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MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: RUSSELL T. VOUGHT
DIRECTOR, OFFICE OF MANAGEMENT AND BUDGET

MICHAEL J. KRATSIOS
DIRECTOR, OFFICE OF SCIENCE AND TECHNOLOGY POLICY

SUBJECT: Fiscal Year (FY) 2027 Administration Research and Development Budget Priorities and Cross-Cutting Actions

"We are going to conquer the vast frontiers of science, and we are going to lead humanity into space and plant the American flag on the planet Mars and even far beyond. And, through it all, we are going to rediscover the unstoppable power of the American spirit, and we are going to renew unlimited promise of the American dream."

– President Donald J. Trump, 2025 Address to Joint Session of Congress

America's science and technology (S&T) engine is—and must remain—the greatest in the world. Long before rockets reached the moon or microchips powered our economy, the outcomes of Federal research and development (R&D) won World War II and laid the foundations for technological breakthroughs that secured our military dominance, built our industries, and improved the everyday lives of the American people. America's post-war recognition of the strategic importance of R&D investments, and its deliberate reshaping of the R&D ecosystem, transformed the United States into the most innovative, prosperous, and powerful nation in history.

Recognizing new circumstances and new challenges, the Trump Administration is aligning the Federal Government's role in the S&T enterprise to once again drive R&D that is bold, mission-driven, and unapologetically in service of the American people. In a world where American dominance is not guaranteed and our adversaries pursue whole-of-nation approaches to S&T competition, federally funded R&D must focus on targeted, transformational investments in areas such as artificial intelligence (AI), quantum science, nuclear energy, biotechnology, national security technologies, and ambitious space exploration.

Today, America's innovation ecosystem is built on a unique partnership between government, academia, industry, and nonprofit research institutions. Universities have served as vital centers of scientific discovery and technical talent development. The private sector plays an increasingly central role, not only in late-stage development and commercialization, but also in applied research, bringing speed and scale to turn basic research into real-world products and platforms. And nonprofit research institutions can pilot novel models of collaboration and inquiry. Across this ecosystem, it is the role of the Federal Government to set clear priorities, align incentives, and ensure that public investments translate into strategic advantage.

Following years of unfocused Federal investments weighed down by woke ideology and diversity, equity, and inclusion initiatives, we are realigning the Federal R&D portfolio to serve its core purposes: driving economic growth and high-wage employment for all Americans, promoting high quality of life, and ensuring U.S. leadership in critical sectors to our national security.

OVERVIEW OF THE FY 2027 MEMORANDUM

For FY2027, the ***five R&D budgetary priorities*** in this memorandum will ensure that America secures its position as the unrivaled world leader in critical and emerging technologies, including AI and quantum information S&T. Additional priorities will advance and secure America's leadership in energy, national security, health and biotechnology, and space. Across the Federal R&D budget, agencies should prioritize the physical, biological, and engineering sciences to accelerate technological innovation and strengthen national capabilities.

This memorandum also describes ***five high-priority crosscutting actions***. These actions will revitalize America's S&T enterprise, unleashing researchers to achieve groundbreaking discoveries. These crosscutting actions underpin the five R&D budgetary priorities and ensure agencies advance scientific progress and technological innovation to fuel economic growth and improve the lives of all Americans.

R&D BUDGETARY PRIORITIES

1. Ensure Unrivaled American Leadership in Critical and Emerging Technologies

The Trump Administration prioritizes the R&D required to ensure and extend American leadership in key critical and emerging technologies, as well as the digital ecosystem and physical infrastructure that underpin advances in these technologies. These critical and emerging technologies promise to fuel American prosperity, improve quality of life and national security, and create high-paying jobs for American workers.

