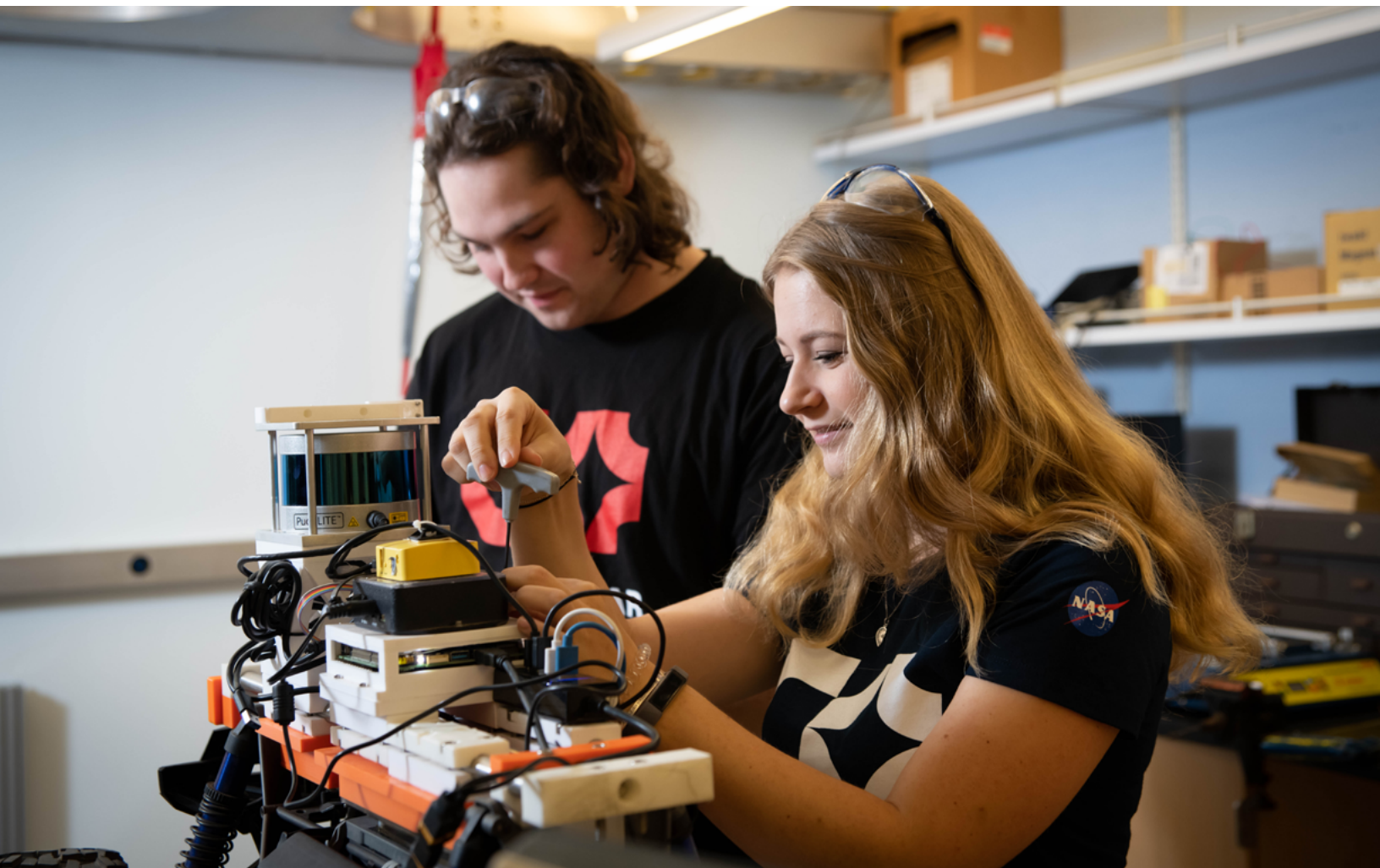




2019 Endowment Report

October 1, 2018, through September 30, 2019

Caltech



SKILLED INVESTMENTS IN WORLD-CHANGING DISCOVERY



I am very pleased to report that Caltech's endowment investment pool grew by over \$85 million to \$2.97 billion during fiscal year 2019.* Contributing to this growth were the continued success of Caltech's *Break Through* campaign, which generated cash receipts of \$122 million for endowment, other additions of \$25 million, and investment returns of \$150 million. Inflows were offset by payout of \$150 million in support of Institute activities and other withdrawals of \$61 million. Over the last 10 years, growth in the endowment investment pool has allowed Caltech to increase its annual payout to support Institute activities by over 60 percent, from \$94 million in fiscal year 2010 to \$150 million in fiscal year 2019, with almost \$1.2 billion in aggregate annual payout to the Institute during that time.

