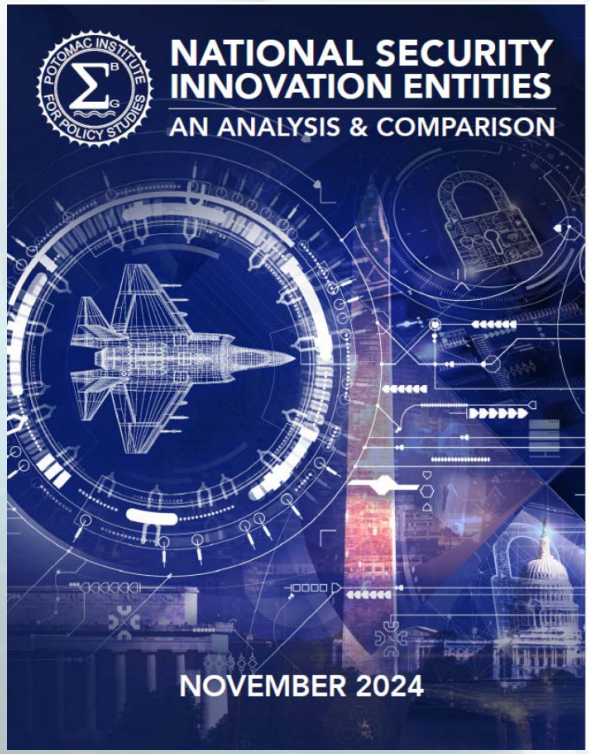
Competitiveness in biotechnology and biomanufacturing has become a clear priority for Congress and the Executive Branch. Technological advancements in these areas impact our national security and economy across health and medicine, food, manufacturing, materials, energy, and other sectors, all critical to the U.S. competitive posture on the global stage. A prime example is the proliferation of biometric technologies—smart watches, phones, rings, and other devices—and the accompanying data analysis capabilities. The Potomac Institute explored the intersections of biotechnology, biomanufacturing, and national security consequential to America's competitive posture.

Biotechnology and the Bioeconomy in the Global Competitive Environment – A Roundtable Summary
Dr. Tim Welter, Dr. Claire Caherty, and Dr. Jason Blessing



National Security Innovation Ecosystem

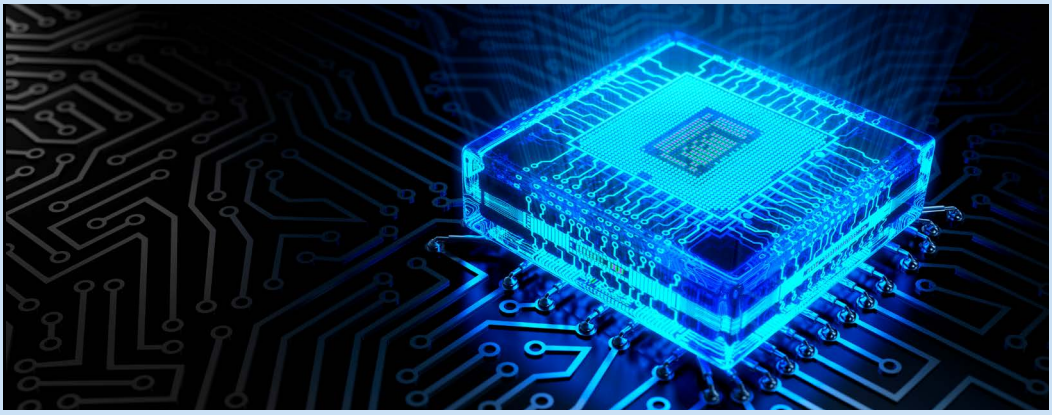
In 2024, the Potomac Institute conducted a study to assess enterprise innovation entities across the national security community. The goal of the research was to determine how effective innovation organizations are at accelerating the adoption of emerging technologies and capabilities for mission-relevant applications. The study focused on a comparative analysis of four national security innovation entities: Defense Innovation Unit (DIU), AFWERX, SOFWERX, and In-Q-Tel (IQT). This encompassed each entity's mission, organizational structure, authorities, funding models, and measures of effectiveness. The Potomac Institute concluded that effective enterprise innovation entities require clarity of mission, robust communication lines, leadership support and backing, and organic resources to improve successful outcomes.



ENDURING INFLUENCE

SEMICONDUCTOR POLICY SUPPORT

The Potomac Institute continued providing semiconductor policy expertise for the Department of Energy's priority interests, including CHIPS Act implementation. This year, the staff also provided insights to the Heterogeneous Integration Facility (HIFac) study, reviewing policy issues impacting the enduring supply of trusted strategic radiation-hardened parts for the National Nuclear Security Administration and the science and engineering consultancy TechSource.