***Artificial Intelligence*:** The potential of AI as a new frontier of exploration and application promises breakthroughs across a range of scientific disciplines and industrial sectors. Federal investment in fundamental research into novel AI paradigms and computing architectures will support continued American leadership in this field. Areas of emphasis include AI architectural advancements; data-efficient and high-performance AI techniques and systems; the interpretability, controllability, and steerability of AI systems; and AI adversarial robustness, resilience, and security. Applied AI priorities include AI for the acceleration of scientific discovery; nuclear fission and fusion for energy production; quantum information science; advanced space analytics, remote sensing, and navigation; and embodied AI (autonomous robotics, drones, self-driving cars, and advanced sensors). Additional priorities include enhanced methodologies for AI evaluation and measurement (e.g., reliability, accuracy, robustness) and the creation and publication of structured scientific datasets for AI model training.

***Quantum Information S&T*:** As quantum technologies mature and become increasingly available on the commercial market, bolstering U.S. leadership will require advancing fundamental science while also tackling emerging engineering challenges and strengthening the critical technologies enabling the quantum ecosystem. Agencies should deepen focused efforts, such as centers and core

programs, to advance basic quantum information science, while also prioritizing R&D that expands the understanding of end user applications and supports the maturation of enabling technologies. Opportunities to support pre-competitive R&D through mechanisms such as consortia and other technology transition efforts, investment in critical infrastructure and testbeds, and advanced manufacturing to enable next-generation quantum devices should also be pursued. Funding for related basic and applied materials research and mathematical and physical sciences should also be prioritized.

***Semiconductors and Microelectronics*:** Federal investments in semiconductor and microelectronics R&D are critical to enabling the development and deployment of AI and quantum applications and strengthening supply chain resilience. Agencies, working together and in collaboration with industry and academic partners where appropriate, should prioritize investments to ensure government access to trusted and assured microelectronics and continued American leadership in semiconductor technologies. Efforts should include underlying materials, devices, designs, and software, with particular focus on and coordination of the fabrication and characterization tools and facilities required for next-generation semiconductor technologies.

***Advanced Communications Networks*:** Agencies, in close coordination with the private sector, should strengthen basic research in advanced communications technologies. This research should further America's leadership in 5G, 6G, and beyond wireless networks, such as proliferated space-based communication networks, to spur innovation and growth. This includes research on AI techniques optimized for wireless systems, novel approaches to spectrum sharing, and application of AI to communications and cybersecurity, toward the goal of secure and trusted applications. Agencies should encourage the development of applications that leverage 5G, 6G, and advanced networks that incorporate security and privacy by design.

***Future Computing Technologies*:** To accelerate critical and emerging technologies, agencies should prioritize efforts to integrate advanced computing, software, and data resources from exascale to the edge towards enabling end-to-end application workflows, while supporting innovations in and translation of future technologies. Investment priorities include fundamental R&D in future computing technologies and paradigms including testbeds, computing infrastructure, experimental systems, and prototypes. Agencies should explore innovative models for resource aggregation and sharing, and for public-private partnerships. Priorities include translational efforts such as consortia or centers of excellence that leverage such partnerships towards the development and sustainability of computing, software, and data solutions.

***Advanced Manufacturing*:** Agency R&D investments should advance innovation that fuels the resurgence of domestic manufacturing. Agencies should focus efforts on advanced and next-generation manufacturing methods (e.g., additive manufacturing, robotics, and automation) as well as application of technologies that improve the efficiency and security of manufacturing (e.g., cyber security, digital twins, and AI). Of particular importance is accelerating the discovery-to-insertion timeline for advanced materials, including with AI and autonomous experimentation.

2. Unleash American Energy Dominance and Explore New Frontiers

Partnering with industry to unleash energy technologies to ensure a secure and abundant energy supply, understanding our unexplored ocean and expanding use of ocean data, and advancing

American interests in the polar regions will enhance the Nation's economic vitality and national security, contributing to the well-being and prosperity of all Americans.