In my comments last year, I noted the peril of focusing on short-term returns. This could not have been more true during fiscal year 2019. During the fourth calendar quarter of 2018 (the first quarter of Caltech's fiscal year), the S&P 500 fell **13.5 percent**. Over the next three quarters (ended September 30, 2019), the S&P 500 recovered **20.5 percent**, resulting in a four-quarter return of 4.1 percent for the fiscal year. Moving just one quarter forward, however, during the four quarters ended December 31, 2019, the S&P 500 returned **31.2 percent**. This is a helpful reminder that, in the investment world, any comparisons have substantial start- and end-point sensitivity, and that to focus on any one short period of time is pure folly. With a perpetual investment horizon, when we think about how to position Caltech's endowment, or which managers to select, we are always trying to look at least five to 10 years (or more) into the future.

With the foregoing in mind, the endowment investment pool enjoyed another fiscal year

"The social object of skilled investment should be to defeat the dark forces of time and ignorance which envelop our future."

-John Maynard Keynes, from *The General Theory of Employment, Interest and Money* (1936)

of solid performance, particularly compared to our benchmarks and peers. On a consolidated basis, the endowment investment pool generated annualized returns of 5.4 percent, 10.2 percent, 7.3 percent, and 8.3 percent, respectively, for the one-, three-, five-, and 10-year periods ended September 30, 2019. These figures exceeded our internal investment policy benchmark returns by

3.0 percent, 2.9 percent, 2.1 percent, and 1.7 percent per annum, respectively. Importantly, over the last 10 years, our investment returns have exceeded the endowment payout plus the average annual increase of 1.8 percent in CPI, allowing us to grow the existing endowment funds on a real (after-inflation) basis.

During our 2019 fiscal year, aggregate performance of public equities in the global markets was dominated by U.S. large-cap growth stocks like Alphabet, Amazon, Apple, Facebook, Google, and Netflix. Given the endowment's positioning toward non-U.S., value, and quality stocks, it is a testament to our managers' skills that we ended the year just under our public equities benchmark, while for longer time periods we remained well ahead of the benchmark, after fees. When one considers that a recent study found that, over the 10 years ended December 31, 2018, 85 percent of active U.S. large-cap managers underperformed the S&P 500, and 80 percent of all active managers in all sectors underperformed their respective benchmarks, our long-term outperformance is notable.

Some sectors continued to perform exceedingly well: Our private equity portfolio, which we have been growing carefully and systematically over the last five years, generated a 14.5 percent return, beating its benchmark by 2.9 percent. Similarly, our real estate portfolio performed well, delivering an 8.7 percent return and beating its



Students gather on the lawn near the Hameetman Center. Named in honor of trustee Fred Hameetman (BS '62) and his wife, Joyce, the new campus hub opened in February 2019.

benchmark by 2.6 percent. Our large marketable alternatives portfolio delivered a disappointing 2.7 percent return but still beat its benchmark by 2.3 percentage points. On the negative front, our private energy investments continued to struggle. The portfolio, which now represents just 5.4 percent of the endowment investment pool, lost 16.8 percent of its value, trailing its benchmark by a full 7.0 percentage points. The decline was driven, in part, by a 26 percent decline in oil prices during the fiscal year. Unfortunately, however, due to excess leverage incurred by some of our private energy managers and other industry dynamics, it is likely that much of the valuation decline will not be temporary. We continue to re-evaluate our energy investment strategy as the supply-demand dynamic for conventional energy quickly evolves.

Caltech's performance as compared to our college and university endowment peers was very good. According to Cambridge Associates, among the approximately 140 institutions of higher education that submitted data to Cambridge for the period ended September 30, 2019, Caltech's endowment investment pool

performance placed it in the top decile for the one-, three-, and five-year periods, respectively.