SHIPBUILDING LANDSCAPE STUDY

The U.S. Navy has a long history of challenges in obtaining ships within budget and on schedule. More recently, increased global maritime threats have elevated the importance of this issue to one of national importance and attention. The Potomac Institute conducted a strategic landscape analysis focused on U.S. Naval shipbuilding, with the goal of establishing a comprehensive list of key questions for a detailed study that will conduct an in-depth analysis of all issues identified in the shipbuilding landscape. The goal of the studies is to provide recommendations for enduring improvements in shipbuilding design, acquisition, and sustainment.

Several cross-cutting issues were identified in the course of the study, including the importance of Smart Buyer principles, incorporation of lessons learned in guiding acquisition strategy, wide-ranging workforce development and competency issues, and the need to better define the expected role of the private sector in future shipbuilding programs.

ENDURING INFLUENCE

NAVAL SURFACE WARFARE CENTER (NSWC) INDIAN HEAD DIVISION

NSWC

Munition expenditure rates and munition performance were at the forefront of American security interests, from Ukrainian assistance to counter Russian aggression to Navy destroyers firing missiles in self-defense for the first time in decades. Munitions, ordnance, and the energetics that power them proved their value. However, even with increased budgets, our nation's suppliers of complex and high-end munitions have been unable to build up production capacity to keep pace with demand. As our adversaries increase coordination and cooperation among themselves, the potential future of all Western democratic societies are at risk.

In 2024, Potomac Institute staff helped Indian Head Division (IHD) of the Naval Surface Warfare Center (NSWC) revitalize the Navy's only remaining arsenal and convince senior DoD leaders of the critical role the industrial base plays in addressing munitions shortfalls. From complicated supply chains, shrinking manufacturing workforce expertise, and convoluted acquisition processes, Potomac staff helped the command understand these complexities and communicate across multiple lines of effort to address these national security threats. The U.S. needs effective arsenals to provide the capacity and capability to deter and win a future global conflict to address the uncertainties associated with the pivot to great power competition. Fortunately, the Navy recognized their arsenal had atrophied and began to fund a broad $2B+ Energetics Comprehensive Modernization Plan the Institute helped draft to bring IHD back to being a capable arsenal. Tied to a hybrid business model where the arsenal's infrastructure and equipment maintenance costs are funded separately from direct orders, the Navy has a great start that will help revitalize atrophying arsenal capabilities.

In the spirit of the Chief of Naval Operation's Get Real, Get Better campaign, Institute staff also helped the command assess its organizational structure and develop improvement recommendations throughout 2024. With an expected fourfold increase in work, the command must prepare for wartime just as it has supported past global conflicts during its storied 135-year history.

Over time, IHD evolved through Navy-wide reorganizations and base reductions, resulting in multiple discrete parts responsible for different aspects of production delivery, innovation, and warfighter engagement. This amalgamation led to overlapping capabilities, miscommunication, and misaligned priorities needed for efficient and effective wartime expansion and execution. The newly organized command structure will allow for successful growth and execution for the energetics "factory," leading innovation and fleet support activities. More contemporary groupings enable the command to address the current landscape and execute its core strategic imperatives—Produce, Create, and Adapt—best to address the nation's current and future munitions requirements. Institute staff will continue supporting the rollout and refinement of the arsenal's organizational structure and its impact in 2025.

ENDURING INFLUENCE

INTERNATIONAL CENTER FOR TERRORISM STUDIES (ICTS)

For over 25 years, the ICTS has been an internationally recognized pioneering research program that has monitored current/future potential terrorist threats and developed response strategies at governmental, inter-governmental, and non-governmental levels. Through numerous forums, projects, and publications, the ICTS sponsors continual communications with policy makers, academic institutions, business, media, and civic organizations nationally and globally.

In 2024, the ICTS published its second volume in a series focusing on the interdisciplinary aspects of the North Atlantic Treaty Organization (NATO) over the past eight years. The current publication consists largely of excerpts from multiple reports published by the Inter-University Center for Terrorism Studies in association with the U.S. Department of State (Office of European Security, Political and Military Affairs-EUR/RPM), the International Law Institute, and the Potomac Institute for Policy Studies. Forewords were provided by the Honorable Leon E. Panetta and General (Ret.) Wesley Clark.

Visit the ICTS webpage at:
potomacinstitute.org/academic-centers/international-center-for-terrorism-studies-icts

LEGACY IMPACT

CETO

After nearly 25 years, Potomac Institute for Policy Studies concluded its longstanding support to the Marine Corps' Center for Emerging Threats and Opportunities (CETO). CETO's core mission was to provide the Commanding General of the Marine Corps Warfighting Laboratory (MCWL) with technical and analytical support for concept development, wargaming, and experimentation programs. CETO conducted assessments of the strategic environment; future threats and potential adversaries; and the geographic, environmental, economic, and demographic trends that could influence future warfighting requirements.

