AMERICAN SCIENCE @250

Rethink | Reimagine | Redesign

Forum Design Workshop Briefing Document

June 18, 2026

Updated 6/25/2026

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Project Background: American Science@ 250

Rethink, Reimagine, and Redesign

Why Now?

American science stands at an inflection point, offering a rare opportunity to rethink and redesign the institutions that fund, steer, and translate discovery into national benefits. Since 2020, a consensus has emerged that the prevailing status quo is not working, at least not well enough, to address the social, economic, and security needs of the nation. It led to several major innovations in institutional design, including NSF's Technology, Innovation, and Partnership (TIP) directorate, NIH's Advanced Research Projects Agency for Health (ARPA-H), and DOE's Office of Clean Energy Demonstration (OCED). The reform movement of the past year took a different turn. Significant cuts to program staff and budgets, withdrawal from international scientific partnerships and organizations, new mandates for research conduct, and changes to grant procedures and indirect cost rates put long-standing scientific practices under scrutiny for the first time in decades. At the same time, public funding of scientific research provided leverage for forcing changes in academic culture and institutional practices. Finally, a significant rollback of the regulatory state diminished, if not eliminated, the role of independent science advice, most notably in healthcare and environmental protection. Yet the apparent contraction of the scientific estate has not stopped certain parts of the scientific enterprise, such as the DOE's high-performance computing infrastructure and NSF's Tech Labs, from experiencing rapid expansion.

The response to the current moment has therefore been mixed and dispersed. The academic, professional, and advocacy organizations whose memberships experienced the largest declines in public support are coalescing around the *"Reinstate Movement,"* which focuses on restoring the status quo. They are using legal avenues and non-federal support to reinstate staff and programs, and outreach strategies to regain trust of the American Public, which has been on decline since the pandemic. The proponents of the bipartisan consensus on accelerating technology transfer and commercialization continue to push for the "*Reform Movement*." They are focusing on reorganization, experimentation, and increased public-private partnerships. Finally, scholars and practitioners of science policy are driving the "*Redesign Movement*." They are concentrating on resetting the social contract for science, shifting from discussions of norms and institutions to systemic redesign, beginning with science's goals, governance, and public purpose. They aim to shape a new vision for how American science serves the nation.

These efforts lack three elements that, if integrated appropriately and systematically, could significantly increase the likelihood of individual and collective success, eventually placing the American Scientific Enterprise and S&T policy on a solid 21st-century footing:

- Historic and dynamic assessment of the tensions that underpinned the evolution of US scientific enterprise for the past 250 years,
- Informed, inclusive, and deliberative engagement on science and technology futures with scientists, communities, stakeholders, and the broader democratic public, and
- Collaboration and coordination among disparate S&T efforts aimed at responding to current crises and opportunities.

Why Us?

Arizona State University's Consortium for Science, Policy & Outcomes (CSPO), a leading DC-based center for research and engagement on science and technology policy, is uniquely positioned to fill these three gaps in assessment, engagement, and coordination. For more than 25 years, CSPO has dedicated its research, scholarship, educational programming, and policy engagements to rethinking, reimagining, and redesigning the American Scientific Enterprise to bring equality, justice, and well-being for all Americans. It has worked with federal government program managers, academic leaders, philanthropic sponsors, nonpartisan think tanks, industry pioneers, and the American Public to develop policy tools, research methodologies, and implementation strategies such as Real Time Technology Assessment (Guston and Sarewitz, 2002), Reconciling Supply of and Demand for Science (Sarewitz and Pielke, 2007), Public Value Mapping (Bozeman & Sarewitz, 2011), Anticipatory Governance (Guston, 2014), and Participatory Technology Assessment (Kaplan et al., 2021).

A central takeaway from this body of work is that "science will be made more reliable and more valuable for society today not by being protected from societal influences but instead by being brought, carefully and appropriately, into a direct, open, and intimate relationship with those influences" (Sarewitz, 2016). In this spirit, CSPO, with strong institutional support, is launching America @250: A National Initiative to Rethink and Redesign the U.S. scientific enterprise with the following aims:

1. Identify and assess the needs, opportunities, and challenges within the U.S. scientific enterprise through literature reviews, expert consultations, and stakeholder workshops.
2. Explore and map informed, deliberated public values through direct engagement with communities, stakeholders, and a representatively diverse public in Massachusetts, West Virginia, and Arizona.
3. Coordinate and integrate the results of expert and public engagement with ongoing efforts to address current crises in science, technology, and innovation through collaborative partnerships, interactive workshops, briefings, reports, publications, and social media.
4. Create and disseminate content, guides, protocols, and learning materials to expand the initiative's deliberative and integration components for other states, regions, and organizations.

What is our approach?

The project will follow CSPO's signature Participatory Technology Assessment (pTA) methodology, a structured process for engaging experts, decision-makers, and citizens in the social appraisal of science and technology. The activities will be carried out in three phases.

- The ***problem-framing phase*** of the pTA will launch with two landscape analyses and three open-frame community dialogues in Arizona, Massachusetts, and West Virginia. These locations were selected for their distinct histories of scientific research, industrial development, and innovation strategies, as well as varying public attitudes toward science and government funding.
- The ***public-deliberation phase*** will include expert consultations and design workshops in Washington, DC, and online. These will inform the design and facilitation of deliberative citizen forums in the three focal states.
- The ***results-integration phase*** will launch with a preliminary analysis of the forum data to inform a series of consultations and briefings with project partners in the public, private, philanthropic, and nonprofit sectors. By integrating lay public, stakeholder, and expert perspectives, we will develop a compelling public mandate that more directly connects science to the values, needs, and priorities of American communities. A final component of this phase will involve

disseminating the deliberative and integration materials to practitioners, experts, stakeholders, and decision-makers for replication and expansion of the initiative in other states, regions, and organizations.

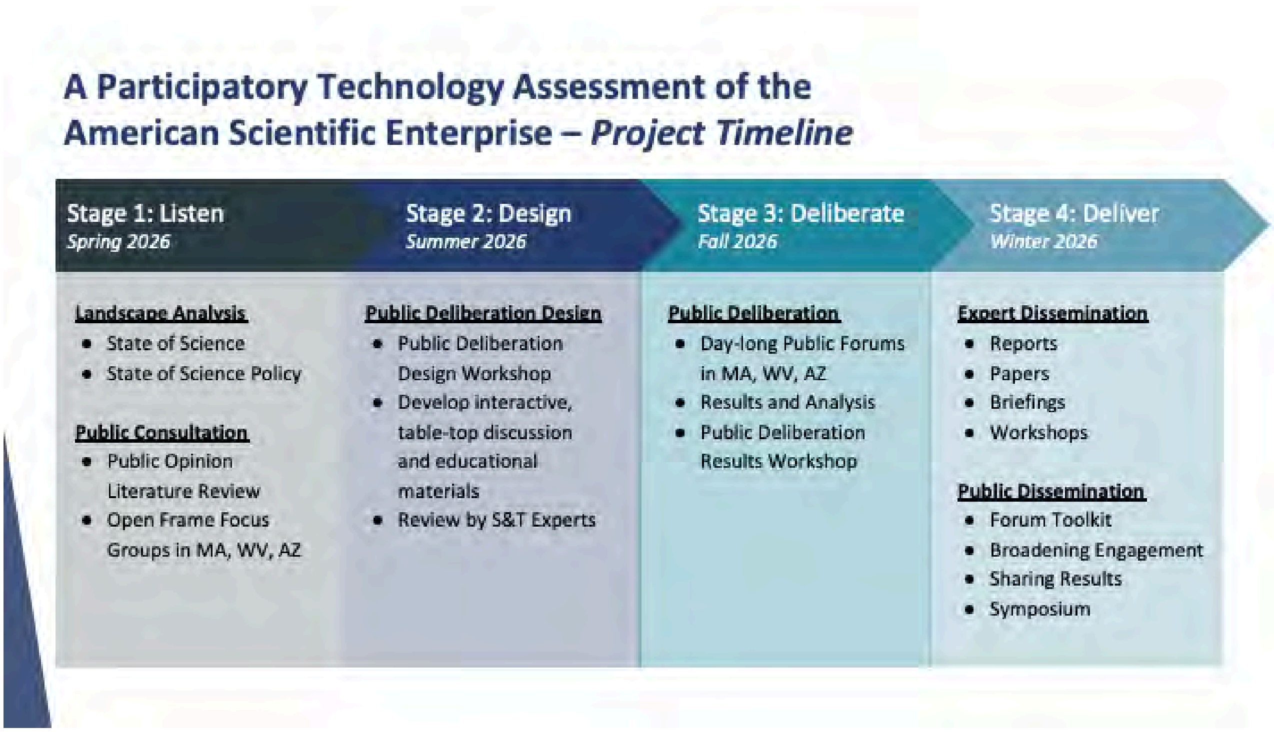
Who are our project partners?
To ensure the success of our gap-filling and coordination objectives, it is essential that we partner with programs, organizations, networks, and initiatives in a structured and systematic manner. We envision three primary categories of partners.

- ***Strategic partners*** are sponsors, advisors, and scholars who will provide overall guidance and direction during the project.
- ***Community partners*** are associations, networks, and local academic and nonprofit organizations that will support the implementation of the project's community, stakeholder, and public engagement activities, including expert consultations, interviews, workshops, and forums. We are thrilled to be working with the Museum of Science, Boston to host our Boston, MA engagements, Arizona Science Center to host our Phoenix, Arizona engagements, and WVU Extension to host our West Virginia engagements.
- ***Collaborative partners*** are regional and national organizations in the public, private, non-profit, and philanthropic sectors leading one or more of the reinstate, reform, and redesign initiatives to address current challenges and opportunities concerning the U.S. scientific enterprise.

What is our timeline and progress to date?
We kicked off our project with a panel discussion and stakeholder workshop in Washington, DC, on November 14, 2025. It was followed by a period of consultations and outreach to science policy experts, stakeholders, and philanthropic funders, as well as a presentation at the AAAS 2026 Annual Meeting in Phoenix on February 13, 2026.

Project launch event in Washington, DC, and Presentation at AAAS Annual Meeting in Phoenix, AZ

Building on the three-phase pTA methodology, we are implementing the project in four stages: Listen, Design, Deliberate, and Deliver.



In addition to ongoing outreach to project partners, stage 1 included commissioning two landscape analyses: (a) Snapshot of the Current U.S. Science Landscape and (b) Horizon Scan of the U.S. Science Policy Ecosystem. It also included the convening of three open-frame community dialogues:

- Museum of Science, Boston, May 11th & 12th, 2026
- Arizona Science Center, Phoenix, May 16th, 2026
- Jackson's Mill, WV, May 30th, 2026.

Public concerns may not always align with those of experts, and an expert-designed series of questions can overlook latent public concerns. Our method thus uses an issue-framing process through open-framing focus group dialogues. During these dialogues, 10-15 members of the public were given minimal background information and asked about their hopes and concerns regarding knowledge, learning, and the past, present, and future of their communities, as well as public support and priorities for science and technology.

Community Dialogues in Boston, Phoenix, and Jackson's Mill

In stage 2, we are convening a public deliberation design workshop on June 18th, 2026, in Washington with science and policy experts and stakeholders to gather advice and guidance on the topics, questions, content, and outputs of the three public forums. This will be followed by the design, development, and review of the three public forums in the summer of 2026.

In the fall, we plan to transition to the third stage of the project by hosting the three public forums simultaneously in MA, WV, and AZ on Saturday, October 3rd. The public forums will be day-long, informed, and facilitated dialogues on the past, present, and future of public support of science, to be held on October 3rd, 2026, among 70-75 non-expert members of the local communities in Massachusetts, West Virginia, and Arizona. During the forums, participants will sit at tables of 6-8 individuals, with a neutral facilitator guiding discussions across multiple sessions. The general structure of each session typically includes (a) watching a short, accessible, and balanced educational video or presentation, (b) engaging in an interactive and facilitated table discussion regarding the session topic, and 3) completing a group activity and individual worksheet. These deliberations are:

- **Informed**: Participants receive information packets reviewing the issues, questions, and areas of uncertainty prior to the deliberation. They are also given additional information throughout the day, including videos, deliberation materials, and briefings, to ensure they have sufficient information to understand and discuss the topic. Providing this information empowers participants to feel ready to discuss a given issue at a high level.
- **Diverse**: Participants are recruited through online and traditional channels and are offered a stipend to incentivize participation. Selection is informed by population demographics but does not prioritize statistical representation. Instead, it strives for diversity of background, expertise, and lived experiences relevant to the topic, bringing together a critical cross-section of the population of the city, state, or country of focus.
- **Interactive**: Participants are divided into small groups, where a neutral, trained facilitator guides them through a carefully designed bidirectional learning and engagement protocol. These are designed, developed, and evaluated by education professionals at science museums to make sure they are accessible and immersive. In addition to discussions, participants review cards depicting technology, stakeholder scenarios, and other relevant topics and complete individual and group activities.

During the public forum, we will collect both quantitative and qualitative data regarding public values and rationales. Quantitative data includes pre– and post-surveys, individual worksheets, Likert-type ratings and rankings, group ranking exercises, and demographic data. Qualitative data include written individual and group rationales, table observer notes, and audio recordings of table discussions. These data are analyzed using traditional methods of open and thematic coding. The statistical work is used to make sense of the data generated by the deliberations and to provide a general sense of the forum's effectiveness. Since more data is collected than can be analyzed in its entirety, we will host a results workshop in late fall to solicit expert and stakeholder input on areas for deeper analysis. This process helps ensure that the outputs of our deliberations are useful to policymakers and decision-makers. Using the feedback, in the final stage of the project, we will proceed on two fronts: (a) Expert Dissemination and (b) Public Dissemination. The expert dissemination will include presentations, reports, briefings, and workshops at scientific and professional society meetings and conferences, as well as events specifically designed for this purpose. The public dissemination will include creating a forum toolkit and sharing it with interested parties in other states and regions to facilitate replication and broaden participation and impact.

Problem Framing Phase Outputs

I. Horizon Scan of the U.S. Science Policy Ecosystem

Prepared by Alex Temple

Introduction: Policy Ideas and Emerging Trends for the Future U.S. Scientific Enterprise

The United States scientific enterprise is at a critical inflection point. Long regarded as the global leader in research, innovation, and technological advancement, the U.S. now faces a convergence of pressures that are reshaping how science is funded, governed, and translated into societal and economic impact. Rapid advances in artificial intelligence and emerging technologies, intensifying global competition, growing demands for accountability and equity, and structural inefficiencies within the research system have prompted a broad reassessment of the U.S. science policy ecosystem.

This horizon scan synthesizes policy ideas from across a diverse set of stakeholders (including federal advisory bodies, think tanks, academic institutions, industry groups, and nonprofit organizations) to identify emerging trends, challenges, and reform proposals shaping the next iteration of the U.S. scientific enterprise. Across these perspectives, there is a shared recognition that the current system, largely built on the postwar model of federally funded, university-based research, is under strain and may require significant adaptation to meet 21st-century demands.

