



# 2021 Endowment Report

October 1, 2020, through September 30, 2021

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**Caltech**

## A YEAR OF RECORD-SETTING GROWTH



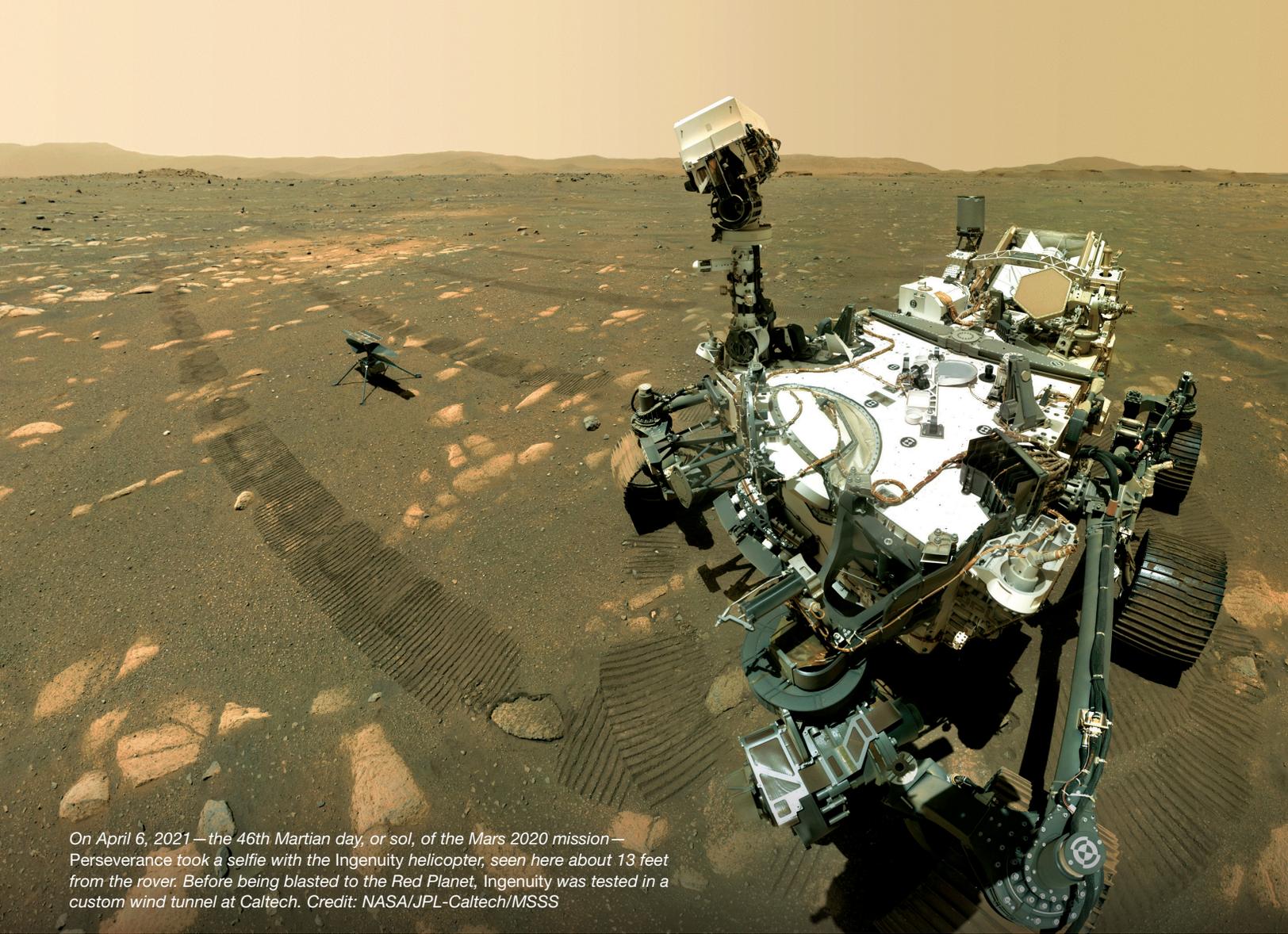
The Caltech endowment investment pool enjoyed record-setting growth of 31.0 percent (\$955 million) during fiscal year 2021.\* Contributing to this growth were gifts to endowment and other additions to the investment pool of \$135 million plus investment returns of \$1.02 billion, offset by \$199 million in payout and other withdrawals to support Institute activities.