CETO functioned as an internal Marine Corps think tank dedicated to developing innovative ideas and concepts in direct support of the Commanding General MCWL and the Director of the Marine Corps' Futures Directorate under the Deputy Commandant for Combat Development and Integration. Established in November 2000 at the direction of the Senate Armed Service Committee's Subcommittee on Emerging Threats and Capabilities, CETO was created in response to a growing concern about the wide range of security challenges the United States will face in the 21st century. This support spanned the full spectrum of combat development-related missions and tasks, including the assessment of future threats and adversaries and the conditions—geographic, environmental, economic, and demographic—that may influence the development of future warfighting concepts, experimentation efforts, and required capabilities across Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities. CETO's primary products included major studies, formal papers, reports, assessments, briefings, seminars and conferences. The following highlights the significant support provided by the Potomac Institute staff to Marine Corps Force Development over the years.

Marine Corps Security Environment Forecast (MCSEF): Provided a current snapshot of Futures Directorate's continual examination of the deep future. The Potomac Institute contributed to collective efforts to ensure the Marine Corps produces the right force, in the right place, at the right time.

Series on Global Trends 2040: This work culminates a series of three appraisals, treating each scenario as "received fact." Each appraisal leveraged and expanded on the National Intelligence Council's work, assessing one scenario at a time and highlighting implications for the Marine Corps. The final paper focused on commonalities among the assessed scenarios and highlighted implications for both Force Design 2030 and Force Design after Next. A principal aim of this approach was to mitigate future risk to Force.

Quick Look: Expeditionary Naval Mine Warfare: New Capabilities in Support of Sea Control: Informed by the 2018 National Defense Strategy's refocus on great power competition between the United States, Russia, and China and influenced by technological trends in warfare, the Navy and Marine Corps debuted three supporting operational concepts: Distributed Maritime Operations (DMO); Littoral Operations in a Contested Environment (LOCE); and Expeditionary Advanced Base Operations (EABO).

Dozens of Table Top Exercises: Designed to help the Marine Corps anticipate and prepare for complex, uncertain futures by simulating scenarios and challenging assumptions to inform smarter decisions about future conflict.

Future Information Environment (IE) Forecasting: *Foresight into the Information Environment* reflected long-term challenges, opportunities, trends, implications, and recommendations for the future force. This report was a culmination of several months' effort by the core members of the Information War Room and the MCWL's CETO to explore the future IE and its implications for and potential impact on the efforts of the community.

LEGACY IMPACT

U.S. DEPARTMENT OF HOMELAND SECURITY

In 2024, the Potomac Institute staff concluded its most recent wide-ranging support to the Department of Homeland Security (DHS) Science and Technology Directorate (S&T) through the DHS S&T's International Cooperative Programs Office (ICPO). ICPO negotiates international agreements on research agendas and S&T development. The Institute's key experts facilitated DHS S&T staff engagement with Israel, South Korea, Singapore, and the United Kingdom on programmatic solutions for 1) Countering Unmanned Aerial Systems (C-UAS), canine detection of pathogens during COVID, passenger and baggage screening challenges, and 2) transitioning promising technologies like wildfire sensors developed by domestic industry to U.S. and Canadian First Responders and Law Enforcement.

The Institute remains a thought leader in international S&T landscapes, leading interagency engagements with the President's Office of Science and Technology Policy, the State Department's Bureau of Oceans and International Environmental and Scientific Affairs (OES), and OES Joint Committee Meetings (JCMs) with allies. JCMs include representation from other federal departments like the Department of Energy and Agriculture, allowing the Institute to leverage these engagements to expand its reach. Institute staff also analyzed and assessed the S&T development capabilities of nations in the Middle East, including government, industry, and academia, which led to specific engagements in the region—for example, collaboration on C-UAS technologies with Bahrain and dialogue with the United Arab Emirates on canine detection of pathogens.

EDUCATION PROGRAM

The Potomac Institute for Policy Studies remains unwavering in its commitment to prioritizing education, research, and the growth of its people by fostering learning opportunities relevant to current S&T policy issues and innovations. The Institute's Education Program is a key resource for cultivating professional development and expertise. Through our internal and external course offerings, the Education Program continues to offer a dynamic and engaging learning environment to meet the needs of our staff, clients, and the larger community of government, industry, and academia.

In 2024, the Institute's Education Program experienced significant growth. We expanded our impact and network through new and ongoing partnerships with NSSA, Purdue University, BENS, TAMU, and NDIA/ETI. Collaborating with these esteemed organizations has allowed us to reach a broader, diverse audience that brings different perspectives and insights to our courses and provides our participants with increased networking opportunities.

