

California Institute of Technology
Pasadena, California 91125

Change service requested

Volume 33, Number 3
1999

C a l t e c h **N e w s**

In This Issue

To the Moon

Beyond Pluto

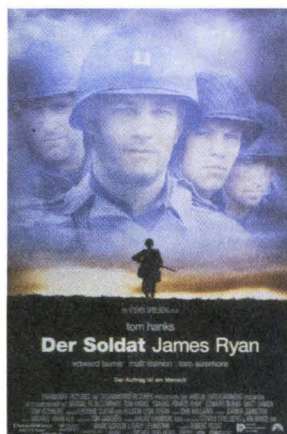
In the Studio

and

On to Stockholm



Caltech News



ON THE COVER. The Renaissance-style Athenaeum ceiling was restored this summer (see story on page 6), uncovering many striking decorative details, including these blue panels, bordered by intricately painted red and gold moldings, and concealed for decades under acoustic tile. Ceiling meets wall at the lower right-hand corner.



- 3 A Little Science on the Moon**
Thirty years later, a professor recalls some very special—and well-traveled—students.
- 10 The Objects of His Affection**
A planetary scientist scours the edge of our solar system for elusive bodies.
- 12 The Reel Thing**
A Caltech instructor puts words into some of Hollywood's more famous mouths.
- 14 Especially Well Suited for the Job**
An alum runs with the challenge of heading up Special Olympics Southern California.

Also in this issue:

A report from East Timor; a new take on Tarzan; a major gift to neuroscience; some thoughts on Caltech's #1 ranking; and a stellar finish (on our back-page poster).

Picture Credits: Cover-Douglas Hill Photography, 2,7,10-Robert Paz, 3-NASA, 3,8,9-Lee Silver, 4-Ravinder Bhatia, 5,11,12-Ryan Poquette, 5-Ed Krieger, 6-Los Angeles County, 6,8-Marcy Drexler, 10-Mike Brown, 11-Hillary Bhasakaran, 13-Paramount Pictures, Dreamworks L.L.C., and Amblin Entertainment, 15-Heidi Aspaturian, 15-Arlana Silver, 16-Herb Shoebridge, 17-*Big T*, 17-Special Olympics Southern California, 19-John Hermeler.

Issued four times a year and published by the California Institute of Technology and the Alumni Association, 1200 East California Blvd., Pasadena, California 91125. All rights reserved. Third class postage paid at Pasadena, California. Postmaster: Send address changes to: *Caltech News*, Caltech 1-71, Pasadena, CA 91125.

H. Kent Frewing
President of the Alumni Association
J. Ernest Nunnally
Vice President for Institute Relations
Robert L. O'Rourke
Associate Vice President for Institute Relations
Jane S. Dietrich
Director of Periodicals

Executive Editor – Heidi Aspaturian
Associate Editor – Hillary Bhaskaran
Contributors – Marcy Drexler, Daryn Kobata, Ryan Poquette, Michael Rogers
Copy Editors – Babra Akmal, Michael Farquhar, Julie Hakewill
Circulation Manager – Susan Lee
Photographer – Robert Paz

Up Front

FEMTOSECOND SCIENTIST GETS REAL-TIME WAKEUP CALL FROM STOCKHOLM

"These are the last 20 minutes of peace in your life," the Swedish caller told Caltech professor Ahmed Zewail at 5:40 a.m. on October 12.

Soon the world would hear of Zewail's award—the 1999 Nobel Prize in chemistry—and Zewail would hear from the world. The Linus Pauling Professor of Chemical Physics and professor of physics would be so busy that he'd forget he'd woken up with a cold. Two thousand e-mails would zoom his way within a few days and three phone lines would start ringing with fervent requests for interviews from the national and Egyptian press and with congratulations from friends and colleagues. But first, the 53-year-old man would share the news with his family.

He kissed his wife, Dema, and young sons, Nabeel and Hani. His mother, whom Zewail reached in his native Egypt, cried and cried. His daughters, Caltech alum Maha and Berkeley chemistry student Amani, "were going crazy on the phone. I couldn't even speak," said Zewail.

"I was disappointed in Nabeel's reaction," he added, recounting his first week in the Nobel limelight and looking not one bit disappointed. "I told him I had won the prize. He said, 'Good.'" But when Zewail asked if he'd tell the kids at school, the six-year-old said, "No. These guys will say 'So what?'" But Nabeel did ask, "Are we going to see the king?"

The Royal Swedish Academy honored Zewail for his groundbreaking work in viewing and studying chemical reactions at the atomic level as they occur. He has shown "that it is possible with rapid laser technique to see how atoms in a molecule move during a chemical reaction."

By combining ultrafast laser technology with molecular beam studies in a novel way, Zewail's Caltech team was able to record the transition state of a chemical reaction, revealing "the chemical act—the breaking and making of chemical bonds," in Zewail's words. Prior to the team's 1987 breakthrough, transition states had never before been observed in real time because they happen on the time scale of a millionth of a billionth of a second, or one femtosecond. Zewail had brought the most

powerful tools from the field of physics into the chemistry lab to create a revolution, and the field of femtochemistry was born. It was "a revolution in chemistry and adjacent sciences," the Swedes announced, "since this type of investigation allows us to understand and predict important reactions," to probe nature at its most fundamental level.

"In my experience," said Zewail after a tumultuous week, "whenever you cross fields or bring in new ideas and tools, you find what you don't expect. You open new windows."

