

## **Sponsored Research at Princeton University**

*A statement by President Christopher L. Eisgruber*

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Federally funded research is indispensable to Princeton and all other American research universities. In the fiscal year that ended in 2016, Princeton's sponsored research expenditures were approximately \$206 million on the University's main campus and \$118 million at the Princeton Plasma Physics Laboratory. The \$324 million total amounted to roughly 18% of the University's budget. Even universities as well-resourced as Princeton lack the capacity to replace this funding. Were it to shrink substantially, we would have no choice but to shrink our research enterprise along with it.

This partnership between government and academia has been an American success story. For much of the last century, the country's investment in basic research made it the world's scientific and scholarly leader, and the resulting discoveries substantially benefited the country both economically and geopolitically. In recent decades, however, America has lost ground. Universities have been asked to fund a larger percentage of the research they conduct, and, as the Committee on the Future of Sponsored Research points out in its report, since 1992 the United States has slipped from second to tenth in national research and development investments measured as a percentage of gross domestic product. These losses reflect a combination of political stalemate and rising pressure on the federal discretionary budget; they have occurred despite bipartisan expressions of support for the nation's research enterprise.

The committee's report contains thoughtful and important recommendations about how Princeton can most effectively support its research enterprise in these challenging circumstances. I am grateful to the faculty members who served on the committee for their conscientious and illuminating work, and I respond to their proposals below. I do so, however, mindful that no set of recommendations could possibly substitute for robust government support. I join the legions of others—from industry, the academy, and elsewhere—who have emphasized that America's continued leadership in engineering and the sciences, as well as its economic prosperity and geopolitical clout, will require increased government investment in both basic and applied research. Princeton must continue to make that case forcefully, even in these politically challenging times.

### **Highest priority recommendations**

The committee report's highest priority recommendations were for faculty research funding, including both additional innovation funds and proposal-related funds, and for a new graduate student support mechanism that would leverage the impact of sponsored research grants, principally through the creation of a policy or fund to mitigate the pressure of fourth- and fifth-year graduate tuitions on those grants. I will begin with the second of these recommendations, about graduate student support, because it involves a topic that emerged as a high priority throughout the University's strategic planning process.

## 1. *Graduate student support*

Graduate student support was a topic of critical interest to multiple task forces, including not only this committee and the Task Force on the Future of the Graduate School but also, for example, the Task Force on the Natural Sciences, the Task Force on the Future of the Humanities, and the Regional Studies Task Force. This confluence is not surprising: graduate education is itself a key component of Princeton's mission, and graduate students are dynamic contributors to the University's research enterprise and its undergraduate teaching program. Princeton supports first-year graduate students in the sciences and engineering with full (tuition and stipend) fellowships. In later years, graduate students in these fields depend for their support on a combination of teaching assistantships, University support, and research assistantships. Most upper-year graduate students in the sciences and engineering serve as research assistants whose time is appropriately charged to federal grants; the University voluntarily cost-shares their tuition with the government sponsors, so that the research grant is charged for one-half tuition and the student's stipend.

The University's strategic framework, issued by the Board of Trustees in January 2016, reaffirmed that "graduate education is indispensable to Princeton's core teaching and research mission," and emphasized that Princeton must "ensure that it offers stipends and other support that allow it to attract the best graduate students, and it must likewise ensure that those students have what they need to pursue their studies and other projects successfully after arriving at Princeton."

In light of those conclusions, Dean of the Graduate School Sanjeev Kulkarni, Dean for Research Pablo Debenedetti, and Provost David S. Lee are launching an initiative to provide research allowances totaling an estimated \$4.5 million annually to faculty who are supporting fourth- and fifth-year graduate students on their grants. In an era when external research funding is growing slowly or contracting in real terms, and when the cost of graduate education is rising, the new fund will use unrestricted dollars to leverage grants won by our faculty. It will also support graduate education at Princeton by making it more attractive for faculty members to hire graduate students as research assistants when they might otherwise have an incentive to add postdoctoral researchers instead.

We have structured the program to maximize the strategic flexibility of the funding it creates. We recognize that faculty members may collectively conclude that the funds are most useful if pooled. For example, departments or groups of faculty could pool the allowances and use them to increase graduate cohort size, adjust stipend top-ups, bridge temporary gaps between grant awards, provide seed funding for projects that require graduate funding, or support equipment purchases. Such alternative uses of the funds require provostial review and approval.

The new program deploys funds made available by the recent change to the University's spending policy and reserved for strategic priorities identified in the framework plan. A commitment of this size, made in advance of any fundraising, is extraordinary; it was

possible only because of the judgments reached during the strategic planning process about the exceptional importance of the University's graduate programs to its future.

## 2. *Innovation funds*

As the committee notes, pressures on federal sponsored research budgets have taken a particularly heavy toll on the new directions that are especially critical to the vitality of the research enterprise. Panels evaluating grant proposals have shown a tendency to prefer well-established research lines over those that are novel and therefore risky. This preference for safe, proven research threatens to choke off the path-breaking investigations that are the germ of many important discoveries. In addition, both early- and mid-career investigators have difficulty obtaining the initial grants that they need to launch their scientific programs and build the reputations that will earn them support in the future. The committee understandably and persuasively urges that Princeton raise innovation funds to encourage exploratory research by both junior and senior faculty members.

