For more than 30 years, undergraduates have traded summer breaks for opportunities to take part in Caltech’s Summer Undergraduate Research Fellowships (SURF) program. This year, 402 Caltech students and participants from universities and colleges across the country took part in the 10-week SURF program, which provides a unique introduction to scientific and engineering research under the tutelage of world-renowned mentors. Research projects ranged from Patrick Xia’s work with K. Mani Chandy, Simon Ramo Professor of Computer Science, in developing mobile robots for radiation detection to Jane Chen SURF Fellow Lainam Chaipornkaew’s study of South Bristol Mountain fault zone geology. SURF aims to provide hands-on exposure to the research methods and collaborative efforts involved in tackling new challenges and reaching solutions. SURF students take on major research responsibilities, each with ongoing guidance from a mentor who serves as a research collaborator and source of support. What sets SURF apart from similar programs is that Caltech and JPL mentors are pioneers in science and engineering. Students have the rare opportunity to interact closely with professors and JPL staff as they learn how to complete high-level research—a focused experience that may not be available during the busy school year.

SURF Provides a Wave of Research Opportunities

SURF Supporter Homer J. Stewart

The late Caltech Professor of Aeronautics, emeritus, Homer J. Stewart had a remarkable career. Could he have predicted that a grade-school model airplane project would spark a fascination with aeronautics, and eventually lead him to join the JPL team that developed and launched Explorer I, America’s first satellite to reach orbit?

In his senior year at the University of Minnesota, a mentor urged Stewart to consider Caltech for graduate work in aeronautics. At Caltech, Stewart caught the attention of Theodore von Kármán, who asked him to teach a class in dynamic meteorology just prior to completion of his doctorate. This assignment led to a professorship in aeronautics (1942–1980).

Stewart also worked at the newly formed Jet Propulsion Laboratory (JPL). His systems engineering contributions during this period made him one of the pioneers in American rocketry. He left Caltech and JPL for two years (1958–1960) to join the newly formed NASA and head a planning group that provided White House staff with advice on the Apollo lunar program.

Throughout his education and career, Stewart was influenced by a number of important mentors. It is fitting that his estate is aiding SURF by funding two named SURF endowments—one related to space exploration and one focused on JPL research. Because Stewart named Caltech in his estate plan, generations of future students will have invaluable opportunities to learn from mentors of their own, gaining the sort of research experience that Caltech and JPL uniquely foster.

Getting to Know a Couple of SURFers

Caltech students Wesley Yu, junior, and Shruti Mishra, sophomore, spent this summer in one of the Institute’s most rewarding undergraduate programs—and both are glad for that.

SURF Provides, continued inside

Gordon L. Cann
(PhD ’61)

Gordon Cann Laboratory of Experimental Innovation

Toronto Conservatory of Music graduate Gordon L. Cann planned to become a pianist and composer, but his enthusiasm for engineering took him down a different path. Following the conservatory, Cann’s change in focus led him to the University of Toronto, where he graduated with a degree in engineering physics. Shortly thereafter, he contributed his engineering skills to the war efforts during World War II as a member of the Canadian Armament Research and Development Establishment. After the war, Cann earned both his MS and PhD in aeronautics at Caltech and helped develop plasma engines for the Air Force and NASA. Cann went on to establish Technion, Inc., which in time was sold and provided him with wealth he later bequeathed to Caltech. His bequest helped support the Guggenheim Aeronautical Laboratory renovation and funded the Gordon Cann Laboratory of Experimental Innovation, a state-of-the-art teaching lab. After a hands-on life—from music and arms research to his engineering career—Cann has given a new generation of aeronautics students an ideal context in which to test ideas and build knowledge.
SURF Provides a Wave of Research Opportunities

Continued from page 1

al-development workshops on topics ranging from the pursuit of research careers to continuing education. In addition, the SURF Student Advisory Council arranges a number of social activities such as field trips and weekly gatherings with faculty at local restaurants.