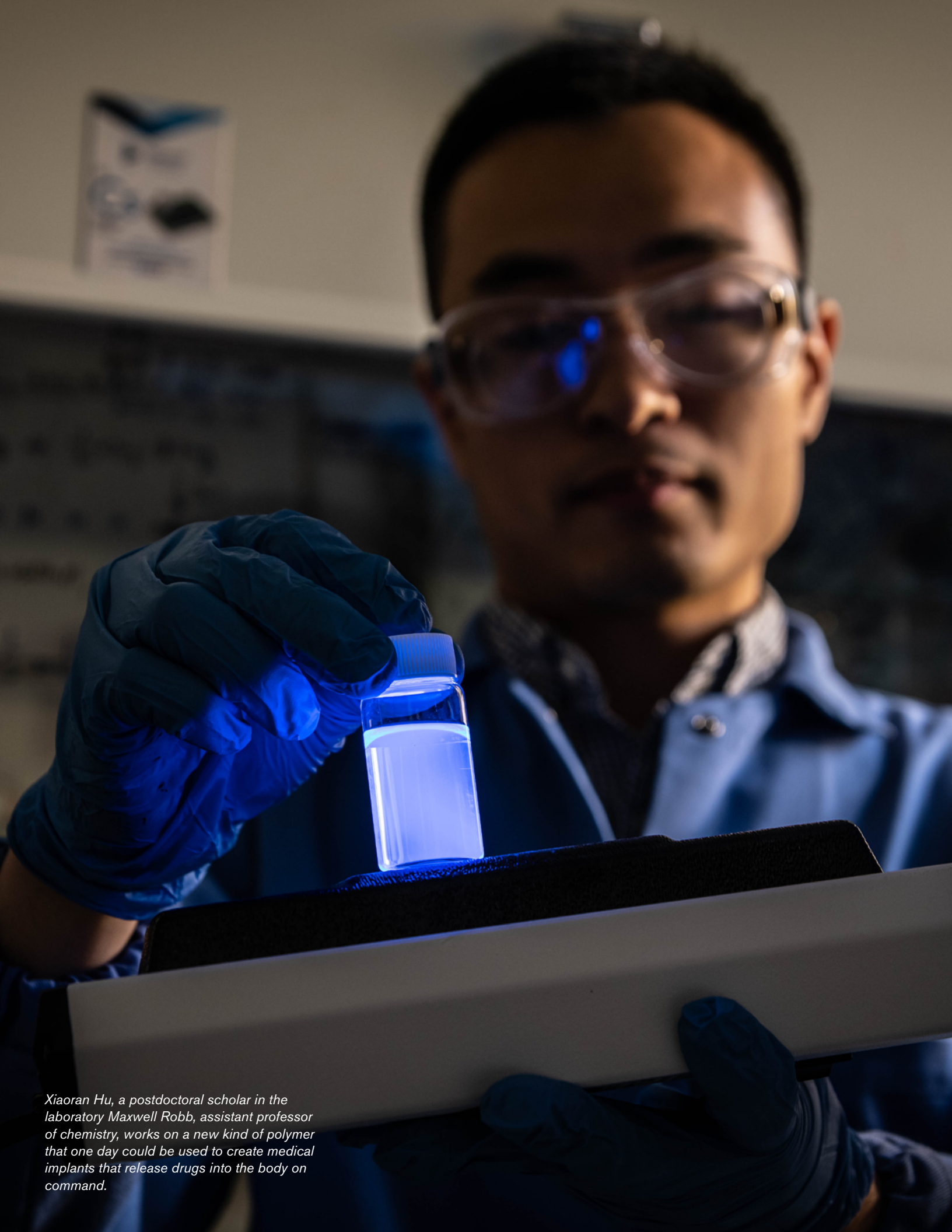
Additionally, for the first time in recent history, we moved into the top quartile for the 10-year period.

I will close by referring to the quote from John Maynard Keynes. In the context of his writing, he was probably referring to the difficulty in predicting the outcomes of investments and the inherent risks confronting market participants. In a different context, though, the Investment Office is honored to contribute to an Institute ecosystem that strives to "defeat the dark forces of time and ignorance which envelop our future" through world-changing science and discovery.