Sometimes you win Nobel Prizes. For several years, colleagues have been predicting that Zewail would win one as breakthroughs led to top awards, including the Welch Prize, the King Faisal Prize, the Wolf Prize, and the Carl Zeiss Award. What did Zewail predict?

"I knew it was possible. People would tell me, I would see in magazines that I was on the short list. I'm not in a vacuum. But I didn't live with the concept that it must happen. In fact, I didn't have the

Continued on page 11 . . .



The Nobel laureate talks with the press on October 12.

“ A l i t t l e s c i e n c e o n t h e m o o n ” *

BY MARCY DREXLER

**Apollo 15 commander Dave Scott, August 2, 1971, speaking from Hadley Delta, on the lunar surface.*

On July 20, 1969, while millions of Americans thrilled to the televised sight of Neil Armstrong and Buzz Aldrin walking on the moon, Caltech Professor of Geology Lee Silver, watching TV at home with his family, had his eyes trained on the dust the two men were kicking up.

“I was a Caltech professor getting ready to analyze lunar samples,” Silver says. “I wanted to see where the samples were taken.” But Armstrong broke protocol and stepped outside the range of the stationary video camera. For 10 extraordinary minutes, Apollo 11’s commander disappeared from Mission Control’s view, gathering 80 kilograms of rocks to initiate what Apollo 15 commander Dave Scott would later call “the meat part” of the Apollo series—the scientific sampling of rocks from the moon’s surface. The 842 pounds of rocks taken by the 12 Apollo astronauts during six lunar landings from 1969 to 1972 would eventually transform planetary science, and questions raised by the lunar samples still roil scientific theory today.

Last November, as part of a presentation for the Caltech Associates, Silver, now the W. M. Keck Foundation Professor for Resource Geology, Emeritus, showed slides from his personal collection and reminisced about his involvement in the Apollo series as geology field instructor to the astronauts of Apollo 13, 15, 16, and 17. That same night, Silver screened an installment of *From the Earth to the Moon*, HBO’s 1998 12-part dramatic series on the Apollo missions. The hour-long episode showed skeptical Apollo 15 astronauts falling under a crotchety but masterful field geologist’s spell, then going on to triumph during their “final exam”—gathering samples from the lunar surface.

In the following comments, taken from his talk to the Associates and a conversation this summer in his basement office in North Mudd Laboratory of Geology and Geochemistry, Silver touches on Hollywood romanticism versus reality, “the cream” of a lifetime of talented students, and his role in an epochal adventure that began 30 years ago this year.

* * *

The HBO film depicts Silver as a reluctant curmudgeon, initially annoyed at being tapped by former student Harrison (Jack) Schmitt '57 to teach a bunch of bored prima donnas. In fact, the professor approached his new students eagerly, having been impressed by Neil Armstrong's enthusiastic geology work.

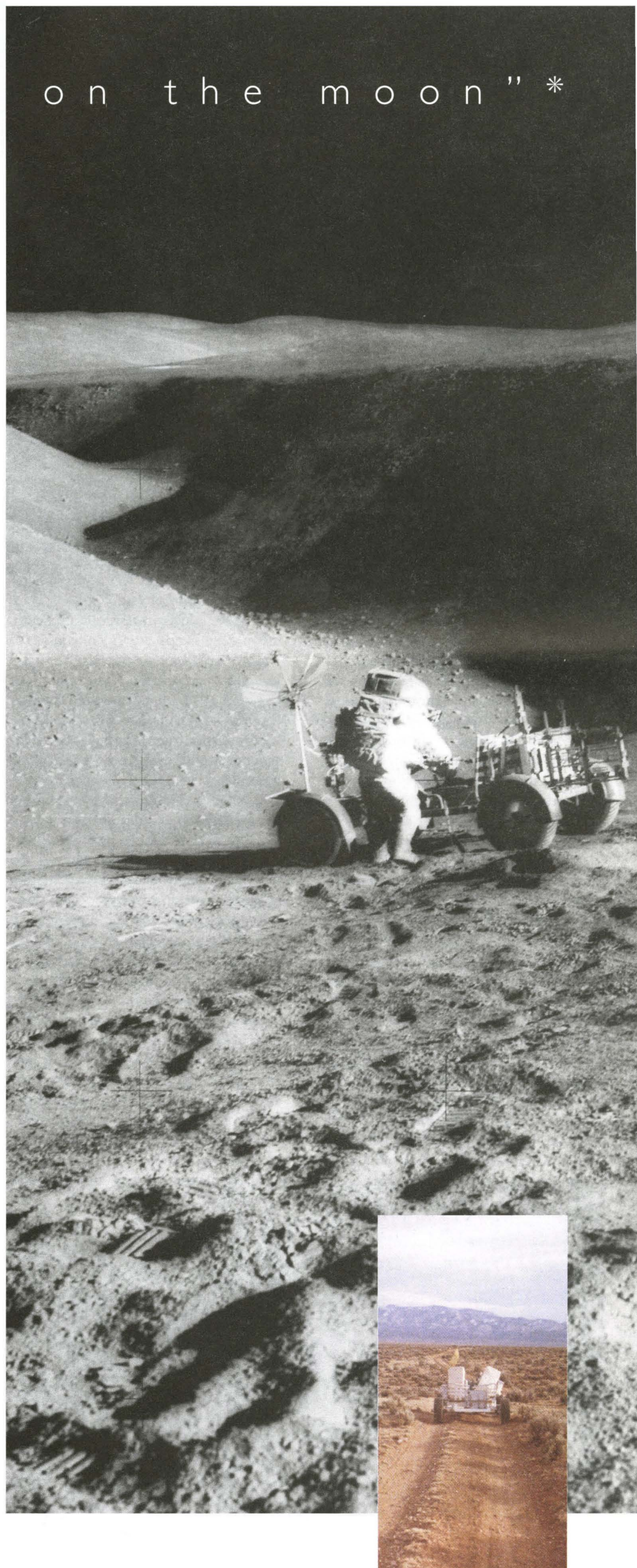
I have to say that the actor [David Clennon in the HBO film] did a very fine and romantic rendition of me, but it wasn't quite the way it happened. When Jack Schmitt first came to me, he'd had a prior discussion with Eugene Shoemaker [chairman of what was then Caltech's Division of Geological Sciences, who died in an automobile accident in 1997], who asked if I was interested in teaching the astronauts. Then I went to Houston as a lunar sample investigator, and Schmitt arranged a meeting with Jim Lovell [commander of the ill-fated Apollo 13 mission]. After we discussed a possible training effort, Jim said to me, “Well, I'll give you a week, but if it doesn't work, we'll do something else.”