Several cross-cutting challenges define the current landscape. First, there is growing concern that the research ecosystem has become increasingly inefficient and administratively burdensome, with scientists spending substantial time navigating complex funding processes, compliance requirements, and institutional incentives that may not align with discovery. Second, the balance between basic and applied research is under debate, with some stakeholders arguing that foundational science has been deprioritized, while others call for stronger alignment between research investments and national strategic goals. Third, workforce development challenges (including talent shortages, immigration barriers, and misaligned training systems) threaten the sustainability of the scientific pipeline. Fourth, the rise of AI and data-intensive science is driving demand for new infrastructure, governance models, and workforce capabilities that the current system is not fully equipped to support.

At the same time, opportunities for transformation are significant. Advances in AI, automation, and data systems offer the potential to dramatically accelerate discovery and reshape research processes. Expanding public-private partnerships can enhance the translation of research into real-world applications, while new institutional models, including focused research organizations and regional innovation hubs, offer more flexible and responsive approaches to organizing scientific work. There is also growing interest in decentralizing elements of the research system to increase participation, improve regional equity, and better align research with community needs.

The policy ideas captured in this scan reflect a wide range of approaches to reform. Some emphasize modernizing and scaling existing systems, such as investing in national AI research infrastructure, improving data access, and streamlining regulatory processes. Others propose restructuring core components of the ecosystem, including changes to grantmaking models, graduate education, and federal funding mechanisms. Still others advocate for greater strategic coordination, aligning science policy with national economic and security priorities, while a contrasting set of perspectives calls for decentralization and reduced federal involvement to restore scientific autonomy and efficiency.

Despite these differences, several common themes emerge. There is broad agreement on the need to reduce friction in the research system, improve the translation of discovery into impact, strengthen workforce pipelines, and ensure that the United States remains globally competitive in science and technology. At the same time, significant debates persist over the appropriate balance between federal leadership and market-driven approaches, the role of public values and societal priorities in shaping research agendas, and the tradeoffs between openness and security in an increasingly contested global environment.

Methodology

An online landscape analysis was conducted to review articles, policy papers, and public-facing publications discussing proposals to shape the future of the U.S. scientific ecosystem. The objective was to identify materials that not only assessed current science and technology policy challenges, but also offered substantive recommendations for improving and modernizing the U.S. research enterprise. In total, approximately 25 policy papers, commentaries, white papers, and response documents were reviewed, representing a broad range of institutional perspectives and viewpoints across the political and policy spectrum (listed in Annex 1).

The analysis began with the development of a stakeholder map of organizations involved in the U.S. scientific enterprise. This included think tanks, universities, scientific societies, industry organizations, research institutions, membership associations, and other science leadership organizations. Publications were selected based on whether they presented concrete policy proposals, governance concepts, or strategic recommendations related to the scientific ecosystem. Materials that consisted solely of commentary or critique without actionable policy ideas were excluded from the review.

A significant portion of the materials analyzed came from publicly available responses to the White House Office of Science and Technology Policy (OSTP) Request for Information (RFI) on strengthening the U.S. scientific ecosystem. The RFI solicited input on a range of topics, including administrative burden, basic research, workforce development, public-private partnerships, data infrastructure, research security, and the role of artificial intelligence in scientific research.

Following collection of the materials, a qualitative thematic review was conducted to identify recurring policy ideas, emerging concepts, and strategic priorities. Themes and key terms were coded across documents, including proposals related to governance reform, research funding models, workforce development, AI-enabled science, infrastructure modernization, regional innovation, and translational research. This horizon scan consolidates these recurring themes and policy ideas to highlight how different stakeholders diagnose challenges within the U.S. scientific ecosystem and the solutions they propose to address them.

Governance Policy Options for the Next U.S. Scientific Ecosystem

Debates over the future of the U.S. scientific ecosystem are increasingly centered on governance: how research is funded, who sets priorities, and how institutions are structured to translate discovery into societal and economic value. A diverse set of organizations—including the Milken Institute, National Security Commission on Emerging Biotechnology, Cato Institute, and Information Technology and Innovation Foundation—have proposed competing and, at times, complementary governance reforms. These range from decentralization and community-driven models to proposals for restructuring or reducing federal funding. Together, they reflect a broader reassessment of the postwar "Vannevar Bush" model of federally driven science.

A major theme across proposals is decentralizing scientific decision-making and increasing community engagement. Supporters argue that decentralization democratizes science and improves societal relevance. Critics caution that it may fragment national priorities, dilute scientific excellence, and introduce non-expert influence into technical decision-making. Proposals include regional hubs, community-integrated translational platforms, and a public education campaign for the value of data.

There was also discussion on ways to reform grant-making, including "mini-grants" and block grants. Focused Research Organizations (FROs) were also highlighted as operating on a smaller, more efficient, and nimbler scale to bypass bureaucratic constraints. Proponents argue these models increase efficiency and innovation. Critics raise concerns about fragmentation, lack of long-term stability, and challenges in scaling or coordinating across many small efforts.

Multiple organizations also called for a national strategy that prioritizes S&T areas to retain leadership in economic innovation. Supporters argue that a coordinated strategy is essential in an era of geopolitical competition. Critics caution that excessive top-down direction could stifle curiosity-driven research and politicize science.

Across the board, there is a desire to address regulatory policies with reforms aiming to create an environment where scientific discovery is more easily translated into commercial and societal outcomes. While incentives are broadly supported, disagreements remain over the appropriate balance between deregulation and safeguards, particularly in areas such as biotechnology and AI.

The governance of the U.S. scientific ecosystem is at an inflection point. Competing visions range from decentralized, community-driven models to strategically coordinated national systems, alongside more disruptive proposals to reduce or restructure federal funding altogether.

The central challenge for policymakers will be balancing autonomy and coordination, efficiency and equity, and innovation and accountability. The next iteration of the U.S. scientific ecosystem will likely incorporate elements from each of these approaches, reflecting both the complexity of the system and the diversity of stakeholder priorities.

Research System Challenges and Policy Options for Strengthening the U.S. Scientific Ecosystem

The U.S. scientific enterprise faces a growing set of structural challenges that are constraining its ability to produce breakthrough discoveries, efficiently translate research into applications, and maintain global leadership. Stakeholders across government, academia, and policy organizations—including the Business Roundtable, Institute for Progress, National Association of Scholars, and Milken Institute—highlight systemic inefficiencies in funding structures, administrative burdens, research prioritization, and security frameworks.

A central concern is the declining emphasis on basic, curiosity-driven research, with major focus on investing in basic research. There is tension between maintaining open-ended scientific inquiry and aligning research with national or economic goals. Critics of reform warn that overcorrection could reduce flexibility and creativity in research. Some organizations would like less of a focus on DEI, while others find that diversity contributes to the creativity of basic research.

Funding models and research incentives are the most contested issues, with ideas ranging from decreasing university funding to an emphasis on DARPA models. Supporters argue that reducing federal control could unleash innovation and reduce inefficiencies. Opponents warn that cuts could undermine basic research, exacerbate inequality between institutions, and weaken U.S. global leadership in science.

Administrative overhead has become a major constraint on scientific productivity. The National Security Commission on Emerging Biotechnology notes that researchers may spend over 40% of their time on administrative tasks, including grant applications, reporting, and compliance requirements. Efforts to streamline regulation must balance efficiency with accountability, ethical oversight, and public trust.

Another structural issue is the role of indirect costs (overhead) in shaping institutional behavior. The National Association of Scholars argues that the current system incentivizes universities to maximize grant revenue rather than prioritize scientific discovery. By tying overhead to direct research funding, institutions may prioritize quantity over quality. Universities argue that overhead funding is essential to maintaining infrastructure, while critics contend that the current system lacks transparency and efficiency.

Balancing research openness with national security has become increasingly complex. The Business Roundtable emphasizes the need to protect sensitive technologies and intellectual property from adversaries, while still enabling collaboration with trusted international partners.

The U.S. scientific ecosystem faces a set of interrelated challenges: declining emphasis on basic research, inefficient funding mechanisms, excessive administrative burden, misaligned institutional incentives, and growing security concerns

Private Sector Engagement and Public-Private Partnerships in the U.S. Scientific Ecosystem

Engagement with the private sector is increasingly viewed as essential to the future of the U.S. scientific ecosystem. Across stakeholders, including the Business Roundtable, National Science Board, Milken Institute, Center for Security and Emerging Technology, Association of American Universities, and the National Security Commission on Emerging Biotechnology, there is strong consensus that innovation is no longer driven by isolated academic or government research, but by integrated, cross-sector collaboration.

Arguments for engaging the private sector, across the board, include the desire to accelerate innovation and translations as well as leveraging private-sector data and capabilities. Sustained collaboration between government and industry is critical for maintaining U.S. leadership in strategic technologies. Public-private coordination enables scaling of innovations, strengthens supply chains, and ensures that research outputs translate into national advantage.

Organizations have numerous proposals to expand and modernize the public-private partnership policies. Concepts to strengthen technology transfer and commercialization pathways through addressing regulations and barriers. There are calls for launching large-scale collaborative initiatives and investing in shared infrastructure and coordination mechanisms. There are also governance ideas like incentivization through funding and tax policies.

Several tensions shape private-sector engagement policies, including public good vs. private incentives, openness vs. proprietary data, regulation vs. innovation, and short-term results vs. long-term research. There is a desire for partnerships to occur, but there are many ideological values that conflict with actors forming stronger collaborations.

Across stakeholders, a clear consensus emerges: the future U.S. scientific ecosystem will depend on deeper, more structured engagement with the private sector. Public-private partnerships are no longer supplementary but foundational to innovation, enabling the translation of research into real-world impact and strengthening national competitiveness.

Policy proposals focus on modernizing partnership models, improving incentives, reducing barriers, and building shared infrastructure. If effectively implemented, these approaches can create a more dynamic, collaborative, and impact-driven scientific enterprise, capable of addressing complex national and global challenges.

Workforce Development Policy Options for Strengthening the U.S. Scientific Ecosystem

The U.S. scientific workforce is undergoing a period of significant strain and transition. Rapid technological change has expanded the demand for science and engineering (S&E) skills across the broader economy, while structural challenges in education, immigration, funding, and workforce pipelines limit the nation's ability to meet this demand.

Organizations recognized the key challenges of the U.S. scientific workforce. Science and engineering skills are no longer confined to traditional research roles but are increasingly required across a wide range of industries. The U.S. scientific enterprise remains heavily reliant on international talent, yet visa delays and immigration barriers hinder recruitment and retention. Workforce development pathways, from K-12 education to advanced research careers, remain disconnected and uneven. Graduate education plays a central role in workforce development, but current funding structures create distortions. There are arguments to separate training funding from research funding to ensure that workforce development is treated as a distinct policy priority. Innovation depends not only on talent creation but also on the movement of talent across sectors and regions, evolving the needs of typical scientific requirements.

Policy options include strengthening the domestic STEM pipelines through stronger support at all levels. Some organizations call for reforms that attract and retain global talent. For higher education, there is emphasis on integrating the workforce pipeline that connects education, research, and industry with more alternative ideas on apprenticeships and the separation of labor from degrees. Lastly, there is a desire for policies that promote workforce mobility to expand regional talent development across disciplines and fields.

Several core tensions shape workforce policy decisions include domestic development vs. international recruitment, equity vs. merit-based systems, training vs. labor needs, and centralization vs. flexibility.

The U.S. scientific workforce is a critical driver of innovation, economic growth, and national security. However, current systems are not fully aligned with the demands of a rapidly evolving scientific and technological landscape.

Policy proposals across organizations converge on several priorities: strengthening STEM education pipelines, reforming immigration systems, modernizing graduate training, and improving workforce mobility. Together, these reforms aim to create a more flexible, inclusive, and globally competitive workforce.

Successfully implementing these policies will require coordinated action across federal agencies, educational institutions, and industry partners. A balanced approach, combining domestic investment, international talent attraction, and structural reform, will be essential to sustaining U.S. leadership in science and technology.

AI-Enabled Scientific Infrastructure for the Future U.S. Research Ecosystem

Emerging consensus across scientific, industry, and policy organizations highlights that artificial intelligence (AI) will fundamentally reshape the U.S. scientific enterprise. Rather than serving as a discrete tool, AI is increasingly understood as a *general-purpose, cross-cutting capability* that accelerates discovery, enhances research efficiency, and transforms how science is conducted. This section synthesizes key policy ideas from leading organizations to outline the infrastructure, tools, and governance systems required to support an AI-enabled scientific ecosystem. These recommendations are critical inputs to a broader horizon scan of U.S. science policy priorities.

AI's importance lies in its ability to dramatically increase the speed, scale, and scope of scientific discovery. Organizations such as the Foundation for Defense of Democracies emphasize that AI acts as a "force multiplier," enhancing data analysis, modeling, logistics, and decision-making across nearly all domains of science and technology. Similarly, the Business Roundtable underscores that U.S. leadership in AI will directly shape long-term economic competitiveness and scientific leadership.

At the same time, AI introduces new risks, including strategic competition and cybersecurity vulnerabilities, reinforcing the urgency of coordinated national investment.

There are some concepts ranging from infrastructure to policies that would boost AI capabilities with scientific research. A foundational requirement is the development of a national AI research infrastructure that ensures broad and equitable access to advanced tools and resources. AI-driven science depends on the availability of high-quality, interoperable, and accessible data. AI is expected to transform not only research inputs but also the process of scientific discovery itself. AI-enabled science is highly resource-intensive, requiring significant physical and energy infrastructure. A successful AI-enabled ecosystem requires a workforce with advanced technical skills and cross-sector experience. Finally, stakeholders emphasize the need for a coordinated national strategy and governance.

Across stakeholders, a clear vision emerges: the future U.S. scientific ecosystem will be AI-native, built on integrated systems of compute, data, infrastructure, and talent. Realizing this vision will require coordinated investments, policy reforms, and new models of collaboration across sectors.

By re-architecting the research enterprise around AI capabilities, the United States can accelerate discovery, improve research efficiency, and maintain global leadership in science and technology. This transformation represents not only a technological shift but a structural evolution of the scientific enterprise itself.

Conclusion

The policy ideas captured in this horizon scan reflect a scientific ecosystem in transition. Across infrastructure, governance, workforce development, research systems, and private-sector engagement, stakeholders consistently identify a need to modernize the structures that underpin U.S. science while preserving the core strengths that have historically driven discovery and innovation. The breadth of proposals, ranging from incremental reforms to more transformative restructuring, underscores both the complexity of the system and the urgency of adaptation.

Several overarching insights emerge from this analysis.

First, there is a clear shift toward viewing science as a system of interconnected capabilities rather than a set of isolated activities. Investments in AI infrastructure, data ecosystems, and advanced computing are not simply technical upgrades; they represent a reconfiguration of how knowledge is generated, shared, and applied. Similarly, workforce development is no longer confined to training researchers, but extends across the broader economy, requiring new approaches to education, talent mobility, and international recruitment. These changes point toward a future in which scientific capacity is distributed, networked, and deeply integrated with other sectors.

Second, the role of the federal government is being actively reconsidered. Some proposals call for stronger national coordination, including strategic priority-setting, large-scale infrastructure investment, and alignment with economic and security goals. Others advocate for decentralization and increased autonomy, emphasizing community engagement, alternative funding models, and reduced administrative burden. In practice, the emerging consensus suggests a hybrid model in which the federal government sets broad direction and enables infrastructure, while allowing flexibility and experimentation at the institutional and regional levels.

