

Innovative partnerships

When I became director of the U.S. National Science Foundation (NSF) in June 2020, the world was in the midst of a pandemic that continues to reshape daily lives, work, education, and the research enterprise. As we enter 2021 with the promise of suppressing COVID-19, the world looks to the science and engineering community for solutions to speed global recovery. To generate the solutions needed from all sectors of science and engineering, the United States must create a vigorous culture of innovation nationwide, leverage public-private partnerships to tackle complex research questions, and align exploratory research with societal impacts.

As a U.S. government agency, NSF was created in 1950 to support research that benefits America's health, security, prosperity, and welfare while ensuring that its scientific infrastructure and workforce remain strong. The agency is fortunate to have had strong bipartisan support from Congress to fulfill this mission. As NSF plans for the future, it also draws inspiration from the past.

In the early 1980s, scientists across the country needed access to the most powerful computers that could advance discovery and innovation. NSF invested hundreds of millions of dollars to build supercomputers and provide remote access to them. What followed was a decade of rapid development, in partnership with research universities, telecommunications companies, and other federal agencies. The result—NSFNET—laid the foundation

for the modern internet. Thirty-five years later, it is apparent how critical this and subsequent investments in computing and communications research have been in advancing global connectedness during the pandemic.

Examples like this offer lessons for creating a path forward. The United States must strengthen the synergies of curiosity-driven exploratory research and use-inspired translational research at speed and scale. NSF's goal today is to build on the intellectual energy captured by projects like NSFNET by driving collaborations across the scientific enterprise. Such partnerships allow public and private entities to align objectives and resources to more efficiently advance science and technology toward common goals. For example, last year NSF led the creation of seven new Artificial Intelligence Research Institutes. These institutes now serve as hubs for academia, indus-

try, and government to work together and enhance American competitiveness in this arena for decades to come.

Imagine the impact of creating engines of economic and talent development like this in every state, working on a range of crucial issues facing society, such as climate change, pandemic response, and diversity in science. NSF intends to build ecosystems across the country that bring together people from a range of socioeconomic backgrounds and abilities, to tackle such challenges. For example, NSF investments are intentionally bringing academic researchers together with civic leaders, local residents, and philanthropy in communities throughout the United States to understand the challenges they are facing—in accessibility and inclusivity, mobility and transportation, energy and water management, and resilience to

disasters, to name a few—to pilot sustainable, scalable research-based solutions. Likewise, in 2020, NSF launched the Historically Black Colleges and Universities (HBCUs) Science, Technology, Engineering, and Mathematics (STEM) Undergraduate Success Research Center. The Center studies successful broadening participation practices at 50 HBCUs to develop evidence-based interventions for transforming education. NSF is now forging collaborations between community colleges, minority-serving institutions, and companies to create experiential pathways for Americans to obtain the skills they need for jobs of the future. NSF will take this model to the next level—empowering regional innovation hubs across the country and with

international partners—to cultivate the dynamic collaborations between researchers that are necessary to tackle 21st-century science and engineering challenges.

America's role as global leader in science and engineering is at a tipping point. If the country is complacent, it will be surpassed by ambitious nations that are investing in their own workforces and infrastructure. There is an opportunity for the United States to continue to be innovative and impactful. It requires reaching into every corner of the country to create pathways to success for those who want to explore and learn, including thousands of young people who lack opportunities to realize their potential in STEM fields. It requires searching for every possible opportunity for partnership and collaboration—because the future depends on it now more than ever.

—Sethuraman Panchanathan



Sethuraman Panchanathan

is the director of the U.S. National Science Foundation, Alexandria, VA, USA. spanchan@nsf.gov

**“America’s
role as global
leader in
science and
engineering
is at a
tipping point.”**

Science

Innovative partnerships

Sethuraman Panchanathan

Science **371** (6525), 105.

DOI: 10.1126/science.abg3779

ARTICLE TOOLS

<http://science.sciencemag.org/content/371/6525/105>

PERMISSIONS

<http://www.sciencemag.org/help/reprints-and-permissions>

Use of this article is subject to the [Terms of Service](#)

Science (print ISSN 0036-8075; online ISSN 1095-9203) is published by the American Association for the Advancement of Science, 1200 New York Avenue NW, Washington, DC 20005. The title *Science* is a registered trademark of AAAS.

Copyright © 2021 The Authors, some rights reserved; exclusive licensee American Association for the Advancement of Science. No claim to original U.S. Government Works