The performance of Apollo 12 in November 1969 confirmed the missions' improved orbital mechanics and pinpoint landing capability, setting the stage for some serious scientific work. Meanwhile, in late September 1969, Silver had had his week with the Apollo 13 landing crew, Jim Lovell and Fred Haise, and their backups, John Young and Charlie Duke, who would later fly on Apollo 16. Jack Schmitt and a field assistant completed the party. Silver's goal was to convince the astronauts that doing geology fieldwork was worth precious training time.

During the '60s, these guys were introduced to field geology but tended to be snowed with geological terms. I said, we don't need any special jargon, we need to use exactly the same language you'd use as a test pilot. We were looking for documentation, interesting samples, an overview of the environment, in clear and simple language, ordered and organized. I was gently trying to show them that they were such acute observers, and such well-educated men, that if they bent their intention to this purpose they would produce useful results that would enhance their missions. These guys would

Continued on page 8 . . .

All-terrain vehicle: Apollo 16's Dave Scott readies the lunar rover at Hadley Delta in July 1971; several months earlier, he and co-pilot Jim Irwin (wearing backpacks) had tried out the "Grover" near Taos, New Mexico.





On the Frontlines of Independence

A Caltech postdoc's report from
the embattled nation of East Timor

"Every day, I ask myself: By going over there, have I actually committed myself to something that I'll never be able to do penance for?" 29-year-old Ravinder Bhatia, Caltech postdoc in physics, speaks these words in a haunted voice, a slight slump in his shoulders.

Bhatia is one of more than 100 international volunteers who recently returned home from East Timor, an Indonesian-ruled half-island in the South Pacific. As an observer for IFET (International Federation for East Timor, a United Nations-accredited organization), he spent three weeks recording the human rights abuses and campaign violations that took place there in August during the historic election for East Timor's independence from Indonesia.

Unfortunately, after the East Timorese people voted for independence on August 30, their greatest fears were realized. Pro-Indonesian militias—who had originally been appointed by the Indonesian government to protect the local population but who now ruled most parts of the territory in a state of unofficial martial law—unleashed a wave of death and destruction, forcing the already embattled population to flee from their homes.

In the wake of this violence, the entire IFET observer project, which had wanted to remain after the election to help protect the East Timorese, was forced to flee the country. Bhatia has yet to hear if those he had come to know and admire, who had "risked their lives to give me information," were able to escape in time. "There are only two things keeping me going right now," says Bhatia. "First, the East Timorese told us that they had had enough. They didn't care if they were endangering themselves. They wanted to vote, for the sake of their children. Second, the fact that I'm able to get the word out about what I've seen through stories like this."

Bhatia's story begins about a year ago, when he and his observational cosmology labmate, Byron Philhour, graduate student in physics, helped start a local chapter of the East Timor Action Network (ETAN) in Pasadena. When IFET announced this past summer that it was accepting volunteers to

observe the election process, Bhatia applied and was accepted.

His first day in East Timor, August 10, was spent in Dili, the capital, amid grim reminders of the violence that had wracked the island for more than two decades. "We walked by the Santa Cruz cemetery, where many of the people who were massacred in the 1991 protest are buried. That was a very sobering kind of thing to see."

The Santa Cruz massacre was one of many attempts by the Indonesian government to subjugate the East Timorese. Indonesia's occupation of the region began in 1975 when it invaded the tiny country—which had recently won its independence from Portugal—an offensive that would over the next several years claim the lives of an estimated 200,000 East Timorese, about a third of the preinvasion population.

Over the last decade, however, East Timor's struggle for independence slowly but surely captured the attention of the international community. In May, Indonesia's newly appointed president, B. J. Habibie, agreed to allow a referendum under United Nations sponsorship in which the East Timorese would be able to decide if they would remain an autonomous part of Indonesia or declare their independence once and for all.

But it didn't take long for Bhatia and other IFET observers to determine that although Indonesia had signed an agreement to run a fair election, the government was "unwilling to control its own local militia groups," who terrorized the local population in an attempt to coerce

them to vote for autonomy.

