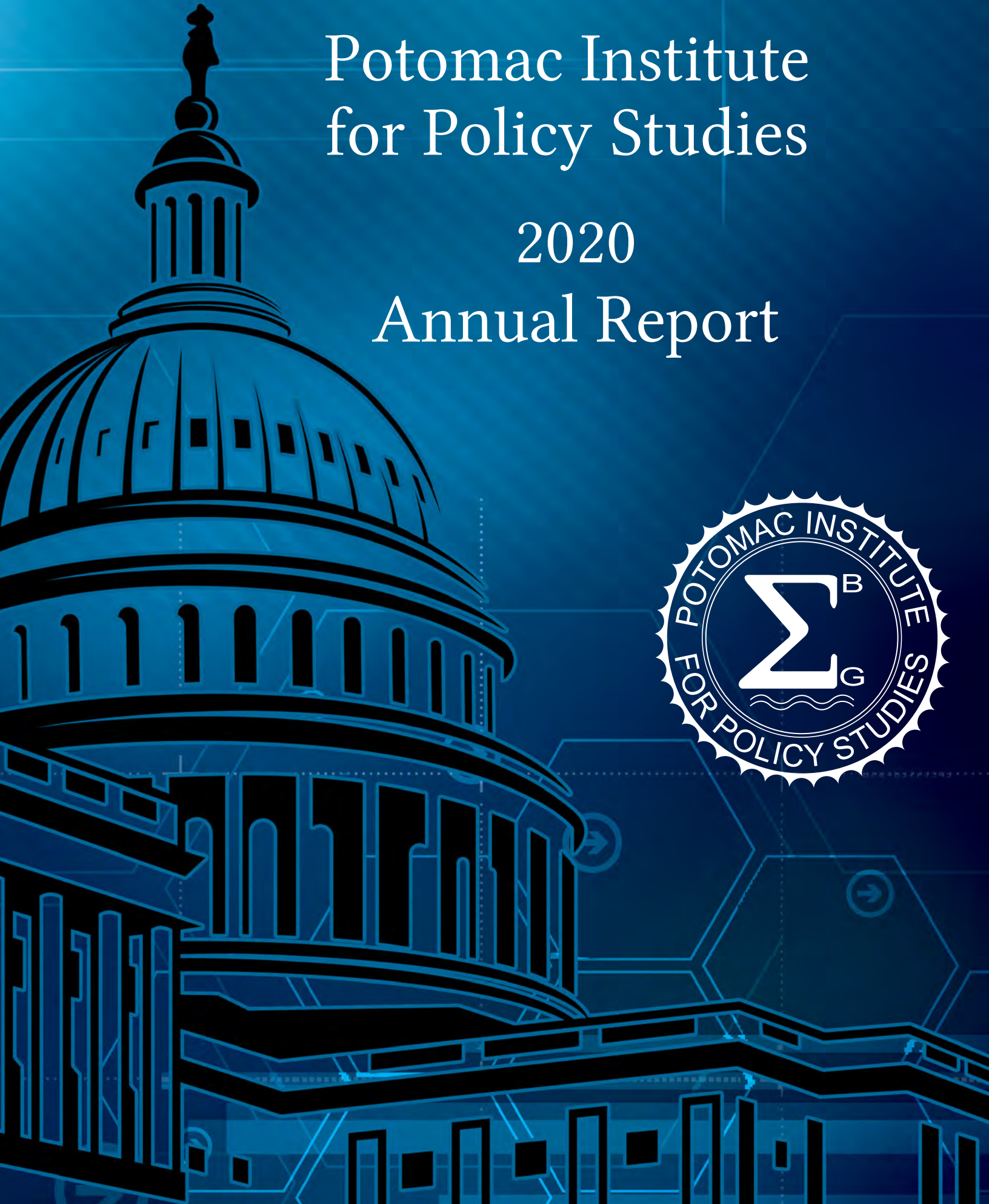
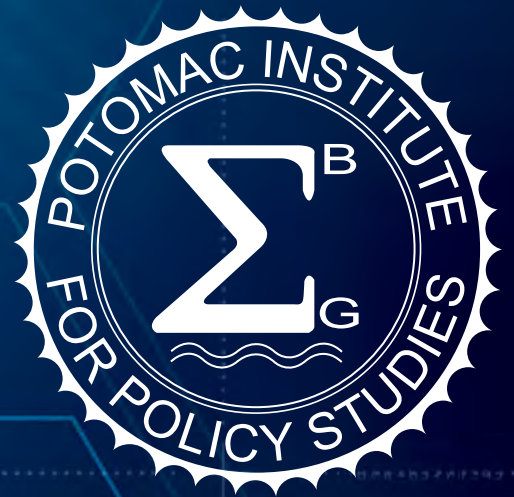


Potomac Institute for Policy Studies

2020

Annual Report



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*The good thing about science is that
it's true whether or not you believe in it.*

- Neil deGrasse Tyson

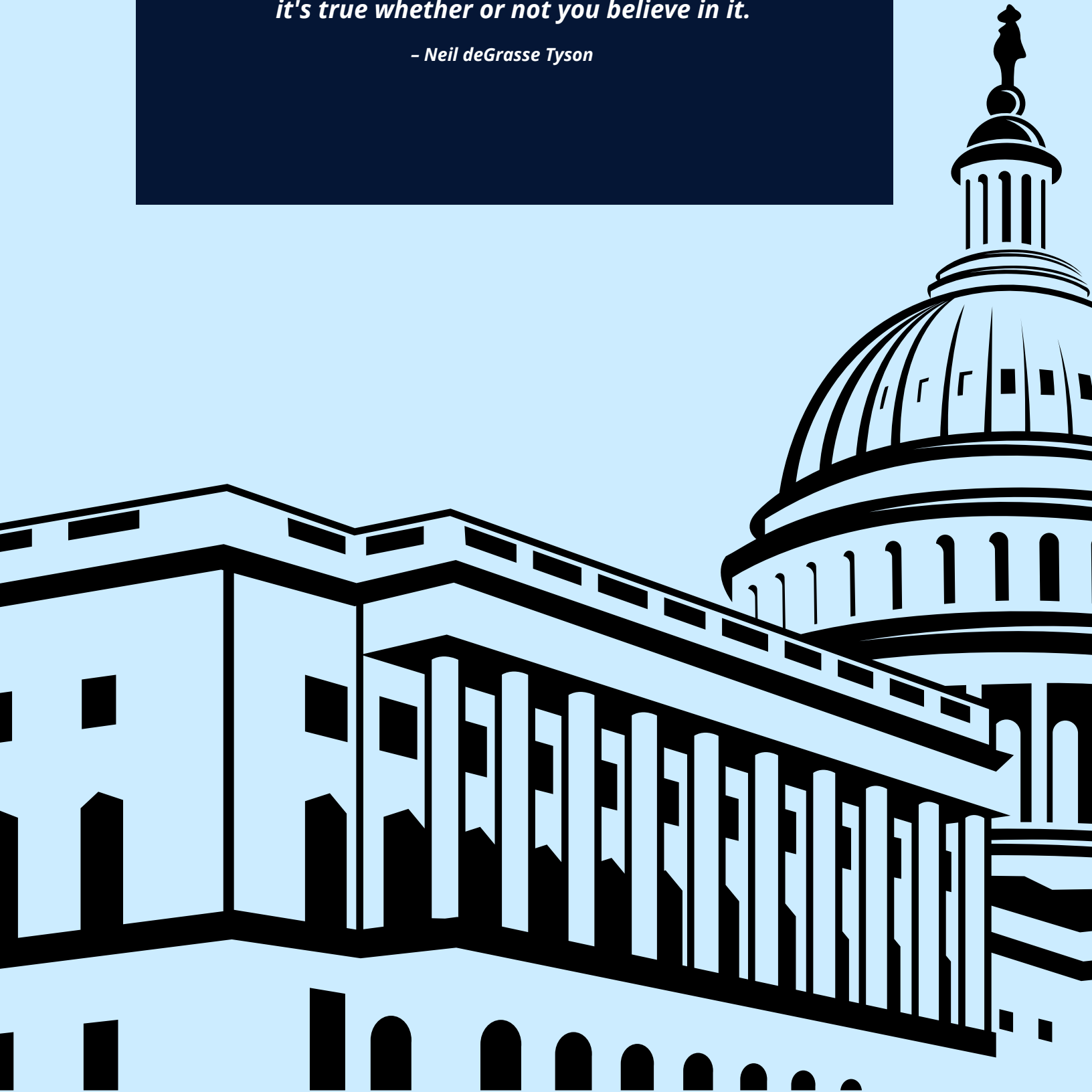


TABLE OF CONTENTS

Bold Ideas for a Better Tomorrow	5
Management Team	6
Message from the CEO	7
History of Potomac Institute	9
Our Mission	9
Core Capabilities	10

CURRENT EFFORTS **12**

Assessing Science and Technology Transition in the Air Force	13
Air Force Industrial Base Study	14
Naval Surface Warfare Center, Indian Head	16
Microelectronics	19
National Aeronautics and Space Administration (NASA)	21
USMC Training and Education Command (TECOM)	24
Defense Health Agency (DHA)	25

ACADEMIC CENTERS **27**

Forging Ahead to the Future	27
Center for Emerging Threats and Opportunities (CETO)	28
Center for Adaptation and Innovation (CAI)	29
Center for Enterprise, Exploration, and Defense in Space (CEEDS)	31
Vital Infrastructure, Technology, and Logistics (VITAL)	32
The Center for Revolutionary Scientific Thought (CReST)	35
Cyber Readiness Index (CRI)	36
International Center for Terrorism Studies (ICTS)	38
Center for Health Policy & Preparedness (CHPP)	40

FINANCES AND FUNDING

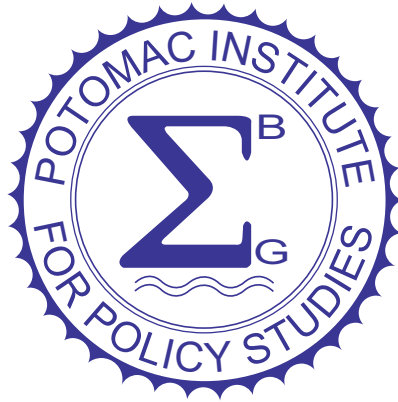
2020 Finances	43
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IN MEMORIAM **44**



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BOLD IDEAS FOR A BETTER TOMORROW

Sir Isaac Newton once said, “No great discovery was ever made without a bold guess.” Our late founder Michael Swetnam lived by that mantra. Bold Ideas was a concept he championed every day. Because of that, and because of him, the Potomac Institute for Policy Studies is always looking towards the future. We believe ideas cannot only be imagined but accomplished. But it takes a lot to get there.