***American Energy Dominance*:** To make America energy-dominant, agencies should prioritize investments in affordable, reliable, and secure energy technologies, including fossil fuels, advanced nuclear fission and fusion, geothermal, and hydropower. Agencies should also support the technological development and demonstration of advanced reactors, including microreactors, small modular reactors, Generation IV reactors, and fusion energy demonstrators, as well as nuclear fuel cycle R&D, including for nuclear fuel recycling and reprocessing. To unleash American critical minerals, agencies should invest in R&D for the identification, characterization, and assessment of domestic mineral resources in the United States, as well as critical mineral processing technologies. Federally funded energy R&D should reflect an increased reliance on the private sector to fund later-stage R&D and commercialization of energy production, storage, and consumption technologies, while also supporting user facilities that can improve multisector collaboration.

***Polar Regions Research*:** As an Arctic nation, the United States is affected by rapidly changing conditions in the Arctic that have national security, commerce, infrastructure, and transportation implications. Agencies should prioritize research and associated research infrastructure investments that enhance America's ability to observe, understand, and predict the physical, biological, geologic, and socioeconomic processes and interacting systems of the Arctic to protect and advance American interests and ensure prosperity of America's Arctic residents. Agencies should invest in R&D that assures America's uncontested navigation and strategic utilization of the Arctic. Additionally, the dominant presence of the United States in Antarctica, under the Antarctic Treaty, is expressed through a world-leading science program. Agencies should maintain and, where feasible, strengthen Antarctic research infrastructure.

***Ocean Exploration and Observation*:** Agencies should prioritize new and emerging technologies and collaborative approaches to efficiently map, explore, and characterize the resources of the United States exclusive economic zone and sea beds under international waters, particularly in connection with deep-sea mining. Agencies should also focus on increasing their capacity to effectively and efficiently manage large volumes of ocean observation and research data.

3. **Strengthen American Security**

American leadership in R&D for strategic competitiveness—including national security and economic security—is key to achieving American strength and prosperity. Each of the R&D budgetary priorities established in this memorandum includes elements with critical relevance to U.S. national security. Targeted Federal investments in those and additional R&D priority areas in national security will lead to robust and flexible capabilities for mitigating and responding to evolving challenges posed by strategic competitors and adversarial threats, as well as natural hazards.

***Advanced Military Capabilities*:** Agencies should invest in R&D to deliver the advanced military capabilities necessary for meeting emerging threats and protecting American security, including offensive and defensive hypersonic weapons capabilities, unmanned and autonomous systems, resilient national security space systems, and modernized and flexible strategic and nonstrategic nuclear deterrent capabilities and supporting infrastructure. Agencies should advance R&D for AI-

enabled intelligence collection, surveillance, and reconnaissance, to enable enhanced decision-making and situational awareness across all domains. Future military space architectures should focus on R&D for new and enhanced national security capabilities for the warfighter that are autonomous, automated, and deliver decisive advantage in conflict, such as ubiquitous sensing and communications, trusted space autonomy, and tactically responsive space. Agencies should develop technology approaches to, and spur innovation in, the defense industrial base to increase novel capabilities that are responsive to emerging threats across all domains, including space and cyber.

***America's Golden Dome*:** Agencies should invest in critical capability needs that will support the President's bold vision for homeland missile defense as outlined in the Golden Dome for America initiative. These include the S&T underpinning sensing and sensemaking, trusted autonomy, space maneuverability, directed energy, advanced materials, and affordable scalability. Agencies should also closely evaluate how their talent communities and unique resources can align towards risk reduction or capability enhancement activities for Golden Dome and explore opportunities for dual-use applications of the exquisite capabilities that the Golden Dome will afford.

***Preparedness and Resilience*:** Agencies should invest in R&D that improves the Nation's safety and resilience and empowers state and local governments and communities, the private sector, and individuals to advance their mutual preparedness. This should include R&D to enhance capabilities for anticipating, preventing, responding to, and recovering from threats and natural disasters. Such R&D priorities should be risk-informed and encompass, as appropriate, integrative approaches across threat and hazard domains, including cyber and electromagnetic attacks on critical infrastructure, supply chain weaknesses, power grid vulnerabilities resiliency, airspace threats, biological threats, severe terrestrial and space weather, and other geophysical hazards. Agencies should prioritize R&D for cybersecurity resilience, to ensure the Nation is prepared with post-quantum cryptography to defend against future threats. Additionally, agencies should explore novel datasets and identify opportunities to leverage AI applications to enable improved resilience.

