



Future scientific innovation requires the transformative power of philanthropy

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The scientific innovation enterprise supporting United States research and development (R&D) has undergone a significant shift in institutional alignment over the past 20 years. This shift has seen the funding mechanisms and strategy setting for R&D activities move from a largely public space to involve more diverse and private funders. Industry now dominates investments in US research, providing 78% of US total R&D expenditures (1).

However, this recent and accelerated change in how the United States invests in scientific innovation has roots in science policy decisions in the 1970s (2, 3). In the 1980s, private industry funding for US R&D began to outpace federal funding (4, 5). The National Academies of Science, Engineering, and Medicine (NASEM) recognized that these changes were occurring and sought to create a neutral venue for addressing common interests while avoiding the potential misalignment of research funders and institutions that changes in the balance of R&D funding might cause. This neutral venue was launched in 1984 as The Government-University-Industry Research Roundtable (GUIRR) (6).

GUIRR was founded to address structural and cultural gaps within the traditional triple helix of G-U-I that had the potential to impede their ability to work effectively together. To do this, GUIRR was tasked with providing a convening roundtable for high-level decision-makers and leaders of the US scientific community to meet and have frank and open conversations about how to productively collaborate to solve the pressing and future challenges facing the US R&D enterprise. Through the GUIRR members and the GUIRR Council, a direct engagement between leaders can occur throughout the triple helix, and rapidly emerging problems at the cutting edge of research can percolate up from representatives at those institutions to be shared across research sectors where common goals can be realized. The dynamics of GUIRR interactions set in motion activities that influence the development and direction of US science policy and catalyze indirect changes in institutional cultures as thought leaders and decision-makers take concepts they have been exposed to at the roundtable back to their home institutions. The ideas discussed at GUIRR meetings are directed to help implement the changes needed to keep the R&D sector nationally and internationally competitive.

A forum like GUIRR was a novel concept in 1984. As such, GUIRR was one of the first and only roundtables at NASEM that addressed the cross-fertilization of ideas and partnerships between these institutions. For 40 years, GUIRR has served as a premier national forum to foster collaborations by bringing its three constituencies together to discuss urgent matters of cross-sectoral importance. The strength of GUIRR is its extensive leadership network and the roundtable's ability to convene leaders focused on science and technology (S&T) priority areas across a diverse spectrum of

the US S&T R&D ecosystem. The lasting mission for GUIRR then, as it is now, is to facilitate better alignment between the public and private sectors that jointly create the capacity within the US research and innovation ecosystem and, therefore, help enrich the nation's scientific output.

As changes within the R&D landscape developed and the diversity of institutions participating in the US research ecosystem accelerated in the 1990s and 2000s, the concept of a triple helix representing only G-U-I interactions became too simplistic. The triple helix model no longer accurately captures the diversity of institutions that support and drive activity within US R&D. Venture capital, private equity, and banking make up many new players that reach beyond typical G-U-I institutions looking to fund and direct activities in this space, along with nonprofits and philanthropy, which comprise the largest non-G-U-I funders of research.

As presented in National Academy of Sciences President Marcia McNutt's inaugural State of the Science Address, philanthropy has become an integral part of our national essential research enterprise, complementing other sources of funds like federal investment. This is part of a mutually supporting system since basic research lays the foundation for future innovation, and much of the philanthropic funding for basic research comes from the wealth created by previous investments in R&D (7, 8). Philanthropy as a powerful driver of basic research was featured in a recent GUIRR webinar discussion around the release of the *Science Philanthropy Indicators Report* by the Science Philanthropy Alliance (9). For basic research performed at US research institutions, the combined support of nonprofit and higher education funds, which include past philanthropy through endowment returns, has doubled to nearly 40% since the 1960s. In comparison, the share of federal support has declined from 75% to approximately 50% over the same time. The scientific questions addressed through philanthropic funding also emphasize a fundamentally interdisciplinary and problem-solving approach that compliments a renewed emphasis on translational research by federal partners.

The Science Philanthropy Indicators Report also highlights the significant role philanthropy will play in the future of

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science funding, especially for novel, high-risk research with long timelines for commercialization (10, 11) and for supplementing, though not alleviating, funding gaps. Federal support for basic research at US research institutions has plateaued in dollars, showing inflation-adjusted growth of only 1% over the last 15 years (9), far less than real growth in research costs (12). Funding from universities and nonprofits has continued to grow, a demonstration that the contributions of philanthropy can shore up the foundations for future innovation. The decoupling between government funding and research costs can also be seen in the latest NIH and NSF budgets, which flattened or decreased in 2024 (13–15). This ongoing trend drives a greater need for thoughtful collaboration across the scientific funding ecosystem.

Given the emerging and essential role of philanthropy in funding the US research enterprise and in continuing with GUIRR's tradition of frontrunning the future of the innovation ecosystem, GUIRR is making a significant change in its name to become the *Government-University-Industry-Philanthropy Research Roundtable (GUIPRR)*. This is the first such change in its 40-year history and aligns with GUIRR's strategic vision for diversifying the institutional stakeholders at the table that are involved in developing national research strategies and contributing to funding the future of US R&D. In the greater policy context at NASEM, this historical shift from GUIRR to GUIPRR reflects the larger strategic plan of the National Research Council (NRC) to “build broad and deep networks of partners and collaborators within the NRC, as well as international, philanthropic, and business communities,” “increase impact” and “continuously learn and innovate” (16). This is also well aligned with the external policy community, as exemplified by the National Science Board's call for “new partnerships and collaborations across sectors” and proposal to “leverage other sectors” to support federal investment in research as federal dollars continue to decline or are flat (17).

