



LETTER TO THE PRESIDENT
Future Opportunities for Science and Technology
to Impact the Nation

Executive Office of the President
President's Council of Advisors on
Science and Technology

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EXECUTIVE OFFICE OF THE PRESIDENT
PRESIDENT'S COUNCIL OF ADVISORS ON SCIENCE AND TECHNOLOGY
WASHINGTON, D.C. 20502

President Joseph R. Biden, Jr.
The White House
Washington, D.C.

Dear Mr. President,

Thank you for giving us the opportunity to serve our nation as your President's Council of Advisors on Science and Technology (PCAST). For each of us, it has been an honor to step back from our daily work of advancing science and technology at companies, universities, and nonprofits to serve our country by providing advice about how science and technology can improve the lives of all Americans.

PCAST's Work

Under your leadership, PCAST has worked on issues critical to our future, including uplifting industrial innovation, mitigating impacts of climate change, improving health outcomes, harnessing artificial intelligence (AI), protecting our national security, and bolstering our overall science and technology infrastructure.

In line with your Administration's early push to enhance our nation's industrial innovation, PCAST provided meaningful recommendations to improve research and development impact in semiconductors and advanced biomanufacturing, which have been implemented through prototyping hubs, defined goals, and expanded coalitions.

Your Administration has done more to address the challenges of climate change than any other in history. PCAST has been proud to contribute to efforts that protect communities from extreme weather through the development of improved forecasting tools, and help reduce emissions of greenhouse gases nationwide through enhanced measurement and monitoring. Most recently, we provided insights to help the United States improve groundwater security, recommending national resources that support local management. Your constant focus on supporting the American people was reflected in our report on wildfires, with recommendations to help first responders improve firefighting efforts.

Improving health outcomes has been a key goal of yours for many decades. PCAST has worked with your Administration to support the public health workforce across the country, and to enhance patient safety by engaging broader coalitions of stakeholders and expanding the use of evidence-based practices. We also supported your Strategy on Hunger, Nutrition, and Health with specific guidance on gaps and opportunities for federal research and development on nutrition.

A strong focus of this PCAST has been on the nation's overall science and technology enterprise. We shared a letter with recommendations to improve agencies' public engagement with science, complementing your efforts to make government more transparent and trustworthy. We released a report on the value of social sciences in addressing the hardest problems facing society. Our report on cyber-physical resilience identified leading indicators and set ambitious performance goals that

are now being advanced by the Department of Homeland Security and industry leaders. We also made recommendations to improve longstanding science and technology coordination efforts. Almost every PCAST report has included a call to improve recruitment and career development of the science and technology workforce. That trend culminated in a short letter on ways that we can enhance the federal science and technology workforce, which is central to the goal of delivering the benefits of science and technology to the American people.

We have particularly enjoyed our discussions with you about AI, and we provided a report that expands on the risks and promising opportunities of AI advances. Your Administration's Blueprint for an AI Bill of Rights sets out the values to guide consideration of those risks, while your Executive Order on the Safe, Secure, and Trustworthy Development and Use of AI is guiding deployment that will help deliver the promises of AI for more efficient and effective public services.

Looking Around the Corner

As we conclude our service, PCAST is now setting our sights on the important goals that can be accomplished by continuing to prioritize science and technology that enables and empowers our nation. We discussed some of these opportunities in our final meeting on January 10, 2025, and hope they may inspire future efforts.

One of the challenges ahead is health and well-being. A particularly exciting opportunity is to better understand the science of aging. This will be increasingly important as a third of the American population is over age 50 and as the generation of baby boomers enters retirement. Other areas of health particularly rely on the power of social sciences. The expanding toolkit of social sciences, with large data sets and novel methods, can also allow us to define the components of our lives that contribute most strongly to our perception of a high quality of life. With that understanding we can, for instance, develop approaches to decrease loneliness across society, lower youth suicide, and increase trust across communities – enhancing efforts that will truly help our nation flourish.