The year started with our CEO, Dr. Jen Buss, and Senior Fellow, Mr. John Wilson, traveling to SOFWERX in Tampa, FL to facilitate the **SOCOM Venture Capital and Innovation Workshop**, which stemmed from the work of our September 2023 **Venture Capital: Casino Royale or Deliberate Innovation** course. In March, we offered **The New Space Race: Economic, Policy and Security Issues on the Final Frontier** with Senior Fellow John Paul "JP" Parker as the course director. This course explored the economic, security, and policy implications of the latest race in space as it related to congressional, White House, industry, and international perspectives on the importance of space to our future. The Honorable Al Shaffer, a member of the Board of Regents, directed our September **Industrial Policy and Global Competition** course. The contemporary resurgence of industrial policy underpins international competition, driving us to explore what propels that resurgence, the trade-offs raised in adopting national-level industrial policies, and what the United States is doing about it. Senior Fellow Dr. Tim Welter was the course director for the last course of 2024, **Economic Statecraft for VC & Business Executives: A 21st Century Reality**. The course brought government leaders and operators together with business executives and leaders from the investment and financial services sectors to explore contemporary economic statecraft activities impacting the public and private sectors. Our keynote, General Tim Ray, USAF (Ret.), President and CEO of BENS, along with experts from government, industry, and academia, shared how they view asymmetric economic threats, what they are doing about it, and how policymakers and the private sector can collaborate to ensure a secure and prosperous future.

https://www.potomacinstitute.org/index.php/education-program

"If a nation expects to be ignorant and free, in a state of civilization, it expects what never was and never will be."

—THOMAS JEFFERSON
LETTER TO CHARLES YANCEY, 1816

In addition to the engaging courses offered this year, the Education Program hosted several panel discussions and webinar sessions from our new studio space. Dr. Michael Fritze, Senior Fellow, took the lead on **Security Standards for Commercial Electronics: Beyond the Foundry** in March and Supply Chain Awareness month in April; he was the moderator for the Institute's **Microelectronics "the New Oil" Fireside Chat**. The Honorable Al Shaffer moderated the **Industrial Policy: Now and Then Fireside Chat** in June.

Alongside our external offerings, the Education Program offers valuable learning opportunities for staff through our Staff Summarizing Institute Projects Series (Staff SIPS). We also had a presentation where Senior Fellow Lois Hollan discussed **Telework and the Impact on Innovation**.

https://www.potomacinstitute.org/index.php/education-program

INTERNSHIPS

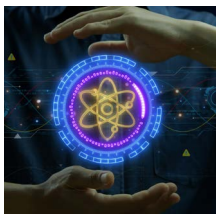
The Potomac Institute hosts three internship programs (Science and Technology [S&T], International Center for Terrorism Studies [ICTS], and Global Competition Project [GCP]) as part of our commitment to developing and encouraging the next generation of policy leaders. The S&T Internship Program allows aspiring graduate and undergraduate students to research an S&T topic of their choosing, provide bold and insightful recommendations in a policy research report, and present their findings to Institute staff and leadership. The ICTS program hosts in-person and remote internships to students across the country. Currently, the program has 21 students from 18 different universities. These students not only work on research projects to support the ICTS but also assist Potomac Institute staff on select opportunities. The GCP program allows students to assist staff in conducting impactful, timely research and to participate in high-level events related to U.S. global competitiveness. With the GCP program, interns learn valuable lifelong skills to improve research, writing, and critical thinking directly applicable to the professional policy world.

2024 INTERN RESEARCH REPORTS

Climate Concerns over the Growing Energy Use of Artificial Intelligence: AI's Energy Use and the U.S.'s Contributions to the Paris Agreement

Olivia Pelzek, Undergraduate at the University of Wisconsin-Madison

Posits that artificial Intelligence (AI) will drive increasing data center power demands and resulting carbon emissions, requiring the U.S. to change regulations if it hopes to reach climate goals.



The Technological Future of Intelligence: The Future of Analysis in Intelligence Decision-Making in an Increasingly Digital World

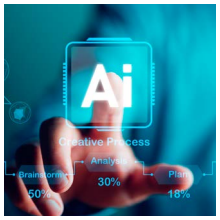
Charlotte Huck, Undergraduate at the University of Georgia

Evaluates federal government investments in AI and Quantum technology and suggests that technology use in the Intelligence Community still requires human oversight.

HALEU Regulation Revisited: Mitigating the Nuclear Risks of High Assay Low-Enriched Uranium (HALEU)

Andrew Maglio, Undergraduate at Yale University

Suggests the Nuclear Regulatory Commission, the Department of Energy, and subgroups reevaluate nuclear industry safeguards considering the increased HALEU demands associated with new "non-light-water reactor" (NLWR) designs.



Deep Fakes Using Generative AI: Lack of Restriction and Urgency

Karla Romo, Undergraduate at the University of California, Berkeley

Considers that the federal government should enact a law that protects victims of sexual deep fakes, mitigating the lack of consistency among individual states (i.e., protections are not uniform and only exist in 14 states).

The views and opinions expressed in the intern research reports do not necessarily reflect those of the Institute.