It takes knowledge. We employ some of the best minds in science and technology. Our staff, Fellows, Regents, and Directors are the best in their respective fields. They have years of experience in the private sector, government, and academia. Our work helps the federal government to *think big* and to organize, structure, and execute new policy that shapes not only today, but tomorrow, as well.

It takes trust. The Institute plants new, bold ideas—firmly rooted in science and technology—into the hearts and minds of decision makers within government. Our reports are based on years of research and presented with actionable policy recommendations for today and the future. The not-for-profit, independent, non-partisan attributes of the Institute make us a trusted partner to provide the most objective perspective to the government.

It takes bold ideas. We challenge our team to employ out-of-the box thinking—to think above and beyond the possibilities of today, to arrive at concepts that will lead us well into the future. To quote world-renown scientist Carl Sagan, “Somewhere, something incredible is waiting to be known.”



No great discovery was ever made without a bold guess.

– Sir Isaac Newton

MANAGEMENT TEAM



General Al Gray, USMC (Ret.)
Chairman of the Boards

General Al Gray, USMC (Ret.) serves as the Chairman of the Potomac Institute's Board of Directors and the Chairman of the Board of Regents. He has been affiliated with the Institute since its beginnings in 1994. General Gray served as the 29th Commandant of the Marine Corps, on the Joint Chiefs of Staff, and as an advisor to Presidents Ronald Reagan and George H. W. Bush. General Gray has led several important studies through the years. He continues to serve the Institute in numerous ways, from his connection to the Marine Corps, CETO, senior government leaders, and the research and development community; to his numerous public speaking appearances; to his thought leadership on a wide range of strategic and technical issues. He is dedicated to charity and public service work with numerous nonprofit organizations serving youth, Marines, and injured service members.



Jennifer Buss, Ph.D.
Chief Executive Officer

Jennifer Buss, Ph.D. serves as the CEO of Potomac Institute in 2020 since the passing of Co-founder and CEO Michael Swetnam. For almost a decade, Dr. Buss has exemplified the organization's core mission and capabilities. She brings keen technical expertise and innovative ideas to this role, and knows how to lead and delegate to make those ideas reality. In 2020, Dr. Buss led the Institute to expand its portfolio on space, DoD, and DOE issues and has added key new staff and Fellows to work on these projects. She has also renewed the Institute's internal research focus on AI, neuro, and bio futures.



Gail Clifford
Chief Financial Officer
Vice President of Finance



Mike Fritze, Ph.D.
Vice President



Robert Hummel, Ph.D.
Chief Scientist
Vice President of Research

MESSAGE FROM THE CEO

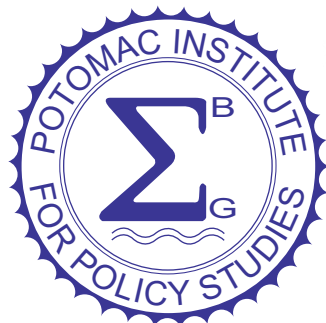
Challenges and Lessons Learned from 2020

Who could have predicted what would happen in 2020? This year brought a lot of change – some good, some hard. We’ve seen so much loss this year because of the COVID-19 pandemic. Many Americans lost loved ones, lost jobs, lost livelihoods, and lost opportunities. We also lost our leader and co-founder Michael Swetnam. While he is gone, his memory and mission live on in us all.

We changed the way we live, communicate, and interact. We changed the way we conduct business. We officed out of our homes – missing the in-person collegial contact and feedback that makes us all so close, but we made great strides in adaptability. We learned to run the Institute remotely. We learned how to communicate, make hires, and close business deals virtually. It hasn’t been easy, but our team has done an amazing job despite all the restrictions. And while this year has taken so much, I’d be remiss if I didn’t point out some of the things we gained this year.

The Institute had a fantastic year. Our work and recommendations will have a lasting positive impact on the nation. This report highlights our initiatives and successes. It’s been a banner year for science. Some of the best scientific minds in the world developed vaccines to fight COVID-19 in literally record time. A process that normally takes years to develop and approve was completed in just months. Science is key to saving lives and has been put front and center because of the pandemic.

This year has taught us that we have resilience, perseverance, and an inherent ability to overcome obstacles thrown in our way. So, let us all look ahead to 2021, to the opportunities it brings, and know we are stronger for having gone through this year of challenges.



A handwritten signature in blue ink, appearing to read "Jennifer Buss".

Jennifer Buss
Chief Executive Officer



HISTORY OF POTOMAC INSTITUTE

The Potomac Institute was founded as a not-for-profit 501(c)(3) in 1994 to provide technical policy expertise to the government, intended to carry on the legacy of the Office of Technology Assessment in providing a source of objective S&T policy advice to Congress.

Our first funding was provided via the National Science Foundation to support a supercomputing center. Some of our early academic work was on terrorism. In the late 1990s, we hosted one of the few academic centers wholly dedicated to studying terrorism, and after 9/11, our book on Osama bin Laden and Al Qaeda was widely read by the intelligence community. We have always had close ties to the military, and our early work with the Marine Corps lives on today at CETO, a futures group and think tank at Quantico.

Over time, the Institute has served a broad set of customers on a diverse range of technical and policy issues. Throughout our history, we have served government customers, including Congress, Department of Defense (DoD) agencies (Office of the Secretary of Defense [OSD], the Defense Advanced Research Projects Agency [DARPA], the Armed Services and their laboratories, research agencies, training commands and operational commands), the National Aeronautics and Space Administration (NASA), the Department of Energy (DOE), many national laboratories, the Department of Homeland Security (DHS), the intelligence community, law enforcement, the Federal Aviation Administration (FAA), the Census Bureau, the National Science Foundation (NSF), National Institutes of Health (NIH), the Department of Health and Human Services (DHHS), and more. We are proud to count many former service members among our board, staff, and fellows, as well as many former senior government officials and industry executives. The common theme across all these efforts has been the Institute's ability to convene policy leaders and technical experts to innovate and work together in the national interest.

OUR MISSION

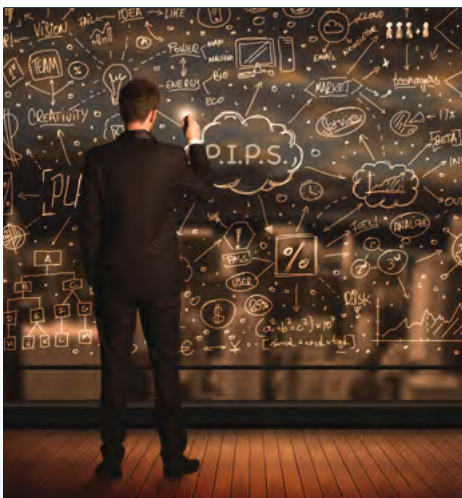
The Potomac Institute for Policy Studies is an independent, nonpartisan, not-for-profit, science and technology (S&T) policy research institute. The Institute identifies and leads discussions on key S&T and national security issues facing our society, providing an academic forum for the study of related policy issues. Based on data and evidence, we develop meaningful policy recommendations and ensure their implementation at the intersection of business and government. The Potomac Institute provides high-level, S&T policy support to the federal government.

CORE CAPABILITIES



TRENDS & IMPACTS

- Analyze and forecast S&T trends
- Describe the impacts of S&T on policy and society
- Leverage technical and government experience to gain unique insights
- Expand strategic and futures thinking to go far beyond what other forecasters imagined



STRATEGIC PLANNING

- Analyze and develop missions, goals, and strategic plans
- Provide agency or office director-level technical and policy strategy
- Define plans, formulate realistic policy expertise, and assist with policy and program development and implementation
- Build stakeholder buy-in with internal and external parties



RESEARCH & DEVELOPMENT

- Provide research strategies and implementation plans to government customers based on their missions, goals, and capability gaps
- Build research agendas, including policy development and implementation
- Utilize technical research on commercial and government trends to provide a comprehensive context

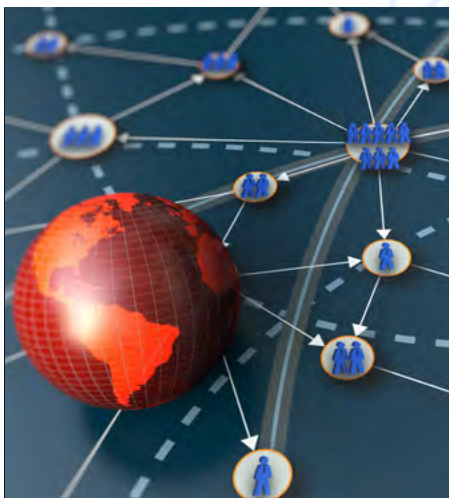


CORE CAPABILITIES



BOLD IDEAS

- Identify bold solutions to hard policy and technical challenges
- Identify and assess innovative research efforts
- Serve as independent innovation engines via CReST and other academic centers
- Translate discussions and ideas into realistic policy solutions



BUILDING NETWORKS

- Utilize one of the Potomac Institute's core strengths—the wide network and reachback capability of the Senior Fellows and Board of Regents
- Offer world-class expertise from policy, government, military, and technical areas
- Utilize this network for review groups, gathering new ideas, policy development, program and technical assessments, independent analysis, and stakeholder input



MARKET TRENDS

- Document and analyze commercial technology capabilities for strategic decision making within government agencies
- Research and assess applicability, company viability, and technical capability
- Provide a full report of recommendations for investment and policy based on government needs

CURRENT EFFORTS

The Potomac Institute works directly with the government to generate strategic advice on S&T issues, formulate policy options, and implement policy. We provide innovative, research-based technology, forecasting insights to the space, defense energy, and intelligence communities.

The Institute provides strategic planning, budget analysis, and technology forecasting in support of areas as varied as innovation in defense acquisition, warfighting activities and capabilities, military training and education concepts, microelectronics and supply chain security, health and human performance in space, future space development, and much more. We let the science and our research provide the findings that lead to data-driven policy. Our recommendations are always based on science, numbers, and data – never on politics.

Our recent customers include the US Marine Corps, Navy, Army, Air Force; DARPA; OSD; Defense Microelectronics Activity; Defense Health Agency; NASA; DOE/NNSA; the intelligence community and DoD; among others. Our work has also contributed to raising and solving large policy questions on issues related to national security, space security, supply chain security, critical infrastructure, and biomedical sciences. Our staff are highly technical experts at the top of their fields, senior government leaders, and talented analytic researchers.



