

The Myriad People Who Count On Caltech Innovation



You'd hardly expect a civil engineer, a retirement counselor, the head of a college nursing program, a nurse, and a crystallographer to direct their estates to the same cause. But that's exactly what **George Housner, Wayne and Ruth Davidson, and Ruth and Eddie Hughes** did. The three households chose to support Caltech research. Why? If you're thinking that they were all alumni, think again: only Housner was.

It seems axiomatic, now, that Caltech is home to a coterie of creative, passionate scholars—from professors to undergraduates—who do innovative research that results in major discoveries and inventions. But that's true only because over the years tens of thousands of people have offered generous financial support. Unlike most grants, private gifts fund innovation, giving scholars latitude to go off in new directions.

The Davidsons, Housner, and the Hugheses each decided that Caltech research merited their lives' savings. What inspired them?

Wayne and Ruth Davidson

The Davidsons lived energetically—Ruth helped Glendale Community College's nursing program garner top ranks, Wayne helped

people get more out of workplace benefits, and they both enjoyed many hobbies. Their only heartaches came from health issues—both lost their first spouses to illness, Ruth suffered from diabetes and cancer, and Ruth's brother succumbed to Alzheimer's disease.



Wayne R. and Ruth E. Davidson

The Davidsons used their estate to support research into diseases such as Alzheimer's and cancer. They established fellowships for Caltech graduate students in psychobiology (behavioral neuroscience). In Caltech's unique, powerful neuroscience program, chemists, biologists, social scientists and others research brain function and degenerative neurological conditions.

Davidson Fellow **Rell Parker** works in professor Linda Hsieh-Wilson's lab, studying how a process called O-GlcNac glycosylation affects

Innovative Research, continued inside

George W. Housner's Vision of Research Support

George Housner (MS '34, PhD '41) prized the freedom Caltech professors and students have to pursue new ideas. He knew that private giving protects that freedom—federal grants usually support projects with predictable public benefit.

"Caltech is about doing things that haven't been tried before," says Professor of Engineering

Seismology **Thomas Heaton (PhD '78)**.

"George knew that. So he structured his gifts in a way that protects what makes Caltech a great institution."

Through outright gifts and his estate, Housner established a research fund and endowed a student discovery fund and a professorial chair.



Thomas H. Heaton
(PhD '78)

An Earthquake Engineering Research Fund

In recent years, Heaton says, nearly every civil engineering student has benefited from the George W. Housner Earthquake Engineering Research Fund.

Heaton and several colleagues collectively allocate the fund, often supporting new graduate students. Students need time to understand their fields and work with their

"Nearly every civil engineering student has benefited from the George W. Housner Earthquake Engineering Research Fund."

advisors to design PhD projects that fit them and hold the greatest promise. Grants seldom cover that period of inquiry. Housner structured his gift to fill the gap.

Housner's Vision, continued inside

CALTECH LEGACIES

Max Beeler Alcorn (BS '23) once said that one of his highest honors was to receive an invitation from the president of Caltech. Caltech meant a great deal to him, his daughter Carol explained, and he saw his education as the reason he'd been successful. In turn, Max has meant a great deal to Caltech students. He and his wife, **Ruth**, funded their first scholarship in 1969 and later established the Max Beeler Alcorn and Ruth Brown Alcorn Endowed Undergraduate Scholarship Fund. They solidified the fund through a multipronged giving approach that included outright gifts, 22 planned gifts, and a bequest. So far, the scholarship fund has honored and financially supported more than 160 Caltech undergraduates. It will continue to grow—several of the Alcorns' planned gifts are still generating income for relatives and will one day help more students. Max and Ruth joined the Torchbearers of Caltech in 2000.



Max Beeler (BS '23) and
Ruth Brown Alcorn

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protein synthesis required for permanent memory storage. It turns out that this process, vital to learning and memory, factors in Alzheimer's, diabetes, and cancer. Parker believes its roles "are only beginning to be elucidated."



