

**Written Testimony of  
Dr. Sudip Parikh, CEO  
American Association for the Advancement of Science  
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Chairman Babin, Ranking Member Lofgren, and Members of the Committee, thank you for the opportunity to testify today. I am Sudip Parikh, Chief Executive Officer of the American Association for the Advancement of Science, one of the world's largest multidisciplinary scientific societies, and the executive publisher of *Science* magazine and the *Science* family of journals. Our mission is to advance science, engineering, and innovation throughout the world for the benefit of all or — simply put — to advance science and serve society.

I also serve as Chair of a Task Force working to crystallize a new Vision for American Science & Technology (VAST). The Task Force includes more than 70 leaders whose experience spans all sectors of the American economy — public, private, and nonprofit — along with many industries, regions of the country, ages, and career stages.

The American science and technology enterprise is strong, but its continued strength is not guaranteed. We must be proactive in implementing our vision by being open to change and disruption without dismantling our foundational principles and strengths.

Thanks largely to the American science and technology enterprise — composed of scientists, engineers, technicians, doctors, nurses, and many other skilled trades — we know more about our universe, our planet, and ourselves than ever. Just this past week we saw fundamental discoveries about the building blocks of life found in an asteroid called Bennu and the approval of a non-opioid pain medication acting through an entirely new biological pathway.

Through an enterprise that includes industry, academia, and sources of capital to scale, we have turned the discoveries of the past 80 years into technological innovations that have increased our prosperity and security. For example, this past week we saw a small company break the sound barrier with a test aircraft that may lead to routine faster-than-sound travel for passengers. Our commitment to exploring the unknown, solving the seemingly impossible, and building the yet unimaginable has established the United States as a global leader that adapts to emerging challenges and seizes new opportunities to secure our prosperity and safety.

From the medicines that treat and cure disease to the rockets that routinely launch satellites and people to the artificial intelligence that influences our decision-making hundreds of times a day, science and technology are woven into the fabric of our daily lives so intimately as to be almost invisible. While much of this is thanks to a strong and vibrant scientific enterprise, make no mistake, American S&T competitiveness is also under threat.

Many of the structures and institutions that have contributed to our achievements are outdated. They were the result of a vision after World War II that the investments in science and technology we had made during a time of war should be continued during a time of peace. Over generations, we have made substantial and sustained federal investments in fundamental research

— much of it carried out at our universities, research institutes, and national laboratories where research and education take place side-by-side. Industry translated and scaled discoveries into technologies and products with intellectual property protections that incentivized continued innovation. It was a relatively simple vision with profound consequences. It created the modern world.

Over the decades, we have built upon this legacy. The investments of government and industry have been supplemented by entrepreneurs, universities themselves, philanthropy, capital markets, private equity, and many other financial instruments. This holistic enterprise has, for many Americans, been central to delivering the promise of our nation: for each successive generation to live better lives, with well-paying jobs, quality education, and strong national defense.

But we are at a crossroads.

Three things are happening at once. First, the pace of change is accelerating so rapidly that the tools and strategies that brought us here are insufficient to ensure our future. Transformational technologies are reshaping our way of life. Second, we face existential threats to our health; food supply and water security; environmental resilience; energy production, utilization, and storage; and our overall wellbeing. Third, more than ever, we are competing with other nations — particularly China — that rival us in talent, infrastructure, and capital investment and that can put our economic prosperity and national security at risk. China trains more scientists and engineers than we do; files for more international patents than we do; publishes just as many highly cited scientific papers as we do; and is leading us in several critical research and technology areas.

Frustratingly, at this critical moment, the American science and technology enterprise is not meeting our full potential and promise. Strategies built for the time when international competition was far behind, and the pace of discovery was slower, will not work in this new era. In addition, we have hurt our own enterprise through self-inflicted wounds.

We as a nation must look forward and ask ourselves: Do we want to be the protagonist of our own story? Do we want to be the nation that discovers, manufactures, and drives the economic, environmental, and health advances that will change society for the better? Or do we want to instead be a nation that is subservient to the standards of other nations and has to buy innovations from friendly competitors, or worse, geopolitical adversaries?

I know for all those here today what the answer is: We want America to lead.

The good news is that we have a suite of significant assets that our nation can leverage.

- **Top Research and Educational Facilities.** The number of U.S. research universities, national laboratories, institutes, and industry sites, with world-class research facilities and talent has multiplied and are present across all 50 states.
- **Industry Investment and Development.** Industry advances knowledge to solve problems and brings scientific and technological discoveries to market in the form of

useful products and services. Companies generate jobs and invest in workforce development, often collaborating with educational institutions like community colleges. Private sector success generates profits and corresponding tax revenue that are, in part, reinvested in the science and technology enterprise.

- **World-class Workforce.** Our science and technology workforce expands our understanding of how the world works and what is possible. Capitalizing on the complementary contributions of all disciplines, workers apply that knowledge to create technologies and services, take part in research and education, craft data-driven policies, and more. Scientists and engineers work across sectors, demonstrating the power of discovery and data and bringing learnings from industry to academia and vice versa. Scientists, engineers, technicians, and the many other types of workers show up in their communities to lead with integrity, build trust in the enterprise. We have this talent all over America and we attract talent from around the world.
- **Excellent and Diverse Sources of Capital.** Venture capitalists, angel investors, entrepreneurs, philanthropists, and other types of investors provide funding with varying risk tolerances, scale, and goals enabling an incredible decentralized array of development across disciplines and sectors.
- **An American Entrepreneurial Spirit.** The people of our nation dream big, take risks, work hard, and have an entrepreneurial spirit to overcome challenges.

