



# The Caltech Commitment

## Summary of Findings from the Final Assessment

### INTRODUCTION

In 2002, the newly founded Gordon and Betty Moore Foundation made an unprecedented 10-year “Commitment<sup>1</sup>” of \$300 million to the California Institute of Technology (Caltech). Combined with a separate, personal gift from Gordon and Betty Moore of \$300 million, Caltech became the recipient of the largest donation ever made to an institute of higher learning. The Foundation’s Commitment was meant to “advance Caltech’s position at the forefront of higher education, technological development, and scientific research, and to foster significant scientific achievements in the life and physical sciences.”

In keeping with the Moore Foundation’s practice of evaluating its major grantmaking projects, an independent final assessment was completed by Science-Metrix in 2013. The Foundation asked Science-Metrix to:

- Understand the impact of the Commitment on advancing science broadly;
- Examine the impact of the Commitment at the institution-level for Caltech; and
- Articulate lessons learned about deploying a long-term, single-institution funding model.

The Commitment funding was used by Caltech to support basic research and discovery science in both the life and physical sciences. As of 2012, 29 grants, ranging from \$1 million to \$28 million each were used to support: new research centers (60% of funding), specific research projects (20%), acquisition and maintenance of new equipment (20%), and educational initiatives (3%). The Commitment was a partnership between Caltech and the Foundation, but one in which Caltech had a large degree of independence in identifying the projects to present to the Foundation for funding.

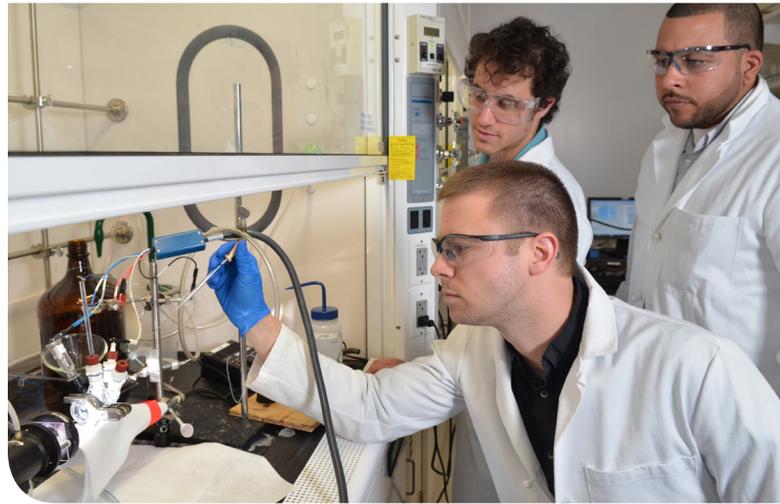
To assess the Commitment’s successes and challenges, and to address the topics posed above, the final assessment team examined the Commitment grants, reviewed numerous key documents, interviewed dozens of grantees and key stakeholders, and examined six case studies in-depth. In addition, an expert panel of eight eminent scientists reviewed and validated the key findings.

This summary document offers a high-level synthesis of the independent review results.

<sup>1</sup>The foundation has defined a “Commitment” as an implementation framework for grantmaking characterized as large-scale, long-term investments in a specific institution or project (others include the Betty Irene Moore School of Nursing and the Thirty Meter Telescope).

## FINDINGS

The Caltech Commitment enabled significant advances in the life and physical sciences, some of which will likely be transformative over the longer term. The Commitment also had a significant and very positive impact on Caltech, giving the institution an unprecedented ability to maintain and advance its position in research, technology, and education. Overall, the final assessment concluded that the Commitment's goal—of placing Caltech at the forefront of higher education, technological development, and scientific research—was achieved.