ASSESSING SCIENCE AND TECHNOLOGY TRANSITION IN THE AIR FORCE

The Potomac Institute for Policy Studies was tasked with providing strategic planning support, market analysis and technology forecasting, and technical evaluation and transition planning in order to deliver recommendations to the USAF detailing how best to measure transition of projects initiated at the Air Force Research Labs (AFRL) to military systems. In essence, the question presented to the Institute was, "How can we calculate a return on investment from the research funded by the Air Force?" Return on Investment (ROI) is an inappropriate measure of the value of Air Force S&T because of the difficulty of monetizing the worth of military capabilities, the retention of core competencies, and the addition to the technology-ready reserve. Like any organization, AFRL needs to find an effective way to measure how well its expectations are being met and it is certainly important to track cost and investment. AFRL's efficacy should be determined by whether it is performing its major functions. This should be done through comparison of its metrics-based assessment against a standard of success for each function. AFRL should develop and employ a meaningful metrics-based process to assess, guide, and report its performance. In addition, innovative and high risk/high payoff efforts are not being sufficiently measured and pursued. AFRL should determine and adopt the right balance between evolutionary and innovative S&T and between risk and payoff in order to maximize Air Force capabilities.

General Pringle, the Commander of AFRL, accepted the new way of thinking and is pushing forward to implement the recommendations. Air Force Acquisition seniors are using the information we provided as the standard for measuring transition of technology within the Air Force S&T enterprise.



U.S. AIR FORCE

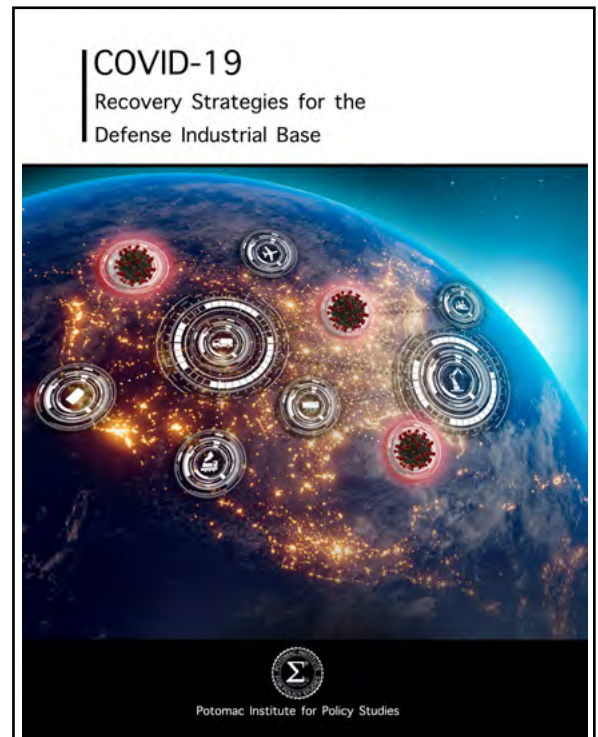
INDUSTRIAL BASE STUDY

The USAF Assistant Secretary of the Air Force tasked the Institute to focus on industrial base protection and implementing more flexible acquisition strategies. We began working this effort in March and the USAF asked us to study the impact of the pandemic on the Defense Industrial Base (DIB).

IMPACT OF COVID-19 ON THE DEFENSE INDUSTRIAL BASE

The Defense Production Act (DPA) and other key Department of Defense (DoD) actions during COVID-19 have demonstrated positive US government support of the DIB. However, the operational readiness, responsiveness, and limitations of the DIB partnership with the US government to meet USAF/DoD critical missions during the pandemic, and ensuing economic crisis, highlighted both strengths and weaknesses. The health, welfare, and shortcomings of the DIB highlighted during the pandemic, and by extension any large-scale national emergency, demonstrate that policy considerations to promote and maintain DIB production for recovery and future emergencies is worth examination. This study focused on the mid- and longer-term strategic impacts and policy recommendations for the US government/DIB partnership going forward, to ensure critical mission delivery not only during national emergencies, but through enduring mission requirements.

This study was undertaken by the Potomac Institute for Policy Studies under sponsorship of the (SAF/AQ) to address policy inputs as a result of the COVID-19 pandemic. As a result of this effort, five key findings are identified. For each finding, specific recommendations were prepared and were summarized in the report. Findings included that the DIB is relatively sheltered from the commercial industry segments. The businesses most at risk struggled because their commercial business came to a screeching halt. The report also highlighted foreign-based industrial threats are increasing with the economic crisis. The pandemic response exposed fragility of critical elements in the supply chain. The resulting economic impacts exacerbated gaps in DIB robustness.



PROTECT AND EXPAND THE INDUSTRIAL BASE

The US Industrial Base has significantly more to offer the US government than what is currently being utilized. The United States must expand the known entities of the industrial base to have a strategic advantage in today's threat environment. The rate of technological change in the commercial marketplace has outpaced the Air Force's ability to spend. Bureaucratically burdened procurement contracts can take decades from inception to completion and demand the majority of defense funding. Furthermore, US companies are discouraged from working with the US government. This occurs for a variety of reasons, namely compromising agility and market share, and – especially for small businesses – reduced working capital.

In a globalized world of research and development, technology solutions to defense needs are hidden in commercial ventures and research laboratories with little knowledge of, or understanding by, the US government marketplace. The Air Force must develop much greater insight into non-traditional and global technology advances outside of the traditional domain to meet the demands. Typically, the DIB only responds to the government request for technology without adding industry standard capability simply because it wasn't written in the work statement.

The Potomac Institute was contracted to support the SAF/AQ organization in their efforts to achieve meaningful acquisition reform. This is a topic of intense current interest with recent renewed focus on supply chain security, acquisition agility, and near-peer competition. The USAF has many ongoing efforts to better engage with the commercial sector, and the Institute helped create a cohesive strategy for the efforts and initiatives. We offered insights and strategies on how best to protect and expand the broader industrial base.

The Institute engaged with the SAF/AQ to assist in identifying forefronts of technology and engineering for use by the Air Force and Space Force of the future. These departments aim to learn ways to invigorate new solutions and new procurements that break the incrementalism of sustainment for everything from major defense systems down to the materials for exercises, and our insight and expertise can greatly assist them in this process. Toward the goal of understanding new technologies and new directions, the Potomac Institute sponsored a series of virtual Technology Forums with Air Force representatives.

To support these changes, the Institute helped Air Force leadership adjust their structure to better support the shifting mentality of protecting and expanding the industrial base, creating sustainable partnerships, and increasing capabilities.

NAVAL SURFACE WARFARE CENTER, INDIAN HEAD

After the end of the Cold War, the US National Defense Strategy transitioned to the Global War on Terrorism (GWOT). During this time, our military forces had all the firepower they needed, and consequently, energetics were de-emphasized. As a result, over the past three decades the energetics industry has contracted with many energetics components and source materials being reduced to single sources. During this time, the Navy's sole arsenal, Indian Head Division (IHD), located in Indian Head, MD, has had minimal funding for RDT&E, and sporadic funding for manufacturing existing components. Like private industry, IHD languished during the GWOT, though maintaining a broad range of capabilities – the organization remains our nation's sole full-spectrum energetics center.

The strategic situation changed during the 2010s back to Great Power Competition, formalized in the 2018 National Defense Strategy. And unlike the Cold War, the US now has two Great Power Competitors: China and a resurgent Russia. And that is where the Institute's support to IHD comes to bear. We began supporting IHD shortly after the new Technical Director (TD), Mr. Ashley Johnson, arrived. The TD started his career at IHD, and quickly realized the organization needed to be reinvigorated at multiple levels, from strategic through tactical, and across the range of IHD activities from "cradle" (research and development) to "grave" (demilitarization and

disposal), and in between, from engineering and testing to manufacturing. To do so, IHD needed expertise that was not all available at IHD, and Potomac Institute partnered with Applied Technology, Inc. (ATI) to provide the needed support.

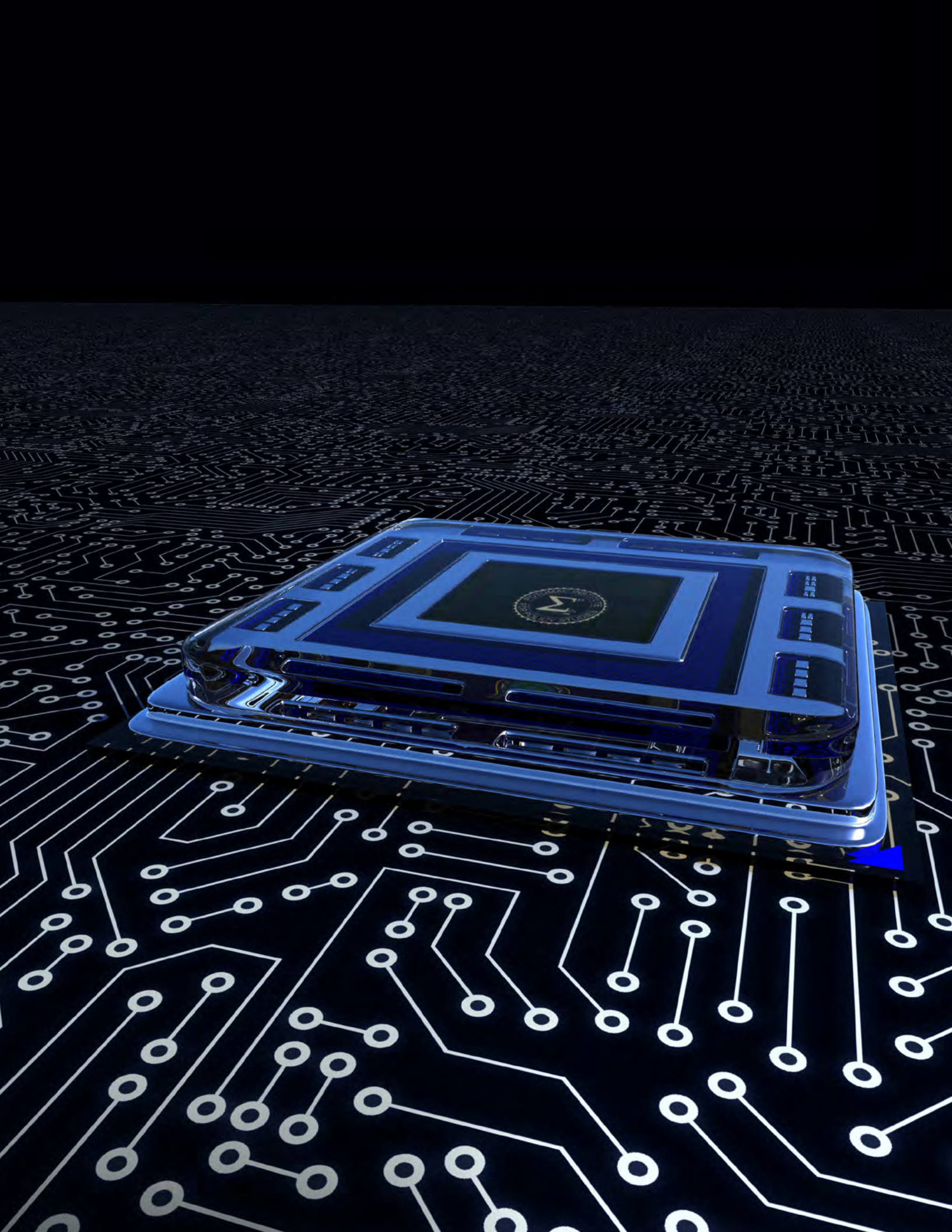
This complex and wide-ranging work is managed and coordinated by our on-site representative, Mr. Mike Hoglund. Mike is supported on various tasks by Gary Brown, Dwight Lyons, and Kathy Goodson, but Mike is the glue that holds it together and is the daily face of the Potomac Institute on the Indian Head campus. As a result, over the course of our support, Mike has demonstrated that contractors can be valuable members of the team. When we started, the government-contractor barrier was pretty solid at Indian Head, but Mike's hard work and good support have broken through that barrier. As a result, he has grown to be a trusted advisor and supporter of the entire IHD senior leadership, from TD to Commanding Officer (CO), Deputy TD, Chief Technology Officer (CTO), and Chief Engineer (CHENG). Mike closely coordinates all Potomac Institute and ATI support with the Indian Head Strategy Officer. Our support has helped IHD make the case for sustaining the necessary energetics and energetic material systems needed to provide our Naval, and in several cases all-Service, capabilities in five core competencies: range, speed, effects (or lethality), signatures management, and safety.