We must also acknowledge that the U.S. research enterprise has changed. Innovative approaches are dispersed across the nation and can be overlooked by funders concentrated in a small number of places. Bureaucratic barriers hinder the alignment of public, private, and nonprofit resources. Structural obstacles and obsolete policies and regulations stifle our enterprise's ability to be as forward-looking, agile, and effective as it needs to be. Our educational system — from K-12 through higher education and beyond — is falling far short of its potential and must be adapted to serve people throughout their lives. Our national commitment to investing in fundamental research — long the cornerstone of our global leadership — has stalled.

The private sector, including industry and philanthropy, invests almost four times as much in science and technology as the federal government. These funds complement but do not replace federal investment, which provides the framework for addressing today's biggest challenges and supports fundamental research that is the seed corn for future advances.

What does our nation need to do next?

**We must recognize that the enterprise as a whole — from federal investment to workforce to industry investment to tax and regulatory policy — is what differentiates our nation from all others.**

If we want to compete with China and other nations that are emulating our S&T innovation model, we must strengthen core elements of our model and at the same time, create new

mechanisms to drive innovation. The VAST Task Force will release its vision later this month and it will include these concrete avenues for action:

- **Release the tremendous power of America's S&T enterprise by reducing inefficiencies and breaking down barriers that hinder progress today.**
  - Spur private sector research and development with pro-innovation policies like optimizing tax policy and using more definitive contract mechanisms for critical needs.
  - Align resources across sectors and geographies by empowering local leaders through regionally based science and technology economic hubs.
  - Focus American science and technology's people and resources on discovery and innovation by researching and adopting evidence-based funding approaches and reducing researchers' administrative workloads.
  
- **Build and empower the strongest and most adaptable workforce in human history to benefit our people and sustain our leadership as science and technology innovators.**
  - Attract more Americans into science, technology, engineering, mathematics, and medicine (STEMM) and ensure they have the support and opportunity to go as far as their God-given talent and drive can take them.
  - Build and strengthen our domestic workforce by creating new science and career pathways for everyone and providing adequate compensation and benefits for graduate students and full employee status for postdocs to address practical barriers to entering high-skill science and technology professions.
  - Keep U.S.-educated international talent here and proactively recruit top talent internationally by fast-tracking lawful permanent residency (Green Card) status for vetted U.S.-educated scientists and engineers.
  
- **Drive breakthroughs, advance global competitiveness, and strengthen our national security with targeted commitments to fundamental discovery research, applied research, and research infrastructure.**
  - Invest strategically in fundamental discovery research, applied research, and research infrastructure that is vital to America's national security and competitiveness.
  - Protect our scientific discoveries from foreign adversaries by strengthening research security to prevent illegal and improper transfer of U.S. research and development by creating policies that are as open as possible and as secure as is needed.

In addition to these holistic recommendations, we must stop hurting our own enterprise with self-inflicted wounds. Two examples illustrate the point.

First, while we must recognize the global competition and take it seriously, we must not demonize people or international collaboration in the process. Our colleagues of Chinese, Indian, and other immigrant backgrounds make up a substantial percentage of the American science and technology workforce. They are colleagues and friends and deserving of respect. We must ensure

that our drive to compete does not alter our humanity. When we make America less welcoming to scientists who are immigrants or those who have been here for generations, we only hurt our own competitiveness and opportunity for prosperity. In addition, science is a global activity. When we close ourselves off to international collaboration, we lose visibility to advances made around the world and slow progress for everyone.

Second, last week, the announcement of an abrupt spending freeze on science and technology funding broke trust and hurt the S&T enterprise. This is the kind of action that, even if brief, can have a lasting negative impact. Many scientists, particularly those early in their careers, live paycheck-to-paycheck. I was most saddened to hear from these scientists who began questioning whether they should even continue their scientific pursuits or switch careers. Scientists and engineers are resilient, and I have no doubt that most will persevere because they care deeply about solving problems and better understanding the world around them. But every time we stop and start, lose focus, break continuity across funding and intellectual property protections, we lose some of the next generation of science and technology talent and hurt America's competitiveness.

Uncertainty, whether in the form of spending freezes, the threat of government shutdowns, or potentially canceling funding that has already been approved reverberates through the scientific community. Institutions must of course change — disruption is not a bad thing and should happen every so often — but we must be careful not to dismantle the very strengths that will keep us competitive long into the future. It is not the message we want to be sending to those shaping our future, nor to our adversaries. And we must not lose sight of our global competitors — they are watching and building narratives about the U.S. enterprise based on these missteps.

In conclusion, discovery and innovation across the world have changed in profound ways that require the United States to find new approaches to how we develop people, build and maintain infrastructure, and fund the scientific enterprise. To secure our future, we need an all-of-America science and technology enterprise with creativity, adaptability, and integrity — one that is rooted in and responsive to the American people, imbued with the national spirit to deliver a better way of life. Getting this right — and soon — is imperative for all sectors, industries, administrations, and political parties.

The stakes are enormous, the necessary actions are clear, and the time is now.

Sources:

- National Science Board Science & Engineering Indicators: Invention, Knowledge Transfer, and Education Executive Summary: <https://nces.nsf.gov/pubs/nsb20241/executive-summary>
- Science & Technology Action Committee: China's Prolific Investment in Science and Technology Threatens U.S. Global Leadership: <https://sciencetechaction.org/wp-content/uploads/2024/12/China-Leave-Behind-FINAL.pdf>