During the period ended September 30, 2021, the endowment investment pool generated annualized investment gains of 33.7 percent, 14.9 percent, 14.0 percent, and 11.2 percent for the one-, three-, five-, and 10-year periods, respectively. As shown elsewhere in this report, these figures exceeded our internal investment policy benchmark returns by 9.0 percentage points, 3.9 percentage points, 3.5 percentage points, and 2.8 percentage points, respectively.

To say the market performance during fiscal year 2021 was unexpected—particularly on the heels of the ebullient last three quarters of calendar year 2020—would be an understatement. However, with hindsight, it is not that hard to understand. Interest rates remained exceedingly low, supported by the Federal Reserve’s purchases of government bonds and a fed funds target rate of just 0.25 percent. Stimulus checks, tax deferrals, and other government-sponsored programs prompted consumers to spend their newly found liquidity, creating strong pull-through demand. A host of pandemic-driven businesses (food delivery, home entertainment and exercise, software and hardware that facilitated remote learning and business communication, social media, automobiles, health care, and many others) benefited as the world adjusted to the “new normal” of living with COVID-19. As a result, the S&P 500 generated a 30.0 percent total return (including dividends) during the fiscal year. However, it would turn out that 30.0 percent was a pittance compared to the private markets of venture capital and leveraged buyouts, which, according to Cambridge Associates, generated **average** returns of 82.4 and 42.5 percent, respectively, during the fiscal year. It was clearly a “risk-on” market as institutional investors plowed money into growth stocks and private equity to replace yield-starved fixed-income holdings.

The term “meme stock” also entered our vocabulary as retail investors frenetically traded from home on new platforms such as Robinhood. Meanwhile, the Caltech endowment investment pool stayed the course, valuing diversification and liquidity and eschewing portfolio-level leverage.

Virtually every asset class, except for investment-grade fixed income, performed exceedingly well. As noted above, private equity performed well above expectations, with our venture capital and buyout managers generating 64.0 percent and 68.0 percent returns, respectively, for the fiscal year. As a whole, private equity beat its internal benchmark by 16.5 percentage points. While it is easy with hindsight to wish we had owned more in these asset classes (which at the end of the fiscal year represented 23.4 percent of the endowment investment pool), we constantly remind ourselves that these asset classes (a) are virtually illiquid and can be locked up at least partially for 15 to 20 years and (b) remain the riskiest asset classes in the endowment investment pool. While as an owner of these asset classes we have enjoyed the recent well-above-average returns, we do not lose sight of the fact that the ever-rising valuations paid for start-ups and highly leveraged companies made venture capital and leveraged buyout investments even riskier. Hence, we approach these markets with caution and patience, creating an annual investment “budget” that ensures we have vintage-year diversification. Interestingly, the other major asset classes, including global public equities, alternative securities, and real assets, all generated about 25 percent returns during the fiscal year. Global public equities generated a 25.9 percent return, exactly equaling our global public equities benchmark. While U.S. equities performed well during the year, it was our developed markets managers that focus on western Europe and Japan who led the pack with an aggregate 30.4 percent return. Alternative securities generated a 26.4 percent return, a heroic comeback from a miserable –0.7 percent return in the prior fiscal year. This return handily beat its benchmark return by 9.2 percentage points. Similarly, real assets, consisting of real estate and energy-related funds, returned 25.5 percent, missing its benchmark return



On April 6, 2021—the 46th Martian day, or sol, of the Mars 2020 mission—Perseverance took a selfie with the Ingenuity helicopter, seen here about 13 feet from the rover. Before being blasted to the Red Planet, Ingenuity was tested in a custom wind tunnel at Caltech. Credit: NASA/JPL-Caltech/MSSS

by 2.1 percentage points, largely driven by a strong recovery in oil prices, in which many of our investments did not fully participate.