Rell L. Parker, 2010 Wayne R. and Ruth E. Davidson Fellow

George Housner (MS '34, PhD '41)

"Genius is one percent inspiration and 99 percent perspiration," Thomas Edison said. But Caltech professor and distinguished alumnus George Housner knew firsthand that discoveries require more than brilliance and toil. Housner opened the field of earthquake engineering and did seminal work, creating ways to strengthen free-



George W. Housner (MS '34, PhD '41)

ways, dams, aqueducts, and bridges. He developed mathematical analyses of how buildings shake. And he knew that private support had helped him accomplish everything. As meticulous in his giving as in his research, he engineered his estate gift to achieve exactly the right structural support for Caltech, distributing contributions among his field and campus-wide projects and among new researchers and icons. He endowed a professorship, an earthquake engineering research fund, and a student discovery fund (see adjoining articles), and made a challenge grant to the Innovation in Education Fund. Housner's gifts, managed to last in perpetuity, will have as long-standing an effect as his research.

Ruth and Edward Hughes

When crystallographer Edward Hughes came to Caltech at Linus Pauling's invitation in 1938, the research environment hooked him. He returned for good in 1946, working for 28 years as a senior research associate. Eddie and his wife, Ruth, hosted visiting scholars, donated to initiatives and established a charitable remainder trust, and joined the Caltech Associates and other groups. After Eddie passed away, Ruth endowed a Summer Undergraduate Research Fellowship in his name. Ruth



Edward W. and Ruth J. Hughes

passed away last year.

Augmented by the Gordon and Betty Moore Matching Program, the Hughes estate endowed eight graduate research fellowships in chemistry and chemical engineering. This support will permit students to take visionary approaches as they investigate DNA biochemistry, nanoengineer small-molecule therapeutics and medical materials, invent polymers and structural materials, study air quality and climate, develop sustainable fuels, and, as Eddie did, explore the many facets of chemistry.

To learn more about establishing or contributing to an endowed fund that supports research at Caltech, please contact the Office of Gift Planning at 626-395-2927 or giftplanning@caltech.edu.



1946 graduation portrait. (Photo courtesy of Big T.)

Recognize This Alumnus?

Just after this alumnus finished high school in Montebello, his draft notice arrived. He thought he'd lost his chance to attend Caltech. Then, in 1943, the Navy began enrolling officer candidates in its V-12 college training program.

He shipped out 12 miles, joining hundreds of V-12 participants at Caltech. He enjoyed access to Linus Pauling, Robert Millikan, and other great scientists and engineers, and

relished an English course with J.E. Wallace Sterling.

He joined Caltech's ski club and helped build a chimney for its Snow Valley cabin. *E&S* noted, "The apprentice seamen are entering into the school activities and are exhibiting a fine school spirit."

He finished the V-12 program in 1946. With the war over, he embarked on an aerospace career that included 27 years at Hughes Aircraft. He spent several years in Europe (primarily in

Paris) where he headed up the consortium during the procurement phase for the command control systems for NATO air defense.

That "fine school spirit" continued to grow. Retirement allowed his wife, **Jeanne**, to reengage Caltech. Alumni Association members they've attended Alumni College with the Association, and contributed to the Alumni Fund for decades. In 1999, they included in their estate plans, joining t

George W. Housner's Vision of Research Support

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"The real issue for them is trying to change the world with their science," Heaton says. "That's the way Caltech is supposed to be. George's gift has helped us to spend more time focusing on science. We can just decide, 'That's a great problem, let's start working on it,' with confidence that George's gift will help support it. I'm sure that's just what he had in mind."

So how have students used the funds? Masumi Yamata developed techniques that are being used in a prototype earthquake early-warning system for California. Daniel Sutoyo characterized how wood-frame buildings move during strong ground shaking. Julie Wolf created mathematical models of damage to reinforced concrete, and In Ho Cho built on Wolf's work to model how concrete structures deform. Vanessa Heckman is building systems to detect broken welding connections in high-rises. That's just the beginning—who knows what's next!

The Student Discovery Fund

"Best case scenario, I would love to be on Mars." Caltech sophomore and aspiring astronaut **Mackenzie Day** has already begun exploring the red planet, thanks to the George W. Housner Endowed Student Discovery Fund.