Some of the projects Mike has led the ATI and our team on include:

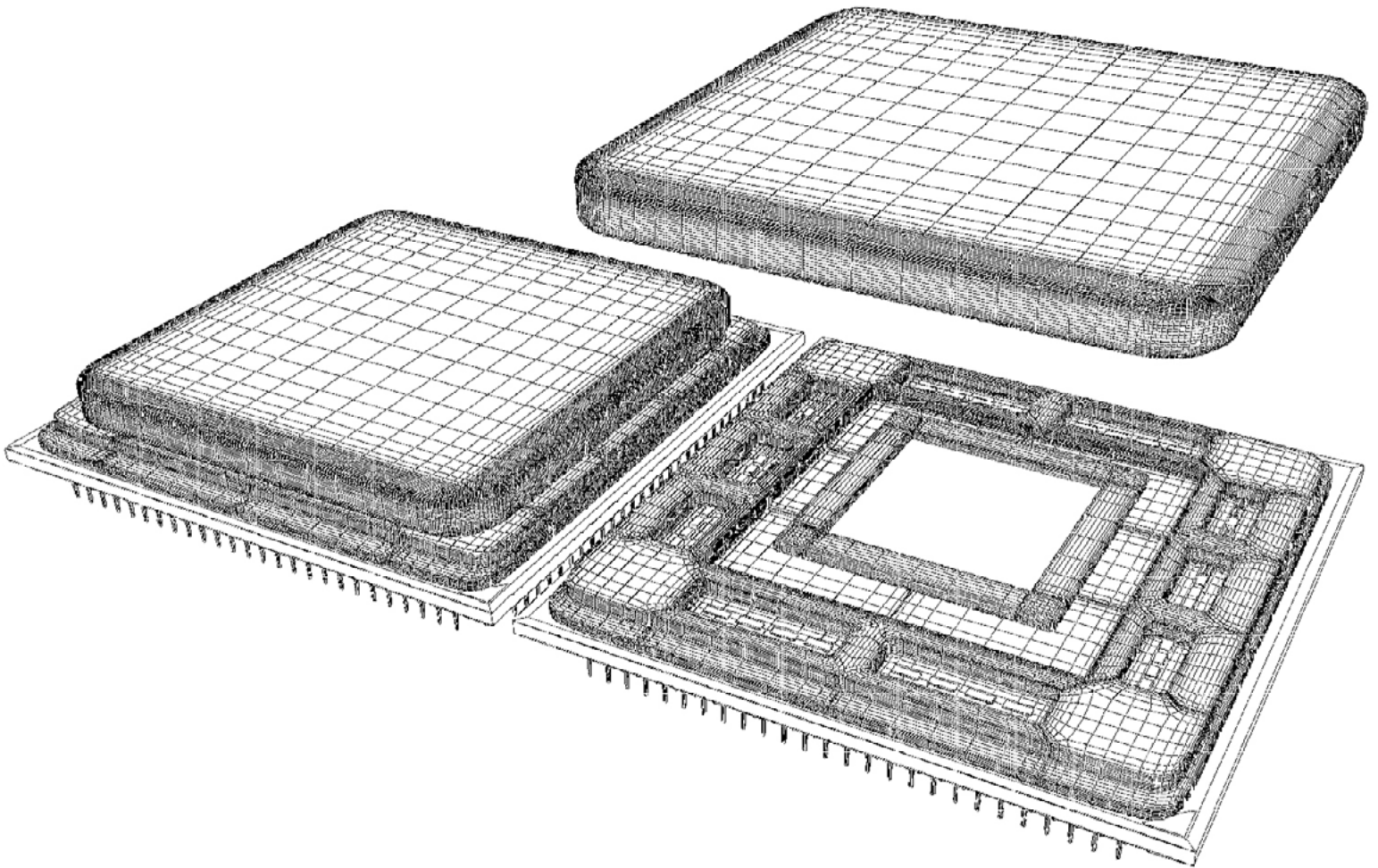
- Development of an Indian Head Vision and Strategy for growing the on-site work back to a healthy level. In particular, Mike and Gary worked closely with all IHD Departments to develop an implementable strategic plan for realizing the vision and strategy.
- Development and implementation of an Energetics Renaissance Strategy, which resulted in a 30-year strategic plan and influence campaign to revitalize energetics R&D.
- Development and implementation of an IHD business development framework and capture strategy to include automated tracking tools.
- Building the Velocity Lab to enable rapid development and prototyping for energetics technologies.
- Establishing the companion Velocity Center to help cement partnerships with energetics industry partners.
- Developing and implementing new standards and procedures for technical rigor, in order to enable appropriate levels of control for the dangerous processes associated with developing and producing energetics and energetic material systems.
- Establishment of the Indian Head University (IHU) to enable on-site educational programs. In addition to establishing the university, Mike and Dwight developed the curriculum for a new course in strategic thinking and leadership for Indian Head employees, titled Strategic Thinking as a Fundamental Element of Leadership (STFEL). Mike and Dwight have assisted the TD in delivering the STFEL course three times through the year. Its goal is to develop a cadre of strategic thinkers and leaders who can help the IHD senior leadership continue to adapt and adjust the vision and strategy for the organization.
- And during this past year, when the CO and TD realized that a series of related incidents coupled with the can-do culture of getting things done was leading to what could have been a catastrophic incident, they shut down the Manufacturing Department for a strategic review. Mike was instrumental in developing the processes and procedures for this shutdown, and the subsequent restart, addressing 38 different manufacturing areas in detail. Mike helped develop both the Restart Readiness Assessment (RRA) and Restart Readiness Board (RRB) processes and supported this detailed review throughout the range of Indian Head's manufacturing processes.

Indian Head leadership has broadened its understanding of the roles in which contractors can assist government organizations. Formerly, the term "contractor" meant someone who delivered materials and supplies or other logistics services. With Mike's on-site leadership, they now understand that contractors can be critical partners working alongside their government counterparts to help solve problems and rebuild Indian Head's range of capabilities. As a result, our team was awarded a new, five-year contract this fall. We look forward to continuing to work with the leaders and employees of IHD, helping maintain the critical national capability the organization provides to our warfighters.



MICROELECTRONICS

In 2020, the Institute continued its long-standing efforts on the topic of microelectronics policy for national security. This area received serious attention over the past year as the COVID-19 pandemic revealed the fragility of critical US supply chains and China continued its efforts to become a major player. The United States government showed a renewed interest in microelectronics by passing the Creating Helpful Incentives to Produce Semiconductors for America Act (CHIPS) and the American Foundries act as part of the 2021 National Defense Authorization Act (NDAA). The legislation authorizes billions of dollars to stimulate US capabilities including semiconductor incentives and research in the next five to ten years.



Technology Trends

The Potomac Institute has stayed on top of developing technology trends in microelectronics. These include envisioning the post-Moore's Law future, which will come with major changes in semiconductor business models as well as technology. We see increasing specialization of chips to function with a smaller volume of a higher mix of specialized parts being made. This trend is favorable, but the US government needs high-mix, low-volume parts. A key enabler for chip specialization will be advanced packaging technologies making modular designs in disparate technologies easier to execute. These new technology trends will be driven by new key applications areas including artificial intelligence enablement and 5G, for example.

Domestic Foundries

The Institute continued its record of commenting on the significance of domestic foundry trends, focusing on rumors of a fabless future for INTEL corporation and the impending closing of global foundries. This recent news came as quite a shock for most people as INTEL has made its reputation by maintaining a consistent lead in fabrication capabilities. Our research pointed out that such a development can be seen as a natural evolution of semiconductor value-add shifting from fabrication to design and architecture in a post-Moore world. A guaranteed access policy must be developed for the US government to access the few remaining state-of-the-art semi players, most of which are not domestic.

NDIA Electronics Division

An important part of the Institute's engagement with the semiconductor Industry took place with our work with the new National Defense Industrial Association Electronics Division. The purpose of this new organization is to address issues of interest to industry stakeholders and US government/DoD managers working in this area. We have been working with Division Headquarters and co-leading the Policy Sub-committee to develop events and webinars of interest to our stakeholders. These included a listening session with OSD microelectronics leaders in both the Research and Engineering (N. Petta) and Acquisition and Sustainment organizations (C. Michienzi). We also recently helped organize a "Microelectronics on the Hill" event on the topic of the CHIPS/Foundries legislation featuring staffers from the major Congressional offices who put this together. We are currently helping put together the annual meeting for the NDIA electronics division in January 2021. This NDIA engagement has been a good way for the Institute to stay engaged with the semiconductor industry.