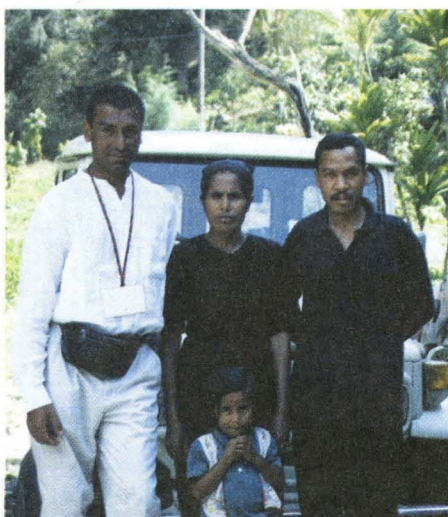
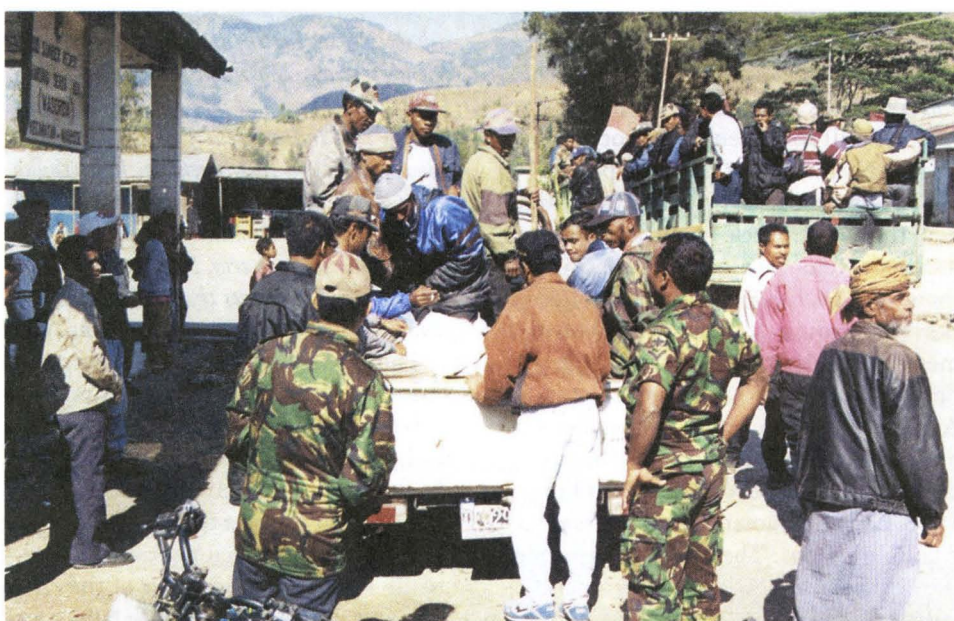
Observers notified the IFET office in Dili, which notified UNAMET (United Nations Assistance Mission to East Timor, comprising the official United Nations staff members in the territory).

Bhatia, who for his field assignment was chosen to be the team leader in the town of Maubisse, a dangerous area with a very strong militia presence, noted that "the general political climate was a lot of fear, a lot of tension, but otherwise reasonably calm. Since the militias had the support of the army and police and could do whatever they wanted, they didn't really feel that they had anything else to prove." He also noted the militia's reactions to UNAMET's assurances that the vote would be secret and the resulting

change in the militia's scare tactics.

"When we first got there, the threat was that if one particular individual or one village did not vote for autonomy, the militias would come to this particular person or village and execute them," Bhatia explains. Certain attacks on and "disappearances" of pro-independence supporters lent credibility to this threat. "But once UNAMET started to emphasize that the vote would be secret, the militias and pro-autonomy groups started saying that it didn't matter how an individual person or village voted; if the East Timor territory as a whole voted for independence, the militias would come back and wipe out entire villages."

Threats to the villagers were not the only challenge that IFET observers



The personal and political faces of East Timor. In the Indonesian archipelago, (see the map at top left) the territory of East Timor (outlined in red) took part in an August election to determine whether it would remain an autonomous part of Indonesia or declare its independence. Above: During his stay in the town of Maubisse as an election observer, Caltech postdoc Ravinder Bhatia captured this photograph of autonomy supporters mixing with militia members in the back of a truck; the armed troops are members of the Indonesian army. Left: In the aftermath of the postelection violence, Bhatia (far left) fears for the safety of his host family. From right: Gaspar da Costa; his wife, Amada; and their youngest daughter, three-year-old Miki.

faced. Up early every day, the volunteers worked long hours under intense scrutiny, observing and interviewing everyone from villagers to militia leaders. "Although we were the observers, we were the most closely watched people out there," says Bhatia. "Every single thing that we did was monitored by the militias and other pro-autonomy groups. From a personal viewpoint, being out in the limelight every single day was very grueling."

Throughout this increasingly tense period, Bhatia's only outside communications were the daily reports he made to

the office in Dili, using a satellite phone with a frustratingly unreliable connection. He called the reports in at night while hiding outside “as openly armed militia and military patrols cruised by.”

While he doesn’t downplay the dangers he faced, Bhatia says that he drew strength from the courage and fortitude displayed by the East Timorese. Not long after he arrived, he and fellow team members attended a rally that a group of pro-independence supporters deliberately held in one of the militia’s strongholds. A line of about 300 demonstrators five or six abreast marched out onto a school field holding a pro-independence flag, and tied it to the flagpole underneath the Indonesian flag. Up to this point, most villagers had not even put up a pro-independence flag outside their homes, much less in the heart of militia territory. Dead silence ensued for about 15 minutes.