Thank you, as always, for your continued support of Caltech and its endowment.

Scott H. Richland
Chief Investment Officer
January 26, 2020

** October 1, 2018, through September 30, 2019*



Xiaoran Hu, a postdoctoral scholar in the laboratory Maxwell Robb, assistant professor of chemistry, works on a new kind of polymer that one day could be used to create medical implants that release drugs into the body on command.

CALTECH'S ENDOWMENT: FOCUS ON ACHIEVEMENT OVER THE LONG TERM

Caltech's endowment magnifies the Institute's ability to answer fundamental scientific questions and to address pressing societal challenges. Endowment generates perpetual funding that emboldens Caltech faculty and students to innovate, even in times when economic fluctuation may constrain the availability of other resources. Visionary donors

have created endowments to support people, programs, and facilities across campus. This support heightens Caltech's ability to bring together the world's brightest minds and most advanced tools to fuel breakthroughs in fields ranging from multi-messenger astronomy to single-cell biology to sustainability and climate science.

FY19: CAMPAIGN CASH
ADDITIONS TO ENDOWMENT

\$122M

More than 1,400 privately donated sub-funds make up the bulk of Caltech's endowment investment pool. The Institute deposits the monies from each new endowment gift into the pool and invests strategically, aiming to preserve the inflation-

adjusted purchasing power of the original gift amount and generate returns that support annual payouts. Caltech manages its endowment with a focus on long-term returns as well as a nimble response to time-sensitive investment opportunities in order to honor each donor's wishes for generations to come.

Caltech's *Break Through* Campaign: Increasing the Margin of Excellence

Caltech's legacy of innovation and impact derives from the Institute's unwavering commitment to excellence. Caltech recruits the most capable and creative faculty, students, and staff and provides an academic environment that challenges and inspires them to test their limits and push the boundaries of science and technology.

The endowment allows this margin of excellence to grow. Flexible endowments, in particular, generate resources that Institute leaders can direct wherever they will have the greatest impact. Caltech's distinctive leadership chairs, for example, give the president, provost, division chairs, and program directors freedom to leverage time-sensitive opportunities, advance the work of pioneering faculty and students, and pursue the most promising opportunities wherever they may lead.

Gifts to establish named professorships enhance Caltech's competitive advantage in recruiting and retaining talented, ambitious faculty who create new knowledge, invent new technologies, and sometimes establish entirely new fields of inquiry. Endowed fellowships give the Institute a discriminating edge in attracting outstanding graduate students and postdoctoral scholars who accelerate faculty research projects and invigorate the campus community with new ideas and fresh perspectives. And endowed scholarships help make an Institute education affordable for all qualified undergraduates, so that gifted students from every background can fulfill their academic dreams at Caltech.

For all of these reasons, raising funds for endowment is a top priority of *Break Through: The Caltech Campaign*. As of September 30, 2019, campaign donors had committed nearly \$2.9 billion to Caltech, including almost \$1.7 billion—59 percent of total gifts and pledges—designated for endowment.

Barbara Wold (PhD '78), Bren Professor of Molecular Biology, is the newly appointed director of the Richard N. Merkin Institute for Translational Research at Caltech. The institute was launched in May with a Break Through campaign gift from trustee Richard Merkin.