A GUIRR to GUIPRR Mission Space

GUIRR (now GUIPRR) will continue to emphasize its rich history of work within the traditional triple helix of innovation while extending beyond this simplistic model of institutional alignment. An example of moving from a GUIRR to a GUIPRR-oriented mission space is illustrated within the recent June 2024 GUIRR meeting, “GUIRR at 40: Reimagining the Triple Helix of Innovation, Investments, and Partnerships” (18). As part of the meeting, a panel discussion focused on “Investment Strategies That Will Rapidly Advance Innovation to Markets.” Within this panel discussion, participants from traditional philanthropic organizations were brought together with value investing and venture philanthropy to discuss new institutional and economic models for underwriting research and accelerating science to benefit the public. In convening around this topic, GUIRR actively integrated philanthropic stakeholders into the conversation within the larger context of supporting the US research enterprise.

At the June GUIRR meeting, panelists from Convergent Research, a philanthropic organization, highlighted a new type of research organization called a Focused Research Organization (FRO). FROs represent a way to pull together seemingly disparate R&D-focused institutions into partnerships that tackle high-impact, highly collaborative research that is not directly

profitable by venture, industry, or private equity standards. FROs serve as a bridge between these institutions to perform research that contributes to the public good without replacing traditional institutions (19). The FRO framework is just one example of new ideas philanthropy can bring to the national conversation around the US research enterprise. At this meeting, The Hypothesis Fund, a philanthropic-driven investment firm that supports high-risk, high-reward science, presented a model that distributes risk across different research environments with different risk tolerances. Using a peer-to-peer scouting model, The Hypothesis Fund can tap into latent scientific expertise to vet and promote high-risk science without some of the potential biases that occur in a traditional venture or grant-supported system, thereby decreasing some of the overall risks to institutions (20). These are two of many examples of philanthropy providing new insights or bringing new models into the discussion to advance scientific research.

GUIPRR Challenges and Opportunities

GUIRR has an expansive mission, that will be amended to include philanthropic organizations, recognizing their importance in shaping the future of national science priorities. This, along with other ongoing GUIPRR initiatives, will increase the diversity of the stakeholders at the table. The broadness of GUIPRR's charge also presents an opportunity to be more responsive to and aligned with national priorities for R&D to keep the US domestically and internationally competitive. Our renewed mission and name allow GUIPRR to be uniquely positioned to engage in both scoping and responding to the priorities outlined by the US Office of Science and Technology Policy (OSTP). A robust dialogue between OSTP and GUIPRR to both amplify and act as a sounding board for OSTP activities and initiatives can, in turn, help bring shape and focus to GUIPRR's broad mandate.

In the 2023 Multi-Agency R&D Priorities for the FY 2025 Budget Memo, White House OSTP Director Arati Prabhakar outlined several fiscal year 2025 priorities (21). GUIPRR, with the addition of new philanthropic organizations working alongside our G-U-I members, can now provide an even more comprehensive and valuable perspective on OSTP-delineated national research priority areas. For example, additional philanthropic expertise can help to advance these OSTP-outlined priorities as they change with the evolving research enterprise. This can be achieved using the unique network and platform that GUIPRR will provide to enhance connectivity and dialogue amongst these sectors to “stress test” OSTP concepts and initiatives. GUIPRR can also, by engaging with philanthropy across its network, offer opportunities for new collaborations between institutions and, in doing so, help to contribute to conversations around national S&T priorities.

Philanthropy can play a central role in shaping the strategy and funding needed to achieve national priorities identified by OSTP and GUIPRR, among other groups. Indeed, in an editorial in *Science*, Prabhakar invites “every member of the R&D community to step up to new challenges” in achieving the nation's aspirations (22). These aspirational goals require robust connections between the diverse sectors of the US R&D ecosystem. GUIPRR, through its inclusion of the philanthropic community, is fully embracing the challenge placed forward by Director Prabhakar and is actively facilitating new

connections between important and emerging institutions as GUIRR strives to represent every member of the R&D community.

Conclusion

Philanthropic funding for scientific research represents a unique opportunity to build on the robust national research network first envisioned by Vannevar Bush (23). Philanthropy can provide an essential service to the nation by acting as an institutional bridge and ushering in a new era of scientific collaboration across traditional G-U-I sectors. All of this can be achieved while aligning the US research enterprise with more significant policy initiatives concerning social responsibility, science, and society, increasing inclusiveness in the scientific community, and uncovering new areas of research

(24). Philanthropy-supported policy and strategy bridges weave existing institutions into a rich tapestry of innovation and promise to repair current cracks in the foundation of trust in science and scientific institutions. As GUIRR looks to the next 40 years as GUIRR, the roundtable is energized by the new possibilities for collaboration with current and emerging stakeholders across the national research ecosystem that this change brings. The goals as GUIRR transitions to GUIRR do not change drastically from those of the past 40 years: that is, to help build a more innovative, inclusive, competitive, and resilient US research enterprise ready to survey and solve the over-the-horizon scientific problems of tomorrow.

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