View internship opportunities online at: https://www.potomacinstitute.org/index.php/education-program/internships

SPOTLIGHT ON SCHOLARS

Space Force Must Address Cybersecurity in Commercial Acquisitions
Jason Blessing, PhD, Research Analyst

A Notorious Israeli Spyware Firm Wants to Use the Gaza War to Make a Comeback
Jason Blessing, PhD, Research Analyst

Star Sailor: My Life as a NASA Astronaut
Charles F. Bolden Jr., Major General USMC (Ret.), Board of Regents, with Tonya Bolden

National Maritime Historical Society celebrated the extraordinary maritime accomplishments of ***Major General Charles F. Bolden Jr., USMC (Ret.).***

Why Xi Created a New Information Support Force and Why Now
Dean Cheng, Senior Fellow

Turning on a Dime
Dr. Margaret "Peggy" McWeeney, Research Analyst, and Kevin Harrington, Research Associate
Presented their work on hybrid warfare and violent non-state actors at the annual American Political Science Association hosted in Philadelphia, PA.

The Dragon's Brain
Gerold Yonas, PhD, Senior Fellow

Dangers That Will Not Go Away and What To Do About Them
The Honorable William "Mac" Thornberry, Board of Regents

Accelerating Defense Innovation Requires Change to Acquisition Approach
The Honorable Alan R Shaffer, Board of Regents, with John Whitley

Righteous Arrows: A Cold War Spy Thriller
Brian Morra, Board of Regents and Senior Fellow

SCIENCE, TECHNOLOGY, ENGINEERING AND POLICY STUDIES (*STEPS*)

The Potomac Institute publication *STEPS* provides original articles by staff, affiliates, and contributors to the work of the Institute on timely topics relevant to S&T policy. This publication provides a space for new experts in the S&T field to partner with and learn from our more established experts on the Board of Regents and Senior Fellows.

We continue to see rapid advances in technologies and continuing scientific breakthroughs, both in the U.S. and globally. This environment is challenging U.S. national policies to stay current, relevant, and responsive to the needs for security and economic wellbeing. These articles are derived from discussions generated by our programs, education, and courses, or from ideas suggested by any of our staff or affiliates.

Peak China: Personal Observations as a Western Businessperson in China
Patrick Ennis, PhD, Senior Fellow
Suggests that China has inherent problems in its economy.

Is AI Ready to Help Win Wars?
Lois Hollan, Senior Fellow, and Robert Hummel, PhD, Chief Scientist
Discusses how AI can flag abnormal activity patterns as early warnings in national security matters.

Applying Lessons from the Commercial Innovation System to the National Security Innovation Base
John Wilson, Senior Fellow
Innovation is fostered and taught in the commercial marketplace of companies.

Trusted Access to Microelectronics: Addressing DoD's Unique Issues of Accessibility, Integrity, and Confidentiality of Microelectronics
Ted Glum, Member, Board of Directors
Lessons learned from decades of experience with providing trusted microelectronics for national defense.

AI Technology to Increase U.S. Government Transparency
Rindha Sudhini, Potomac Institute Intern from the University of Pennsylvania
Proposes government agencies' responsibilities to make data AI-compatible to increase transparency in government activities.

Read current and past issues of *STEPS* online at: potomacinstitute.org/steps

SCIENCE, TECHNOLOGY, ENGINEERING AND POLICY STUDIES (*STEPS*)

This year, Potomac Institute was privileged to produce two issues of *STEPS*.

The Potomac Institute has a longstanding interest in understanding the impacts of emerging technologies like semiconductors, space-based systems, and artificial intelligence. We continue to assess their broader effects on critical sectors, including information ecosystems and innovation frameworks. Our ongoing analysis and discussions help illuminate the intricate connections between technology, policy, and society.

The Wicked Problem that Confronts the U.S. Space Force
Alden V. Munson, Jr., Senior Fellow and Member, Board of Regents, and Robert Hummel, PhD, Chief Scientist
Threats that confront the Space Force and approaches to address those threats.

Technology Opportunities for National Prosperity
Rosalie Loewen, Research Economist and Robert Hummel, Chief Scientist
A compendium of excuses for industrial policy and some technology directions that might warrant government support.

The Detrimental U.S. Tax Policy on Research and Development
Robert Hummel, PhD, Chief Scientist
Why aren't reasonable R&D expenses deductible as ordinary and necessary business expenses?

Mitigating Algorithmic Targeting in Social Media Platforms
Kayla Dunn, Potomac Institute Intern from Georgetown University.
Surveys regulations and legislation that attempts to provide governance over social media and AI algorithms.

Approaching Orbital Overload
Carrie Zuckerman, Research Associate
The problem of clutter of satellites in orbit and the likelihood of Kessler syndrome.

Government Opportunities for AI Technologies
Robert Hummel, PhD, Chief Scientist
Since government has access to large stores of data, it can leverage AI to provide early warning and discrimination tasks.