“We all expected gunfire,” says Bhatia. “It was very tense, and there was a real danger the militias and the military would shoot with their M-16s. But at the same time, there was an incredible determination in the villagers’ eyes. These people were willing to risk their lives. They were not going to give in to intimidation.”

Bhatia also found that the rallies themselves were a hotbed of campaign abuses and violations. “We monitored numerous campaign violations, every one of them carried out by the pro-autonomy groups. The majority of these violators were people carrying weapons, mostly knives. We didn’t see autonomy supporters openly carrying guns during the rallies, but we would see them before and afterward sitting with rifles in the backs of trucks, openly mixing with the militias and the military.”

Amid this intensifying climate of threats and intimidation, Bhatia and his team found themselves hauled in on false charges. A story went around that UNAMET members had searched a pro-autonomy house for weapons—a serious violation of the neutral code of conduct. One of Bhatia’s team members had been in the area, and Bhatia was called in to speak in his team’s defense.

“We were all terrified,” Bhatia says. “Although we were international observers, we were well aware of the fact that we could have been tortured and killed.”

As Bhatia soon saw, the situation was

even worse than it first appeared. “They were trying to use this case to discredit the entire IFET organization so that they could then discredit UNAMET and prove it wasn’t neutral.” After repeated interrogations over the next few days, Bhatia, his team, and UNAMET were finally cleared of the charges.

Although Bhatia had originally intended to stay for one week after the vote, the election was delayed by nine days by the United Nations, due to concerns about security. And since Bhatia had to be in Paris for a physics meeting on September 1, his last day in East Timor was August 30—election day. He didn’t see any violence at the polls, but, as he would later discover, this was the calm before the storm.

Shortly after the election results were announced—nearly 80 percent of those voting chose independence—the militias made good on their threats, initiating an onslaught that included murder, kidnapping, and the destruction of many homes and businesses. The full extent of the situation is impossible to calculate, although estimates place the number of homeless in the hundreds of thousands.

The rest of the world has now reacted. In September, an Australian-led peacekeeping force began to restore order in the ravaged nation. In October, Indonesia elected a new president, who has said that he is willing to meet with East Timorese independence leader Xanana Gusmao, who is expected to be the new nation’s first president. Finally, as *Caltech News* was going to press, the United Nations announced that it was officially taking control of East Timor and sending a force of 9,000 troops to the half-island nation to restore order.

But several hundred thousand East Timorese are still hiding in the mountains of East Timor or in refugee camps in Indonesian-controlled West Timor. Building materials are in short supply as the treacherous rainy season begins. And perhaps most importantly, East Timor is lacking in many vital institutions, including schools, courts, and police. Much more remains to be done before East Timor can survive on its own as a nation.

To find out more about the situation in East Timor, check out the East Timor Action Network’s Web site at www.etan.org.

RYAN POQUETTE

DAVID TIRRELL NAMED TO CHAIR DIVISION OF CHEMISTRY AND CHEMICAL ENGINEERING

David Tirrell, the Ross McCollum-William H. Corcoran Professor and professor of chemistry and chemical



David Tirrell

engineering, has been appointed the chair of Caltech’s Division of Chemistry and Chemical Engineering, succeeding Bren Professor of Chemistry

Peter Dervan, who has stepped down after five years in the position.

Tirrell’s research focuses on connections between materials science and the biological sciences. His specific interests include the preparation of new materials for application in biology and medicine and a better understanding of the ways in which materials are made in nature.

Before joining Caltech in 1998, Tirrell was the director of the National Science Foundation Materials Research Science and Engineering Center at the University of Massachusetts, where he was also the Barrett Professor of Polymer Science and Engineering. He earned his BS from MIT in 1974 and his PhD from the University of Massachusetts in 1978.

Elected a fellow of the American Institute of Medical and Biological Engineering in 1994, Tirrell received the American Chemical Society’s Carl S. Marvel Creative Polymer Chemistry Award in 1991, and during his years at U-Mass was honored numerous times as an outstanding teacher.

INSTITUTE TRUSTEES APPOINT SANDRA ELL AS TREASURER

At their September board meeting, Caltech’s Trustees voted to appoint Sandra Ell as Institute treasurer and chief investment officer.

Ell had been serving as acting treasurer for the past year, where her accomplishments included overseeing the management of Caltech’s \$1.2



Sandra Ell

billion endowment, coordinating a significant and challenging bond issue, and managing the operation of the treasurer’s office.

A graduate of UC Berkeley with honors, and a CPA since 1984, Ell has served in various roles within the finance organization—both on campus and at JPL—and celebrated her 15th year of service at the Institute this past May.

Walter Cronkite, renowned CBS news anchor and household name, stopped off at JPL in September to film scenes from “Beyond the Moon,” a one-hour program that KCET/Hollywood is planning to air nationally on PBS in the year 2000. Produced by Cronkite Productions, Inc., and hosted by Cronkite, the program tells the story of space exploration, examining both the technology and the vision of the men and women who created it, among them JPL’s director, Ed Stone (pictured with Cronkite, below). The documentary is being made possible through the contributions of Caltech trustees Peter Mullin—of Mullin Consulting, Inc.—and Stan Rawn and his wife, Barbara.