As the program progresses, students define and develop their projects in a process culminating in their final presentations during SURF Seminar Day. This year’s SURF Seminar Day will be held on October 17, 2009, and provides students the opportunity to speak about their summer work to faculty, alumni, peers, parents, and friends. Please join us if you can!

SURF benefits tremendously from the generosity of those who have supported the program through outright and planned gifts that have established a number of named endowments. There are only a few named SURF endowments. There are only a few named SURF endowments.

If you would like more information on how to support the SURF program, please contact our office at 626-395-2927.

---

Jane and Don (BS ’57) Pinkerton

Pinkerton believes that the research opportunities SURF offers are integral to students’ future careers. He notes that his own career path might have gone in a different direction had SURF existed during his undergraduate years: thinking back, he says, he “was just at the forefront. At that time, just experimenting with transistor technology would have been exciting.”

Since 2005, Pinkerton has been serving as a SURF Seminar Day session chair and judge. Session chairs introduce each student, monitor speaking time, and collect audience evaluations, while judges rate students’ presentations. Though he’s an electrical engineer, Pinkerton is—as he has to assure students’ family members—qualified to judge SURF’s spectrum of topics: the judges aim to evaluate a student’s ability to communicate research findings to an audience many programs that support students. They have been particularly active in SURF, through financial support and Pinkerton’s leadership on the board.

In addition to being a SURF board member, Pinkerton is active in the Alumni Association and is on the Caltech Y board. He and Jane are Associates and joined the Torchbearers, Caltech’s legacy society, in 2008 when they included the Institute in their estate plan.

---

Recognize this Alumnus?

This alumnus first heard about Caltech from his junior-high electrical-shop teacher, and a high-school math instructor who'd attended Caltech heightened his interest. One morning in the fall of 1950, he walked six blocks from home to the Pacific Electric Station in San Pedro, California, took the “Red Car” to Pasadena, and began his freshman year at Caltech. As he prepared to attend a Rickets House luau one afternoon—coincidentally to be held in San Pedro—Richard Feynman stopped by to ask for directions to the same event, offering a ride in exchange for the information. Our alumnus obliged, but he asked Feynman for one stop on the way: to drop off laundry at his mother’s house. He jokes, who else can call a Caltech legend his “laundry man”?

He focused on applied physics but also enjoyed humanities courses, and he made lifelong friends through Rickets House activities. So eager to educate. He believes they are essential to an undergraduate experience. His research experience has shaped his desire to attend medical school and pursue a research career.

As a recipient of the Jane and Don Pinkerton SURF endowment fellowships and the support of Mr. and Mrs. Fran Fagin, Pinkerton has been able to pursue his research interests. His research has contributed to our understanding of the mechanisms underlying cognitive disorders such as Alzheimer’s disease, and schizophrenia, among others. This research may speed the development of new, effective drugs for a wide range of diseases.

Yu is grateful for the support of the families who have supported the research he has conducted over the years. Their support has been critical to his success and has allowed him to pursue his research interests.

---

Get to know Wesley Yu

Wesley Yu was diagnosed with schizophrenia at age seven, and his family’s efforts to treat him led to a treatment he is now receiving. Raised in Irvine, California, at Caltech, he was named the Hoag Professor of Chemistry and Chemical Engineering. He entered Caltech at the age of 12 and graduated in 1999. Since then, he has been working as a researcher in the field of medicinal chemistry.

Yu focused his research on developing new drugs for a wide range of diseases. His research may speed the development of new, effective drugs for a wide range of diseases. His research may speed the development of new, effective drugs for a wide range of diseases.