USAF Microelectronics Strategy

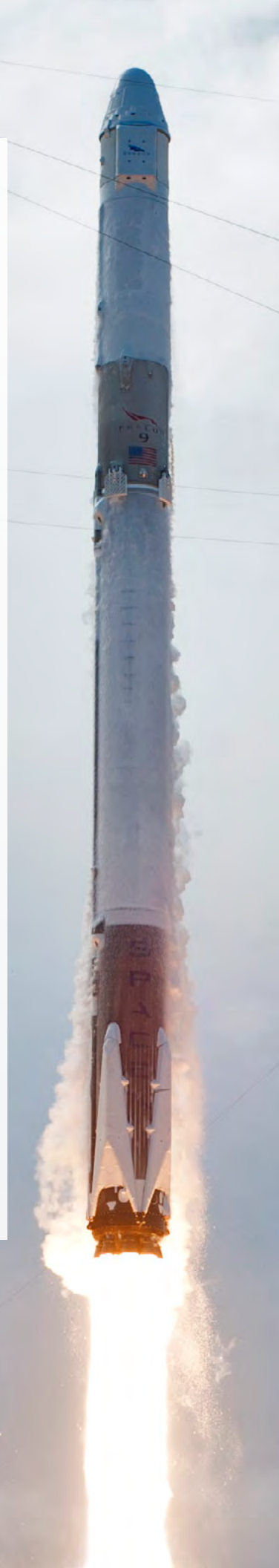
As part of our work on Industrial Base and Acquisition Reform efforts for USAF SAF/AQ, we are preparing a Microelectronics Strategy for the USAF. This effort articulates the key challenges in this area including how the USAF/DoD can achieve guaranteed access and supply chain robustness in a globalized industry. It summarizes the current USAF/DoD efforts in microelectronics and identifies shortcomings requiring further efforts. Current microelectronics acquisition procedures are summarized and specific recommendations along with organizational responsibilities are made for how to source this critical technology in the future.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

Precision Medicine for Improving Astronaut Performance

Potomac Institute staff have been working closely with NASA's Human Research Program (HRP) to further efforts in human aspects of spaceflight and policy considerations. In January, the Potomac Institute began an in-depth study on precision medicine capabilities for spaceflight. Precision medicine includes treatment approaches and preventative care based on an individual's different omics (e.g., genomics, proteomics, metabolomics), environmental, behavioral health, and lifestyle factors. Problems that could potentially arise on long-duration missions (e.g., bone loss and vision problems due to microgravity environments, behavioral or psychological problems due to isolation and confinement, or cancer from increased radiation exposure) could be planned for and even mitigated by tailoring health and treatment approaches to the individual based in the aforementioned components. The Institute performed a market survey, technical analysis, and forecast of precision medicine to advance NASA's operational goals and protect human health and performance capabilities on long-duration space missions.

Preliminary findings from this report have sparked interest from other stakeholders, particularly in potential endeavors to explore an evidence base to inform precision medicine decisions. This will not only affect the astronaut corps but also has a role in impacting the life and longevity of the broader population. This study will have the long-term impact of helping develop a robust, evidence-based precision medicine strategy for NASA, thereby helping mitigate the risks of spaceflight for humans and ensure success of long-duration crewed missions.

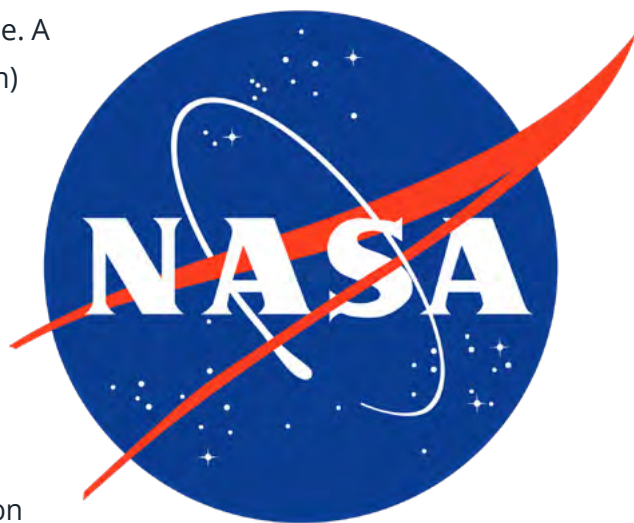


Predictions and Costs Associated with Research and Development of Food Technologies for Space Missions

NASA's current prepackaged spaceflight food system is insufficient to support missions to Mars or extensive prepositioning for Gateway and Lunar missions. The existing approach only maintains quality and nutritional stability for one to three years, which is inadequate for the five-year stability requirement for long-duration exploration missions. One approach to closing this gap is to develop spaceflight food production capabilities. The Potomac Institute for Policy Studies supported NASA through a study to identify knowledge, development, and technology gaps for the following novel food production systems: (1) aquaculture, (2) aquaponics, (3) cell culture: animal products, and (4) insect culture/products. To provide NASA a comprehensive look at an integrated spaceflight food production system to support astronauts during long-duration space missions, the four distinct production systems were evaluated. Each system varies in technological maturity; however, each offers the potential to be incorporated, to some degree, into an overall spaceflight food plan with the right guidance and path forward.

We evaluated the current state of the science for each of these food systems, forecasted their development in the next 10 and 20 years to help NASA expand their research, and developed a roadmap to include a comprehensive, integrated spaceflight food system. The roadmap provided a framework of the task areas that will need to be addressed in order to close identified knowledge, development, and technology gaps.

We recommended that to establish a robust spaceflight food strategy, NASA should invest in complimentary in-flight food and food production options to ensure crew health and performance in space. A space-based food production system (artificial food production) has desirable features against the alternative of long-term storage of food. At some point, for long-duration missions or missions of indefinite length, on-board production will be necessary. Based on a comprehensive review of all the findings, we concluded that space-based food production is valuable and something that NASA should track, but commercial systems to provide long-term production is at least a decade away. A potential exception is that aquaculture systems might be able to provide some supplementary nutrition and food variety with fairly short-term development, after some further experiments are conducted in space on near-term missions.



Health and Human Performance Data Management

Effective and efficient data management is vital for scientific research and progress. Data is not just a byproduct of research activities; it should be considered and treated as a vital asset in advancing the mission of the Human Research Program (HRP). Quality metrics, accessible data, and thorough analytics are crucial in sound decision making, managing risk and errors, and effective research. When data is inferior, unclear, undiscoverable, or not accessible, or the governance system is ineffective, the effects are far-reaching and detrimental to NASA's, and thereby HRP's, overall goals. These effects can include work stoppages, insecure proprietary or confidential data, loss of opportunity to further research, and inability to relate data to strategic decision making. Thus, finding alternatives for this critical capability is an essential issue for HRP.

Over the course of three months, our team engaged in HRP stakeholder interviews to assess the needs for data collection and to understand the data lifecycle, processes, supporting IT, and other challenges of the system. A preliminary market survey was completed to learn more from the sectors with analogous database management needs and requirements to understand the best practices. Then, the team created an initial tradeoff analysis of possible courses of action for the program, including the relative costs, time, advantages, and disadvantages of each. From this study, the Institute recommended short and long-term action steps to move HRP to a modern data management system that will allow the program to routinely utilize data analytics for the purpose of enabling leads to meaningful conclusions and informing decision making. Based on this short, initial assessment, HRP has committed to working with us to develop a more robust, long-term data management strategy. The results of this work will help HRP to meet its mission by using accurate and timely data to drive progress and innovation to discover the best methods and technologies to support safe, productive human space travel.



USMC TRAINING AND EDUCATION COMMAND (TECOM)

Dwight Lyons has been supporting the Marine Corps Training and Education Command (TECOM) for over 12 years. His support has always been in the Science and Technology (S&T)/Futures area. The support provided ranges from S&T awareness and assistance in selection of technologies to pursue, to coordinating development of S&T transition agreements, to analysis and assessment of developing technologies, to S&T policy and documentation.

Dwight helped the TECOM Future Learning Group (FLG) author and publish a new Marine Corps Doctrinal Publication (MCDP): MCDP-7, Learning. MCDPs are high-level doctrinal publications, and very infrequently published. The most recent new MCDP prior to MCDP-7 was published in 1998, over 20 years ago. Dwight was privileged to be an integral part of the writing team, helping formulate, outline and draft the document, then assisting with adjudicating one of the most thorough reviews he has ever seen – several major rounds of review, with active and retired Marines from Staff NCOs through General Officers providing review comments. In addition to the paper and electronic versions of the new MCDP-7, Dwight helped develop an interactive, online version using the DoD Advanced Distributed Learning (ADL)-sponsored Personal eBooks for Learning (PeBL) technology. PeBL books are similar in form to Kindle books, but with much more functionality including multimedia content, links to definitions and references, discussion questions, polls and other interactive features that make exploring the MCDP much more interesting and engaging, especially for digital generations. PeBL also provides an audiobook option. This is the first MCDP that has been put into the interactive format; others may follow.



DEFENSE HEALTH AGENCY (DHA)

The Potomac Institute for Policy Studies supported the Defense Health Agency (DHA) R&D Directorate (J-9) through a research and development planning project, including program management, strategy development, S&T transition planning, and tailored acquisition approaches. This effort drew on the Institute's experience in R&D strategic planning across a wide range of S&T areas, and on the Institute team's technical expertise in strategy development, strategic communication, portfolio development and analysis, and organizational design. The focus of our activities involved progressing the analysis and development of processes and practices to enable DHA J-9 continuous development of S&T and Advanced Development solutions to address military medical capability gaps, and the rapid advancement and distribution of medical capabilities to the Warfighter.





ACADEMIC CENTERS FORGING AHEAD TO THE FUTURE

As part of the Potomac Institute's public service mission, we are proud to be home to several academic centers which provide thought leadership across our core areas of expertise. The Institute is a non-partisan, not-for-profit 501(c)(3) research organization, so all profits are dedicated to this mission. Our academic centers convene experts, host public events, perform independent research, publish reports and white papers, and provide expertise to the government and other organizations, often on a pro bono basis. These Centers provide thought leadership and assemble experts, serving a critical role for the exchange of ideas at the intersection of business, government, and academia.

The Potomac Institute hosts dozens of events and forums every year and publishes reports on their findings that make the technical and policy aspects accessible for both specialists and generalists. To stay in the loop on future events and publications, subscribe to our mailing list at www.potomac institute.org.



CENTER FOR EMERGING THREATS AND OPPORTUNITIES (CETO)

The Center for Emerging Threats and Opportunities is an internal Marine Corps think tank, run by the Potomac Institute and led by General Al Gray since its inception via Congressional mandate in 2000. CETO resides within the Marine Corps Warfighting Laboratory (MCWL) on Marine Corps Base Quantico and supports a broad range of combat development activities within the Headquarters Marine Corps Combat Development and Integration Department. During 2020, CETO activities were largely in support of the Commandant of the Marine Corps Force Development 2030 initiative. Members of the team facilitated several wargames conducted at the strategic, operational, and tactical levels to define future force requirements and identify potential capability and capacity shortfalls beyond 2030. Additionally, CETO participated in capability development focused wargames as core members of the red cell and in experimentation as subject matter experts in expeditionary operations.

In addition to the annual *Flashpoints* assessment of global instability, CETO has engaged in a wide range of projects this year and produced reports and papers dealing with Naval Command and Control, Strategic Forecasting, Mine Counter Measures, and Terrain Shaping Operations. CETO routinely provides expertise in conferences and forums across the Marine Corps and broader security community. Members of the CETO staff represent all elements of the Marine Air Ground Task Force and have extensive operational experience in the Fleet Marine Force.