4. Strengthen and Safeguard American Health and Biotechnology

A top priority of the Trump Administration is to strengthen and safeguard the health and quality of life of individuals, families, and communities. Federal R&D investments in health, biosafety, biosecurity, and biomanufacturing will help the Nation combat critical health challenges facing our citizens while also countering biological threats.

***America's Health*:** Agencies should prioritize funding and generating Gold Standard Science that leads to interventions to prevent and treat America's most pressing health challenges, including chronic diseases, obesity, metabolic disorders, Alzheimer's and other neurodegenerative diseases, autoimmune conditions, cancer, and rare and undiagnosed diseases. Relatedly, agencies should prioritize basic and applied R&D in plant health, animal disease prevention, and food safety technologies to strengthen U.S. agricultural resilience and food security. Leveraging next-generation -omics and AI, agencies should prioritize R&D to improve our understanding of the environmental, lifestyle, and genetic causes of disease and appropriate prevention approaches to maximize health and quality of life for Americans.

***Biosafety and Biosecurity*:** Preparing for and responding to biological threats remains essential for our national security. Agencies should ensure R&D investments in life sciences research

improve biosecurity by advancing our ability to detect, respond to, and mitigate potential biological threats, whether intentional, accidental, or of natural origin. Agencies should also prioritize research into function-based screening for the pathogenicity and toxicity of nucleic acids, proteins, small molecules, and other biochemical products, as well as approaches to test the accuracy and reliability of such screening methods. Agencies should ensure that funded projects unequivocally follow biosafety and biosecurity standards.

***Domestic Biomanufacturing Capabilities*:** The United States holds the resources to lead the world in producing next-generation bio-manufactured products. Feedstocks from America's heartland and novel biological processes can be used to secure our supply chains, create jobs, and build scalable and universal manufacturing capacity. Agencies should support innovation in modular and scalable biological platforms and ensure that promising technologies have clear lab-to-market pathways by leveraging lab and biofoundry infrastructure.

5. Assure America's Continued Space Dominance

R&D investments in space contribute to both civilian and defense mission needs and should prioritize ambitious targets that unlock new mission capabilities, enable discoveries, and achieve exploration goals. These investments should include building capacity for human missions to the moon and Mars. Agencies should prioritize R&D for human space exploration and development, including long-duration travel and habitation, in-space aggregation and assembly, local resource utilization, space weather hazard prediction and mitigation, space nuclear power systems and biotechnologies for space applications. National security R&D should focus on basic and applied research to unlock currently untenable and transformative space capabilities, including novel sensing modalities, accurate forecasting of the space and near-Earth environment, radiation belt remediation, high-precision chip-scale frequency standards, and advanced power and propulsion systems. Agencies should also leverage new business models and cost constructs enabled by commercial space capabilities, such as science enabled by signals of opportunity, rideshares, hosted payloads, and commercial partnerships.

PRIORITY CROSSCUTTING ACTIONS

To usher in the Golden Age of American Innovation, we must renew the American S&T enterprise for the century ahead with a number of crosscutting actions. At the forefront of these efforts is the need to restore Gold Standard Science. Efforts are also needed to educate and train the future workforce with the skills in science, technology, engineering, and mathematics (STEM) required to compete in the global marketplace and support American businesses. Maintaining and expanding a world-class research infrastructure is imperative to empower researchers and train next-generation innovators. Additionally, new paradigms for collaboration must be explored to fully leverage existing resources and capabilities and spur robust private sector investment in the research enterprise. In all efforts, focus should be on high-value R&D aligned with the core purposes of agency missions. Together, these efforts will advance scientific progress and technological innovation to fuel economic growth and better the lives of all Americans.

