

CALIFORNIA INSTITUTE OF TECHNOLOGY FRAMING THE BIG PICTURE: THE CALTECH DISCOVERY FUND

Since its founding almost a century ago, the California Institute of Technology (Caltech) has distinguished itself as a place where leading scientists and engineers pioneer bold ideas that shape our understanding of the world. We attract and cultivate a select cadre of faculty, staff, and students who have exceptional intellectual capacity, creativity, and drive—and who share excitement about the potential of basic science to help address civilization’s grandest challenges. With our rigorous, collaborative approach to education and research, we push past existing frontiers, create new fields of thought that inspire investigators at other institutions the world over, and deliver outsized impact on science, technology, and society.

Private philanthropy has played a significant role in the Institute’s ability to sustain this legacy—and in today’s era of uncertain government funding for basic research, private support is more essential than ever before.

Today, as Caltech launches the most ambitious fundraising campaign in its history, we are redoubling our commitment to securing funds to support basic scientific research and education. Philanthropic investment will help ensure the Institute’s continued ability to deliver on its promise of transformational science and technology by advancing high-risk, high-reward investigations—ensuring that Caltech continues to be a place where scientists and engineers are limited by nothing but their imaginations.

Background

Knowledge-driven basic research is at the core of Caltech’s mission. Recruited for their extraordinary talent and promise, Caltech’s faculty, research scientists, and students create new knowledge that deepens our understanding of the world in which we live. Over the long term, their discoveries often lay the groundwork for advancements in marketable applications and devices yet unimagined. The Institute’s role is to foster an environment that encourages bold, creative thinking and to offer the means by which researchers may bring their ideas to fruition.

A key priority within the new campaign is to encourage discovery by building upon a model that has a proven track record in promoting early-stage investigations and taking them to the next level. Established in 2009 with a generous gift from trustee James F. Rothenberg, the Caltech Innovation Initiative provides seed funds ranging from \$50,000 to \$250,000 to support Institute scientists and engineers in pursuing fundamental research that ultimately could give rise to marketable technologies.

Since its founding, the Caltech Innovation Initiative has demonstrated the powerful impact of small grants for big ideas. Investigators supported by the initiative have conducted foundational research leading to original materials that are opening up new possibilities for designing safer and more efficient aircraft and automobiles, development of a device that conveniently and

reliably tracks changes in intraocular pressure to advance glaucoma research and treatment, innovative technologies for treating traumatic brain injury, and more.

The Caltech Discovery Fund

With this proof of concept in hand, we are creating the Caltech Discovery Fund to expand the scope of the Caltech Innovation Initiative. This new fund will enable Institute leadership to take risks and nimbly leverage the talent and creativity of researchers across campus—at all levels—who are engaged in fundamental investigations. The focus is on projects with the potential to open up new avenues of basic scientific research, develop novel cross-disciplinary collaborations, advance original research methods or procedures, and take the first steps in exploratory investigations with a high probability of generating future grant support from external sources such as the National Institutes of Health, National Science Foundation, and other government agencies.

Every investment in Caltech is an investment in discovery—but the Caltech Discovery Fund represents a special opportunity to probe timely, out-of-the-box ideas without delay, to test yet-untried fields of study, and to furnish a proving ground for tomorrow’s leaders in discovery-driven research.

Fund Structure

Endowment contributions to the new Caltech Discovery Fund will be pooled with the Institute’s endowment investment portfolio, which is managed by the Investment Office under the direction of the Investment Committee of the Caltech Board of Trustees. Endowment payout—like current-use contributions to the fund—will be used to provide grants for basic research. These grants will be awarded in a flexible and responsive manner with respect to project selection, use of resources, and duration—thereby stimulating creativity and catalyzing potentially path-breaking scientific inquiry at a level higher than the norm.

Investigators

The Caltech Discovery Fund will broaden the scope of the Caltech Innovation Initiative, which currently provides seed grants to faculty scientists and engineers. Within this expanded model, investigators across the entire range of the Institute’s academic enterprise—faculty members, research scientists, postdoctoral scholars, graduate students, and, perhaps most importantly, undergraduates—will be invited to apply for grants to advance basic research. Caltech is one of the few institutions of higher education in the world where undergraduate research is an intrinsic part of the academic culture. In fact, many top students choose to come to Caltech specifically for the opportunities to engage in academic research under the guidance of internationally renowned scientists and engineers. This new fund will encourage the entire spectrum of Caltech investigators to think beyond the realm of the traditional, ensuring that skillful researchers at all levels have the freedom to build scientific capital by following their curiosity into the unknown.

Range of Research

Because the most powerful new ideas often emerge at the borders of fields, funds will be used to support basic research across all six of Caltech’s academic divisions—Biology and Biological Engineering; Chemistry and Chemical Engineering; Engineering and Applied Science;

Geological and Planetary Sciences; Humanities and Social Sciences; and Physics, Mathematics, and Astronomy.

Additionally, priority will be given to discovery-driven research addressing the major themes that have been identified within Caltech's developing campaign. These themes include but are not limited to:

- Advanced Materials and Nanoscience
- Earth and the Environment (including geochemistry and seismology)
- Exploring the Universe (including theoretical and experimental physics, astronomy, and planetary sciences)
- Energy
- Biosciences and Translational Medicine (including medical engineering and chemical signaling)
- Information Science and Technology
- Science of Society

The themes incorporate many of the Institute's academic and research foci, and are sufficiently broad to encompass promising new areas of investigation that may emerge in the years ahead.

Governance and Fund Allocation

Based on review of research proposals, fund allocation will be determined by the provost, the vice provost for research, and the chairs of the Institute's six divisions.

Grants will be awarded based on merit and potential, consistent with the Institute's emphasis on enabling its scientists to investigate fundamental questions about nature and take smart risks. Within those parameters, support may be directed toward innovative, single-investigator research or larger-scale cross-disciplinary lines of inquiry. Funds may be used across the entire scope of research, from facilities, equipment, and renovation to student stipends and researcher salaries, to workshops and visiting scientists. Student awards will be managed by the appropriate division(s).

Caltech may recognize donor contributions to this initiative through a variety of naming vehicles for endowment as well as current-use (expendable) gifts. Naming opportunities are available, for example, for seed funds, faculty start-up funds, professorial chairs, graduate and postdoctoral fellowships, and undergraduate scholarships.

Fueling Transformational Science and Technology

Functioning essentially as an incubator for pioneering basic research, the Caltech Discovery Fund will quicken the pace of discovery at Caltech by providing a crucial complement to traditional grant awards. Whereas the Institute's success in securing federal research support is remarkable, government grants generally favor more conservative investments—projects with proven potential, conducted by investigators who are already known in their fields. This practice, in which unconventional and untested ideas are passed over in favor of “safe” choices, often constrains ambition and creativity, leading to more predictable outcomes.

The Caltech Discovery Fund, conversely, will provide a source of funds for leading-edge research that otherwise might not be pursued. Institute leadership will be empowered to respond

quickly with seed funding for bold ideas, helping bridge the gap between inspiration and preliminary proof of concept. Supporters, in turn, will share in the rewards of seeding and supporting breakthrough science today and for generations to come.

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