Third, there is growing recognition that the effectiveness of the scientific enterprise depends on reducing friction across the system. Administrative burden, fragmented data access, inefficient funding mechanisms, and regulatory complexity are repeatedly identified as barriers to productivity and innovation. Many of the proposed reforms, such as streamlined grant processes, interoperable data systems, regulatory sandboxes, and new funding models, seek to address these inefficiencies directly. The desired outcome is a system where researchers can devote more time to discovery, collaboration is easier across sectors, and ideas can move more rapidly from concept to application.

Fourth, the importance of translation and impact is a unifying theme. Stakeholders across the spectrum emphasize that scientific discovery must more effectively translate into societal and economic benefits. This has led to increased focus on public-private partnerships, technology transfer, regional innovation ecosystems, and mission-oriented research initiatives. At the same time, there is ongoing debate about how to balance these goals with the need to sustain curiosity-driven basic research, which remains the foundation of long-term innovation.

Fifth, the global context, particularly competition in emerging technologies, looms large in shaping policy priorities. Maintaining U.S. leadership in science and technology is increasingly linked to national security, economic competitiveness, and geopolitical influence. This has driven calls for strategic investment, stronger research security frameworks, and policies to attract and retain top global talent. However, it also raises important questions about how to preserve the openness and international collaboration that have historically fueled scientific progress.

Taken together, these insights point toward a future U.S. scientific ecosystem that is AI-enabled, workforce-driven, partnership-oriented, and strategically aligned, but also more complex and dynamic than its predecessor. Achieving this vision will require navigating a series of fundamental tradeoffs: between centralization and decentralization, efficiency and accountability, openness and security, and short-term impact and long-term discovery.

Importantly, no single reform or policy lever will be sufficient. The proposals outlined in this scan suggest that progress will depend on coordinated, iterative change across multiple dimensions of the system. Pilot programs, new institutional models, and policy experimentation will play a critical role in identifying what works, while sustained investment and leadership will be necessary to scale successful approaches.

As policymakers consider the path forward, this horizon scan highlights both the risks of inaction and the opportunities for renewal. By embracing a more adaptive, integrated, and forward-looking approach to science policy, the United States can strengthen its scientific enterprise to meet the challenges of the coming decades and continue to lead in discovery, innovation, and global impact.

List of Organizations

American Physical Society (APS)

American Public Land Grant Universities (APLU)

Association of American Universities (AAU)

Association of Research Libraries (ARL)

Business Roundtable (BRT)

Cato Institute

Center for American Progress (CAP)

Center for Security and Emerging Technology (CSET)

Consortium for Science, Policy & Outcomes (CSPO)

Foundation for Defense of Democracies

Gates Foundation

Heritage Foundation

Institute for Progress (IFP)

Information Technology and Innovation Foundation (ITIF)

Milken Institute

National Academy of Science, Engineering, and Medicine (NASEM)

National Association of Scholars (NAS)

National Education Association (NEA)

National Security Commission on Emerging Biotechnology (NSCEB)

Potomac Institute

Research!America

Technet

Vision for American Science & Technology (VAST)

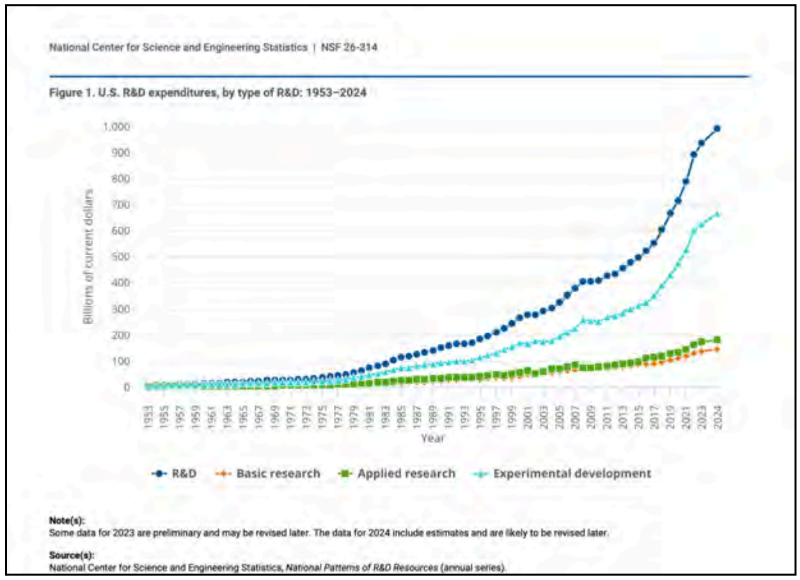
Wyss Institute

II. A Snapshot of the Current U.S. Science Landscape

Prepared by Maureen Kearney

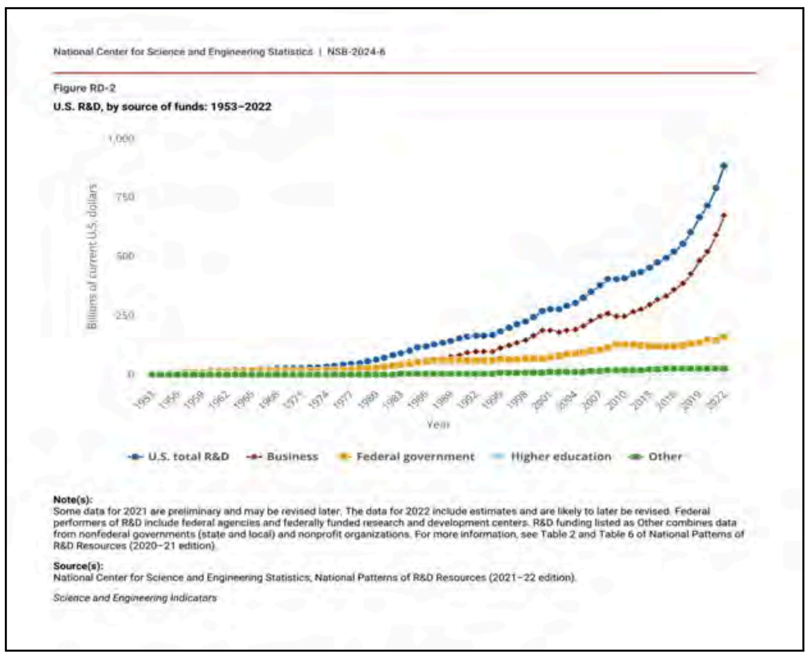
U.S. R&D at a Glance

The U.S. research enterprise has grown significantly, investing nearly a trillion dollars annually in R&D, with growth concentrated increasingly in experimental development. Total R&D expenditures have increased steadily for decades, while basic research represents a smaller share of overall activity and continues to depend heavily on federal support and university-based research environments. The overall balance of investments shapes the kinds of knowledge the system produces.

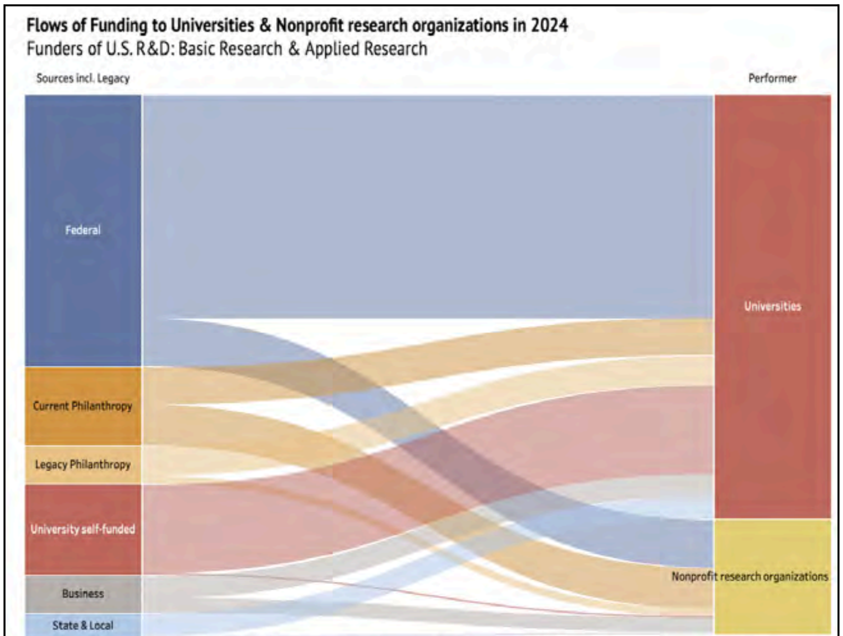


Who Funds Science?

The funding landscape has diversified, and federal investment remains uniquely important for long-term scientific discovery and capacity-building. During the decades following World War II, federal spending played the dominant role in expanding scientific capacity. Today, private industry accounts for most R&D expenditures, while federal investment represents a smaller share of the overall enterprise. Different sectors support different parts of the research enterprise. Industry funds most development-oriented research and product innovation. Federal agencies remain the primary supporters of basic research and mission-driven science. Universities contribute increasingly large amounts of funding, while philanthropy and venture capital have become important influences in selected fields. Federal agencies continue to play a unique role because they fund research whose benefits may emerge over decades rather than quarters. Philanthropic organizations and venture capital increasingly shape research agendas in areas such as biomedical science, artificial intelligence, climate technologies, and translational research. These investments can accelerate emerging fields but are often concentrated among a relatively small number of institutions and research domains.



Funding Pathways

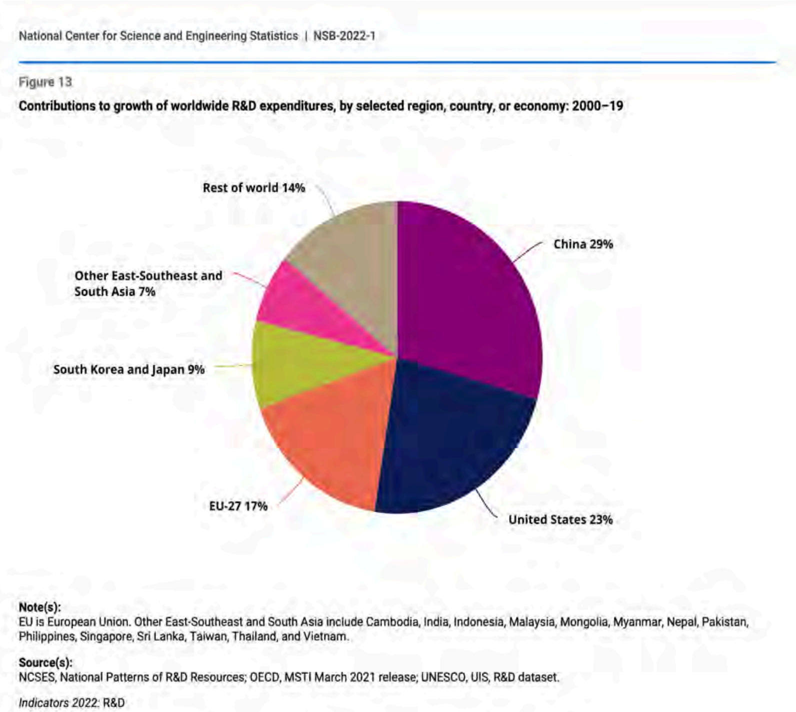


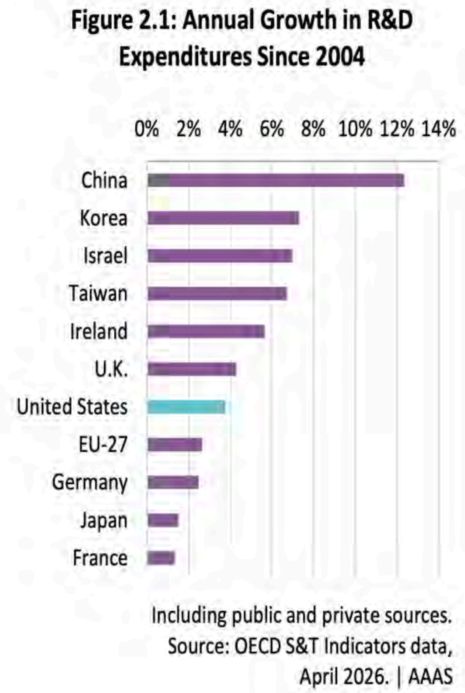
Source: National Center for Science and Engineering Statistics. 2026. National Patterns of R&D Resources: 2023–24 Data Update. NSF 26-313. Alexandria, VA: U.S. National Science Foundation. Available at https://ncses.nsf.gov/data-collections/national-patterns/2023-2024 Note: This figure is adapted to estimate "legacy philanthropy" at both universities and non-profit research organizations as Conn et al. (2023) did for universities.

Funding pathways are diverse, and scientific priorities emerge from thousands of decentralized organizations, decisions and interactions. In the United States, scientific priorities emerge from thousands of decisions made by federal agencies, congressional appropriations processes, universities, private firms, philanthropic organizations, investors, scientific communities, and the public. Federal research funding is largely organized around missions - agencies such as NSF, NIH, DOE, USDA, NASA, and DOD each pursue distinct objectives and support different forms of scientific activity. Outside government, private industry prioritizes opportunities that align with commercial incentives and market demand. Philanthropic organizations often support areas overlooked by traditional funding systems or seek to accelerate work on specific societal problems. Universities shape priorities through hiring decisions, infrastructure investments, and institutional strategy. The resulting system is highly decentralized.

Science, Globally

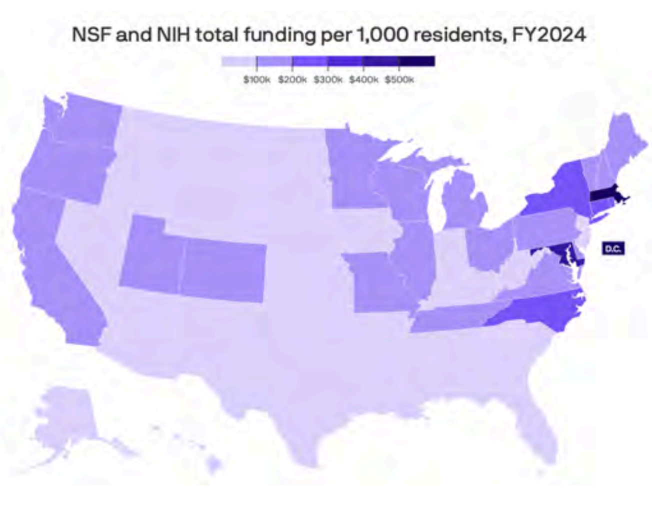
Scientific capacity is increasingly distributed across nations, creating a more competitive and interconnected global research system. Over the past three decades, research investment has expanded across much of the world. China's growth has been especially rapid. Once a relatively minor participant in global science, it is now a major contributor across most scientific indicators, including R&D spending, publications, patents, and STEM degree production. Other nations, including South Korea, India, Singapore, and several European countries, have also expanded research investments substantially. Scientific publication output has grown worldwide as new institutions, funding systems, and international collaborations have emerged. The result is a far more distributed global knowledge system than existed at the end of the twentieth century.