1. Implement and Support Gold Standard Science

As detailed in the June 23, 2025 OSTP memorandum, "Agency Guidance for Implementing Gold Standard Science in the Conduct & Management of Scientific Activities," agencies should prioritize efforts to support the tenets of Gold Standard Science. In addition to establishing appropriate requirements for the conduct, management, and communication of scientific activities, agencies should foster training and support relevant efforts to advance Gold Standard Science. For example, where possible, agencies should support replication studies and statistical validation methods in addition to funding potential breakthrough science programs. Agencies should categorize funding as basic research, applied research, or experimental development (according to the definitions of these types of research in OMB Circular A-11) in their performance reporting. Agencies should also prioritize support for the development of federated, publicly accessible databases and other research-sharing platforms and identify ways to streamline administrative burdens in the grantmaking and research process to maximize the use of taxpayer resources.

2. Build the S&T Workforce of the Future

As R&D investments expand the frontiers of knowledge in S&T, opportunities arise to provide students access to the most advanced knowledge that will prepare them to enter the workforce of the future. Agencies should support and advance existing efforts to provide all Americans with access to high-quality STEM education and workforce development pathways throughout their lifetimes. Agencies should identify efforts at all stages of learning to prioritize promising programs and activities in collaboration with the private sector, nonprofits, and local and state governments. With the rapidly accelerating advancements in emerging technologies, including AI, agencies should invest in programs that utilize technology to support students and teachers.

3. Expand and Make Accessible World-Class Research Infrastructure

Access to specialized tools and facilities enables and empowers researchers to achieve groundbreaking discoveries and advance R&D efforts. Agencies should prioritize research infrastructure investments that provide broad access, including for researchers from small colleges and businesses. Research infrastructure includes characterization and fabrication tools and facilities, as well as computational and data infrastructure, testbeds, prototyping, qualification facilities, and globally distributed assets such as ships and research stations. Where possible, agencies should use existing capabilities and collaborate with the private sector and international partners. Digital tools, data sets, and data sharing and communications infrastructure underpin the enabling research infrastructure for emerging technologies and support Gold Standard Science efforts. Agencies should prioritize efforts that advance and share new paradigms for research, including the expansion of autonomous experimentation facilities that can accelerate R&D efforts.

4. Revitalize and Strengthen America's S&T Ecosystem

The S&T ecosystem of the United States encompasses government, academia, nonprofits, and industry working together to ensure research discoveries lead to commercial advancements that fuel the economy and better the lives of all Americans. Agencies should explore innovative models for funding and sharing scientific research infrastructure and results to accelerate research and to strengthen domestic supply chains and manufacturing. Agencies should consider initiatives to ease

administrative and regulatory burdens for Federal technology transfer to increase private sector investment in R&D. Agencies should prioritize funding for cooperative projects that align organizational incentives and advance new public-private partnerships and multisectoral consortia, including engagement with philanthropic organizations. Multisector activities should focus on efforts to accelerate entrepreneurship and innovation to support the next generation of industry leaders.

Agencies should increase interagency collaboration, including through the National Science and Technology Council, to strengthen coordination on existing and new partnerships to fully leverage whole-of-government efforts. Agencies should coordinate and collaborate with each other and non-Federal stakeholders to drive discovery and innovation in high priority research areas by leveraging research infrastructure, including tools, platforms, and protocols. Agencies should make data generated or funded by the agency discoverable, accessible, and useable, consistent with all applicable laws, regulations, and policies governing data use, disclosure, and sharing.

Agencies should prioritize efforts to protect R&D programs critical to our national security objectives from theft, diversion, and exploitation by strategic competitors. Agencies should institutionalize risk-based and data-driven technology protection practices, and provide resources and actionable guidance to academic and industry R&D partners across the defense industrial base and manufacturing sector.

5. Focus on High-Value Research Efforts

As the Trump Administration realigns the Federal Government's role in the S&T enterprise to focus on R&D that is purpose-driven and unequivocally beneficial to the American people, there is an opportunity to double down on high-value research efforts. Agencies should support R&D efforts that are focused and fully aligned with the core purpose of the agency's mission. Funding programs may require reorganization to address changes in funding levels to focus on promising and high-value research. These programs should be consolidated and managed, as necessary, to focus research on efforts that produce meaningful outcomes.