In September, the Los Angeles County Board of Supervisors honored Caltech with a plaque for being named the nation's top university by *U.S. News & World Report*. From left, Supervisor Mike Antonovich is joined by President David Baltimore and Senior Councilor for External Relations Alice Huang.

CALTECH IS RANKED #1 BY U.S. NEWS . . .

Caltech has for the first time been ranked the top university in the nation by *U.S. News & World Report's* annual guide "America's Best Colleges." The magazine hit the newsstands on August 23.

Over the past decade of *U.S. News* rankings, the Institute has always placed in the top 10, ranking as high as third in 1989. For 1999, Caltech also places first in many ranking categories: faculty resources, freshmen in the top 10 percent of their high school classes (100 percent), SAT scores, financial resources, and undergraduate student to professorial faculty ratio (3 to 1).

U.S. News bases its national school rankings on academic reputation, graduation and retention rates, faculty resources, student selectivity, financial resources, alumni giving, and graduation-rate performance (the difference between actual and predicted graduation rates).

You can access the rankings from www.usnews.com. The "America's Best Colleges" issue of the magazine also included a feature on Caltech.

In related news, in the September issue of *Kiplinger's Personal Finance Magazine*, Caltech was ranked number two among the top 100 Values in Private Colleges.

Alumni Association president Kent Frewing reflects on the USNWR ranking and its significance for the Institute and its alumni in his letter on page 15.

. . . AND WELCOMES A CLASS THAT IS SECOND TO NONE

Gifted, trendsetting, and well-rounded are words that come to mind in describing the class of 2003. Of the 235 young people who make up the incoming class, 83, or 35.3 percent, are women—the highest in Caltech's history in both number and percentage, according to Charlene Liebau, director of admissions. "We had the largest female applicant pool ever, and with the highest level of preparation and active involvement in the sciences," Liebau says. "This reflects recent efforts in the high schools to encourage young women in math and science, and we're now seeing the benefits."

The class also achieved the highest mean SAT scores in recent history: 1500 combined (770 in math and 730 verbal). Several students skipped a grade or more, or graduated early, and will arrive for fall quarter at the tender age of 15 or 16. One student took advanced-placement calculus in the ninth grade; others took college-level courses after exhausting the math and science options at their schools.

The varied array of backgrounds and personal interests among the students is sure to lend breadth and perspective to their academic life. Included in the group are four Eagle Scouts; a young woman who kayaked through the Florida everglades, observing environmental degradation; a young man who was in charge of his school's technological facilities and got to demonstrate them to President Clinton and British Prime Minister Tony Blair; a Rose Princess finalist; and a young man who trained to be a Buddhist monk in Thailand. Many are musical, including classical, jazz, and rock musicians, a harpist, a taiko drummer, several bell choir members, and the founder of a punk band. Others participate in a variety of sports ranging from rock climbing to roller hockey to competitive swing dancing.

About 30 percent of the incoming students are from California, among the lowest percentage in recent years. The trend toward fewer homegrown students and increasing out-of-state enrollments has resulted from more aggressive national recruiting efforts by Caltech admissions staff, says Liebau. In terms of diversity, the class is 22 percent Asian, 6 percent Latino, and 51 percent Caucasian; 6 percent are international students. Twenty percent of the students declined to identify their ethnic origins, a sharp increase from previous years. Liebau says this is a nationwide trend: "Students want to be admitted on their merits rather than because of ethnicity."

Although more African American students applied this year, and Caltech admitted a number, they accepted other offers. And of course, competition in attracting top students is intense. Liebau notes that "of the students who choose to go elsewhere, 83 percent pick MIT, Stanford, Harvard, or Berkeley"—showing that some very worthy rivals lured away the rest of the 520 students who received Caltech acceptance letters.

RESTORATION RENDERS THE ATHENAEUM DUSTED OFF, SHINED UP, AND MORE AUTHENTIC

The jewel in Caltech's architectural crown is sparkling brighter than ever, thanks to a \$60,000 restoration this summer that refreshed the surfaces of three elaborate Athenaeum ceilings and uncovered decorative elements hidden for decades. The refurbishing also constituted a kind of artistic reunion after nearly 70 years. The work of cleaning and retouching was supervised by a restoration consultant whose father was the main professional rival of the Italian émigré who created the graceful designs when the Athenaeum was built as Caltech's faculty club between 1929 and 1931.

"John Smeraldi [born Giovanni Battista Smeraldi] was probably the best painter in Italian-style decoration in his time," says Tony Heinsbergen of the artist, who was born in Palermo, Italy, in 1867. Heinsbergen, who came out of retirement to supervise the Athenaeum restoration, is the son and namesake of Smeraldi's chief competitor, who painted the ceilings of the Wilton and Pantages theaters in Los Angeles as well as those of the libraries of Caltech's Guggenheim and Gates Annex buildings. But Smeraldi was the acknowledged master at recreating the European Renaissance style of architectural decoration that was popular in notable residences and public spaces of '20s and '30s America. A Pasadena resident, he died in 1947.

For the Athenaeum's Spanish-Renaissance-style dining room ceiling, Smeraldi had covered the wooden beams and panels with a rich array of floral and fruit arrangements, illusionistic architectural details, fake "jewels," and even seahorses. "The ceiling of the Athenaeum's dining room is a masterpiece," says Heinsbergen. "The design, the execution, and the coloration couldn't be better if Raphael had done it."