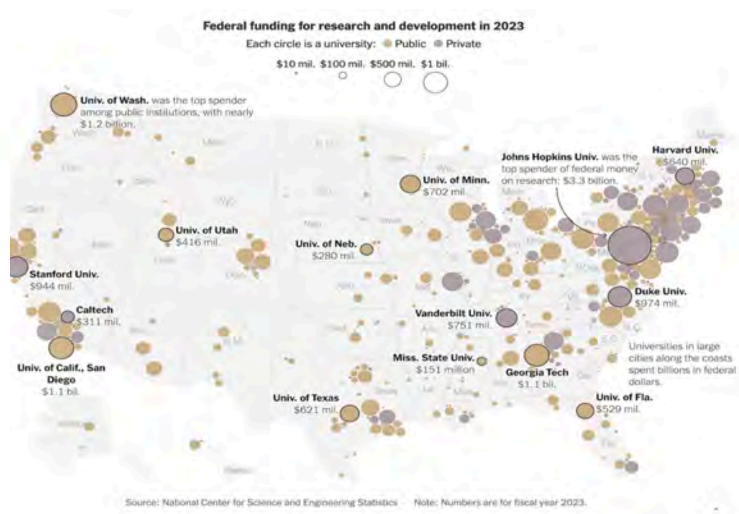




Where Science Happens

Research capacity exists throughout the nation, yet funding, infrastructure, and workforce are concentrated in a relatively small number of places. The U.S. research enterprise is often described as national in scope, yet research activity is highly concentrated. A relatively small number of states, metropolitan regions, and institutions receive a disproportionate share of federal research funding. This concentration reflects both historical investments and self-reinforcing dynamics. Institutions with strong research reputations attract faculty, students, funding, and industry partnerships, creating positive feedback loops that further strengthen their positions.

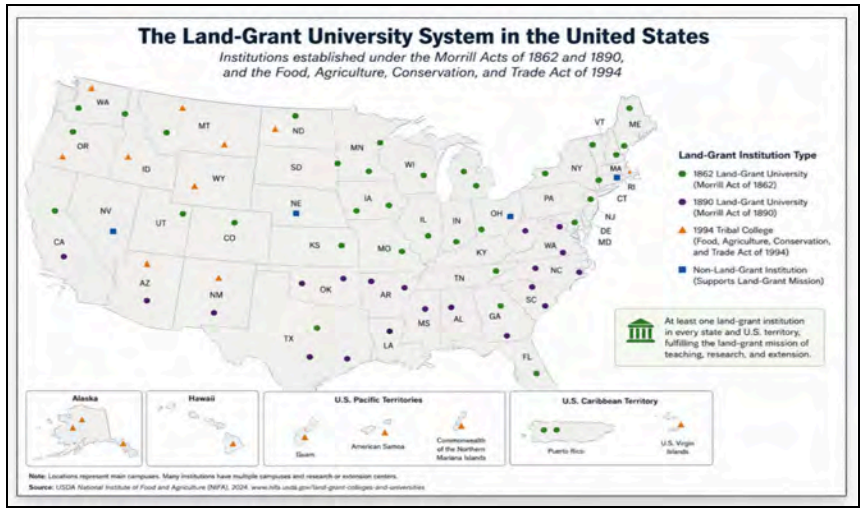


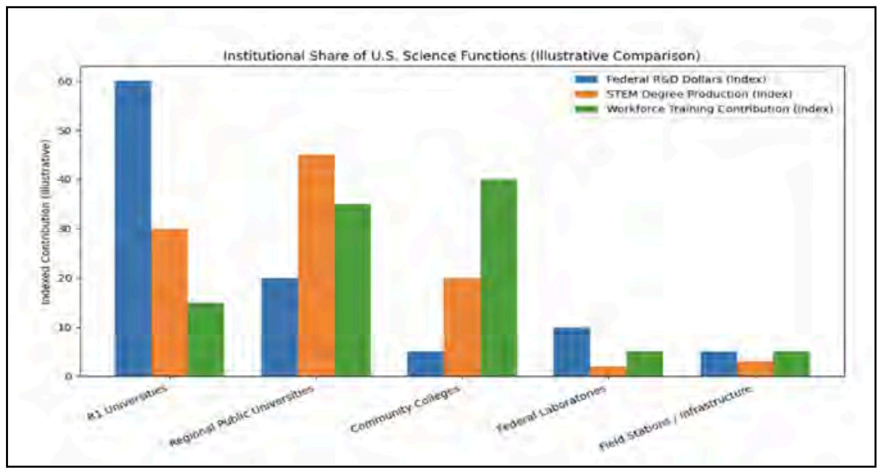


Source: Fitzpatrick, A. (2025, January 29). *Which states get the most federal health and science funding*. Axios.

The “Invisibles”

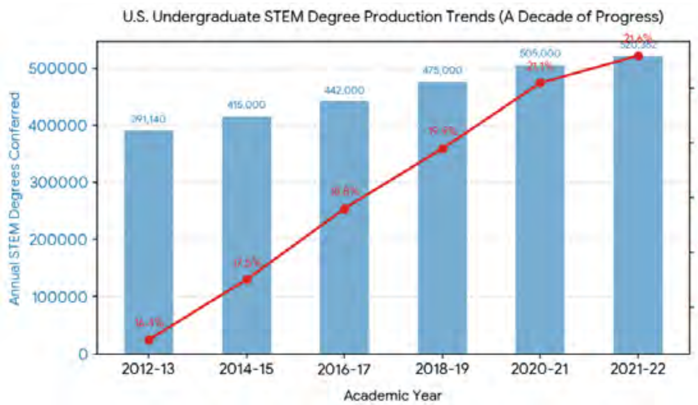
The broader scientific ecosystem depends upon a much larger and more diverse set of institutions that is commonly recognized. Established to expand educational opportunity and support agricultural and industrial development, land-grant universities continue to conduct research, educate scientists, provide extension services, and serve communities across every state. Regional public universities, primarily undergraduate institutions, HBCUs, TCUs, HSIs, research museums, field stations, and marine laboratories also play essential roles. Together they educate large numbers of students, provide scientific expertise to communities, steward collections and data resources, and maintain research capacity in regions that might otherwise lack it. Although these institutions often receive a smaller share of federal research funding, they contribute disproportionately to workforce development, public engagement, regional innovation, and place-based research.

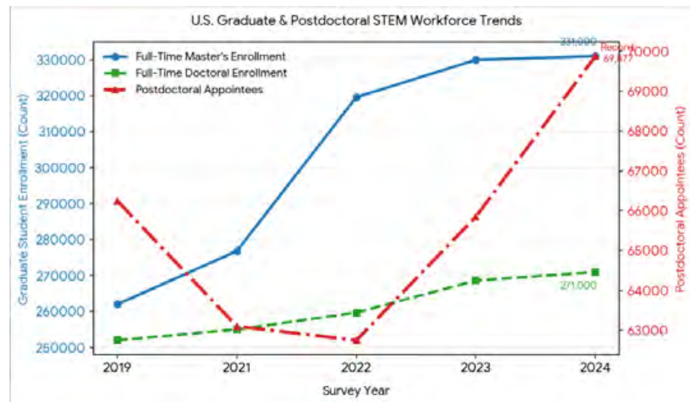




Creating Scientists

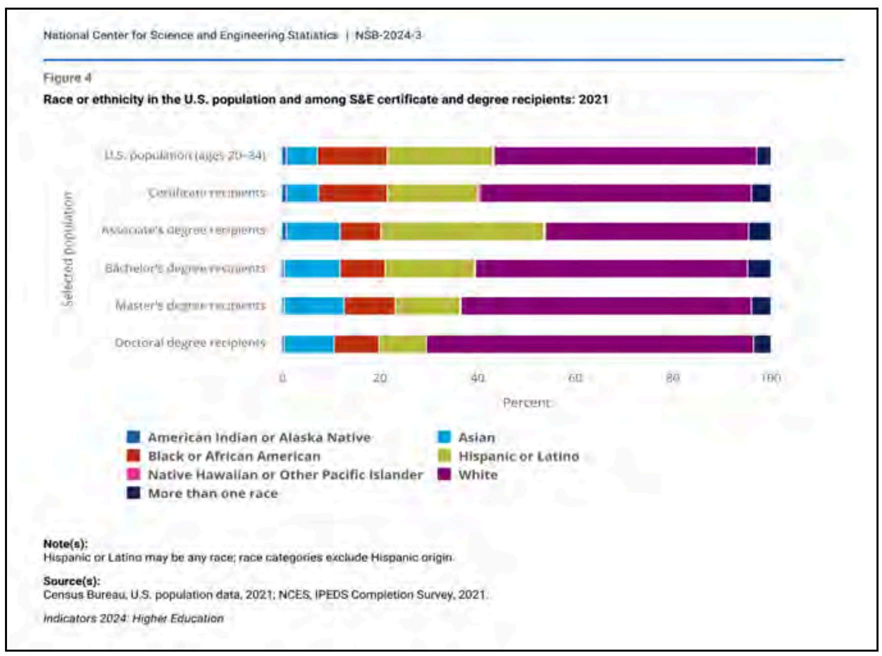
The research enterprise depends on a growing talent pool, but the pathway from training to stable science careers has become increasingly uncertain. The American research enterprise depends on a continuous flow of students entering scientific and technical fields. Over the past decades, undergraduate degree production has expanded substantially, particularly in computing, engineering, and the life sciences. Graduate education has expanded as well. Hundreds of thousands of graduate students and tens of thousands of postdoctoral researchers now participate in the nation's research enterprise. Many researchers spend a decade or more in advanced training before obtaining stable professional positions. Graduate students and postdoctoral researchers increasingly perform essential research labor while simultaneously preparing for careers whose outcomes are often uncertain. The expansion of educational attainment has strengthened national scientific capacity. At the same time, it has created growing questions about career pathways, workforce sustainability, and the relationship between training systems and employment opportunities.





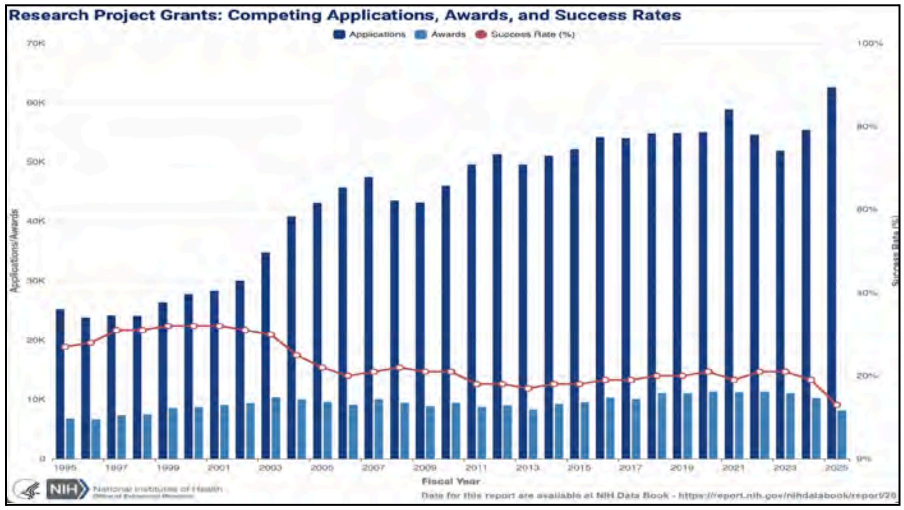
Data Sources: National Center for Education Statistics [NCES], 2024

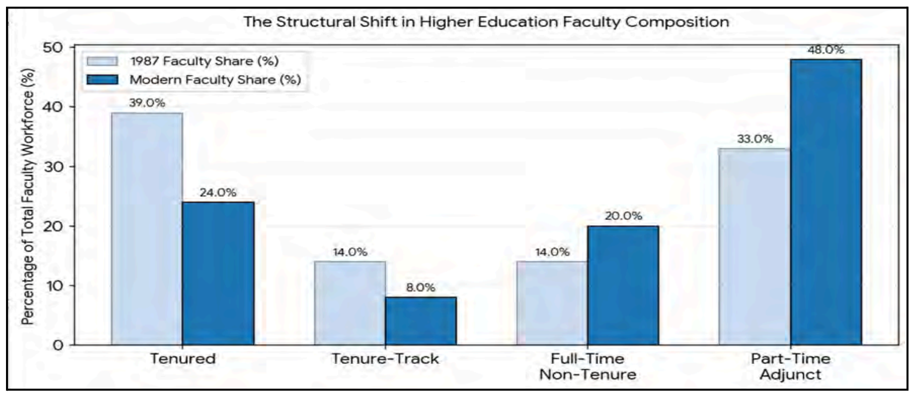
Who Participates?



Participation in science has broadened, yet significant disparities remain across career stages and disciplines. The demographic composition of the scientific workforce has changed over the past half century. Women and historically underrepresented groups participate in STEM fields at higher rates than previous generations, reflecting expanded educational access and deliberate efforts to broaden participation. Progress, however, has been uneven. Representation varies considerably across disciplines and career stages. In many fields, diversity among students and early-career researchers exceeds diversity among senior faculty, institutional leaders, and principal investigators. These patterns suggest that access alone does not fully address disparities in advancement, retention, and leadership opportunities. The United States also relies heavily on international talent. Scientists and engineers from around the world play major roles in research universities, national laboratories, startups, and technology industries.