---
Support the research "decided and "how do"

A student who demonstrates potential to progress in science indicates that the "faculty, curiosity" that ultimately fueled his own efforts. George Yu received the Hughes SURF in 2006, which is given to students to earn a stipend over the summer on campus. Attending Caltech was, however, and she came for the research. Under the guidance of Frances Arnold, Dick and Barbara Dickinson Professor of Chemical Engineering and Biochemistry, Mishra's research focused on the directed evolution of fungal cellulase toward improved hydrolysis of cellulose. Her lab work focused on the creation of better cellulase enzymes through a mutation process, which resulted in an improved enzyme. Cellulase is a component in the breakdown of cellulose, the most abundant carbon compound on Earth—which, when broken down, can be used in biofuel production. While this process is costly and not ready for commercial use, Mishra's research may contribute to the creation of a cost-effective process. Throughout the 10-week program, Mishra kept a detailed blog to share her SURF experience and research progress, which was an excellent exercise, she notes, in making her work accessible to a diverse audience.

Mishra puts it: If you are a Caltech student, it would be a crime not to do SURF at least once.

"If you are a Caltech student, it would be a crime not to do SURF at least once."

New to our website is the Legacy Planner™ tool, which allows you to design your own gift plan. It takes your goals and assets into account, leads you down a decision tree, and points to the planned gift that best meets your needs. This is an interactive way to gain a general understanding of planned giving at your leisure. Please visit our website www.giving.caltech.edu/gp and click Gift Planning Tools, then select Legacy Planner™.

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:

Nichole Baker, CFP, CSGP, Director
Phone: 626-395-2927
E-mail: giftplanning@dar.caltech.edu

On the Web: giving.caltech.edu/gp

Techniques is published by Caltech's Office of Gift Planning. For more information on the content of this publication, please call 626-395-2927 or e-mail giftplanning@dar.caltech.edu, or visit our website at http://giving.caltech.edu/gp.

The generosity and foresight of Caltech alumni and friends benefit the Institute. Below are just a few of the many people who have contributed to Caltech over the years.

Donald B. (BS '29) and Ruth H. Milliken have provided for Caltech through an unrestricted bequest of more than $988,000.

The Institute has received an unrestricted bequest of $369,700 from the estate of Calvin W. Kempton (BS '46).

Caltech has received $270,000 from the estate of William E. Leonard, to fund the Mr. and Mrs. William E. Leonhard Merit Scholarship Fund.

From the estate of Hugh F. Colvin (BS ’36), the Institute has received $270,000 to support the Colvin Fund for Research Initiatives in Biomedical Sciences.

Torchbearers

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

A. Richard (BS ’61, MS ’63) Sophia Su-hwei Yen Fred (BS ’47, MS ’48, PhD ’53) and Gretchen Emerick Ruth B. Roth and Frederick J. Kubik Sangtae Kim (BS ’79, MS ’79)

(one member wishes to remain anonymous)

Did You Know...

Did you know the Legacy Planner™ tool...?
Testamentary charitable remainder trusts (testamentary CRTs) can help donors establish reliable income for their heirs, reduce estate taxes, and create a legacy at Caltech. This technique particularly helps donors who wish to make a meaningful gift to Caltech while retaining the ability to provide for heirs and address special needs. A testamentary CRT is created through specific bequest language—Caltech can suggest wording—in the donor’s will or living trust. Upon the donor’s passing, the estate transfers assets to the trustee of the testamentary CRT (which can be Caltech), who coordinates the funding of the CRT and the beneficiary payments that follow. After the heirs have passed away, the CRT value is distributed to Caltech.

Under current federal law, if a donor’s total estate exceeds the applicable exemption during the year the donor passes away, the excess is taxable at the current gift tax rate. The current federal estate-tax exemption is $3.5 million per individual ($7 million per married couple). The tax is repealed for 2010, but a sunset provision schedules the return of the tax in 2011 with only a $1 million exemption per person. Donors with taxable estates who establish testamentary CRTs receive an estate-tax charitable deduction, which may lower their tax due if the deduction brings the total taxable estate below the prevailing federal estate-tax exemption amount.

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.

RECOGNIZE THIS ALUMNUS?

Class of ‘54

Ricketts

This alumnus has certainly left behind him a record that the folks back in San Pedro can be proud of. Besides serving as Ricketts executive vice president in his senior year, he did time on the Board of Control, lettered in frosh football and track, held a class office, and was a member of the Beavers and IRE. After graduation he would reluctantly go to work.