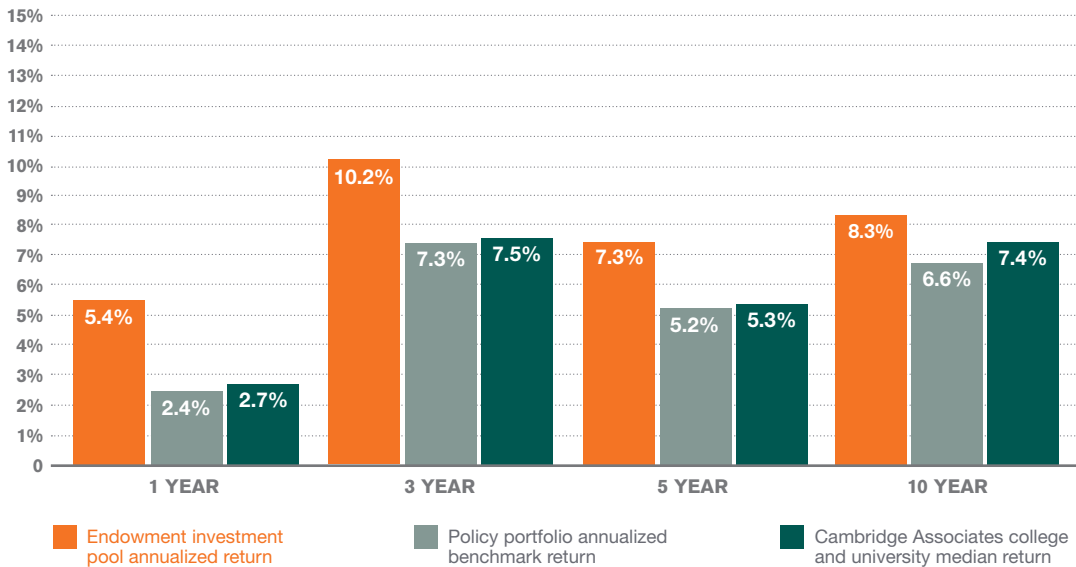


ENDOWMENT PERFORMANCE, FISCAL YEAR 2019

Endowment Investment Pool Return

As illustrated in the figure below, Caltech's endowment investment pool generated a 5.4 percent return for fiscal year 2019, exceeding its benchmark policy portfolio by 3.0 percentage points. For the three-, five-, and 10-year periods ended

September 30, 2019, investment pool returns beat their benchmarks by 2.9, 2.1, and 1.7 percentage points, respectively. Over the last five years, the added value generated by this outperformance of the policy portfolio was nearly \$250 million.