The Scientist's Experience



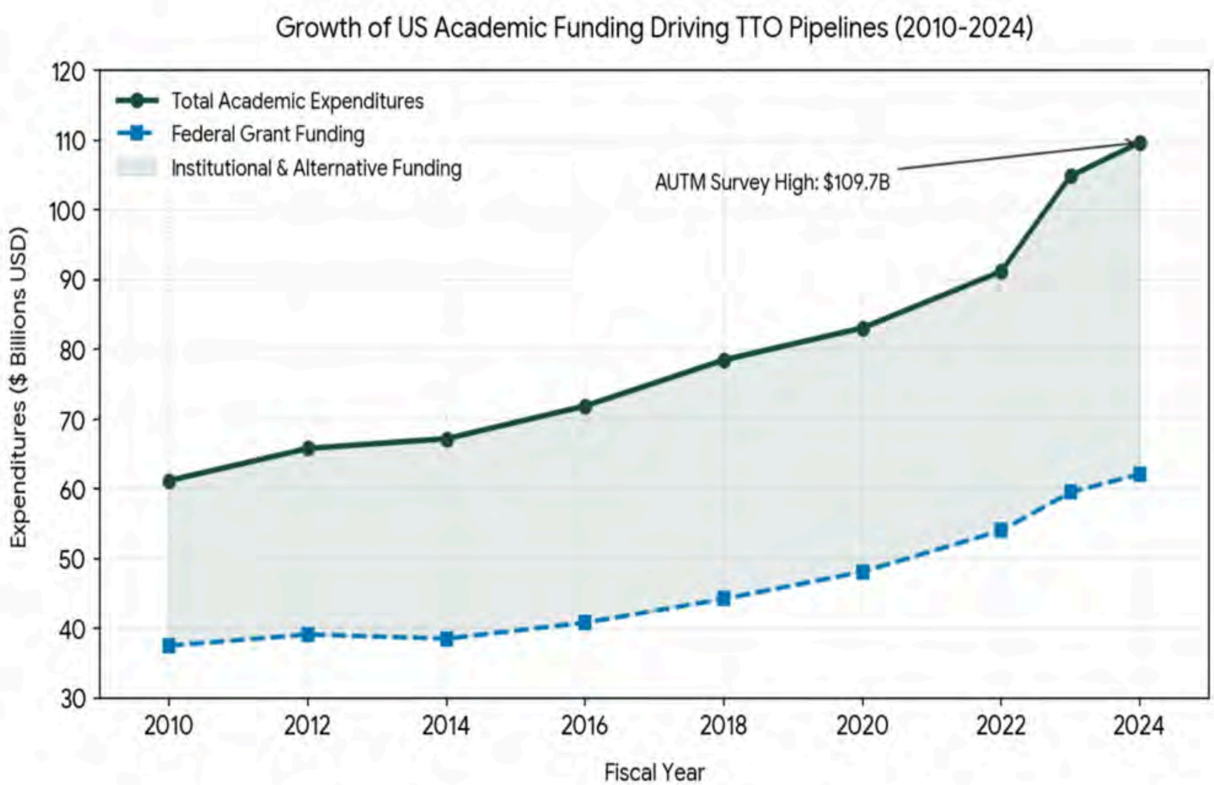


The incentives that shape scientific careers increasingly shape the kinds of science that get done. The experience of being a scientist today differs in important ways from that of previous generations. Research funding has become increasingly competitive, proposal preparation consumes more time, and administrative requirements have expanded substantially. Many scientists operate within environments characterized by short-term funding cycles, uncertain career trajectories, and strong pressure to secure external grants. Academic institutions themselves increasingly depend on grant revenue, creating incentives that reinforce competition throughout the system. The structure of scientific employment has also changed. Non-tenure-track faculty, soft-money researchers, research staff, and postdoctoral scholars now constitute a growing share of the workforce. Stable academic positions have not expanded at the same pace as scientific training programs. These dynamics have generated concerns about research culture, workforce sustainability, mentorship, well-being, reproducibility, and the ability of scientists to pursue high-risk, long-term questions.

Graphics Data Source: American Association of University Professors [AAUP], 2024

Knowledge Transfer and Public Value

The United States has built powerful systems for translating science into applications and markets, but weaker systems for translating science into broader public value outcomes. One of the defining strengths of the U.S. research enterprise is its ability to convert scientific discoveries into economic activity. Over the last few decades, agencies and universities have dramatically expanded technology transfer operations, patenting activity, startup formation, and industry partnerships. These mechanisms have contributed to advances in medicine, information technology, agriculture, energy, manufacturing, and countless other sectors. Yet commercial success represents only one pathway through which science creates value. Many important societal challenges—including public health, environmental sustainability, education, resilience, and community well-being—depend upon translating knowledge into policies, practices, institutions, and public decision-making. Compared with commercial technology transfer systems, these public-value translation pathways are often less developed, less coordinated, and less consistently supported.



Data Sources: AUTM. *AUTM Annual Licensing Activity Survey*, 2025, autm.net.

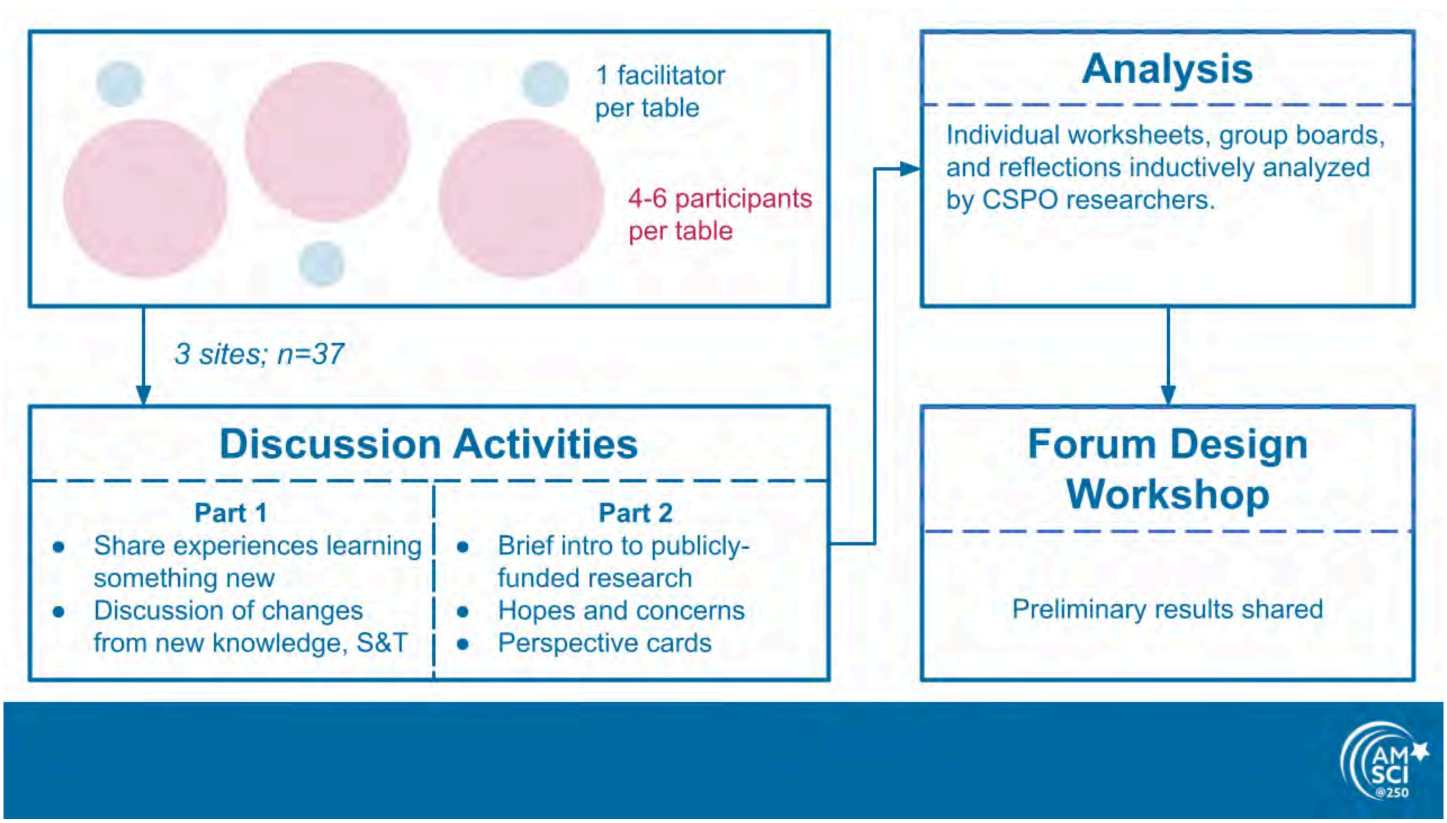
III. Open Framing Dialogues

Prepared by Nicholas Weller & Porter Malcolm

Open framing dialogues explore public perspectives and values about the American Scientific Enterprise for considerations alongside those reported in literature and those of experts and stakeholders. Rather than constricting discussions at these dialogues to known perspectives from experts and stakeholders, discussions were relatively unstructured and allowed public participants to share their ideas and stories about the value of science, research, learning, and public funding for research.

In May 2026, we conducted one dialogue in each of the following locations: Boston, MA, Phoenix, AZ, and rural West Virginia. See Tables 1 and 2 for the demographics of participants. Dialogues consisted of facilitated small group discussions broken into two parts. Part one explored participants' experiences, ideas, and views about personal and societal pursuit of new knowledge, changes in societal knowledge over time, and the interaction between discovery and social change. Part two explored participants' ideas and views about public funding for research and their corresponding hopes, concerns, and priorities for the research enterprise. See Table 3 for a more detailed dialogue agenda.

Overview of open framing dialogues



FINDINGS

Here we report the most salient findings from preliminary qualitative and quantitative analysis of these focus groups. Findings show that the public viewed science and research as a pathway to societal outcomes and as valuable in their own right. Participants were skeptical of current governing institutions and their decisions about science while also offering a variety of viewpoints for improving the scientific enterprise.

Finding 1 - Societal outcomes of research

Participants highlighted the **societal outcomes of research, science, and technology in discussions about the past, present, and future**. Outcomes discussed included:

- Cures, treatments, and the prevention of various health (including mental health) conditions and diseases (especially cancer).
- Solutions to existing environmental problems and changes to human and technological activities that contribute to environmental harm.
- Improvements to everyday life, including transportation and communication technologies like autonomous vehicles or cell phones.
- Jobs, financial growth, and economic outcomes enabled by new technologies, new knowledge, and education about those new technologies

Participants also discussed managing negative societal outcomes that have already or might arise with new knowledge and technologies. These included the loss of jobs, environmental harm, and changes to human relationships. Participants often framed these negative outcomes by discussing the failings or misalignments of current institutions; for instance, lack of regulation on industry and technological development were cited as reasons for environmental degradation or job losses. Participants also discussed how changing social norms shape and are shaped by new technologies and knowledge. For example, participants discussed the dynamics between norms of in-person communication and services or businesses replacing in-person stores with automated or app-based storefronts with no face-to-face interactions.

When asked to list their own priorities for publicly-funded research, participants included the following societal challenges in addition to the topics listed above:

- Ending homelessness
- Healthier foods and food systems
- Enabling access to new technologies and new knowledge through education and public access programs

Participants also prioritized efforts to make the fruits of public investments in research more accessible and affordable. For example, two of eight groups explicitly linked their desired priorities and outcomes to universal access programs for healthcare, jobs, and housing. In a ranking activity about various priorities for governing public investments in research, participants ranked "Public Ownership of

Research" second highest of all priorities, and justified the ranking by stating that scientific advances should be affordable and widely available (see Tables 6 and 7).

In responses to the registration questionnaire, 23 participants (62%) responded they had "a great deal" of confidence in science to create valuable contributions to the public, the highest of any of the societal institutions in the questionnaire (see Table 4)

Finding 2 - Science and learning as important endeavors

In addition to finding 1, many participants discussed **science and learning important and worthwhile endeavors worthy of public investment** regardless of its contributions to specific societal, technological outcomes. These took the form of:

- General references to the importance of pursuing knowledge and science
- Desire for more funding for research
- Desire to generate or revitalize popular interest in science and scientists
- Value of learning new things (both for individuals and for society)

Some discussions of this topic were not accompanied by detailed explanations while others occurred when participants brought up federal funding cuts to scientific research and higher education. Participants also pointed to science as an important human ideal, noting that it inspires, challenges our thinking, and betters our lives in intangible ways. For example, one participant wrote of the need to "keep the fire [of science] going" for future generations. Another reflected that it was part of the human condition due to our constant "creating and solving problems."

Finding 3 - Low confidence in federal government's ability to make decisions about science

Participants were **deeply skeptical of governing institutions and their past and present decision making about science.**

No participants expressed they had a great deal of confidence in the federal government in the pre-dialogue questionnaire. Fifteen participants (41%) said they had very little confidence in the federal government (see Table 4). When the current administration was mentioned, it was generally referenced as causing harm to the national innovation system.

In discussions about federal funding for research, participants consistently questioned whether congressional decisions about the federal budget reflected the public's priorities. In particular, participants frequently stated the desire to reallocate funding from the Department of War (including S&T and non-S&T funding) to other ends, including health, housing, environment, science, and education.

As part of the ranking activity of perspectives for governing science, the card "Public Funding for Public Outcomes" explicitly pointed to Congress and the federal government as decision makers about what research contributes to the public good. It was most frequently selected by participants as their lowest priority, despite being similar to other perspective cards (e.g., Public Ownership of Research Outcomes) that did not mention Congress or the federal government (see Tables 6 and 7).

Some participants brought up concerns about corruption, conflicts of interest, and greed when discussing decisions about publicly funded science or the institutions that make those decisions (e.g., Congress). Similarly, participants scrutinized the role of industry in making decisions about or receiving public funds for research. Still others worried about "political" motivations for decisions about publicly-funded research, with some participants concerned about current changes to policy and others pointing to the need for "bi-partisan and independent" research projects.

While not explicitly about governing science, many participants suggested or asked questions about changing shared governing institutions. For example, participants in Boston and Phoenix wrote questions about reforming how Congress makes decisions about the federal budget. A group in Phoenix discussed the need for accountability for Congress and the federal government to promote decisions that reflect what the public desires from public institutions. Taken together with other results, this suggests that participants were constructing a view of the public good or public will not represented in existing democratic arrangements.

Finding 4 - Variety of perspectives for governing publicly-funded research

Participants discussed the **importance of a variety of values and considerations regarding governing publicly-funded research**.

Participants referenced a clear role for scientists and experts to play in making decisions about publicly-funded research, noting the important expertise research themselves bring to evaluating research ideas. However, participants also strongly emphasized the need for publicly-funded research to pursue goals important to the public good. In the ranking of governance considerations, for example, "Mission-Driven Science" was most frequently selected by both groups and individuals. Discussions about this perspective highlighted the need for public investments to result in research that benefited the public and avoid research that "goes nowhere." The perspective card, "Curiosity and Science" attracted mixed views from participants, with some emphasizing the importance of giving scientists agency to pursue what's interesting to them and others concerned about research that leads to few benefits. Participants in West Virginia were particularly enthusiastic about the importance of curiosity for guiding research.

Many discussions focused on factors that participants thought could improve research or outcomes from research. Participants frequently pointed to actors external to research as important contributors, noting that input from communities, those with local knowledge, industry, the international community, or those from different cultural backgrounds was important for doing good research. Others referenced the importance of including people from all backgrounds in things like clinical trials. That said, some were skeptical of the ways different actors might exert influence on research or decisions about research funding, pointing to bureaucratic motivations, the ambition of researchers themselves, or industry motivations as concerns.

Some participants prioritized transparency about research and decisions about science as a key attribute. Others noted the importance of ensuring that publicly funded research was not subject to political pressures or biases. Some of these conversations about transparency and bias were framed as challenges for the accuracy, legitimacy, and trust of the research produced.

As outlined in finding 3 above, participants also discussed alternative ways of making decisions about publicly-funded research, including democratizing decisions about funding or questioning if existing democratic mechanisms (e.g., Congress) are representing the public good in such decisions.