These new funds would supplement ones created earlier by generous gifts from visionary donors who recognize the need to support bold research directions. The Eric and Wendy Schmidt Transformative Technology Fund, established in 2009 with a \$25 million gift from Eric Schmidt '76 and his wife Wendy, serves "to advance science by supporting the most creative and innovative ideas of the Princeton University faculty that would be advanced by the creation or the adoption of new technology." The Project X Fund, created by a \$10 million gift from Lynn Shostack W69 provides grants to "support faculty interests in the Engineering School that are 'out of the mainstream' of the University's normal budgeting process and which are not ordinarily fundable through grant proposals to the grant-making agencies and organizations on which the School normally relies." We have supplemented these visionary gifts with programs made possible by the generosity of other donors and by general funds allocated through the Office of the Dean for Research and the Office of the Provost.

I agree with the committee that Princeton should continue to seek funding that gives faculty members at all career stages the freedom and the capacity to pursue novel insights with the potential to change their disciplines and the world. We will seek to raise additional gifts that enable innovation, creativity, and intellectual risk-taking.

## 3. *Proposal preparation funds*

The committee observes that, because of their quality, Princeton faculty members have a successful track record at attracting grants despite the hyper-competitive environment that now surrounds federal research programs. As already noted, the committee recommends leveraging the impact of these awards through policies that mitigate the cost of graduate research assistants, a recommendation on which we have already acted. The committee also recommends two mechanisms designed to encourage faculty to continue to submit competitive proposals to funding agencies: one mechanism would support the preparation of grant proposals or the completion of experiments or calculations necessary

for proposal submission, and the other would provide matching funds to investigators who receive competitively awarded funds. As described below, the Dean for Research has already dedicated staff to assist faculty with grant applications. More support, including well-conceived incentive programs like those suggested by the committee, may become necessary if the federal funding climate grows more challenging. Our ability to create programs of this kind will depend on the interest of donors in supporting the efforts of our faculty to continue to attract federal funding at high levels.

## **Other recommendations**

The committee made a number of other, lower priority recommendations. All of these proposals are thoughtful, and I address them each briefly below.

- *Princeton should undertake a transformative, long-term initiative to raise funds for internally competitive graduate student fellowships.* Philanthropic support for graduate fellowships, such as [Professor of Chemistry Emeritus Edward Taylor's extraordinary gift to support third-year chemistry students](#), simultaneously leverages the external grants that are critical to the University's research enterprise and provides our graduate students with greater flexibility as they move through their careers at Princeton. We hope that Professor Taylor's generosity will create a model for future gifts, and we will continue to seek them actively.
- *Provide a pool of funds to support a yearly internal competition for the purchase of capital equipment for shared facilities.* Princeton already provides multiple kinds of internal support for equipment purchases. For example, the University draws upon both central and departmental funds to support high priority equipment purchases, such as the recent investment in a center for multi-modal imaging of biological processes to provide Princeton researchers with high-resolution single particle electron cryo-microscopy (cryo-EM) imaging capability. The Schmidt Fund also addresses some needs pertaining to equipment development. To supplement these programs, the University would have to draw upon the same donors and funding sources available to support the innovation grants discussed above. We will seek to raise innovation funds in as flexible a form as is possible, so that they can support the highest priority needs of Princeton's research enterprise, including equipment needs.
- *Allow deferring first-year of external fellowships to graduate students who have been awarded such fellowships in areas linked to sponsored research.* The Graduate School has implemented this recommendation. As of this fall, entering graduate students who hold National Science Foundation Graduate Research Fellowships may now reserve the fellowships in their first year, allowing them to be fully supported by the University in their first year of study.
- *Increase the size of Corporate Engagement and Foundation Relations staff to a level that is comparable with that of peer institutions (accounting for our size), as a means of securing additional philanthropic and industrial sources of funding in support of*

*research.* We have added two staff positions in Corporate Engagement and Foundation Relations recently to increase corporate funding for research, currently at about 5 percent of research expenditures, and to expand relationships with international foundations and corporations. We will take stock of the impact of this expansion before considering additional staffing.

- *Create proposal development positions within the Office of the Dean for Research, whose main functions will be to proactively identify new government funding opportunities and to assist faculty in the writing and preparation of large or interdisciplinary grant proposals.* A position within the Office of the Dean for Research to provide proposal development support has been made permanent, and I have asked the dean for research to monitor the need for additional proposal development support in the future.
- *Create a task force charged with identifying internal mechanisms for reducing the administrative burden on investigators who perform federally funded research, while maintaining full compliance with applicable regulations.* I have asked the dean for research to lead an effort of this kind.
- *Explore the creation of department-specific policies for first-year graduate students aimed at encouraging them to apply for external fellowships, with an overall goal of creating a culture where such applications are expected of eligible first-year graduate students.* Many of our academic departments already have cultures that encourage graduate students to apply for external fellowships and grants. The Graduate School intends to launch work with the academic departments this year to consider various options to support this practice more broadly.

## **Conclusion**

Sponsored research is an indispensable part of Princeton's academic enterprise and this nation's commitment to scientific and scholarly leadership. I am grateful to the members of the committee for their recommendations about how best to leverage Princeton's strengths and the federal government's crucial support. I look forward to continuing our implementation of these recommendations in the years to come.