Heinsbergen is referring to the 16th century Italian Renaissance painter/architect who popularized a fanciful style of architectural decoration after discoveries were made of similar designs on the walls and ceilings in the rooms beneath the ruins of Nero's palace in Rome. "This style of ornamentation, which features cherubs, foliage, and medallions, is called 'grotesque,' which refers to its discovery in grottoes, not its actual appearance," says

Romy Wyllie, the Athenaeum's interior designer and instigator of the project. Wyllie's book on Caltech's architecture will be published in December.

Working with a vacuum cleaner and a weak solution of dishwashing liquid and water, a small crew gently cleaned the oil-based paint of decades of dirt, dust, and nicotine stains. Selected details were altered with a brighter shade of paint to liven up the otherwise muted ceiling. Finally, a satin latex varnish was applied to bring out the details without making the artwork look like it was painted yesterday.

"It's supposed to look like a ceiling in an old castle," says David Bell, the crew chief and an artist who has worked on many such restorations, including the ceiling of the Pasadena Civic Auditorium. "This ceiling was originally glazed to look dirty. Smeraldi wanted his own work to look as if it were 400 years old."

The restorers stumbled onto a delightful surprise when they removed the unsightly



Athenaeum interior designer Romy Wyllie (right) and architectural restorer David Hunt examine a panel in the newly restored ceiling of the Hall of the Associates.

acoustical panels that had been glued into the rectangular coffers between the beams during a 1960s renovation. Under those panels, they found the original teal-blue tempera-sponged panels framed by moldings covered in a red and gold egg-and-dart pattern. Badly damaged by the tile adhesive, the panels were recovered with a layer of canvas sponge-painted in teal blue tempera to match the originals.

The restorers also gave new life to Smeraldi's barrel-vaulted, neoclassical style ceiling in the Athenaeum entry hall. In a display of *trompe l'oeil* (literally, "trick the eye") technique, Smeraldi had painted hundreds of rosette-studded coffers that appear to be three-dimensional plaster carvings casting strong shadows, but are, in fact, optical illusions. Fortunately, no retouching was necessary on the entry ceiling, but Bell and his colleagues repainted portions of the frieze beneath the vaults to set off the ceiling's vividness.

The ceiling of the Florentine-style Hall of the Associates, the last of the Ath's three refurbished ceilings, is the most architecturally striking. Here Smeraldi's painting was limited to the heraldic university shields that nestle in the arches beneath the ceiling. Workers cleaned the surfaces and repainted the vault ribs and rosettes, which had turned from gold to black over 70 years, and repainted a shield that had been badly damaged during a prior cleaning. As a final addition, the restorers applied genuine gold leaf to the tiny rosettes at the rib intersections. The ceiling now glitters, making the magnificent beamed ceiling in the adjacent dining room look somber by comparison.

"This was all the work," says David Hunt, contractor for the restoration, standing in the dining room. "That," he says, pointing across to the Hall of the Associates ceiling, "is all the glory."

NEW DISCOVERY FUND NAMED FOR WILLIAM T. GIMBEL WILL SUPPORT NOVEL AND PROMISING RESEARCH IN THE BIOLOGICAL SCIENCES

Leading a program funded through the Institute's Biological Sciences Initiative, Erin Schuman, associate professor of biology and assistant investigator for the Howard Hughes Medical Institute, has been awarded the first grant from the William T. Gimbel Discovery Fund in the Biological Sciences at Caltech. Schuman, who has made significant contributions to understanding intercellular communication in the brain, is using the grant to study the neural basis of learning and memory in humans.

In collaboration with Adam Mamelak, a visiting associate in biology at Caltech and a neurosurgeon at Huntington Memorial Hospital in Pasadena, and Bob Astur, a postdoctoral fellow at Caltech, Schuman is specifically focusing on neural reactions in the human hippocampus, the part of the brain that is believed to be a center of learning and memory.

"Although a large number of electrophysiological recordings have been conducted with other animals, we know very little about the native physiology of the human hippocampus," said Schuman, who has studied the hippocampus for the past nine years. "Animal studies and neuropsychological studies in humans strongly suggest that the hippocampus is important for encoding certain kinds of memories. We would like to examine this by recording neural reactions from the hippocampus while patients are learning specific tasks and then remembering what they learned."

Schuman said that insights from the project may eventually lead to the development of tools and drugs for the enhancement or preservation of memory function following brain injury, and could also lead to methods for improving memory overall. "This is a long way down the road, but it is possible," Schuman said. "We will need to exercise caution in designing general memory enhancers since most of the molecules important for memory have general roles in many brain functions. So I think it is easier to justify using a drug tool to help someone with a profound problem, and less easy to justify using a drug to just improve memory."

According to Mel Simon, chair of the Division of Biology and the Anne P. and



William Gimbel, shown at left with his wife, Georgina, on the Big Island of Hawaii, was an admirer and supporter of Caltech for many years. In 1997, a year before his death, friends, family members, and professional colleagues of Gimbel established the William T. Gimbel Discovery Fund in the Biological Sciences at Caltech in his honor. Now the largest discovery fund at the Institute, the fund will support innovative and pioneering research in biology, particularly the neurosciences, such as the investigation into the neural basis of learning and memory being carried out by Associate Professor of Biology Erin Schuman (pictured below).