CENTER FOR ADAPTATION AND INNOVATION (CAI)



The Potomac Institute for Policy Studies' Center for Adaptation and Innovation (CAI) identifies and defines new and potentially disruptive defense capabilities. CAI assists senior defense leaders grappling with the most demanding issues and problems posed by a complex and uncertain security environment. CAI convenes thought leaders from across the national security community on specific topics of interest to senior military leaders and provides thoughtful analysis on issues of the day. CAI operates under the mentorship and guidance of General Al Gray. CAI regularly hosts Navy and Marine Corps Commanders returning from deployments who share the highlights of their deployment. These briefings and forums connect policymakers with operational reports from the field.



***Chaos and uncertainty
create opportunities.***

- General Al Gray, Marine



CENTER FOR ENTERPRISE, EXPLORATION, AND DEFENSE IN SPACE (CEEDS)

Centers for Enterprise, Exploration, and Defense in Space (CEEDS) identifies, assesses, and makes recommendations on policy issues related to government's fundamental role in space. CEEDS brings together experts from across relevant government organizations and private industry to discuss what is being done today and what can be done tomorrow to further space exploration. Here are some of the key projects we took on in 2020:

Potomac Institute staff have been developing scientific and technical advisory studies, policy analyses, strategic planning, and recommendations in furtherance of NASA's mission to research and mitigate human health and performance risks of spaceflight. The Institute has been exploring the International Space Station (ISS) as a national lab in terms of function and operational procedures. The study team is currently hosting discussions to provide recommendations to HRP on how to best utilize and leverage the ISS as a national lab. Strategic planning and providing policy recommendations for NASA will have long term impacts on mitigating the unique risks of spaceflight for humans.

Institute staff have been exploring policy surrounding astronaut health, medical care, and the utilization of genetic information for mission readiness. Collection and utilization of genetic information for the mitigation of risks to spaceflight for humans would require heavy policy changes but would result in improved safety and security of the astronaut corps. Stemming from our initial studies, NASA has increased interest in next steps exploring the decision-making process for individualized astronaut health and medical care. A focus has been on policy considerations to inform the process for identifying and implementing individualized medical decisions for astronauts on long-duration space missions.



VITAL INFRASTRUCTURE, TECHNOLOGY, AND LOGISTICS (VITAL)

The Vital Infrastructure, Technology, and Logistics (VITAL) Center was founded at the Potomac Institute with the mission to apply the Institute's expertise in supply chain security and national security to emerging areas of concern, including critical infrastructure, commercial and industrial base, and defense industry supply chains.



Industrial Partnerships

The Potomac Institute continues to host discussions on commercial industry innovation and partnerships. The Institute has engaged with venture capital firms, commercial companies, startups, academia, research labs, and others to support US government mission goals.

The Potomac Institute team conducted several case studies in 2020 to provide situational awareness to reduce the risk of being caught unprepared due to disruptive technologies. Staying at the forefront of changing technology environments can help reduce risks and if needed, prime for rapid technology transition, increase reliability, mitigate supply chain vulnerabilities, avoid technology exoduses, and leverage connections with companies.



VITAL INFRASTRUCTURE, TECHNOLOGY, AND LOGISTICS (VITAL)

Some of the case study areas include the following:

Autonomous Vehicles Changes with connectivity and digitalization offer features that can benefit the driver and increase the efficiency of the car, but also present new possibilities for harm and vulnerabilities to exploit. The projects explored types of data potentially available for collection and traced enabling technology developments pathways, milestones, and impacts areas.

Biometrics There has been a growing demand to utilize unique biological measurements and characteristics for security needs. Some of these unique identifiers can be analyzed based on behavioral markers (e.g., gait, typing habits, gestures, how to hold phone), external physiological markers (e.g., fingerprint, eye veins, facial recognition, ear shape), or internal physiological markers (e.g., blood, tissue, other DNA markers). In addition, there are multiple types of collection means becoming available, whether through new technologies in an individual's external surroundings, wearables, or inside the body. Furthermore, possibilities with biometrics have changed companies' approaches to authentication, such as decisions to use Single Factor Authentication (SFA) compared to Multi-Factor Authentication (MFA) or to use one-off events versus continuous validation for security. The Institute published a **report of the policy concerns of biometrics** in early 2020.



Synthetic Biology Synthetic biology's approaches and solutions have attracted attention due to the potential to tackle healthcare, agriculture, manufacturing, and environmental challenges. Synthetic biology tools offer novel opportunities but are also being monitored for how they can be used to introduce risks. Many government, industry, and academia organizations are operating in the biotechnology space. The Potomac Institute team studied advancements in certain biotechnology areas, specifically including applications of synthetic biological materials such as synthetic biomimetic material, smart material, and others.

Lastly, the Potomac Institute team has continued to delve into discussions on other potentially disruptive capabilities. Additional topics that have come up include artificial intelligence, smart cities, and data analytics.



THE CENTER FOR REVOLUTIONARY SCIENTIFIC THOUGHT (CREST)

The Center for Revolutionary Scientific Thought (CREST) was founded in 2012 to serve as the Institute's "think tank within the think tank" – to develop new bold ideas in S&T policy. It has convened numerous events, from large public seminars to small discussion groups with thought leaders from government, industry, academia, and other fields.

CREST's technical mission is to keep the Institute well-informed on the cutting edge of new technologies and scientific research and to assess the impact of emerging trends. Over the last several years this work has encompassed biotechnology, genetics, ambient energy harvesting, neurotechnology, big data and privacy, artificial intelligence, and much more. This year, CREST built upon these efforts in a major survey of ongoing research in machine intelligence and policy implications of neuroscience. CREST serves as the Institute's internal policy group, holding discussions on topics in emerging technology and their policy implications. Topics this year included data privacy and governance in the digital age; ubiquitous surveillance; the future form of government; and the social, privacy, and policy implications of genetic sequencing and engineering technologies.

CREST also serves as a training program, providing a unique curriculum in strategic thinking, tech forecasting, and public policy based on readings and lectures in S&T trends, science fiction, history, and policy. It has trained over thirty fellows, early-career Ph.D. scientists, who have gone on to careers in S&T policy. CREST's vision is to build a cadre of future S&T leaders have the skills to make and influence policy at the highest levels. This year CREST has continued on this mission. The group has an ongoing reading list with selections related to S&T futures and their implications for society.



CYBER READINESS INDEX (CRI)

The recent hack of the US government agencies and private companies revealed in December 2020 has brought new light to the nation's lack of cyber security readiness. While finding who is responsible for the hack is of vital importance, the bigger picture of the country's overall vulnerability is an even bigger issue. So, this year, the Potomac Institute Cyber Readiness Index (CRI), led by Board of Regents member and cyber security expert Melissa Hathaway is more crucial than ever.

The Cyber Readiness Index 2.0 (CRI) provides a comprehensive, comparative, experience-based methodology to assess countries' commitment and maturity to securing their national digital infrastructure and services upon which their economic growth and national resilience depend.

The CRI 2.0 built on the 2013 Cyber Readiness Index 1.0, which was the first available methodological framework for assessing cyber readiness. The CRI assessment tool can help countries identify existing gaps, strengthen their current cybersecurity posture, and better manage national-level cyber risk. Since 2013, the CRI has been applied to over 100 countries and 14 in-depth reports have been completed.



CYBER READINESS INDEX (CRI)

The Potomac Institute's CRI 2.0 was one of several tools recommended and discussed at the 2020 Global Forum on Cyber Expertise. Other tools recommended included:

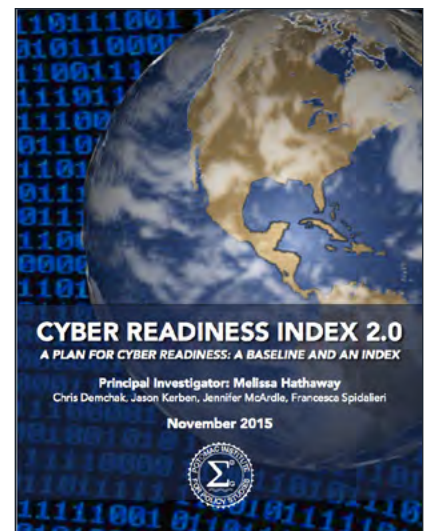
- Combatting Cybercrime Capacity Building Tool, The World Bank
- Cyber Maturity in the Asia-Pacific Region, Australian Strategic Policy Institute (ASPI)
- Cybersecurity Capacity Maturity Model for Nations (CMM), Global Cyber Security Capacity Centre (GCSCC)
- Global Cybersecurity Index (GCI), International Telecommunication Union (ITU)
- National Cyber Security Index (NCSI), e-Governance Academy (eGA)
- National Cyber Strategy Development & Implementation (NCSDI) Framework, MITRE Corporation

The CRI 2.0 uses over 70 unique indicators across seven essential elements to discern operationally ready activities and identify areas for improvement in the following categories:

1. National Strategy
2. Incident Response
3. E-crime and law enforcement
4. Information Sharing
5. Investment in R&D, Education, and Capacity
6. Diplomacy and Trade
7. Defense and Crisis Response

For a complete description of each essential element, refer to the full methodology:

<https://www.potomac institute.org/images/CRIndex2.0.pdf>



Melissa Hathaway is recognized world-wide as an expert in cyber security and cyber policy and served two presidential administrations as an advisor in these fields. She is a frequent keynote speaker on matters of cyber security, publishes papers, and makes frequent media appearances on this and related issues.



We ignore public understanding of science at our peril.

– Eugenie Clark

INTERNATIONAL CENTER FOR TERRORISM STUDIES (ICTS)

The International Center for Terrorism Studies is Potomac Institute's long-standing center for the academic study of terrorism. Founded in 1998, ICTS is led by the world-renowned counter-terrorism expert Professor Yonah Alexander, and includes a wealth of noteworthy, expert panels of academics and ambassadors. ICTS cooperates with universities, governments, and nonprofits around the world to educate about terrorism and other dangers the world faces.

ICTS activities include publishing reports and publications, conducting in-person and virtual seminars – many of which draw from original research by Professor Alexander. The information provides academic and professional advice to governmental and non-governmental bodies alike. In 2020, ICTS conducted seven seminars ranging from the ongoing challenges in the Middle East to the worldwide pandemic, COVID-19. Some of the Ambassadors Forums were entitled: "Middle East Security Challenges: Past Lessons and Future Outlook," "A Lab of One's Own: Fighting Bioterrorism, Cholera, and COVID-19," and "Global COVID-19 and the Economy: Costs, Lessons, and Future Outlook." These seminars, moderated by Professor Alexander included keynote speakers Gen. Wesley Clark (US Army, Ret.), Potomac Institute Senior Fellow Dr. Rita Colwell and expert panelists including Dr. Vint Cerf, Vice President of Google and Chief Internet Evangelist.