Mackenzie Day, Class of 2012

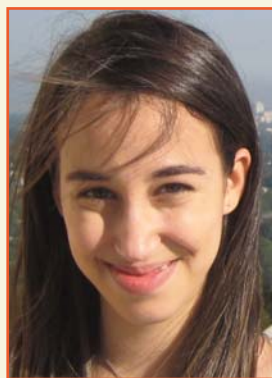
Fletcher Jones Professor of Geology John Grotzinger invited Day to spend a summer searching Martian image data for the spectra of clays that formed where water wore down basalt. But the idea arose too late for SURF funding. Day feared she'd have to work a retail job instead. Then she learned about the

"The Housner fund gave me the opportunity to do what I really wanted to do. All I did was look for water on Mars—it was super cool."

Housner fund, which helps undergraduates pursue unique academic opportunities.

"The Housner fund gave me the opportunity to do what I really wanted to do. All I did was look for water on Mars—it was super cool."

Junior **Dalia Taylor**, on the other hand, would rather be in court. She used Housner funds to work with Visiting Professor of Law Edward McCaffery.



Dalia Taylor, Class of 2011

"I'm interested in law school and I wanted to do research connecting law with science.

[McCaffery] was very willing to work with me, and he mentioned all these problems available to look at. One of them was neuroscience and law. I'm a biology major, so that one caught my attention right away."

"It's made me more excited about going to law school. I thought the only connection between law and science was patent law, and now I see that there are many more interesting connections."

Taylor studied how neuroscience might change court systems, surveying past uses of scientific and pseudoscientific evidence from DNA to polygraphs and phrenology. "Can people really understand the science they see?" she wondered. "Can they be manipulated by whoever is presenting it?"

"It's made me more excited about going to law school. I thought the only connection between law and science was patent law, and now I see that there are many more interesting connections. . . . I just think it's really important and wonderful that [the Housner fund] exists."

And it will, for a long time. Managed for perpetual use, the endowed fund will take thousands of students on academic adventures—on Earth and other planets.

Gifts by Will

The generosity and foresight of alumni and friends is crucial to Caltech's success. Below are just a few of the many individuals who have supported research, education, and programs at Caltech through their wills.

Caltech received \$3,974,300 from the estate of **John W. Miles (BS '42, MS '43, PhD '44)**, which will provide additional support for the John W. and Herberta M. Miles Scholarship Fund and establish the John W. and Herberta M. Miles Endowed Professorship.

From the estate of **Thomas F. Movius (BS '54)**, the Institute has received \$1,240,300, which will provide additional support for the Thomas F. Movius '54 Scholarship Fund.

Caltech received an unrestricted bequest of \$282,500 from the estate of Ann Jeanette Edwards. Caltech will apply this unrestricted gift to its highest priority.

Torchbearers

In recent months, Caltech has added five new members to the Torchbearers Honor Roll:

**Anne McMenamin
Stephen (BS '79, PhD '87) and
Ritsuko Toner
Laurence M. Trafton (BS '60, MS
'61, PhD '65)
(one member wishes to remain
anonymous)**

Alumni Weekend

Caltech's alumni reunions take place May 13–16 this year. Undergraduate alumni with class years ending in zero and five will celebrate their reunions. Seminar Day, May 15, will feature general-session speaker **Steven E. Koonin (BS '72)**, under secretary for science in the U.S. Department of Energy, and more than a dozen other faculty speakers. On May 13, alumni from the classes of 1940–1952, many of whom served in World War II, will reunite for a luncheon. After the lunch, several alumni will give short talks describing their personal experiences.

To learn more about this special weekend, visit alumni.caltech.edu/reunions. Via our secure website, makeagift.caltech.edu, reuniting alumni can contribute to the reunion class gift, which helps provide a Caltech education to a deserving student.