The tools of research and technology are poised to allow us to open doors to a multitude of new advances that can help improve human health, address climate change, and create more trustworthy institutions. The use of enhanced automation technology combined with AI offers the opportunity to accelerate science and discovery. For example, we are on the cusp of being able to engineer biology to solve important problems in medicine, chemicals, fuels, materials, and more. Another area of technology on the cusp of broader application is nuclear energy, including fusion energy. Your Administration has just released guidance on enhancing nuclear power, which will be essential to support the growing power needs of AI. Streamlining construction of clean power will allow us to achieve our net zero goals and minimize the impacts of climate change. Research and many technologies are posed to address the looming challenge of feeding our nation healthy foods while also protecting our climate and the environment.

Our nation's strong democracy and unique freedoms have enabled remarkable capabilities: a capacity for risk taking, enthusiasm for cross-disciplinary and multi-institution collaboration, individuals and teams empowered to take action, and a willingness to come together to do big things. The strength of our nation's scientific and technological capacity has been clearly demonstrated during your Administration, with deployment of the James Webb Space Telescope, which has awed us with images and is rewriting the history of the universe and giving us a deeper understanding of our place within it; advances in cancer treatment and care, including support for patient navigation and novel immunotherapies that are extending life and increasing the quality of life for patients and families; and historic efforts to bring leading-edge semiconductor manufacturing back to the United

States, so the manufacturing that is critical for supply chains and jobs is not dangerously concentrated in one part of the world.

The Critical Role of Federally Funded Research and Development

For each of these future possibilities and so many more, our future success is critically dependent on federally funded research and development. Investments by earlier administrations made possible many benefits that we enjoy today, from the internet to mobile phones with GPS, from novel cancer treatments to the mRNA vaccine for COVID-19, from weather prediction to clean air and water. Our high quality of life and vibrant economic prosperity is built on a foundation of federal research and development.

We have seen corporate research and development spending soar, one indication of America's competitiveness on the global stage. Many of us work at companies, and virtually all of us have worked closely with companies. So, we know that corporate research and development will not continue to thrive without complementary public investments that keep pace. Companies draw on federal research for new inventions to advance product development and to inform risk assessments before products or their own research and development advance. New companies and entirely new industries grow out of federally funded research, and existing companies depend on hiring workers because many in the corporate research and development workforce are trained in universities supported by federal research funding. Americans also need federal research and development that serves public purposes, like national security, health, energy, space exploration, agriculture, education, and transportation. Our future depends on broader investment in research and development than what industry alone spends.

You have been steadfast in your support for federally funded research and development, and your Administration has made unprecedented investments. In 2023, you secured a 24% increase in federal research and development compared to fiscal year 2021. This important investment strengthened our established federal research and development agencies and also started important new efforts. You created the Advanced Research Projects Agency for Health (ARPA-H), which is already working to increase cancer survival rates, transform women's health, and improve our health system. Your commitment to research and development launched a new directorate at the National Science Foundation—the Technology, Innovation and Partnership Directorate that is already accelerating technology transition and building innovation hubs across the country.

We stand now at an inflection point. Unfortunately, Congress did not support your budget request for research and development in recent appropriations. This means we are not sufficiently replenishing the “seed corn” that fuels American well-being. Meanwhile, the People's Republic of China continues to increase its research and development spending, growing by 10% this year alone. Research and development are important to every goal we have for the future, and much is at stake in the decisions of the coming years.

You have set an example of prioritizing science and technology to achieve a bright future. That started when you restored the importance of scientific integrity in your first week in office. You reignited your Cancer Moonshot, took the boldest action ever to mitigate climate change, and put the use of AI on the right track for our nation's future. You are leaving behind a dynamic science and technology ecosystem that is prepared to work for the nation's well-being. These actions will change Americans' lives for the better for years to come.

We thank you for your service to our nation and for the opportunity to advise you on matters of science and technology over these last four years.

Sincerely,

Your President's Council of Advisors on Science and Technology

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About the President's Council of Advisors on Science and Technology

The President's Council of Advisors on Science and Technology (PCAST) is a federal advisory committee appointed by the President to augment the science and technology advice available to them from inside the White House and from the federal agencies. PCAST is comprised of 27 of the Nation's thought leaders, selected for their distinguished service and accomplishments in academia, government, and the private sector. PCAST advises the President on matters involving science, technology, and innovation policy, as well as on matters involving scientific and technological information that is needed to inform policy affecting the economy, worker empowerment, education, energy, the environment, public health, national and homeland security, racial equity, and other topics.

For more information about PCAST see www.whitehouse.gov/pcast.
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