### Impacts for Science

- Nearly all of the grants funded under the Commitment realized or will realize their intended, and often ambitious, outcomes. These outcomes will have notable impacts on science, industry, government, and the general public over time. Half of the grants developed new technologies or methods that represent potential 'trigger points' for future transformation.
- Several projects have high potential to result in major transformations in science:
  - The Center for Analysis of Higher Brain Function contributed to the growth of a new field: neuroeconomics.
  - The Center for Exotic Quantum Systems supports multidisciplinary theoretical and environmental work in quantum and information science, which, according to an Expert Panelist, enables scientists to "tak[e] physical electronic optimal systems to the quantum limits."
  - The Center for Catalysis and Chemical Synthesis acquired state-of-the-art instrumentation that dramatically decreases the timeframe and scale of experiments required for new catalyst discovery.
  - Research thrusts of the Detectors for Cosmology project have the potential to transform cosmology and astrophysics as they are known today.
  - Tectonics Observatory grants led to new methods and software (some free for non-commercial use) that advance understanding of earthquakes, dune migration, glacier displacement, landslides, and sand fluxes on Mars.
- In energy science, two grants resulted in new breakthrough technologies for solar energy capture, conversion, storage, and utilization.
- In materials science, structural chemistry, and astronomy, several initiatives led to important scientific outcomes, including a combined telescope that significantly advanced capabilities to conduct sky surveys and answer important astronomical questions.
- Commitment-supported researchers had a high level of impact, as measured by publications and their citations. In a number of cases, impact increased during the years of the Commitment funding. A very high proportion of the papers by Commitment-funded researchers are among the 1% most cited in their field (five to seven times what would be expected), suggesting that they contributed to breakthrough science.
- Commitment-funded researchers won prestigious awards as a result of making significant advancements in their fields (e.g., NIH Director's Pioneer Awards, MacArthur Fellowship).
- Based on conservative estimates, the amount of money leveraged from Commitment grants from federal, industrial, and private sources was approximately \$225 million.

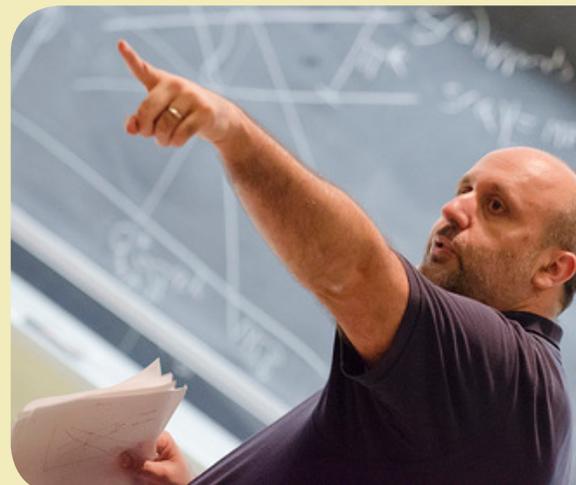


### Impacts for Caltech

- Caltech grew in reputation as a world leader in fields where it has traditionally excelled, including astronomy/cosmology, chemistry, physical sciences, earth sciences, and experimental economics. In addition, several new areas of strength became established at Caltech due to their investments with Commitment funding.
- Caltech strengthened the school's culture of valuing discovery research, risk taking, and cultivating the environment necessary for significant scientific discoveries. Caltech also greatly increased multidisciplinary collaboration and training with this funding.
- Caltech strengthened its wealth of human talent by using the funding to attract and retain top faculty, staff, post-docs, and students.

### Commitment Lessons

- The Commitment's flexible scope and long-term structure stimulated faculty to think 'out of the box' and allowed for investments in initiatives that broke down silos in research culture, leading to increased multidisciplinary collaboration.
- Making a large grant to a single, small, high-performing institution is a strong model for helping that institution to advance. The tradeoff, however, is that it may make less funding available for an alternative model focused on specific fields and great ideas at multiple institutions.
- The Foundation's flexibility with Caltech using an internal process for identifying projects carried important benefits and fostered more risk-taking. The external review panel noted that most of the Commitment projects were at a stage that would not have been fundable through other sources. However, Caltech's internal process for selecting projects to propose to the Foundation was not always fully understood by the broader faculty.
- Committing funds long-term without an explicit targeted focus worked well with Caltech because the vision of the institution and Foundation were well aligned, and the Foundation was confident of the grantee's ability to orient the funds strategically and manage effectively.
- Not all of the projects were planned early enough for funding to continue after the Commitment ended. This was recognized later in the Commitment and specific plans for longer-term durability were incorporated into the newer projects.



All photos courtesy of Caltech

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1661 Page Mill Road Palo Alto, CA 94304