INTERNATIONAL CENTER FOR TERRORISM STUDIES (ICTS)

The Center publishes numerous reports documenting their work and events, including topics such as bioterrorism, weapons of mass destruction, international cooperation, legal frameworks, and country and regional analyses that impact the United States and have far-reaching benefits across the globe. Some of the publications released this year include the following monographs: "Global COVID-19 and Sports: Exposure Claims and Liability Mitigation Concerns," "Combating Global COVID-19: From Isolation to International Cooperation," and "Global COVID-19 and Energy: Threats and Responses," just to name a few. Professor Alexander also plans to continue a series of reports tackling COVID and issues related to this pandemic in 2021.

Professor Alexander contributed to multiple other publications including *Terrorism: An Electronic Journal and Knowledge Base*, founded more than twenty years ago. In May, NATO published the Counterterrorism Reference Curriculum where Professor Alexander served as an Academic Advisor. Professor Alexander also continues to lecture internationally via video conferencing.

ICTS hosts a next-generation internship program that has taught and molded hundreds of young scholars in the study of terrorism, who have gone on to successful careers in government, industry and academia. It is also key to recognize the university partnerships ICTS has fostered over the years to assist with its work. Those include the International Law Institute at Georgetown University, the National Security Law Center at the University of Virginia School of Law, and the Hoover Institution Library and Archives at Stanford University.



CENTER FOR HEALTH POLICY & PREPAREDNESS (CHPP)

The need for robust analysis and policy advocacy with regard to health security and its role in national security reemerged as a priority in 2020. In April, the Institute reinvigorated the Center for Health Policy and Preparedness as an academic center. To lead this revival, Dr. Donald A. Donahue and Dr. Stephen O. Cunnion were asked to reprise their roles as executive director and medical director, respectively.

The history of CHPP began with the creation of the National Security Health Policy Center (NSHPC) following the dual events of 9/11 and the postal anthrax attacks. The NSHPC was an early and powerful voice for the dissemination of timely and accurate information on public health policy, focusing its research on how existing or proposed legislation, policies, and procedures impact the ability of the United States government to improve national security, while preventing, detecting, and responding to a growing number of health threats. The NSHPC also provided insight into responses to bioterrorism, medical countermeasures to biological threats, and the role of technology in providing effective solutions to national security and health.

In 2009, NSHPC was redesignated as the Center for Health Policy & Preparedness in recognition of the intricacy of the threats, the complexity of the nation's healthcare system, and the increasing relevance of global health. This revised focus was encapsulated by the CHPP vision statement:

The foundations of national security that served for over a century no longer meet the dynamic world environment. Asymmetrical threats, non-state actors, revolutions in technology, and emerging natural diseases



demand innovative approaches and solutions. Health policies and technologies are universally impactful; national security relies on the ability to identify and counter the next unknown. CHPP exists to promote those solutions. Simply stated: Preparedness is a best practice.

The novel coronavirus SARS-CoV-2 and the disease it causes, COVID-19, have had a profound impact on every aspect of society. Beyond the public health and medical crises, COVID-19 has disrupted economic, political, and diplomatic affairs, posing a distinct threat to national and global health security. An effective response to these multiple challenges relies on sound policy built on robust scientific inquiry, analysis of new and emerging technologies, and comprehensive assessment of myriad and often conflicting considerations.

To meet this need, the Potomac Institute for Policy Studies reinstated the Center for Health Policy & Preparedness (CHPP). Operating under the constraints of social distancing, CHPP focused on promoting evidence-based countermeasures, supporting the development of treatment modalities, and repudiating misinformation.

CENTER FOR HEALTH POLICY & PREPAREDNESS (CHPP)

PUBLICATIONS

Hertelendy, A.J., Burkle, F.M. Jr., Greenia, E., Goniewicz, K.D., Ciottone, G., & Donahue, D.A. (In Press). A new core competency for healthcare administrators: Discussing the need for emergency and disaster management education in the graduate healthcare administration curriculum. *The Journal of Health Administration Education*.

Donahue, D.A., Burkle, F.M.Jr., & Blanck, R.R. (2020). National Health Preparedness and Response Centers: Revisiting the Increasingly Critical Need to Expand Cooperative Emergency Response Capabilities in the United States. *Disaster Medicine and Public Health Preparedness*, 1-9. doi:10.1017/dmp.2020.26

Beyond Isolation: Returning to an Undistanced Workplace During COVID-19. Webinar (1:27:23), 6 May 2020. University of Maryland Global Campus, <https://youtu.be/OxoC2m9ImxU> (designer, facilitator, and speaker).



***Preparedness
is a best practice.***

– Center for Health Policy & Preparedness

PRESENTATIONS

World Humanitarian Forum, 23 September 2020. Strategic Dialogue Roundtable: Medical and Health – Strengthening international responses to global health crises (Moderator).

World Health Innovation Summit, 1 August 2020. LIVE discussion on COVID19.

Summer Leadership Summit 2020. American Institute of Architects Academy of Architecture for Health and the American College of Healthcare Architecture, 24 July 2020. *Surviving to Thriving in Healthcare: Resiliency Re-Imagined*.

Steve Cunnion and Don Donahue participated in the Neuro Strike Analysis and Research Group, hosted by the National Strategic Research Institute of the University of Nebraska and funded by the Department of State. This examined the use of directed energy weapons against US diplomatic and intelligence personnel.

Looking forward to 2021, CHPP plans to pursue multiple projects, including analysis of federal medical surge capabilities and utilization, military and interagency domestic medical response enhancement, and redesign of the uniformed Public Health Service.



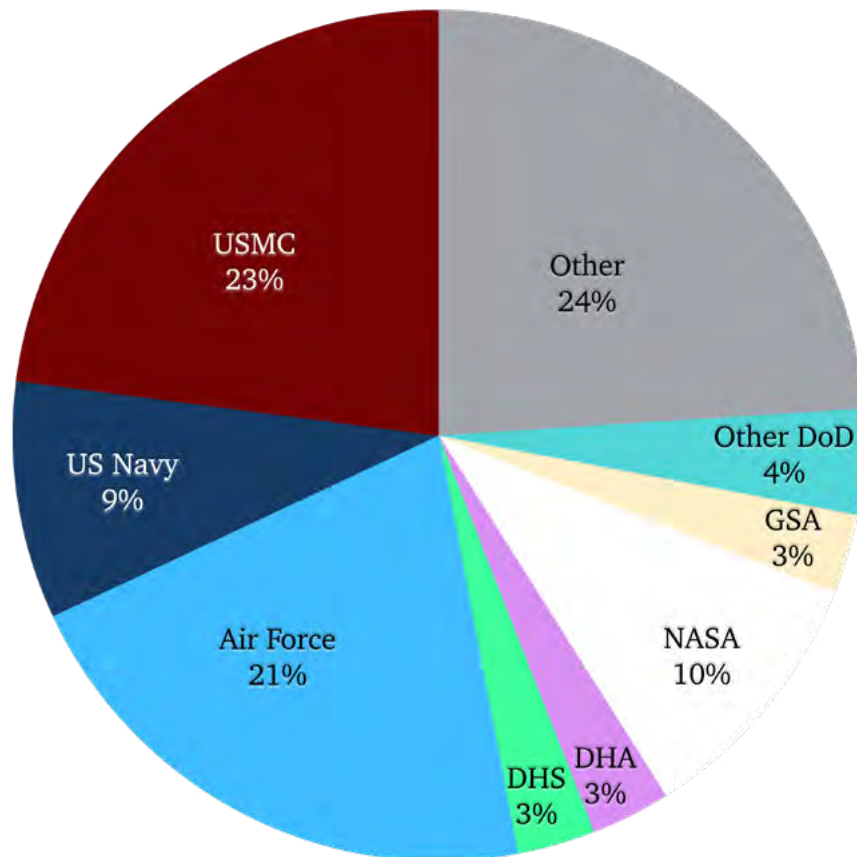
2020 FINANCES

The Potomac Institute is a unique organization that merges elements of a think tank, consulting organization, federally-funded R&D center, and university. We strongly value our position as an independent, non-partisan, trusted source of expertise on science, technology, and national security issues.

Our funding is almost entirely from government contracts. The majority of our funding comes from the Department of Defense via the services

or agencies focused on S&T. This funding model gives us a unique role as a trusted advisor to policymakers and provides an up-close window into the real world of policy issues. Historically, the Institute has not relied on foundation or individual giving, because we value our independence from ideological or special interests. As a not-for-profit, our public service mission is to contribute an independent and academically rigorous voice to the policy dialogue.

THE POTOMAC INSTITUTE'S REVENUE (AS A PERCENTAGE OF TOTAL) BY SOURCE FOR CY 2020, FROM ESTIMATED REVENUE BASED ON UNAUDITED FINANCIAL STATEMENTS.



The background of the page is a photograph of a sunset over a cityscape. The sun is a bright orange circle on the left side, partially obscured by the bare branches of a tree. In the distance, a city skyline is visible, including a prominent tower with a spire. In the foreground on the right, there is a large, dark silhouette of a soldier in a combat stance, holding a rifle. An American flag is flying on a pole to the right of the soldier. The sky is a gradient of orange and red.

IN MEMORIAM

We want to remember those we lost in 2020 who were part of the Potomac Institute family.