Contact Us

For more information about the stories featured in this issue of *Techniques*, or for other questions about deferred gifts, please contact the Office of Gift Planning:

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Torchbearers of Caltech. These gifts are their way of making a difference. "Places like Caltech," he says, "help educate people to keep our civilization going." In 2008, they established a charitable gift annuity that will endow a named scholarship. "If I can help a bright student who would otherwise have been unable to afford college," he says, "that student just might end up doing something brilliant." Many future Teachers will have the chance, thanks to **James C. Evans (BS '46 EE)**.



James C. (BS '46) and Jeanne Evans

Home Is Where the Heart Is

Through a gift of their home, the Wus express heartfelt appreciation to Caltech professors.

Ask **Jain-Ming “James” (MS ’59, PhD ’65)** and **Ying-Chu Lin “Susan” Wu (PhD ’63)** what makes a university great, and they’ll tell you—“An institution is great only if it has excellent professors.” To honor such professors,



Ying-Chu Lin “Susan” (PhD ’63) and Jain-Ming “James” Wu (MS ’59, PhD ’65)

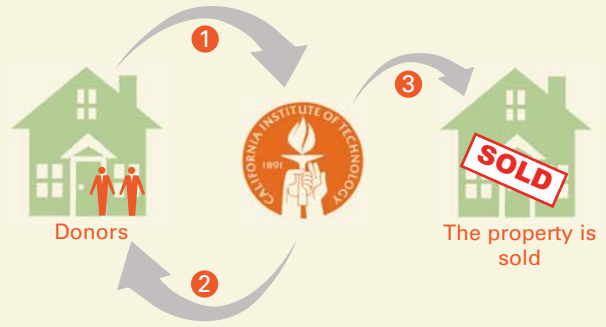
the two Caltech alumni recently gifted their home—plus an additional pledge—to the Graduate Aerospace Laboratories at Caltech (GALCIT).

Their GALCIT educations influenced the Wus throughout their lives. Both became professors at the University of Tennessee Space Institute, mentoring many students of their own.

GALCIT’s first female PhD, Susan gained renown as an expert in magnetohydrodynamic power generation. She also founded an engineering firm and cofounded a software company. James conducted research in fluid mechanics, aerodynamics, aircraft, rockets, and thermal sciences, serving as principal investigator on more than 50 research programs.

In thanks, the Wus established a retained life estate (RLE). They gave their Pasadena condominium to Caltech, although they will live in it for the rest of their lives. In exchange for their remainder interest in the property, the Wus will receive an immediate income-tax deduction. One day their RLE will

How It Works: the Retained Life Estate



- 1 Mr. and Mrs. Anderson transfer their vacation home, valued at \$500,000, to Caltech. They receive an immediate charitable tax deduction in the amount of \$229,343.
- 2 Mr. and Mrs. Anderson continue to live in the property while maintaining responsibility for all taxes and upkeep.
- 3 When the life estate ends, the property passes to Caltech and is sold to support the designated program of the Andersons’ choice.

Calculations are based on a gift made in March 2010.

fund the Drs. Ying-Chu Lin (Susan) and Jain-Ming (James) Wu GALCIT Endowed Fund and support GALCIT’s priority initiatives.

Not wanting “to waste time in waiting for our [RLE] to mature,” the Wus added a pledge of outright funds to support a lecture series recognizing living professors who’d influenced them.

The inaugural lecture honors **Frank E. Marble (BS ’40, MS ’42, Eng ’47, PhD ’48)**, the Hayman Professor of Mechanical Engineering and Professor of Jet Propulsion, Emeritus. The guest speaker, **Professor Sébastien Candel (MS ’69, PhD ’72)** of Ecole Centrale, Paris, studied under Marble, as the Wus did.

Susan shares, “It is from the bottom of our hearts that we want to honor our professors, just to say thank you.”

If you or your professional advisors would like more information about this strategy, please contact Nichole Baker at 626-395-2927 or giftplanning@caltech.edu.

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This issue is in memory of **Dr. Andrew E. Lange**, the Marvin L. Goldberger Professor of Physics at Caltech.

Recognize This Alumnus?

Fleming

“J.C.” or “The Kid” ...one of the few Ski Club members who skis...Musical...football manager and hurdler in track... “Big T” staff member.

Continue inside for more.



Photo courtesy of Big T

Class of '46

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