Caltech's performance as compared with our college and university endowment peers continues to be strong and to improve. Based on Cambridge Associates data for the period ended September 30, 2021, Caltech's endowment investment pool performance placed it in the first (top) quartile for each of the one-, three-, five-, and 10-year periods among the approximately 132 institutions of higher education that submitted data to Cambridge. This performance is particularly satisfying given the endowment investment pool's lower exposure to private equity in relation to many of our top-performing peers.

The Investment Office continued forward with its DEI (diversity, equity, and inclusion) initiatives during the year.\* The Investment Committee approved a DEI statement that will guide the office's approach to

DEI-aware manager selection. In addition, completion of a DEI questionnaire addressing diversity among ownership, management, employees, and interns has become a standard part of our investment manager selection process.

It is an honor and privilege for our investment team to support the activities of Caltech's extraordinary group of scientists, researchers, engineers, students, postdoctoral scholars, and administrators who work tirelessly to advance science and technology to address some of the world's most complex issues. We thank you for your continued support of Caltech and its endowment.

**Scott H. Richland**  
Chief Investment Officer  
March 2022

\* October 1, 2020, through September 30, 2021



*Victoria Orphan, the James Irvine Professor of Environmental Science and Geobiology and holder of the Allen V. C. Davis and Lenabelle Davis Leadership Chair for the Center for Environmental Microbial Interactions, is pictured here with a seagrass sample. Seagrass meadows are considered critical ecosystems for long-term carbon sequestration in the marine environment.*

## ENDOWMENT: MAKE WAY FOR THE FUTURE

The power of endowment is its continuity. Because it provides a stable source of funds year after year, Caltech's endowment provides a buffer against fluctuating financial markets and the unpredictability of external funding sources. It also fuels intellectual fearlessness and creativity. When faculty and students know the Institute has long-term resources to support them, they are emboldened to venture into uncharted territories and do what has never been done before.

For this reason, raising endowed funds was a high priority for *Break Through: The Caltech Campaign*. And alumni and friends took up the challenge, investing in people, programs, and facilities across campus. When the campaign ended on September 30, 2021, donors had given more than \$3.4 billion to Caltech—with more than half of that total directed to endowment.

FY21: CAMPAIGN CASH  
ADDITIONS TO ENDOWMENT:

**\$125M**

Through the endowment of professorships, leadership chairs, fellowships, and scholarships, campaign donors have helped to secure Caltech's competitive advantage in recruiting and retaining the brightest, most creative scholars from around the world for generations to come.

Campaign supporters also directed endowed gifts to advance cross-disciplinary research in areas where Caltech has the potential to change the world. Investments in neuroscience, biological and medical engineering, translational research, autonomous systems and technologies, planetary studies,

theoretical physics, energy and sustainability, and other fields are enabling Caltech investigators to forge dynamic cross-disciplinary collaborations and develop innovative approaches and tools. This work, in turn, is driving fundamental discovery, bringing life-changing technologies to market, opening up entirely new fields of research, and redefining how science is done.

Donors to the *Break Through* campaign also expressed their confidence in the Institute's leadership and continued excellence through the creation of unrestricted and flexible endowments. Because endowed funds are invested strategically to generate income in perpetuity, these flexible resources will ensure that future generations of Caltech scientists and engineers have the wherewithal to tackle challenges and seize opportunities we cannot yet imagine.