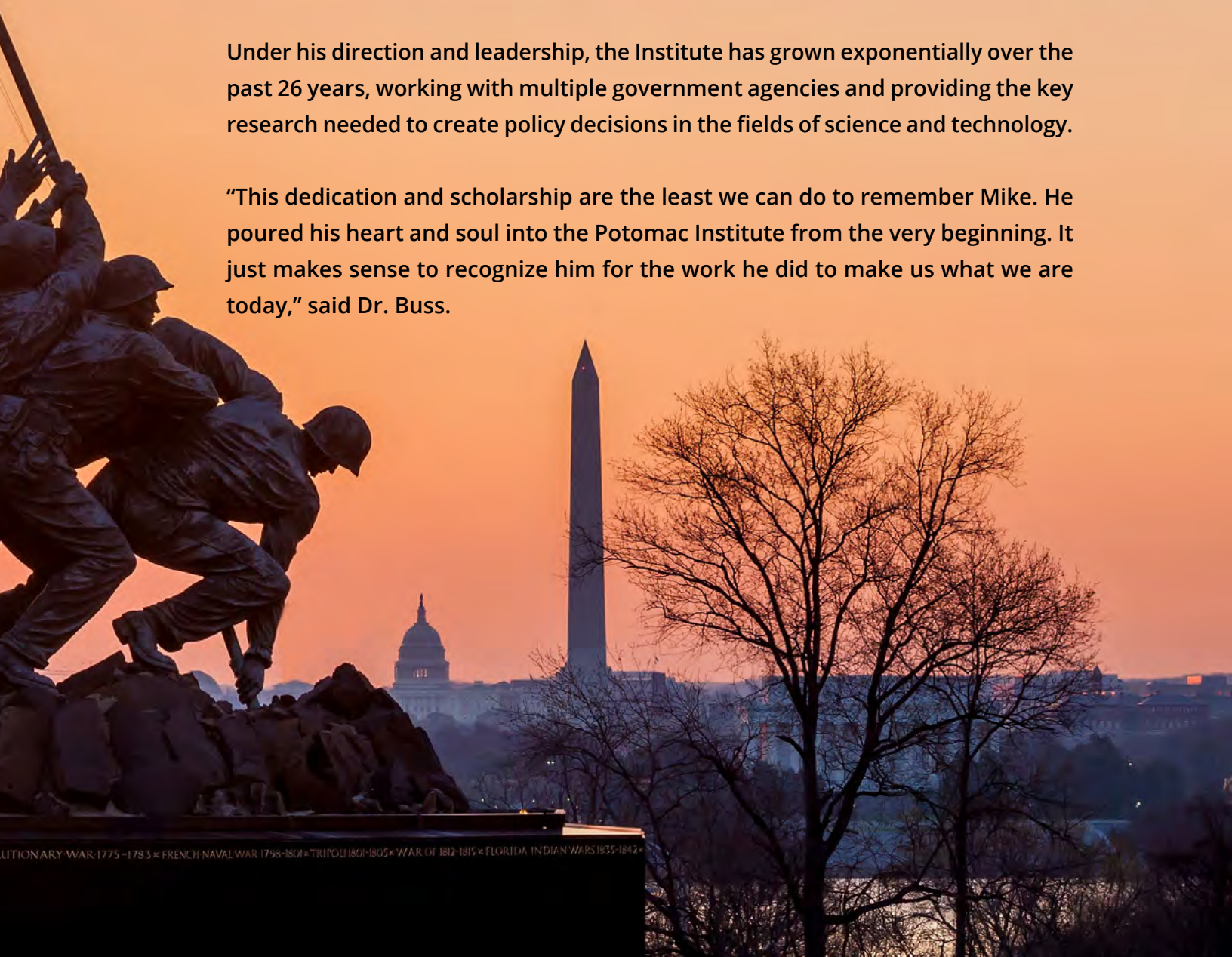
Co-Founder Michael Swetnam and Senior Fellow Dr. Fred Saalfeld were instrumental to the Institute in their own ways. Mr. Swetnam started it and led us with his vision for 25 years. We wouldn't be here today without him. Dr. Saalfeld brought his knowledge and expertise to us, which made our work all the better. The next few pages are a tribute to honor them for all they did. They will be missed.

Potomac Institute for Policy Studies Honors Founder with Boardroom Dedication and Visiting Fellowship Fund

The Potomac Institute for Policy Studies is paying tribute to its late founder, Michael S. Swetnam, who passed away in September 2020. General Al Gray and Dr. Jen Buss announced the honors to the Institute staff. The first is the dedication and naming of the Institute's official Michael S. Swetnam Board Room to celebrate his accomplishments and leadership. The second is the establishment of a Visiting Fellowship Fund that encourages, grows, and supports the bold and innovative thinking that Mr. Swetnam was famous for throughout his lifetime.

Under his direction and leadership, the Institute has grown exponentially over the past 26 years, working with multiple government agencies and providing the key research needed to create policy decisions in the fields of science and technology.

"This dedication and scholarship are the least we can do to remember Mike. He poured his heart and soul into the Potomac Institute from the very beginning. It just makes sense to recognize him for the work he did to make us what we are today," said Dr. Buss.



IN MEMORIAM
Michael S. Swetnam, CEO & Chairman of the Board
Potomac Institute for Policy Studies



It is with extreme sadness that we share the passing of our leader, colleague, and friend Michael S. Swetnam. He was the Founder, CEO, and Chairman of the Board of the Potomac Institute for Policy Studies. Words cannot express the sorrow upon losing someone so important to the Potomac Institute family.

Mr. Swetnam dedicated his life to the service of our country, spending nearly a quarter century in the US Navy, both as an active and reserve officer. He then worked for the Director of Central Intelligence as a Program Monitor on the Intelligence Committee Staff. He developed and presented the National Security Agency Budget to Congress. He also helped develop, monitor, and present the DOE Intelligence Budget to Congress.

From 1990-1992, Mr. Swetnam served as a Special Consultant to President George H. W. Bush's Foreign Intelligence Advisory Board. There, he provided expert advice on intelligence community issues and assisted in authoring the board's assessment of intelligence community support to *Desert Storm* and *Desert Shield*. Before founding the Potomac Institute, Mr. Swetnam worked in the private sector as a Vice President of Engineering at the Pacific-Sierra Research Corporation, Director of Information Processing Systems at GTE, and Manager of Strategic Planning for GTE Government Systems.

Mr. Swetnam was passionate about national security. He authored and co-authored several books and edited many articles on the subject, including: *Al-Qa'ida: Ten Years After 9/11 and Beyond*, *Cyber Terrorism and Information Warfare*, and *Usama bin Laden's al-Qaida: Profile of a Terrorist Network*. "There have always been small groups and individuals who have threatened societies and nations around the world. The difference today is that advanced technologies, particularly the spread of advanced technologies of mass destruction are enabling these groups to threaten us in a way that, in the past, was reserved only to nation states," Swetnam once told the Nuclear Threat Initiative Project.



Mr. Swetnam also served on several boards and committees. He'd been a member of the Technical Advisory Group to the United States Senate Select Committee on Intelligence where he provided expert advice to the US Senate on the research and development investment strategy of the Intelligence Community. He was also Chairman of the Term Limits Referendum Committee (1992-93); President (1993) of the Montgomery County Corporate Volunteer Council, Montgomery County Corporate Partnership for Managerial Excellence (1993); and the Maryland Business Roundtable (1993). He was on the Board of Directors of Space and Defense Systems Inc., Dragon Hawk Entertainment Inc., and the Governing Board of the Potomac Institute of New Zealand.

One could say the creation of the Potomac Institute for Policy Studies was one of Mr. Swetnam's "Bold Ideas." He recognized the importance of Science and Technology and the crucial role they play in our nation's security. "We are advocating Science and Technology as a part of the full solution that includes economic and social values and indicators because they really do go together," Swetnam once said. His philosophy for the Potomac Institute was to always maintain objectivity and credibility, remaining independent of any federal or state agency, political party, or private concern. He said the Potomac Institute is proud to call itself "fiercely objective" by divorcing political issues from policy challenges. He believed the challenge at the Institute is to anticipate the problems our society will face in the future and work toward establishing meaningful policy options for addressing these problems before they come to fruition. He expected a lot from the Potomac Institute team and set a very high bar. He also knew the value of surrounding himself with smart, driven people who he knew would only make the work better.

Mr. Swetnam is survived by his son Alex, his daughter Kelly, and his grandchildren, Tommy, Alex, Josh and Bella, and a great-granddaughter Zoey. Our thoughts and best wishes go out to his family.



Our thoughts, prayers, and condolences are with all of Mike's family and loved ones as well as his multitude of friends. As we cope with the tragic loss of our beloved leader and colleague Mike, we at the Potomac Institute for Policy Studies must continue to go forward as Mike would expect us to do. Let's all stick together and make that happen as a lasting tribute to a great American Patriot.

— General Al Gray, USMC (Ret.)

Chairman, Board of Directors; Chairman, Board of Regents; and Senior Fellow

Mike's influence spanned decades, both in and out of government. His many contributions to our national security were, at times, concrete and, at times, intangible, but equally significant. He addressed so many issues that his full influence can never be fully measured but is certainly consequential. The Potomac Institute will shine as a lasting symbol and enduring influence. It is his true legacy.

— Gary L. Sojka

Secretary/Treasurer and Member of the Potomac Institute Board of Directors

Mike made sure we had the tools needed to do our jobs and take care of our families at the same time. He was my mentor and friend. He influenced all those he came into contact with, looking to always change things for the better. I can speak for all of us at the Potomac Institute when I say Mike was family. He will be truly missed.

— Dr. Jennifer Buss
Potomac Institute CEO

Mike always pushed us to do our best. He was very proud of our work in the S&T field, and was happy to stay behind the scenes, while providing invaluable support and advice to the many sectors of government. He always wanted to go the extra mile for our staff.

— Gail Clifford

*Potomac Institute
VP for Financial Management and CFO*

IN MEMORIAM
Dr. Fred E. Saalfeld,
Senior Research Fellow
Potomac Institute for Policy Studies

It with heavy hearts we also mourn the passing of a member of our Board of Regents, and Senior Research Fellow at Potomac Institute, Dr. Fred E. Saalfeld.

Dr. Saalfeld dedicated his life to science and technology and spent 40 years in civil service. He may be best known for his role as the Technical Director and Deputy Chief of Naval Research for the Office of Naval Research (ONR). His was a career filled with scientific firsts and achievements. He joined the National Research Laboratory in 1962. While there, he and his team lead pioneering research, developing the Central Air Monitoring System (CAMS) that makes recycled air breathable in submarines. That research into atmospheric monitoring and life support is used today in nuclear submarines, firefighting gear, spacecraft, and other equipment using recirculated air.



Four US Presidents recognized Dr. Saalfeld's achievements. He became a charter member of the Senior Executive Service (SES) under President Carter. He was named to the Presidential Meritorious Executive Rank by President Reagan in 1986, to the Presidential Distinguished Executive Rank by President Bush in 1989, and to the Presidential Distinguished Executive Rank for a second time by President Clinton in 1996.

Several civilian employees have received the Dr. Fred E. Saalfeld Award, which recognizes lifetime achievements in science for those with the Department of the Navy, members of the military service on active duty, or contractors funded by the Department of the Navy.

Dr. Saalfeld and his wife Elizabeth were a frequent presence at the Institute. Those who knew him say he always gave sage advice and pushed the staff to be bold and to think outside the box.

His contributions are too many to list. He was a mentor and friend to many, whose contributions to Potomac Institute are immeasurable. He was a visionary and leading voice in the development of science and technology that our freedoms so depend on today.

Upon his retirement from ONR, Dr. Saalfeld was honored and thanked on the floor of the US Senate. The official record reads: "In times of adversity and challenge, America has always been blessed with men and women who have stepped forward to fight our battles and serve our country. Dr. Fred Saalfeld is such a man, much like those Founding Fathers who were patriot scientists and dedicated public servants. I wish we had more like him."



***Science is philosophy proven correct
by observation and experiment.
It's revolutionary thought backed up by data.***

- Michael S. Swetnam



***Nothing in life is to be feared,
it is only to be understood.
Now is the time to understand more,
so that we may fear less.***

- Marie Curie



***Only the most exceptional
will dream of leadership
and only those who dream of leadership
will ever accomplish it.***

- Michael S. Swetnam

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