Read current and past issues of *STEPS* online at: potomacinstitute.org/steps

REMEMBRANCE

In 2024, the Potomac Institute family lost two irreplaceable members. Both of these individuals were instrumental to the Institute in significant ways. **General Al Gray, USMC (Ret.),** the Chairman of Potomac Institute's Board of Regents and the 29th Commandant of the Marine Corps, helped found the Institute and shared his leadership, vision, and experiences for 29 years. The Institute would not be here today without him.

Over the last 25 years, **Dr. Yonah Alexander,** Board Member, Senior Fellow, and Director of International Center for Terrorism Studies, brought his knowledge and expertise in international terrorism to the Institute, which made our work all the better. The next few pages are a tribute to honor them for all they did. They will be missed.

GENERAL AL GRAY

General Alfred M. Gray Jr., the 29th Commandant of the Marine Corps, was born on June 22, 1928, in Point Pleasant Beach, New Jersey. Gray enlisted in the Marine Corps in 1950 after leaving college to serve in the Korean War. As a radio operator with the Amphibious Reconnaissance Platoon, Fleet Marine Force, Pacific, he began a distinguished 41-year military career that included eight deployments, many involving dangerous or clandestine missions.

In Vietnam, Gray led the first independent ground operations by a Marine unit, commanding a composite signals intelligence team with attached infantry. His pioneering work in signals intelligence and the operational integration of intelligence collection earned him induction into the National Security Agency's Hall of Honor in 2008. His early units laid the foundation for today's Marine Cryptologic Support Battalion.

Gray's leadership spanned every operational level—from platoon to Marine Amphibious Force. In 1987, Secretary of the Navy James Webb appointed him as the 29th Commandant of the Marine Corps. As Commandant, Gray championed professional education and intellectual development. He created the Marine Corps University, uniting formal officer and senior enlisted education programs. Today, hundreds of Marine leaders earn degrees there each year.

Gray also instituted the Commandant's Reading List, requiring Marines to read at least two books per year. This initiative, still active today, reflects his belief in the value of critical thinking and lifelong learning.

One of his most enduring contributions was the Marine Corps' adoption of maneuver warfare. Emphasizing adaptability, initiative, and decentralized decision-making, maneuver warfare became the Corps' guiding doctrinal philosophy, influencing military and civilian organizations worldwide.

Gray's leadership style was deeply rooted in his early experience as an enlisted Marine. He frequently told young officers their first responsibility was to take care of their Marines. In interviews, he cited his promotion to corporal as his proudest moment. "My proudest day probably was when I got to put corporal on my return address on the envelope [home]," he once said.

His humble, grounded approach set him apart. In the Marine Corps hallway of the Pentagon, among portraits of past Commandants in full dress uniform, General Gray stands out—smiling in his camouflage

utilities. His message was clear: "Every Marine is, first and foremost, a rifleman. All other conditions are secondary."

Gray prioritized combat readiness, emphasizing training in varied environments—from deserts to cold-weather operations. Under his leadership, the Marine Corps expanded special operations capabilities and adopted doctrine-driven, large-scale maneuvers. His post-Vietnam transformation of the Corps focused on education, adaptability, and expeditionary excellence.

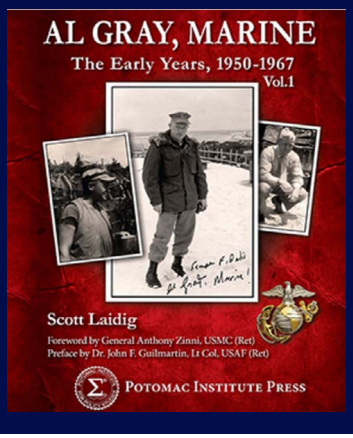
After retiring from the Marine Corps in 1991, Al Gray remained active in public service and defense. He served as a board chairman and CEO for several organizations and advised the DoD through roles on the Defense Science Board, the NSA Science Advisory Board, and the National Reconnaissance Office Gold Team, among others.

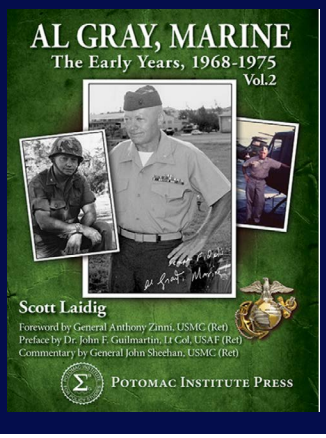
Gray also supported veteran and youth organizations. He was chairman emeritus of the Injured Marine Semper Fi Fund and America Fund, helping wounded veterans and their families. He served as Chancellor of the Marine Military Academy and Chairman of the U.S. Marine Youth Foundation. General Gray led research and policy initiatives through the Potomac Institute for Policy Studies and the Norwich University Advanced Research Institute.