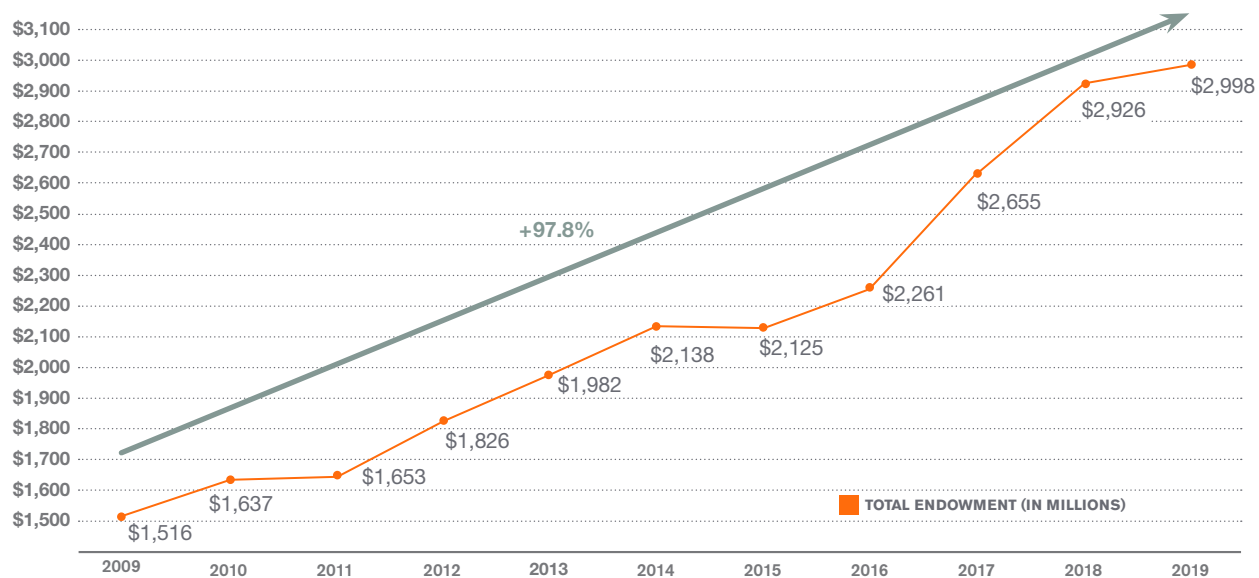


LAST FIVE YEARS:
\$148M
 in financial aid
 from endowment

Growth of the Total Endowment

The market value of Caltech’s total endowment investment portfolio increased to nearly \$3.0 billion as of the close of fiscal year 2019. This increase was made possible by generous giving to endowed funds and strong performance from our real estate, private equity, and alternative securities asset classes. New gifts and investment gains were partially offset by endowment distributions. Since the end of fiscal year 2009, the beginning of the recovery from the 2008 financial crisis, Caltech’s total endowment value (net of outflows) has grown at a compound annual rate of nearly 7.1 percent and has supported Caltech’s research programs and people with almost \$1.2 billion in payout.

FY19:
\$72M
 increase in total endowment



Total endowment includes the investment pool and separately invested endowments.

Asset Class Allocation and Performance

Caltech’s private equity portfolio (which includes both buyout and venture capital funds) performed well during fiscal year 2019, delivering a 14.5 percent return and beating its benchmark by 2.9 percentage points. In real assets, our real estate portfolio provided solid performance, up 8.7 percent and beating its benchmark by 2.6 percentage points; however, this was more than offset by private energy and

infrastructure losses caused by the rapid decline in oil prices. The overall alternative securities market struggled during the 12 months ended September 30, 2019. (The HFRI Fund of Funds Composite Index return was down 0.1 percent.) Despite this weakness, our alternative securities portfolio fared well, up 2.7 percent and beating its composite benchmark by 2.3 percentage points.

	Allocation (as of September 30, 2019)	FY 2019 Asset Class Returns	FY 2019 Benchmark Returns
Global developed markets equities	25%	-0.9%	1.8%
Emerging markets equities	10%	3.0%	-2.0%
Alternative securities	27%	2.7%	0.4%
Private equity and venture capital	18%	14.5%	11.6%
Real assets*	12%	-5.8%	-2.6%
Global fixed income	1%	1.0%	9.7%
Cash and other	7%	2.4%	2.4%

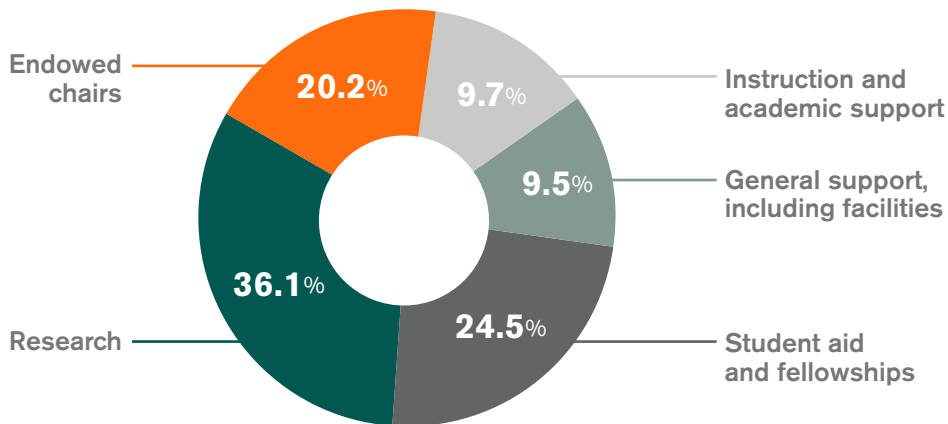
* Primarily real estate, energy, and commodities

ENDOWMENT PAYOUT, FISCAL YEAR 2019

Over \$150 million in endowment payout contributed nearly 22 percent of Caltech’s operating budget in fiscal year 2019, supporting research and education in many valuable ways. Endowed fellowships, for example, afforded graduate students the freedom to

pursue their passions without being unduly constrained by a lack of funding. And endowed undergraduate scholarships helped Caltech maintain its place among the 6 percent of institutions nationwide that admit students on a need-blind basis.

Allocation of \$150 Million Payout



Endowed Early-Career Professorships: Fast Track to Impact for Stellar New Faculty

Katie Bouman (left) made headlines in April 2019 for her work with a large international team on the Event Horizon Telescope (EHT), which captured the first-ever image of a black hole. She joined Caltech two months later as an assistant professor of computing and mathematical sciences.