***Break Through: The Caltech Campaign* concluded on September 30, 2021, as the most successful fundraising initiative in the Institute's history. A total of 14,801 donors gave more than \$3.4 billion—including \$1.9 billion committed to endowment—to help Caltech faculty and students push the boundaries of science and technology toward a brighter future for us all.**



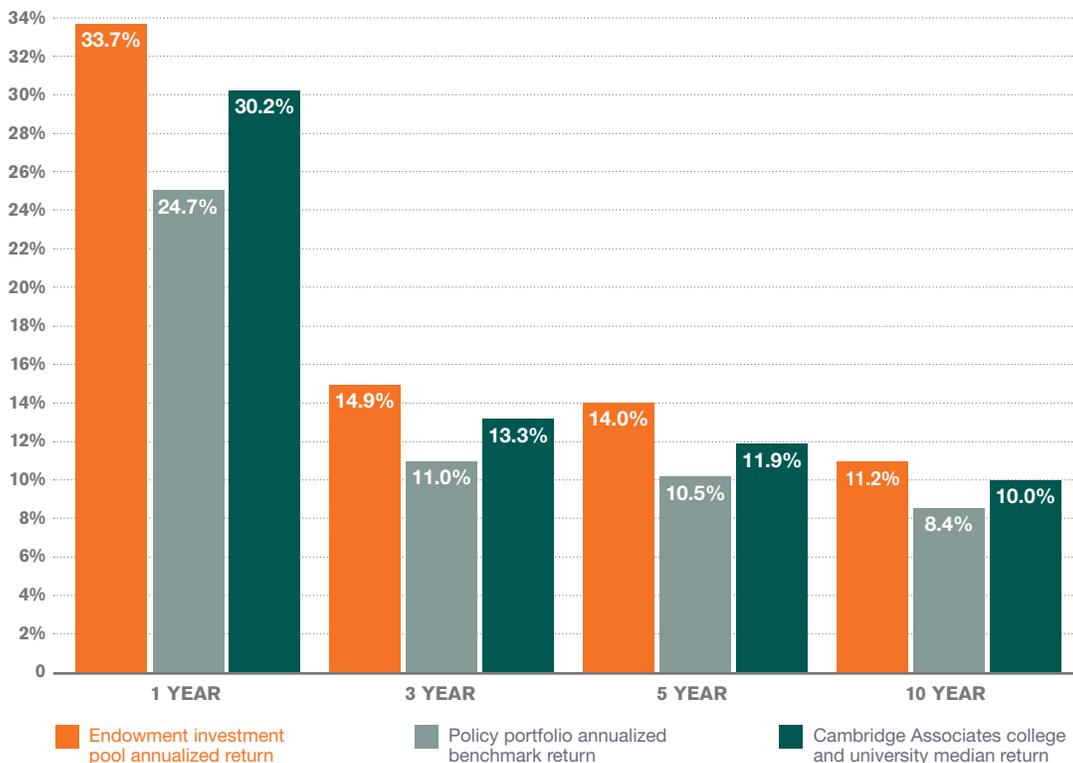
In August 2021, Caltech announced a gift of more than \$100 million from Donald Bren, chairman of Irvine Company and a lifetime member of the Board of Trustees, to form the Space-Based Solar Power Project (SSPP). The goal is to develop technology that can generate solar power in space and beam it to Earth, 24/7. Pictured here are the project leads (from left): Sergio Pellegrino, the Joyce and Kent Kresa Professor of Aerospace and Civil Engineering, Jet Propulsion Laboratory Senior Research Scientist, and SSPP co-director; Harry Atwater, holder of the Otis Booth Leadership Chair of the Division of Engineering and Applied Science, Howard Hughes Professor of Applied Physics and Materials Science, and director of the Liquid Sunlight Alliance; and Ali Hajimiri, the Bren Professor of Electrical Engineering and Medical Engineering and SSPP co-director.

## ENDOWMENT PERFORMANCE, FISCAL YEAR 2021

### Endowment Investment Pool Return

As illustrated in the chart below, Caltech's endowment investment pool generated a 33.7 percent return for fiscal year 2021, exceeding its benchmark policy portfolio by 9.0 percentage points. For the three-, five-, and 10-year

periods ended September 30, 2021, investment pool returns beat their benchmarks by 3.9, 3.5, and 2.8 percentage points, respectively. Over the last five years, the added value generated by this outperformance of the portfolio was over \$418 million.