Table 1. Open framing dialogue participant demographics

	Total Count	%	Boston	Phoenix	West Virginia
Total participants	**37**	100%	12	16	9
GENDER					
Male	17	46%	5	11	1
Female	19	51%	7	5	7
Nonbinary	1	3%	0	0	1
GEOGRAPHY					
Urban	21	57%	9	11	1
Suburban	9	24%	2	4	3
Rural	7	19%	1	1	5
HOUSEHOLD INCOME					
Less than $25,000	7	19%	3	4	0
$25,000-$49,999	9	24%	3	6	0
$50,000-$74,999	8	22%	2	2	4
$75,000-$99,999	4	11%	1	2	1
$100,000-$149,999	2	5%	1	0	1
$150,000 or more	4	11%	1	1	2
Prefer not to say	3	8%	1	1	1
POLITICAL PARTY ID					
Republican Party	6	16%	1	4	1
Democratic Party	10	27%	3	3	4
Independent (no party)	14	38%	6	5	3
Other (Green Party, Libertarians, etc.)	3	8%	1	1	1
Prefer not to say	4	11%	1	3	0
POLITICAL LEANING					
Very Liberal	7	19%	3	2	2
Liberal	8	22%	2	3	3
Middle of the Road	15	41%	6	5	4
Conservative	4	11%	1	3	0
Very Conservative	1	3%	0	1	0

Table 1 continued

	Total Count	%	Boston	Phoenix	West Virginia
ETHNICITY					
White	22	59%	4	9	9
Black	5	14%	2	3	0
Asian	3	8%	3	0	0
American Indian or Alaska Native	1	3%	0	1	0
Native Hawaiian or Other Pacific Islander	1	3%	0	1	0
Multiracial	1	3%	1	0	0
Hispanic or Latino	7	19%	3	4	0
Prefer not to say	0	0%	0	0	0
Other	1	3%	1	0	0
EDUCATION					
No high school degree	1	3%	0	1	0
High school degree or equivalent (GED)	5	14%	0	5	0
Some college	12	32%	2	6	4
Bachelor's degree	11	30%	7	3	1
Graduate or professional degree	8	22%	3	1	4

Table 2. Self reported industry of participants by location

Boston	Phoenix	West Virginia
• Curriculum Development and Education • Customer Service • Healthcare • Healthcare • Healthcare • Higher Education • Laborer • Online • Performing Arts and B2B Sales & Marketing Support • Real Estate • Retail • Technology	• Customer Service Representative • Automotive • Banking • Caregiver • Collections • Construction • Educational/Financial Services • Events and Promotions • Financial Services • Food and Beverage • General Labor • Healthcare • Healthcare • Retail • Skilled Trade • Transportation	• Education • Education • Education • Education • Education • Education • Industrial/Commercial Electrical Construction & Maintenance • Retail • Student

Table 3. Dialogue agenda

Section	Guiding Questions/Topics
Part 1	**Knowledge and Change**
Table Introductions	Participant introductions Share something (picture, story, etc.) that makes you curious about the world
Ways of Knowing	Describe a time you learned something new or learned how to do something new
Sci/Tech Changes	How have past, present and future generations experienced new ideas, whether that be new technologies, medicines, foods, transportation, social changes, etc.?
Part 2	**Exploring American Science Policy**
Publicly-Funded Research	5-minute video describing history of public investments in research in the US and a breakdown of federally funded research budget from 2024
Hopes & Concerns	What are your hopes, concerns, priorities, and questions about publicly-funded research in the US?
Perspectives Ranking Activity	Read then rank 10 perspectives about publicly-funded research. Perspectives drawn from historic and present debates about science policy.
Themes From Today	What themes best describe your discussions today?

Participant Pre-Dialogue Questionnaire Responses

Table 4. How much confidence do you have in each of the following institutions of American society to create valuable contributions to the public?

	Science	**Higher education**	**Civil society**	**Technology companies**	**The medical system**	**Local govern-ment**	**Church or organized religion**	**State govern-ment**	**Federal govern-ment**
A great deal	62%	41%	19%	14%	11%	8%	5%	3%	0%
Quite a lot	19%	32%	41%	46%	30%	27%	24%	27%	16%
Some	16%	24%	38%	32%	38%	54%	49%	49%	43%
Very little	3%	3%	3%	8%	22%	11%	22%	22%	41%

Table 5. How important are each of the following institutions to creating positive change in American society?

	Science	**Higher education**	**Civil society**	**Technology companies**	**The medical system**	**Local govern-ment**	**Church or organized religion**	**State govern-ment**	**Federal govern-ment**
Very important	49%	43%	32%	19%	43%	49%	16%	38%	49%
Important	32%	49%	32%	35%	32%	30%	35%	41%	30%
Somewhat important	19%	5%	30%	38%	22%	19%	38%	19%	14%
Not at all important	0%	3%	5%	8%	3%	3%	11%	3%	8%

Table 6. Perspectives on governing publicly funded research - Ranking activity
(1-10, 1 being most important)

All sites	**All Sites - Average - Indiv**	**All Sites - Median - Indiv**	**All Sites - Average - Group**	**BOS - Average - Indiv**	**PHX - Average - Indiv**	**WV - Average - Indiv**
Mission-Driven Science	3.5	3.0	2.8	2.8	4.3	3.2
Partnerships for Research Outcomes	4.5	4.0	3.8	3.7	5.5	4.1
Public Ownership of Research	4.5	4.0	3.0	4.1	5.5	3.6
Science & Curiosity	4.8	4.0	4.5	5.8	4.7	3.2
Scientists Make Decisions	5.2	5.0	4.6	6.3	5.0	3.9
Distribution of Funding	5.9	6.0	6.1	5.4	5.7	6.9
Supporting Industry	6.6	7.0	7.3	6.6	6.6	6.7
Commercialization & Incentives	6.8	7.0	6.9	7.5	5.8	7.3
Reducing Administrative Costs	7.1	8.0	8.3	6.4	7.0	8.4
Public Funding for Public Outcomes	7.5	9.0	7.9	6.5	8.3	7.7

Table 7. Perspective cards for ranking activity

Card Title	Card Text
Mission-Driven Science	Decisions about what science to fund should be guided by specific missions, such as helping farmers grow their crops or developing new treatments for diseases.
Partnerships for Research Outcomes	Today's science and technology challenges require partnerships among industry, researchers, governments, and communities.
Public Ownership of Research	When publicly funded research leads to a new technology or medical treatment, the public should own the rights to it. This would allow the government to make these inventions available at lower prices.
Science & Curiosity	Science does not have to solve a specific problem. The open-ended pursuit of knowledge deserves public funding because understanding our world is a worthwhile goal..
Scientists Make Decisions	Scientists are the experts in their fields. They understand the long-term commitment their work requires and the costs and benefits that come from research. Scientists should make most of the decisions about what science should receive public funding.
Distribution of Funding	Some argue that too much public funding for science goes to senior researchers at large universities, which limits the growth of early career researchers and new ideas. Others argue that public funding for science should be more evenly distributed across states.
Supporting Industry	Public funding of science helps industry by creating knowledge, patents, and technologies that industry can use. Industry won't pay for some research because the benefits of that research are uncertain and don't justify the cost.
Commercialization & Incentives	Universities and small businesses that receive public funding for research should be able to patent the discoveries they make with that funding to prevent promising research from going unused.
Reducing Administrative Costs	Many universities and organizations that receive public funding spend some of that money on administrative costs for staff and laboratories that make research possible. Some argue that too much public funding for research goes to administrative costs.
Public Funding for Public Outcomes	Public institutions—like Congress or the federal government— should make most of the decisions about what scientific research is funded by the government and how it contributes to the public good.

Workshop Participant Responses to Pre-Workshop Questions

Responses below have not been edited except to de-identify participants where necessary. The response list was updated as of 6/24/2026 at 12:00 pm EST.

Which components of the NIS are working well and must be maintained at all costs?

- Companies are doing a good job of developing new products and services - oftentimes the result of university discoveries. US companies are still leading the world in making products and getting them to market where they lead the world.
- I think the NIS is in turmoil and I am not sure any of its components are currently working well in a political environment that is chaotic. The pragmatic optimist in me says "never waste a good crisis," so I hope we can use this instability to adapt and improve the NIS for the long-term. There are two parts of the NIS that are of particular interest to me: (1) building S&T policy capacity in state and local governments; and (2) using science fiction to inform and engage public opinion about S&T policy issues.
- Broad support for research, esp. biomedical research. Flexible triple helix.
- Federal investment in science through grants, agencies, etc.
- The strongest components of the NIS are those that explicitly connect knowledge creation to public benefit, including sustained federal research investment with “broader impacts” expectations, the land-grant tradition of outward-facing engagement, and the continued support for longitudinal and population-based data systems that enable real-world measurement over time. Together, these elements create a foundation in which research is not only produced but positioned to inform policy, economic development, and community well-being. From our research center’s perspective, these strengths are most evident where rigorous data infrastructure intersects with public-purpose mandates, reinforcing a system in which empirical evidence, representative sampling, and longitudinal tracking allow institutions to demonstrate how research translates into societal outcomes rather than remaining confined within academic domains.
- The country's research universities continue to serve as powerful engines of discovery. Federal investments in basic research have generated enormous returns over decades, creating foundational advances in computing, biotechnology, aerospace, materials science, medicine, among many fields. And the United States continues to possess an exceptional capacity for reinvention.
- The national labs and industry laboratories are generally working well and must be maintained as strong pillars of our NIS. The relationships between NIS entities and institutions in other countries are also generally working well and must be maintained.

- Federal funding of science in the public interest, science that advances the basic foundation, blue sky, addresses gaps that private sector wouldn't take on, advances equitable outcomes for the public in health, food, environment, climate, transportation, energy, security, agriculture, social sciences, arts and humanities, etc.
- This is a bit of a random list but it's what comes to mind at first blush. (1) Innovation and commercialization in the private tech markets - especially those related to consumer software, enterprise / productivity software and devices and especially the financial markets that enable companies. (2) Lifecycle of biomedical research from NIH-funded basic to commercialization. (3) the moxy and resolve of young scientists. (4) the fragmented agency approach to funding federal R&D. (5) many institutions standing up to political attacks (though of course not all).
- I believe after 30 years we did get to the point where it was accepted that good government and organizations include evidence building and learning as part of core operations. Staff accept this and look for it. I hope this culture and mindset can be protected.
- Prior to the current administration, there was a good movement toward integrating social science into improving the outcomes of S&T research and development. It barely got started but I saw some promising relationships being built between social scientists and technical scientists within the federal government. NSF also had adopted a number of programs doing this kind of work (e.g., EFRI). One good thing that seems to be happening in some states is that STEM research is receiving more support at the state level to buttress against what is going on at the federal level.
- It is working brilliantly as a spending program. In terms of stimulating innovation, that's another story. The private sector and military technology seem to be thriving. Academic and government science not so much.
- Intellectual freedom - the U.S. has been great at fostering an ecosystem that allows for the pursuit of varied interests from the research community, and this has resulted in early adoption advantages in many of the more unpredictable breakthrough innovations on top of the expected tech improvements.
- Historically, the U.S. federal research ecosystem invested in several different ways to fund undergraduate, graduate, and postdoctoral research opportunities for different swaths of the U.S. population. Although most of these programs have since been eliminated, they encompassed a large diversity of approaches to reach different target audiences and provide immersive and hands-on experiences to train U.S. citizens for careers in research. While the pipeline could be improved for training a skilled-technical or trades-based workforce, the NIS was always powerful in training doctorate and masters-level trainees.

- Access to STEM careers; training and funds for engagement with the public; until recently, disbursed university research infrastructure with federal funding support increasing access to STEM training and the national ability to tackle multiple research priorities simultaneously; until recently, global science training and diplomacy coordination

- Innovative models and flexibility to perform research. The U.S. is good at creative models such as DARPA and FROs. We are also flexible at trying out new ways of scientific operation.

- In space sector, there are key knowledge bases in the workforce that know how to do complex space activities. There are key test stands and capabilities needed to enable facilities. The supply chain in many cases is struggling and needs funding to grow and support. More broadly, federal leadership in science and engineering helps create public value that a pure market approach would likely not create.

- Centering the basic research production line, largely centered around universities, is very successful. This model has allowed not only a consistent knowledge creation but also workforce/future research cultivation. Maintaining this model, as a loose framework is essential for increasing the box of knowledge that industry later uses to create businesses and products that drive the economy.

- 1. I think the NIS does a good job creating and supporting pathways into research careers. Even though some groups and people are less supported by the pathways and the pathways sometimes over or under produce researchers I worry more, now, about big gaps in the production of researchers and what that means for future innovation. 2. Once research priorities are decided on, the NIS does a good job (through peer-review) of selecting high-quality efforts to meet those priorities. Loosing that science focused review, or replacing it with something that doesn't have the same level of scientific independence would likely reduce the quality of science. 3. Support for international collaboration. I think all components of the NIS have some struggles. That said, I think the way research is done at universities is, and has been, productive. I would like to see that arm of the NIS maintained and stewarded effectively by the federal government.

- A) Informal science education institutions (museums, aquariums, science centers, botanical gardens, zoos, and public libraries) serve as trusted spaces where public audiences feel safe and can access STEM, explore STEM topics and learn how to apply scientific, technological, engineering and mathematical concepts to solving real-world problems. B) Peer-review in both competitive grant making and publication of research should continue. Micromanagement by political operatives should not be allowed.

- The national lab system - underappreciated and comparatively large, decentralized ecosystem that supports innovation, workforce, training, public engagement, local economies, and national defense needs. The land grants - public institutions that, through their state charters, federal mandate, and host of public services, e.g., extension programs, are invaluable to the populations and communities they serve.

- At a macro level, the investments we make in scientific discovery greatly improve our well-being, at least when measured in terms of GDP growth. Also, historically, huge demand to study here among promising scientists domestically and around the globe.

- Recent shifts towards engaged research that seeks to involve publics in science and decision making about that science. Recent shifts away from thinking of science as just an input into decision making. For example, it's great that a good portion of the climate change and climate tech community view R&D to develop new energy systems as important (as opposed to harping on the need for more/better climate models to inform decision making). Recent shifts towards integrating social science into various nonsocial science R&D, research, etc.

- I don't think anything needs to be "preserved at all costs." I do think that we need to prioritize and emphasize building the S&T pipeline and workforce for the future at all costs, so that we have capacity for future leadership. There are likely to be a variety of ways to do this that might look different from the existing university system

- The provisions protecting academic freedom, including the freedom to pursue research without extensive political interference, must be maintained. While funders can decide on which research they want to support, this should still be based primarily on scientific merit.

- The ability for undergraduates to be exposed to research is invaluable and must be preserved, and research experience should be accessible in some format to students at any institution in the country.

- Immigration policy (pre-2025) doing well with respect to high skilled immigrants

- strong federal investments in basic discovery research, academic freedom, strong investments in translational research

- What must be preserved: peer review, both discovery and applied science, protection from political interference, federal funding for science

- 1) The usage of universities as a vehicle to conduct research is still an important and valuable component of the NIS; 2) Using the quality of the science as determined by scientific experts (as opposed to politically motived or factors and to some extend geographical considerations) to judge evaluate and determine which science deserves support (with some caveats); 3) Focus on basic research as underpinning the NIS (recognizing we also need programs to help transition new ideas from the Labor to the marketplace.

- An erratic federal investor, regulator and legal system has created what hazard professionals call "cascading, compound and complex" threats to the network as described in the question. One thing that must be revived and maintained is the role and maintenance of Federal data collection and management -- without federal interference. Reliable and well-funded data -- social, economic, environmental - needs to be restored. The data and the reputation and institutional frameworks that were trusted not develop and deliver it need to be maintained at all costs. These systems and the partnerships on which they depend are part of what informs and support a National Innovation System, and must include the data needed for the transparent evaluation of that system. Although it's hard to address this through the haze of the moment, but perhaps new incentives and new courage to push forward -- new innovation in the innovation system -- is what needs to be protected. Who are the science policy entrepreneurs -- the must be maintained. Where are the market forces and workers and researchers having to take on a wider civic role which puts them closer to, and more dedicated to, defining what is desirable and what is undesirable.