An expert in computational imaging, Bouman uncovers hidden information in images that can yield insights about our universe as well as terrestrial phenomena. Already, she has connected with campus and JPL colleagues to explore techniques to better understand earthquakes, use videos to detect minuscule vibrations that could point to defects in objects, and study clouds for climate science applications.

In September, Bouman was named a Rosenberg Scholar. The position comes with research support thanks to an endowment gift from benefactors Richard Rosenberg and his wife, Barbara, to jumpstart the careers of promising new faculty by assuring crucial financial resources during their pre-tenure years. Bouman also received the 2020 Breakthrough Prize in Fundamental Physics for her role on the EHT team. She is part of Caltech’s emerging Sensing to Intelligence initiative, which will unite sensing and imaging with computation and algorithms in service of health, energy and the environment, and scientific discovery.

A Transformative Investment to Unite Science and Bold Creativity

Trustee Stewart Resnick and his wife, Lynda, founders of The Wonderful Company, amplified their investment in Caltech's Resnick Sustainability Institute (RSI) with a new pledge of \$750 million, the second-largest reported gift ever to a U.S. university. This transformative commitment, announced in September 2019 as part of the *Break Through* campaign, will enable Caltech to expand upon and scale up the work it has led for the last 10 years through RSI.


The initiative will bring together researchers from across academic divisions and JPL (which Caltech manages for NASA) to advance research in solar science, climate science, energy, biofuels, decomposable plastics, water and environmental resources, and

ecology and biosphere engineering. It also will provide a shared facility with state-of-the-art undergraduate teaching laboratories and unparalleled instrumentation to augment investigators' ability to carry out innovative research and invent breakthrough technologies. To ensure uninterrupted support for research and education, the Resnicks' commitment creates a permanent endowment to fund the work of Caltech scientists and engineers who are charting a more sustainable future for society.

"Science and bold creativity must unite to address the most pressing challenges facing energy, water, and sustainability," Stewart Resnick says.

Lynda Resnick, Caltech President Thomas F. Rosenbaum, and Stewart Resnick in the surface science lab at Caltech's Joint Center for Artificial Photosynthesis (JCAP). (credit: The Wonderful Company)





This 2006 image from the Spitzer Space Telescope reveals hundreds of thousands of stars gathered in dust clouds at the center of the Milky Way galaxy. The telescope was retired in January 2020 after more than 16 years studying the universe in infrared light. (credit: NASA/JPL-Caltech)

INVESTMENT PRINCIPLES

Asset Allocation and Risk Management

The asset allocation policy for Caltech's endowment investment pool emphasizes diversification across asset classes, investment styles, and geographic locations, striving to achieve strong long-term investment performance while avoiding highly concentrated risks.

Portfolio risk management focuses on market correlations and sensitivity (beta), interest-rate risk, and expected volatility as well as liquidity. In addition, the portfolio is subjected to analysis that models how it is expected to act in situations comparable to the Great Financial Crisis, the 2001 tech wreck, the September 11 tragedy, and other scenarios. The portfolio responses to these scenarios are monitored over time, and adjustments may be made if the projected portfolio drawdown is larger than anticipated.

Strategic asset allocation ranges are established by Caltech's Investment Committee and are subject to periodic review. In addition, tactical adjustments are made by the Investment Committee and the Investment Office in response to current or anticipated shorter-term market conditions.

At the end of fiscal year 2019, the endowment investment portfolio was tactically underweight in traditional investment-grade fixed income and real assets and overweight in private equity relative to our strategic allocation guidelines. The underweight position in fixed income (which has been the case for nearly 10 years) continued due to the low level of interest rates and the expectation that rates at some point will revert to more "normal" levels; the real assets' underweight position reflects continued weakness from low commodities prices.

Endowment Liquidity

Caltech's endowment investment pool is closely managed and monitored for liquidity. We define liquidity as the ability to realize and access cash from an investment in a timely manner. Liquidity is desirable for five primary reasons:

1. The portfolio has financial obligations such as investment fund capital calls, which often must be satisfied with relatively short notice.
2. The ability to implement changes in tactical and/or policy allocations requires liquidity.
3. From time to time, unusual investment opportunities arise—driven by market or other forces—that cannot be seized without liquidity.
4. In periods of economic downturn, the endowment investment portfolio must be prepared for a potential reduction in cash inflows while maintaining its payout to the Institute, which is essential to achieving Caltech's mission.
5. Unrestricted endowment investment pool funds may need to be tapped to assist in maintaining operating continuity in cases of emergency or financial disruption.