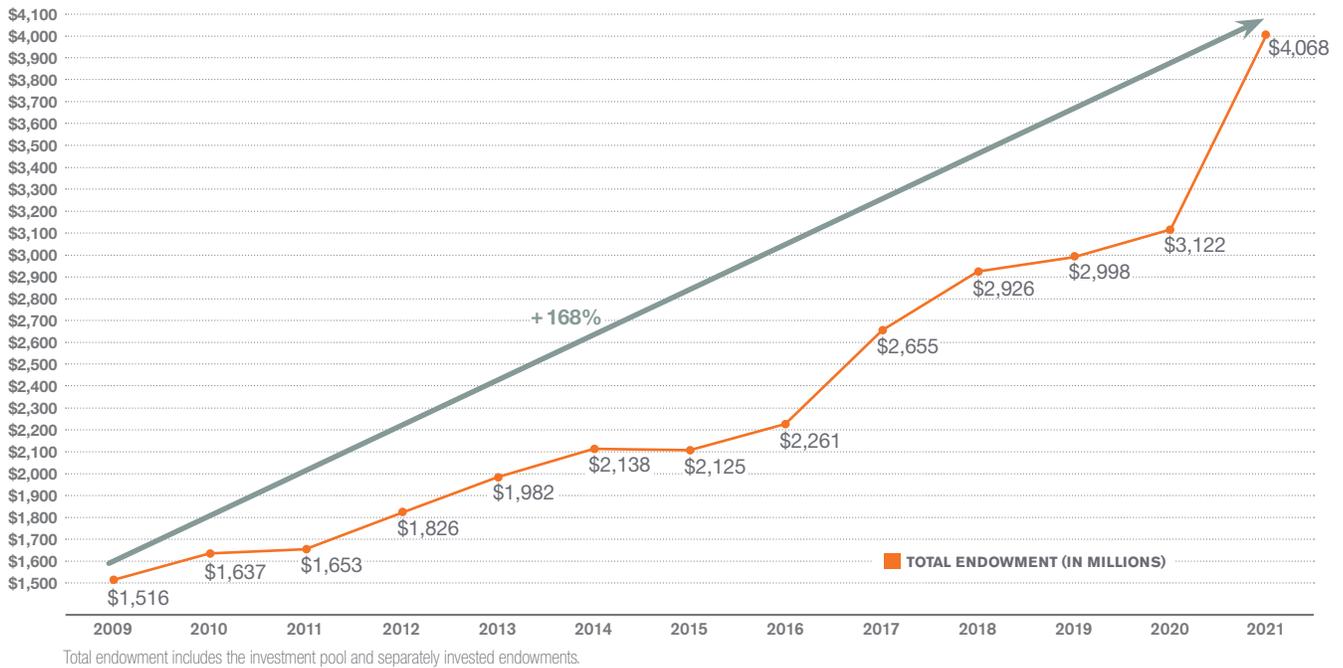


LAST FIVE YEARS:  
**\$175.5M**  
 in student financial aid  
 from endowment

## Growth of the Total Endowment

The market value of Caltech's total endowment investment portfolio increased to \$4.1 billion as of the close of fiscal year 2021. This increase was made possible by generous giving to endowment and strong performance from our real estate, private equity, and public equities asset classes. New gifts and investment gains were partially offset by endowment outflows for intended purposes. 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 8.6 percent and has supported Caltech's research programs and people with almost \$1.5 billion in payout.

FY21:  
**\$946M**  
 increase in total endowment



## Asset Class Allocation and Performance

Caltech's private equity portfolio (which includes both buyout and venture capital funds) performed exceedingly well during fiscal year 2021, delivering a 66.9 percent return and beating its benchmark by 16.5 percentage points. With respect to real assets, our real estate portfolio provided good performance, going up 23.4 percent and beating its benchmark by 2.1 percentage points; private energy and infrastructure began to show signs of recovery as the industry has recovered, with a 28.4 percent return,

but lagged behind its benchmark by 2.6 percentage points. Our alternative securities portfolio, which struggled quite atypically during the previous fiscal year, has recovered nicely with a strong performance of 26.4 percent, beating its benchmark by 9.2 percentage points during fiscal year 2021. Our overall public equities portfolio (both global developed and emerging markets equities) performed well, with a 25.9 percent return that was right in line with its benchmark.