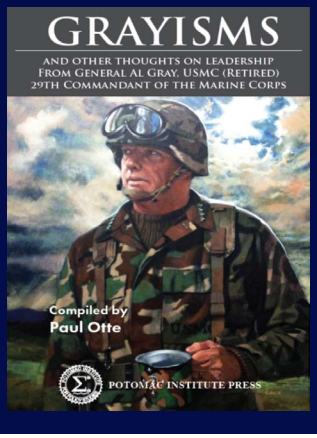
General Gray's legacy is one of intellect, grit, and dedication to those he led—in military service and through the Potomac Institute for Policy Studies. He reshaped the Marine Corps into a more agile, informed, and strategically minded force while never losing sight of the individual Marine. His belief in service and excellence inspired generations of Potomac Institute scholars and staff and these values continue to resonate throughout the Institute's efforts today.

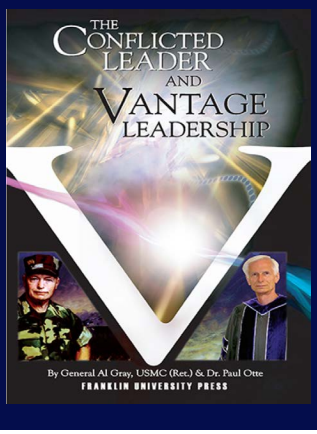
Al Gray met Jan Gray in 1969 and they married in 1980. Throughout their marriage, Jan tirelessly supported the Marine Corps community. She was active in the Navy-Marine Corps Relief Society, the Marine Corps Scholarship Program, Toys for Tots, and support efforts following the Beirut bombing. Her contributions earned her the Marine Corps League Distinguished Service Award and the Navy's Distinguished Public Service Award.

General Al Gray passed away on March 20, 2024, at his home in Alexandria, Virginia. He was 95. He was preceded in death by Jan, who died on January 30, 2020.









DR. YONAH ALEXANDER

Professor Alexander served as a member of the Board of Regents, Senior Fellow, and Director of the International Center for Terrorism Studies at the Potomac Institute for Policy Studies. His affiliation with the Potomac Institute spanned 25 years, with prescient work alongside Michael Swetnam, General Al Gray, USMC (Ret.), Brig. General David Reist, USMC (Ret.), and many other distinguished professionals in the United States and abroad. Professor Alexander's contributions to the Potomac Institute included publishing books and reports (available on the Institute's website), holding in-person and Zoom-based seminars, obtaining external funding, raising its domestic and international media profile (including 63 video appearances on C-SPAN), hosting hundreds of interns, providing guidance on combating terrorism to the public and private sectors, and serving as a dedicated colleague. As a devoted scholar and teacher, his primary mission included inspiring the next generation to recognize historical patterns, thereby minimizing the risk of future conflict. He cherished his long association with the Potomac Institute and viewed it as an honor and privilege to partner with such an eminent institution.

Professor Alexander was a pioneer in an uncharted field. He worked on the forefront of terrorism studies, publishing innovative research, lecturing, writing, and analyzing global terrorism. Professor Alexander served for over 40 years at universities in the United States and abroad. Among his more than 100 published books on global security and counterterrorism, he authored seminal works on al-Qaida and documented the evolution of U.S. and international terrorism policy. He founded five academic journals, including: *Terrorism, Minorities and Group Rights*, *Political Communication and Persuasion*, *NATO's Partnership for Peace Review*, and *Terrorism: An Electronic Journal & Knowledge Base*. Professor Alexander's publications have been translated into many languages. He lectured in dozens of countries and appeared extensively in international media. Professor Alexander's personal papers and terrorism collection are housed at the Hoover Institution Library and Archives at Stanford University.

Professor Alexander studied under numerous distinguished academics. He earned his Bachelor's degree in Political Science from Roosevelt University, a Master's degree in International Relations from the University of Chicago, and a PhD in Public Law and Government from Columbia University. He cited Dr. Edward Teller, one of the early members of the Manhattan Project, as a catalyst for his academic work in terrorism studies.

Professor Alexander listed Professor Hans Morgenthau and Justice Phillip Jessup as mentors and inspirations for his work. During his long career, he was also guided by and collaborated with Henry Kissinger, Justice Arthur Goldberg, Al Gore, Wesley Clark, William Webster, Clarence Kelley, Robert Mueller, Madeleine Albright, Joseph Lieberman, Thomas Ridge, Stuart Eizenstat, and Abraham Sofaer.