- Universities and national laboratories are worth preserving. That said, they have become fat bureaucracies in serious need of a diet and process re-engineering.
- One part of the NIS that must be preserved is the government's role in supporting work that markets will systematically underprovide. People often make this case in terms of basic research, where the commercial payoff is uncertain or too far in the future, and that remains essential. But there is another category that is just as important: research and related work that has clear societal value without being easily monetizable. That includes work on public health, environmental protection, and other forms of knowledge that help society make better decisions but do not necessarily generate private returns. If we rely too heavily on market incentives, this kind of work gets neglected even though it is often exactly what makes innovation legitimate, trusted, and publicly beneficial. Preserving a strong government role in supporting these public-good functions is therefore essential to the long-term health of the innovation system.
- The U.S. has long led the way in fostering creativity, open exchange of ideas, and entrepreneurship. These attributes remain strong, and must remain central to the NIS.

Which components of the NIS are not working as well and are worth rethinking and redesigning?

- The US has too many barriers to allow for rapid translation of IP.
- 1. Collapse of support for R&D except military from the top of federal government. 2. NIH increasingly bureaucratic and conservative; expansion of unfunded mandates on researchers and research institutions. 3. Weak ability outside defense sector to link science outputs to public benefit and desired outcomes. Stark in health, but true in many other areas as well. In the ""scientific opportunity and public need"" assessment, far more attention and competence in assessing the scientific opportunity than ensuring the new knowledge gets applied for public benefit. 4. Many reforms (including many good ideas about experimentation with merit review, peer review, support for new researchers) are focused on conduct of researchers and research institutions, not on making science useful for the public purposes that Congress intends.
- We don't have equitable and reliable models for building trusting relationships with communities

- The NIS is underperforming in how effectively it translates research into public understanding, decision-making, and measurable societal impact, largely due to weak dissemination infrastructure, misaligned academic incentives, fragmented data systems, and insufficient mechanisms for continuous public listening. As one of my recent co-authored articles underscores, research visibility remains uneven and often disconnected from underlying scholarly strength, limiting institutions' ability to demonstrate value and maintain competitiveness in a resource-constrained environment. A general redesign is needed that elevates translation, integrates datasets across domains, and embeds systematic public opinion and behavioral insights into the research cycle, and a more specific emphasis on panel-based and survey-driven methodologies can offer a practical model for aligning knowledge production with public needs and expectations.
- Need to draw talent from a wider range—across regions, institutions, socio-economic, etc. Although we are doing well at generating ideas, implementing those ideas is an opportunity. We need more public-private partnerships. Coordination mechanisms have not kept pace with the complexity of today's urgent challenges. Problems such as climate resilience, health disparities, water security, AI governance require integrated approaches that many institutions are not currently structured to support. Another concern is that public trust in institutions has weakened.
- The federal labs, universities and colleges, and domestic relationships between sectors in the NIS are not working well because of deliberate destruction by the current federal government, and must be redesigned for excellence, inclusion, partnership, and opportunity.
- Integration of community research, data, Indigenous Knowledge, feedback loops between academy and on-the-ground input. Focus on equitable impacts and use of data that is representative populations and experiences.
- University researcher pay and working conditions; over-reliance on peer review but not then throwing our hands up and saying there's no merit gauging of any value; burdensome paperwork, research security, etc; legal protections for political interference at science agencies (from specific issues to maybe even agency structural design tweaks)
- The investments in evidence development and use need to be shored up and protected. We need to get back to the point we are co-developing learning systems where science, policy and practice are working together towards improving systems, processes and outcomes.
- Most innovation systems in the private and public sector don't have a good way for the public to weigh in on the direct of R&D. What I mean by this is more direct forms of input like pTA which gives the everyday person a chance to weigh-in instead of the more entrenched usual suspects that already know how to manipulate the existing public input systems (e.g., federal register public commenting periods) to their benefit.

- Academic science, that is to say, basic science, is being systematically crushed. It no longer rewards innovation and thoughtful explorations of the nature of nature, and instead rewards phony metrics of discovery, like publication numbers or grant dollars. This is not to say innovative academic research is not happening. Rather, that it is no longer being rewarded for what it is, and in the very place it should be most rewarded - academia,
- Experimentation - the research ecosystem has mostly fallen back on a handful of modes for disseminating funds and has a very low risk tolerance for new distribution mechanisms that could bring about more inventive research instead of iterative.
- Much of the federal research ecosystem uses a series of peer and merit-based review criteria to decide which research proposals to fund for awards. These criteria balance the tension between promoting academic freedom (i.e. scientists choosing which science is best for the sake of science) and public accountability (i.e. responsible stewardship of U.S. taxpayer dollars). Peer and merit-based review, along with other federal agency mechanisms, often do not solely promote academic freedom or public accountability exclusively. There is a spectrum of different intended outcomes within these mechanisms, some of which are modularized and siloed, often with little transparency with the public. These mechanisms have served the American public and scientists historically well. But with the recently charged political moment, conversations about these topics are performed in vacuum with little awareness over how to operationally improve this multilayered system or without transparency into how the different levers of this system address complicated political topics and nuanced scientific issues.
- How research priorities are set and by whom; public engagement to define research priorities and benefits--must shake the deficit model at all levels of public engagement; P3 models seem beneficial but continue to shape agendas in ways driven more by profit than by public benefit
- Public-Private Partnerships. There is a clear focus and understanding of the benefits, but there need to be easier ways to bridge university and private sector. Through tax benefits or other incentives to encourage both sides to cooperate.
- Many things could be done better- but I'd base it on a realigned north star. A few areas: Federal hiring, early career training, getting the research enterprise to enable replicability, public values and good societal outcomes. Just a few. Acquisition reform, information sharing to avoid siloes.
- Universities and scientists need to revaluated their role in the social contract of American society. They are not permanent aspects of the workforce and scientific development. Instead they are fulfilling a need/duty to the country and are therefore in constant partnership with it. The first priority of a university should be how to positively effect the community and the country, which should be entirely separate from personal political leanings. This ultraistic outlook may better resonate with an America which hyper-skeptical of all institutions.
- We disproportionately support research that appears will yield economic profits. For example, research into pharmaceutical interventions for mental health yield generous support, while

those about mental health outcomes and interventions associated with behavior, exercise, community, etc. are sidelined, if supported at all. Research into generalizable truths is well supported, but research into questions of known knowledge needs (usable and used science tends to be situation specific) remains under-supported.

- How we set scientific priorities. I think we need more and broader civic participation in setting scientific/research priorities and determining how and what science will be leveraged for the benefit of Americans, our planet, and everyone and everything on the planet. I think this probably means more partnership and collaboration between people who are and are not professional scientists in all parts of the science enterprise, perhaps with the largest attention to where and how we set scientific priorities and where and how we communicate/share science results.

- I think there is a misalignment between private and public interests, both in how research from universities is applied and how innovation in the private sector is regulated. There is an imbalance between the needs of the public, the desires of researchers at universities, and the freedom afforded to industry.

- a) Our grant making at the federal level needs to be streamlined where possible. It is unwieldy and burdensome. I understand needing to be careful in how public funds are expended, but the systems used for the end-to-end process create significant barriers to obtaining those funds. b) We can do more to support co-design of research projects that have a direct impact on the communities that the research is intended to serve. There has been an erosion of respect for the scientific process in generating new knowledge and potential solutions to problems that matter to public audiences. Part of that is created by a disconnect in how people engage with STEM in their daily lives and the relevance they see it having in their lives. c) Too many people in the US have insufficient STEM education, particularly in relation to systems level thinking, to be critical of misinformation campaigns about complex problems, like climate change. Let's acknowledge that STEM education should not be an afterthought or simply a means to create future workforce (which is important). Instead, let's create sustained investment of resources to ensuring STEM education and public engagement in contributes to people seeing the relevance of STEM to their daily lives; how they can participate in it; and how it serves their communities

- Sponsored research at universities - everything about grantmaking and GUIPPR partnerships, e.g., peer review, broader impacts, indirect costs, timelines, internal agency processes and organization, size and expected outcomes, data sharing, corporate sponsorships, private philanthropy, research security, university-based patenting, EPSCoR - all of the above currently being discussed in science policy circles is on the table to be reimagined at this moment; FACA committees - effectively shielded from meaningful public participation despite their intent to serve as a channel for representative and diverse views, and as a corollary; governance - how to build resilience into our policy infrastructure, e.g., NSF/NSB/OSTP/State/science agencies; tenure - designed without public interest in mind.

- There's a wedge between the value of the NIS and what the American public thinks is the value of the NIS. That's a democratic challenge that must be named, understood, and responded to. The current politicization dynamic that's happening can only be understood by taking this wedge seriously.
- STEMM training; pathways between STEMM training and practice outside academic research; modulation of training, trainee numbers, and pathways to practice in response to actual STEMM needs
- Over the past two decades, the link between innovation and intellectual property has been systematically challenged, if not completely bifurcated. Most if not all lawmakers support innovation, but they have vastly divergent views of the need to protect innovation through IP. This has impacted the regulatory environment and the incentives for technology transfer.
- Pipeline of students to research. Many students are steered towards S&T as an approach to make progress on today's biggest challenges. Do advanced degrees help them do that? I'm concerned about the intertwined fate of science/research, higher education, and democracy and how that might impact the NIS. For good reasons, higher education has moved away from conceptualizing itself as a place for debates about truth and knowledge, and has embraced a future vision of itself where it helps solve societal problems. Acknowledging its responsibilities to the broader community it serves is good and we should welcome it, but this also places higher education (and the researchers, students, etc that constitute it) more in the locus of debates about policy, politics, etc. How does it navigate the role of open scholarly debate while emphasizing the outcomes that scholarly/research work contributes to? Likewise, well intentioned scientists and scientific organizations are increasingly recognizing the inherent politics in their work. Yet at the same time our politics and democracy are in important ways moving away from pluralistic language, practices, and institutions. How can we support pluralism in the politics of science and the NIS? More of a question: What to make of the incredible growth in R&D spending (and interesting products, outcomes, wealth) generated by technology companies? If federal R&D spending should be held to some democratic accountability (as it should be), how do we conceptualize the accountability of private sector actors in the NIS?
- Even prior to this current moment of acute disruption, the U.S. scientific enterprise has been showing early warning signs of instability for years — research becoming measurably less disruptive, grant success rates falling, administrative burden consuming nearly half of researcher time, alternative funding models proliferating at the margins (e.g. FROs, Fast Grants, etc), because the core systems were not sufficiently responsive. Many of our research institutions were built for a scientific, technological, and geopolitical environment that no longer exists. They were optimized for incentives and stakeholders that have changed and have lacked the flexibility to adapt. The acute perturbation over the past year, massive cuts to federal grants and large-scale erosion of the federal workforce, has rapidly exacerbated an instability that was already there. All of these components of the core systems are worth rethinking and redesigning in a manner fit for purpose.

- The interfaces between government agencies, universities, and private firms are still too difficult to navigate. Universities over-complicate partnering with firms, firms have unrealistic expectations of academic research, and government support for university-industry collaboration adds more administrative burden than what is justified for that support. Some new options could be created to facilitate instances where these sectors need to coordinate and collaborate.A lot of rhetoric surrounds the concept of ""use-inspired research"" without really understanding why the concept exists and what it means. If we want new organizations like the NSF TIP Directorate to support this category of research, we need to provide better guidance on what it is and how it is different from pure fundamental research. In my view, there may not be enough of a distinction to merit recognizing this as a different class of research. Financing of new technology-based ventures through programs like SBIR work reasonably well, but need to do more to balance out the serious biases in venture capital investing and rethink how and why academic entrepreneurs are supported."

- Academic training largely prepares students for careers in academia, which have become few and far between. The "grind culture" of 60-80 hour work weeks, writing dozens of grants to keep the lights on, exploiting student labor for little pay, and the lack of work-life balance is unacceptable. Mentorship training should be a critical part of faculty hiring. Large allocation of grant funds to indirect costs (university admin) decrease the impact of public dollars, and allocation to large research institutes removes opportunities for students at state schools or from rural/disadvantaged backgrounds to break into the field. The necessity for industry to commercialize findings from publicly funded research means that the public does not get the financial return on their investment for decades, if ever. Data and publications are often paywalled and financially inaccessible to the very people that funded it, and when it is open access, the normalized language is so dense that it is still inaccessible for the public.

- Mechanisms for real democratic accountability; priority setting process integrating democracy and outcomes-orientation with scientific merit considerations

- Roles and responsibilities of academia, government and industry

- Public value knowledge translation, access to science, democratic research priorities and agenda-setting

- We need stronger connections between scientists and the rest of the societal ecosystem, including an overhaul of the academic framework to ensure science engagement, communication, and outreach (including to policy) are part of both science curricula and the tenure and review processes; we need a greater diversity of funding sources for science; we need much more intentional and robust initiatives for interdisciplinary research, perhaps by focusing projects and departments on big questions rather than disciplines; we need stronger rules to ensure integrity of and public access to datasets, including those maintained by the private sector; we need much deeper and stronger scientific integrity laws; we need more boundary sonnets

- 1) How we teach undergraduate students and encourage domestic students to take and interest in, study and continue in STEM fields; 2) the apprenticeship model of PhD education in STEM whereby graduate students help conduct research and become the future scientists and the confusion between if they are students or employees; 3) stability and predictability of research funding.
- While there are pockets of an NIS that are well designed and able to function through current circumstances, trust has evaporated throughout this system; uncertainty pervades as a mechanism of instability. There were problems in the NIS way before this Administration, and maybe part of the rethinking and redesign has to do with disrupting patterns of entitlement. Who is entitled to federal, state, and philanthropic support and why? Inertia has been the norm of the system, with moments of breaking free; how do we rethink what a system looks like that makes room for and benefits from a wider variety of participation? What would it look like for participatory processes to develop a portion of the priorities of investments in innovation?
- 1. At the institutional level, state-sponsored university elitism. 2. Federal government oversight of its R&D investments in inadequate. 3. Grant allocation and technology transfer mechanisms need tweaks more than an overhaul, perhaps placing greater emphasis on the promise of proposals, and more emphasis on the transfer of tacit knowledge."
- One component of the U.S. National Innovation System that is especially worth rethinking is graduate training. The current system does a strong job of producing disciplinary expertise but a weaker job of preparing scientists to understand the societal implications of their work, engage with communities, and navigate the public institutions that shape how knowledge is used. It is also where they learn that the incentives of career advancement are heavily oriented toward publishing papers and securing the next round of grant funding, which can crowd out attention to the broader public purposes of research. That is shortsighted, because federal research funding ultimately depends on public support and trust. If we want a strong innovation system over the long term, scientists need to be trained not only to generate rigorous knowledge, but also to understand their responsibilities to society and to engage more actively and effectively with the public whose investment sustains their work.
- Too much has been broken in the last 18 months to elaborate on here. Fundamentally, trust in government as a good-faith partner in the NIS is broken. But long prior to that there were challenges- among them a breakdown in engagement between science and society related at least in part to misaligned incentives, a merit-review system that worked well to identify solid science but too often discouraged risk-taking, and a general conservatism in institutions that made institutional reform difficult.