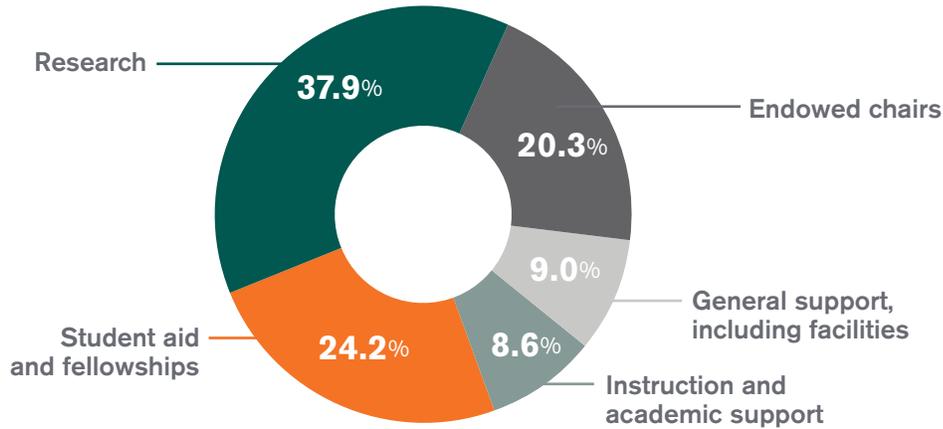
	Allocation (as of September 30, 2021)	FY 2021 Asset Class Returns	FY 2021 Benchmark Returns
Global developed markets equities	25%	26.8%	28.8%
Emerging markets equities	10%	24.1%	18.2%
Alternative securities	26%	26.4%	17.2%
Private equity and venture capital	23%	66.9%	50.4%
Real assets*	10%	25.5%	27.6%
Global fixed income	1%	7.3%	-1.7%
Cash and other	5%	0.0%	0.1%

\* Primarily real estate, energy, and commodities

## ENDOWMENT PAYOUT, FISCAL YEAR 2021

In fiscal year 2021, \$166 million in endowment payout contributed over 21 percent of Caltech's operating budget to support 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 a select group of competitive four-year colleges nationwide that admit students on a need-blind basis.



### Fellowship Helps Graduate Student Break New Ground in Medical Imaging

Advances in medical imaging are allowing researchers to peer deeper inside the human body at unprecedented speed. With support from the Gharib Family Fellowship, graduate student Yilin Luo aims to become an innovator in this burgeoning field.

Working with Lihong Wang, Caltech's Bren Professor

of Medical Engineering and Electrical Engineering, Luo explores ultraviolet photoacoustic microscopy (UV-PAM). This technique could enable surgeons to analyze the edges of excised tissues during surgery rather than requiring patients to wait for time-consuming postoperative biopsy evaluations to make sure no cancer cells are present.

"At Caltech, I have access to cutting-edge tools and learn from the best professors in the world," says Luo,

who is pursuing her studies in Caltech's Andrew and Peggy Cherng Department of Medical Engineering. "As a long-term goal, I want to test my own UV-PAM system, commercialize this technology, and launch a start-up."

Mory Gharib (PhD '83), his wife, Shoreh, and their daughters, Maral and Alma (PhD '15), established the fellowship to help attract more exceptional female scholars to Caltech. Himself an inventor and entrepreneur, Gharib is the Hans W. Liepmann Professor of Aeronautics and Bioinspired Engineering, holder of the Booth-Kresa Leadership Chair in Caltech's Center for Autonomous Systems and Technologies, and director of Caltech's Graduate Aerospace Laboratories.

He says, "There's nothing that compares to the feeling of meeting a student who has benefited from your contribution—the feeling of knowing that, in a small way, you helped shape the career of one of the best scientists in the country."