The Caltech endowment investment pool is quite liquid, with more than 21 percent of the assets currently convertible to cash within one to two weeks and nearly 30 percent convertible to cash within a calendar quarter under normal circumstances. The Institute's additional sources of liquidity include substantial funds that have been raised from issuing bonds over the last five years as well as committed lines of credit provided by commercial banks.

MANAGEMENT OF THE ENDOWMENT INVESTMENT PORTFOLIO

The Caltech Investment Office reports jointly to the Institute's president and the Board of Trustees' Investment Committee, which has primary responsibility for setting investment policy, overseeing policy implementation, and approving major investments. The committee meets at least quarterly to discuss and review asset allocation,

The Investment Office

The Investment Office develops recommendations on investment policies, strategies, and asset allocation for review and approval by the Investment Committee. With the general guidelines in place, the Investment Office then identifies investments and what it considers to be best-in-class asset managers around the world who can effectively implement the adopted investment strategies. The office focuses on medium- to long-term performance, identifying

investment policies, new investments, and portfolio performance. To discuss specific investments and other opportunities as they arise, the committee also interacts frequently between meetings. The members bring extraordinary expertise in both specific asset classes and the investment industry in general.

global trends and investment opportunities that may develop over many years. While quarter-to-quarter performance is closely monitored, and appropriate portfolio adjustments are made from time to time, the primary goal is to earn long-term rates of return that support the annual endowment payout and maintain the endowment's inflation-adjusted purchasing power, allowing it to support Caltech's activities for generations to come.

INVESTMENT COMMITTEE MEMBERS

Timothy J. Sloan, Chair

Retired Chief Executive Officer and President,
Wells Fargo & Company

Dr. Ronald K. Linde (MS '62, PhD '64), Vice Chair

Vice Chair, Caltech Board of Trustees
Independent Investor
Chair, The Ronald and Maxine Linde Foundation
Founder and Former Chief Executive Officer,
Envirodyne Industries, Inc.

Joshua S. Friedman, Member*

Co-Founder, Co-Chairman, and Co-Chief Executive Officer,
Canyon Partners, LLC

B. Kipling Hagopian, Member

Managing Partner, Apple Oaks Partners, LLC

G. Bradford Jones, Member

Founding Partner, Redpoint Ventures

Dr. David L. Lee (PhD '74), Member

Chair, Caltech Board of Trustees
Managing General Partner, Clarity Partners, L.P.

A. Michael Lipper, Member

President and Chief Executive Officer,
Lipper Advisory Services

Li Lu, Member

Founder and Chairman, Himalaya Capital

Dr. Thomas F. Rosenbaum, Member

President, Sonja and William Davidow Presidential Chair,
and Professor of Physics, Caltech

Susan Schnabel, Advisory Participant

Co-Founder and Co-Managing Partner,
aPriori Capital Partners

Robert V. Sinnott, Advisory Participant

Co-Chairman, Kayne Anderson Capital Advisors

Lance N. West (MS '83), Advisory Participant

Retired Chairman and Chief Executive Officer,
Centerbridge Partners Europe, L.L.P.

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* Past Investment Committee Chair

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ABOVE:

A palm tree is reflected in the window of Seeley W. Mudd Laboratory of the Geological Sciences.

COVER (clockwise from top left):

Claire Bucholz, assistant professor of geology, studies Earth's rock record for important clues about the planet's deep past.

Marina Agranov, professor of economics (center), confers with students and enjoys the view from the ninth floor of the Robert A. Millikan Memorial Building, known as Millikan Library. Agranov's research focuses on how people form beliefs and make choices.

Jake Ketchum and **Alexandra (Sasha) Bodrova** (both class of 2020) helped design and build the robot that garnered second place in the Defense Advanced Research Projects Agency (DARPA) Subterranean (SubT) Challenge in August 2019.