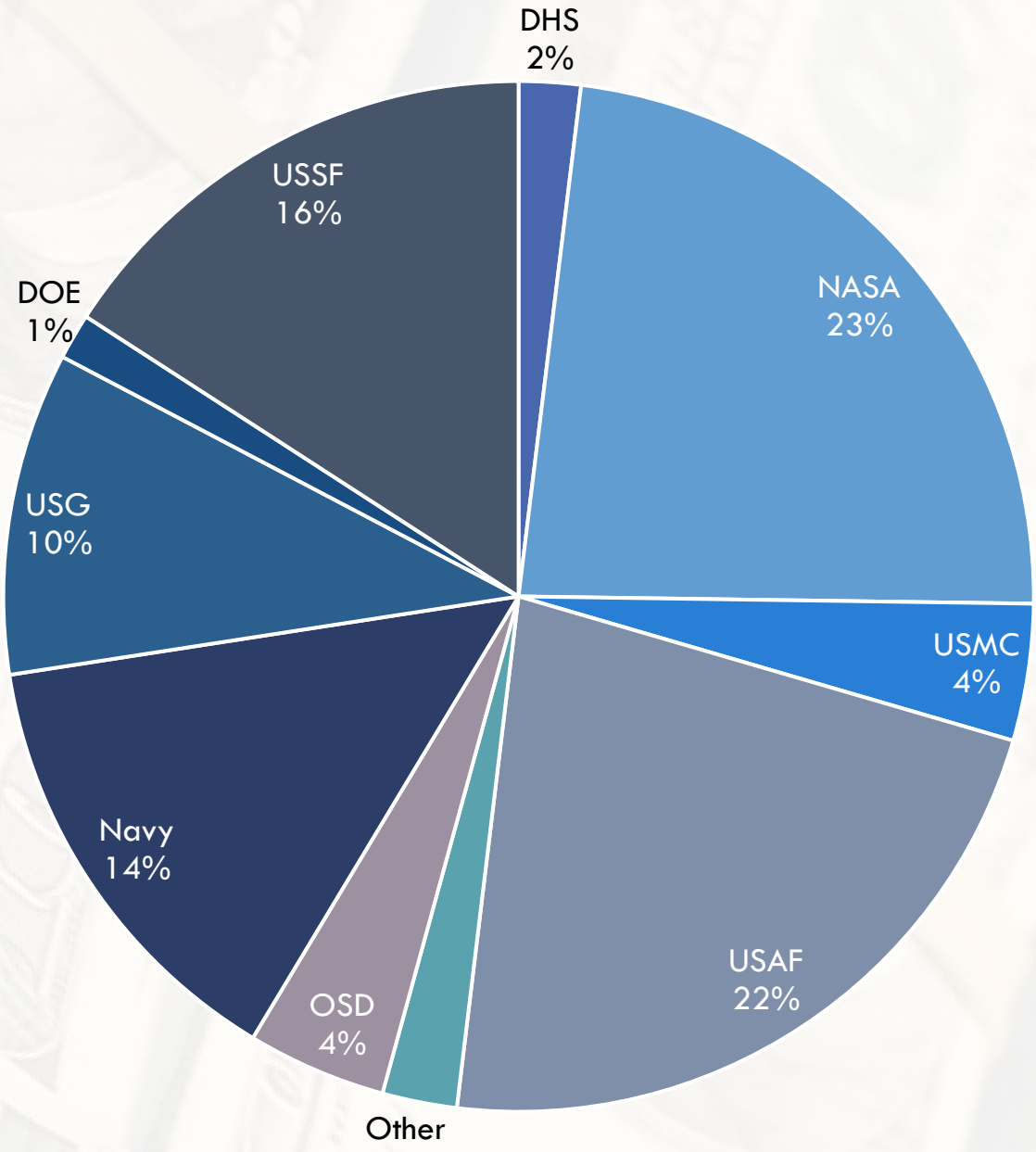
Professor Alexander's final work, *NATO: Past Lessons and Strategic Mission for the 21st Century*, was published posthumously in May 2024.

Professor Yonah Alexander passed away peacefully at the age of 93.


policy

FINANCIALS

Potomac Institute for Policy Studies
Estimated Revenue FY2024



LOOKING FORWARD TO 2025/2026

Throughout its 30-year history, the Potomac Institute for Policy Studies has adapted to the cyclical nature of S&T topics and trends. While we will continue to prioritize current national security issues as well as topics that may no longer be "in vogue" to anticipate future Congressional or Administration interests, we will also revive legacy focus areas to address emerging priorities. As we head into 2025, we are taking a renewed look at our research priorities to ensure we are focusing on the issues of today and tomorrow.

One way the Institute is addressing problematic issues expected to vex the S&T community is by revitalizing some of our former centers. The Institute is realigning internal research and reorganizing staff to continue preparing its highly-valued independent and data-driven solutions. One 2025 priority will be elevating our work on semiconductors, expanding its scope to include technologies like cyber and AI and aptly renaming it the Center for Technology Leadership and Security.

The Institute remains steadfast to its core mission—safeguarding U.S. national security by addressing the pressing S&T issues of today, forecasting future concerns for tomorrow, and protecting Americans for the next 30 years.

POTOMAC INSTITUTE FOR POLICY STUDIES

The Potomac Institute for Policy Studies
901 N. Stuart Street, Suite 1200
Arlington, VA 22203
Telephone: 703.525.0770
Fax: 703.525.0299