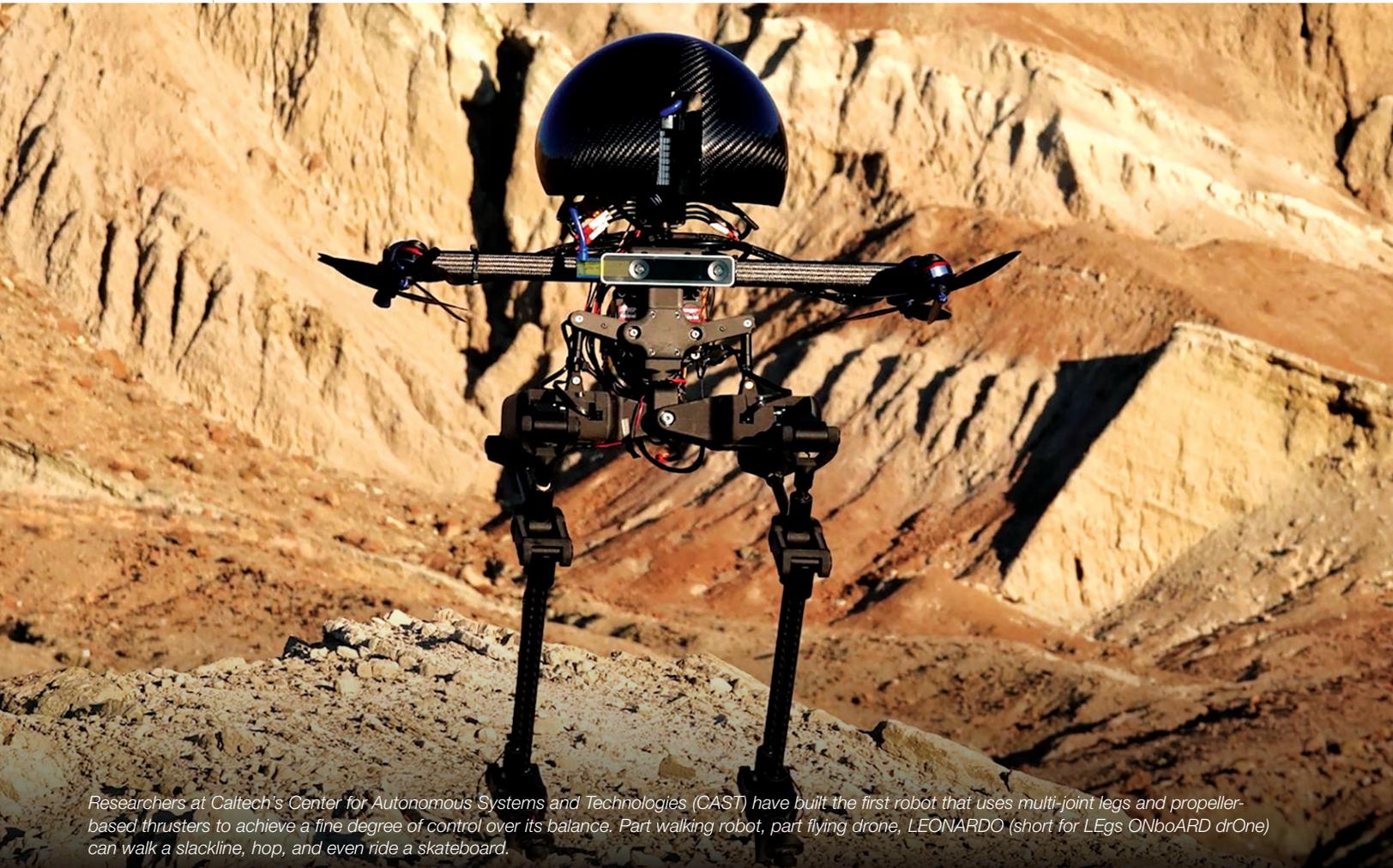
## Financial Aid Director Leaves a Lasting Gift to Caltech

A \$100,000 endowed gift from the estate of Caltech administrator Don Crewell (1952–2020) provides the Institute with flexibility to support scientists and engineers at every level as they pursue bold ideas and tackle unforeseen challenges.