Which components of the NIS are not working at all, and we should go back to the drawing board?

- Protections from political interference have been dramatically weakened.
- The guardrails we thought kept NIS relatively safe from partisan and ideological interventions.
- Several core assumptions of the NIS no longer hold and require a full reset, most notably the belief that research value is self-evident, that visibility will occur organically, and that episodic communication is sufficient to sustain public trust and investment. Legitimacy must now be actively earned through continuous, visible, and verifiable demonstrations of public impact, particularly in an environment where attention, relevance, and reputation are tightly linked. This requires replacing ad hoc communication practices with always-on visibility infrastructure and closing the gap between research investment and public awareness, while also more fully integrating social science insights into innovation policy. In this context, measuring public perception, tracking change over time, and identifying gaps between institutional activity and public understanding are central to rebuilding a more accountable and effective NIS.
- We need to think more broadly about NIS as a civic and economic architecture for solving problems at scale. This will require some fundamental design work.
- No component is not working at all, which is fortunate.
- Demonstration and communication of public impacts of government-funded science. Prioritizing science that serves people who've been marginalized. Support for early-career scientists. Concentration of research dollars in certain institutions and labs and PIs or certain fields of inquiry over other (health vs. social sciences)
- #1: Perhaps looming all over all of this / biggest picture: public trust in NIS, so that the public wants to invest in and believe in our NIS and its value, so that they feel ownership over NIS as a national asset, so that they are part of NIS, so that they believe the version of truth finding that NIS enables. #2: investing in AI that improves lives and guiding that from R&D to delivering for the public; directed R&D generally; #3 new funding mechanisms and institutions beyond agencies, corporations, and relatively small amounts of philanthropy #4 funding/inventing/encouraging performers that aren't universities, corporations, or national labs. #5 I acknowledge that these are probably out of scope for this discussion but I view NIS as including the following problems needing a complete redo: wealth and power concentration that results from gains from NIS and the resulting deleterious effects on democracy and inequality; regulation of the tech industry; affordable access to medical cures; better regulatory pathways to getting biomedical innovation to market/patients; military industrial complex and its relative rigidity"

- These statements are my own and not those of HHS. If I was queen of the world, in the rebuilding of the federal evidence infrastructure, I would be sure to have science and policy at the table as co-equals. I think that is a tall ask but I'm dreaming big!
- We need to have legal protections for independence, whether that is OIG offices or science and evaluation offices.
- Academic science needs to be completely overhauled. We made a foundational mistake in 1950 with the passage of the National Science Foundation Act of 1950, which departed significantly from many of the constructive suggestions of the authors of Science: The Endless Frontier. By essentially making basic science a public good, rather than a value in itself, a network of perverse incentives were established that, over time, have been gutting the essential nature of basic science.
- Workforce training - the current model does not reward the right incentives to make the workforce that is needed. There is too much focus on grad students as the workforce of the future, and incentive structures within academia mean that they (1) do not get trained in the skills that are requested by their future employers and (2) the more successful a PI, the less they have time to actually mentor their students. This means that students exit their training unprepared for the modern workforce, and modern employers cannot find people with the skillsets they want to hire.
- Governance and stewardship of NIS by scientists have been heavily attacked in the modern political moment. Many attacks against mechanisms of scientific self-governance have been met with little resistance by the community and community-leadership due to fear of reprisal against individuals or home institutions. Historically, the scientific community refrained from engaging in partisan or political dialogue or topics. While I respect many reasons for refraining from this dialogue, the lack of a sufficient response to these topics hinders survivability of the NIS from political attacks.
- Governmental regulation of corporate actors, e.g. tech and defense companies, whose decision making impacts the public; lack of academic sector incentives for community-led or -engaged work/scholars; build an enterprise whose purpose is to perpetuate life on this planet--humane, non-violent, nurturing, compassionate, collaborative, etc.
- There is too much administrative burden on research. There needs to be a decrease in administrative request with a counter stronger support for research funding that can navigate more efficiently scientific proposals and reporting.
- Strategy setting and policy too often gets locked in by historical inertia. Having big mega projects that delay and soak up budgets is diminishing of a deeper approach to science and engineering policy. Core narratives for engineering tied to the linear model should be retired.

- The universities must fundamentally change how they view education tracks. Not all degrees require the same time to complete or cost to complete. Degrees which point towards societally beneficial jobs (school teachers, social workers, etc.) should not have to pay the same in tuition as extremely high earning degrees. This change needs to be systemic and not isolated.
- The NIS has low and declining public credibility. The NIS has to be seen as accountable to public needs, and the most direct route to that outcome is making the NIS more responsive to public needs.
- The underinvestment in "translation" and especially translation into public or civic benefits. We do a better job, I think, of privatizing the benefits of research, and hoping private innovation produces public benefit. As a result, public benefit is uneven at best, maybe slow. Even the idea that we can translate science results into societal benefit needs to replaced by a much more integrated mode of doing science as part of civic processes - informed by, guided by, as an input to, and as outcome of, civic processes.
- Currently, functional democratic participation is absent from how we regulate technology in this country. I don't know that this is an issue solved by theorizing as opposed to coordinated political effort.
- There are too many silos in STEM institutions. Either we invest in more boundary spanning jobs to ensure there is better connection between different parts or we will continue to fail to leverage expertise among different fields and inhibit sustained collaboration.
- Academic publishing - absolutely captured by private interests with no clear solution; K-12 education - extraordinarily difficult to address through science policy; student and high skilled immigration - same as previous; industrial policy - we don't have one; think tanks - the government needs its own expert capacity for social and innovation policy; equity and participation in higher ed.
- I'd like to see the proliferation of alternative models of funding research with public monies. E.g., more career development oriented awards, lotteries, block grants to states/universities/research entities for specific purposes, etc. Then I'd like to see some systemic evaluation of such approaches.
- With declining trust and confidence in the institutions meant to define the public good (Congress, the Executive branch), how will we define what parts of the NIS serve the public interest?
- Journals/scientific publishing.
- Two priority areas for reform are the funding and systems for supporting postdoctoral scholars across almost all fields and how PhD students are supported and trained. Postdocs should be short-term appointments to help worthy doctorate-holders to prepare to be research leaders, whereas now they are temporary employment supporting early-career researchers looking for work. For PhD students, we should explicitly recognize that most of them will NOT work in

academia and ensure that their funding and training will prepare them for a broader range of careers. Also, support for scientific infrastructure is completely inadequate and poorly managed. Standard grants from most agencies are too small to support purchasing or developing specialized instruments, and dedicated funding streams (MRI at NSF or DURIP at DOD) aren't sufficient to fill the gap. Also, infrastructure requires long-term support, especially for technicians, which is not provided by research agencies.

- In most forms, public dissemination of science is not working at all. It is often sensationalized, misrepresented, or impossible to understand. The drive to get grant funding means that we are taught to frame our issue as the "most important", our findings as "revolutionary", and our impact as "immeasurable", while downplaying or burying the limitations and NEVER publishing the negative data. The competition for funding also means we don't share methods widely or until our findings are "complete", so there can be considerable duplication of effort within a field. All of this has sown the seeds of distrust in the NIS, and we are seeing that arise as conspiracy theories, defunding of science, physician burnout, social media "research", etc. I don't know what the solution is to fix that, but we desperately need a re-work.
- Lack of public sector research on off patent drugs and other market failures, public value failures continued linear thinking in science governance
- This is controversial, but I think we need to eliminate the “scientific hero” and PI model of science.
- 1) Reproducibility/replicability of scientific results; 2) ensuring the out of the box and high-risk research gets supported which transcend current scientific thought and consensus; 3) Public engagement and understanding of the NIS to ensure future support from political leaders.
- Now is the time for major changes; it is hard to see if there is a drawing board to go back to. Or, realistically, there will need to be "triage" moves and long-game strategic, cooperative development. Civil society needs a way bigger presence in the core pieces of the system. That's the importance of citizen science and participatory practices in the innovation system. The bloated whale of the private sector and the economy it drives is a huge factor in the innovation system; going back to that board will take a generation.
- At the core of the US NIS is a cultural problem: the widespread belief that public investments in science automatically translate into positive societal outcomes.
- One part of the NIS that may need more fundamental redesign is the federal research funding system itself. In my view, it has become too far removed from meaningful public accountability and too dominated by the institutions best equipped to navigate its complexity. In practice, universities and large industry actors often have a structural advantage, reinforced by sophisticated grants offices, compliance infrastructure, and lobbying capacity, that can resemble a kind of regulatory capture. The result is that organizations that may technically be eligible for support, including smaller nonprofits, newer institutions, or community-rooted groups, are often shut out by the sheer complexity of the process. In addition, funding and overhead structures can

look defensible inside the system while seeming opaque or unreasonable from the public's perspective. Rather than continuing to layer fixes onto that architecture, I think there is a case for starting from first principles: how to make federal research funding more transparent, more publicly accountable, and more equitably accessible beyond the most elite and well-resourced institutions.

- We have not really moved the needle in making the scientific enterprise more representative of the population of this country.

Workshop Agenda & Objectives

Objectives

- Convene science policy experts and stakeholders,
- Introduce project and workshop goals, objectives, and timeline,
- Simulate a participatory technology assessment (pTA) forum session,
- Present results from the landscape analysis and the community dialogues, and
- Discuss topics, questions, content, and outcomes for public forums in MA, AZ, and WV

Agenda

Thursday, June 18th, 2026, Forum Design Workshop
8th Floor Event Pavilion, ASU DC Center, 1800 I St NW, Washington, DC

8:30 am — Check-in & Breakfast

9:00 am — Welcome & Introduction

- Miki Kittilson, CGF, ASU
- Arthur Daemmrich, CSPO, ASU
- Mahmud Farooque, CSPO, ASU

9:30 am — Forum Simulation: Interim Siting of Spent Nuclear Fuel Facilities

- National Oversight for Waste Management Decisions
- Priorities for Collaboration in Siting Facilities
    - Nich Weller, CSPO, ASU, lead facilitator

10:45 am — Break

11:00 am — D1: Science & the American Public

- Lightning Talks, Lisa Margonelli, ISSUES, moderator
    - Jonathan Shulman, UPenn
    - Amanda Vernon, ASTC
    - Tony Mills, AEI
- Community Dialogue Results Part 1
    - Nich Weller/Porter Malcolm, CSPO, ASU
- Large Group Q&A, Lisa Margonelli, ISSUES, moderator
- Small Group Discussion & share out (25 min)

12:00 pm — Lunch

12:45 pm **D2: Policy for Science**

- Lightning Talks, Erica Goldman, FAS, moderator
  - Bhaven Sampat, JHU
  - Ian Banks, FAI
  - Jenn Gustetic, IFP
- Landscape Analysis 1: State of Science
  - Maureen Kearney, CSPO
- Community Dialogue Results Part 2
  - Nich Weller/Porter Malcolm, CSPO, ASU
- Large Group Q&A, Erica Goldman, FAS, moderator
- Small Group Discussion

2:05 pm Break

2:15 pm **D3: Science for Policy**

- Lightning Talks, Angela Bednarek, Pew, moderator
  - Kei Koizumi, GWU
  - Tony Boccanfuso, UIDP
  - Greer Arthur, NC Collaboratory
- Landscape Analysis 2: Science Policy Futures
  - Alex Temple, GWU
- Community Dialogue Results Part 3
  - Nich Weller/Porter Malcolm, CSPO, ASU
- Large Group Q&A, Angela Bednarek, Pew, moderator
- Small Group Discussion

3:45 pm Break

4:00 pm **D4: Science for All**

- Lightning Talks, Rajul Pandya, ASU, moderator
  - Toby Smith, AAU
  - Stephen Gavazzi, OSU
  - Taylor Spicer, ESAL
  - Monica Feliú Mójer, Ciencia Puerto Rico
- Large Group Q&A, Rajul Pandya, ASU, moderator
- Small Group Discussion

5:00 pm **Summary & Synthesis**

- Group Presentations, Mahmud Farooque, CSPO, moderator
- Large Group Discussion, Mahmud Farooque, CSPO, moderator
- Closing, Arthur Daemmrich, CSPO

6:00 pm **Reception & Networking**

Participant List

Please see [participant bio] for details

Speakers & Moderators

- Lisa Margonelli, Issues in Science & Technology
- Jonathan Schulman, University of Pennsylvania
- Amanda Vernon, Assoc of Science & Technology Centers (ASTC)
- Tony Mills, American Enterprise Institute (AEI)
- Nicholas Weller, Arizona State University*
- Erica Goldman, Federation of American Scientists (FAS)
- Bhaven Sampat, Johns Hopkins University
- Ian Banks, Foundation for American Innovation (FAI)
- Jenn Gustetic, Institute for Progress (IFP) (former NASA)
- Maureen Kearney, Arizona State University (former NSF)
- Porter Malcolm, University of Michigan (ASU intern)*
- Angela Bednarek, Pew Charitable Trusts
- Kei Koizumi, George Washington University (former OSTP)
- Greer Arthur, North Carolina Collaboratory
- Tony Boccanfuso, University-Industry Demonstration Partnership (UIDP)
- Alex Temple, George Washington University (former NASEM)
- Raj Pandya, Arizona State University
- Toby Smith, Association of American Universities (AAU)
- Stephen Gavazzi, Ohio State University
- Taylor Spicer, Engineers and Scientists Acting Locally (ESAL)
- Monica Feliú Mójer, Ciencia Puerto Rico

Attendees

- Jeff Alexander, RTI International
- Rashada Alexander, American Association for the Advancement of Science (AAAS)
- Ira Bennett, Arizona State University
- Kensey Bergdorf-Smith, West Virginia S&T Policy Initiative
- John Cabeca, Council for Innovation Promotion
- Edward Chu, Arizona State University (former EPA)
- Jay Cole, West Virginia University (former WV Department of Education)
- Bob Cook-Deegan, Arizona State University
- Christine Custis, Institute for Advanced Study
- Kenny Evans, Rice University
- Albert Hinman, House Committee on Science, Space, and Technology
- Miki Kittilson, Arizona State University
- Adam Seth Levine, Johns Hopkins University
- Jason Locasale, Locasale Research Group
- Jenny Luray, Research! America
- Mark Neff, Western Washington University
- Avital Percher, National Science Policy Network (NSPN)
- Pallavi Phartiyal, Union of Concerned Scientists (UCS)
- Dan Pomeroy, Scientific Citizenship Initiative
- Sarah Schoedinger, Thalassa Strategies (former NOAA)
- Lexi Schultz, American Geophysical Union (AGU)
- David Sittenfeld, Museum of Science
- Dahlia Sokolov, House Committee on Science, Space, and Technology
- Lauren Supplee, Department of Health and Human Services (HHS)
- David Tomblin, University of Maryland
- J. Scott Turner, National Association of Scholars
- Walter Valdivia, Arizona State University
- Alessandra Zimmermann, American Association for the Advancement of Science (AAAS)

CSPO Program Staff*

- Arthur Daemmrich
- Mahmud Farooque
- Emily Hostetler
- Mara Karageozian
- Chanel Okosun
- Zachary Pirtle
- Joshua Barry, Intern
- Edward Cariño, Intern
- Jeslyn Cho, Intern
- Mia Peterson, Intern
- Eyan Weissbluth, Intern