The son of educators, Crewell valued the opportunities a university degree affords. At Caltech, he dedicated his time as director of financial aid to making education accessible for some of the world’s brightest and most talented students. During his 12-year tenure, more than 1,000 students and their families received financial assistance.

Today, more than half of Caltech undergraduates receive financial aid. This statistic is a testament to the hard work of Crewell and his staff, and also to Caltech’s need-blind admissions policy, which considers applicants based on their merit, not their families’ finances. “Don was motivated by a personal concern that each student leave Caltech without a heavy burden of debt,” says Greg Timberlake, Crewell’s friend and executor to his estate.

Although the Don Alden Crewell Endowment is unrestricted, to be allocated at the discretion of the president and provost, Crewell had good reason to believe his gift would benefit members of the Caltech community. Adds Timberlake: “Creating an unrestricted fund is an expression of his trust in Caltech’s commitment to students.”



Researchers at Caltech’s Center for Autonomous Systems and Technologies (CAST) have built the first robot that uses multi-joint legs and propeller-based thrusters to achieve a fine degree of control over its balance. Part walking robot, part flying drone, LEONARDO (short for LEgs ONboARD drOne) can walk a slackline, hop, and even ride a skateboard.

*Ilaria Caiazzo (below, right), the Sherman Fairchild Postdoctoral Scholar Research Associate in Theoretical Astrophysics, was lead author of a study describing the smallest and most massive white dwarf ever seen—packing a mass greater than that of our sun into a body about the size of Earth’s moon. This artistic representation shows the two bodies next to each other for size comparison; in reality, the white dwarf is 130 light-years away. The discovery was made by the Zwicky Transient Facility, which operates at Caltech’s Palomar Observatory. Illustration credit: Giuseppe Parisi*



## 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 as the Institute strives 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, expected volatility, and liquidity. In addition, the portfolio is subjected to analysis that models how it is expected to act in situations comparable to the 2007–2008 financial crisis, the 2001 tech wreck, the September 11 tragedy, and other scenarios (which now include the COVID-19 pandemic). The expected 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 reviewed periodically. In addition, the Investment Committee and the Investment Office make tactical adjustments in response to current and anticipated shorter-term market conditions.

At the end of fiscal year 2021, the endowment investment portfolio was tactically underweight in traditional investment-grade fixed-income and real assets, and was tactically overweight in private equity relative to our strategic allocation guidelines. The tactically underweight position in fixed income (which has been the case for over 10 years) continued due to low interest rates and the expectation that rates at some point will revert to more “normal” levels; the real assets’ tactically 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 important 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 help maintain operating continuity in cases of emergency or financial disruption.

The Caltech endowment investment pool has ample liquidity, with more than 21 percent of the assets currently convertible to cash within one to two weeks under normal market conditions, and 29 percent convertible to cash within a calendar quarter under normal conditions. The Institute’s additional sources of liquidity include substantial funds that have been raised from issuing bonds over the last six 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, 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.

## The Investment Office

The Investment Office develops recommendations on investment policies, strategies, and asset allocations 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 primarily on medium- to long-term performance, identifying 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

Senior Adviser and Partner, Fortress Investments, LLC

### 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

### G. Bradford Jones, Member

Founding Partner, Redpoint Ventures

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

Chair Emeritus, 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

### Thomas F. Rosenbaum, Member

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

### David W. Thompson, Member

Chair, Caltech Board of Trustees

President and Chief Executive Officer (retired), Orbital ATK, Inc.

### Susan Schnabel, Advisory Participant

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

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

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

\* Past Investment Committee Chair

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# Caltech

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### ABOVE:

*On a warm Pasadena evening, members of the campus community gather in the Beckman Institute's Glanville Courtyard.*

### COVER:

*Caltech's 127th commencement was a virtual celebration because of the COVID-19 pandemic, but festivities included a small on-campus gathering that allowed vaccinated graduates to watch the virtual event together.*