Benjamin F. Biaggini Professor of Biological Sciences, Schuman's project is the first of several novel and promising investigations that will be advanced by the William T. Gimbel Discovery Fund in the Biological Sciences. Preference will be given to projects in neuroscience.

The fund was established in late 1997 in honor of William T. Gimbel, a longtime member of the Caltech Associates who died last December. It was created by many of those who knew Gimbel, including his long-time friend Robert Henigson '48, MS '49, many Gimbel family members, Reliance Steel & Aluminum Co.—the Los Angeles-based firm that Gimbel led for 40 years—and members of the company's board. The fund now totals more than \$6 million.

In one stroke, Gimbel helped make the Gimbel Discovery Fund the largest discovery fund ever established at Caltech and helped Caltech exceed its goal for discovery fund support in the Biological Sciences Initiative when he committed \$5 million to the effort three months before he died. "Bill Gimbel has been a great friend of the Institute for many years," said Simon. "His gift to the Gimbel Discovery Fund, as well as the contributions from his many friends, will make an important and a lasting impact on science for years to come."

Gimbel served on the Associates' board of directors for many years, and was secretary of the board from 1987 to 1988. He and his wife, Georgina, have supported several projects at Caltech, including the Georgina and William Gimbel Building in Hawaii, a sea-level support building for the Caltech Submillimeter Observatory on Mauna Kea.

"Bill Gimbel was a remarkable man," said Henigson, president emeritus of the Associates, who thought up the idea for the Gimbel Discovery Fund. A retired attorney, Henigson met Gimbel more than 40 years ago, when he first represented Reliance Steel in the late 1950s. At that time, the company operated a single metals service center with annual revenues of about \$13 million, according to Henigson.



Gimbel guided the company until it became one of the nation's largest metal processors and distributors, with sales last year of \$1.35 billion. "Bill took that company from infancy to maturity," said Henigson. "He knew every aspect of the business, from steel processing to marketing to accounting. He was brilliant."

Georgina Gimbel said that her husband had admired Caltech ever since he was an undergraduate at UC Berkeley, studying engineering. He then spent several years as an aeronautical engineer at Douglas Aircraft Company, where the couple met, and also worked at Northrop Corporation. "He knew how much aeronautical engineering knowledge—the text books and much of the technology—came from Caltech." Gimbel went to work for Reliance Steel in 1947, when his uncle convinced him to trade his dream of a Harvard MBA for practical experience. More than 20 years later, while serving as Reliance's chief executive officer, he went back to school at night, and earned an MBA from Pepperdine University in 1973.

Georgina Gimbel said that through the Gimbel Discovery Fund, she and her husband hoped to advance research that might lead to greater understanding of neurological diseases. "My husband suffered from Parkinson's disease for 10 years, and that was the cause of his demise. It seems as if Caltech has the best chance to make real breakthroughs in the study of neurological diseases."

Gifts by Will

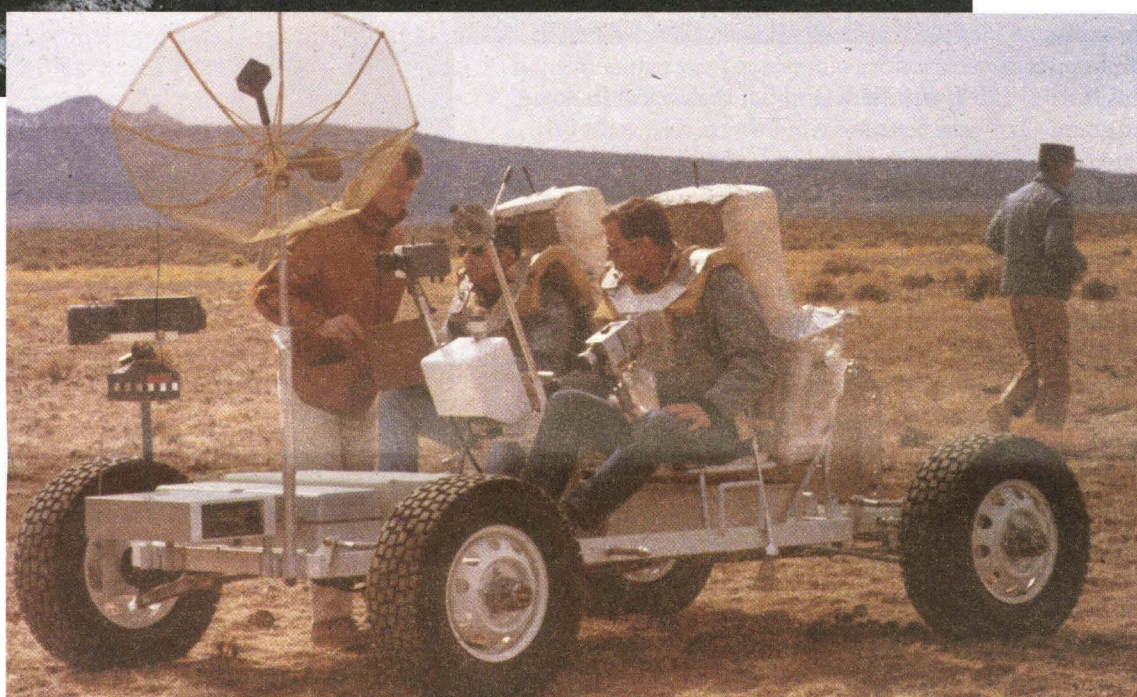
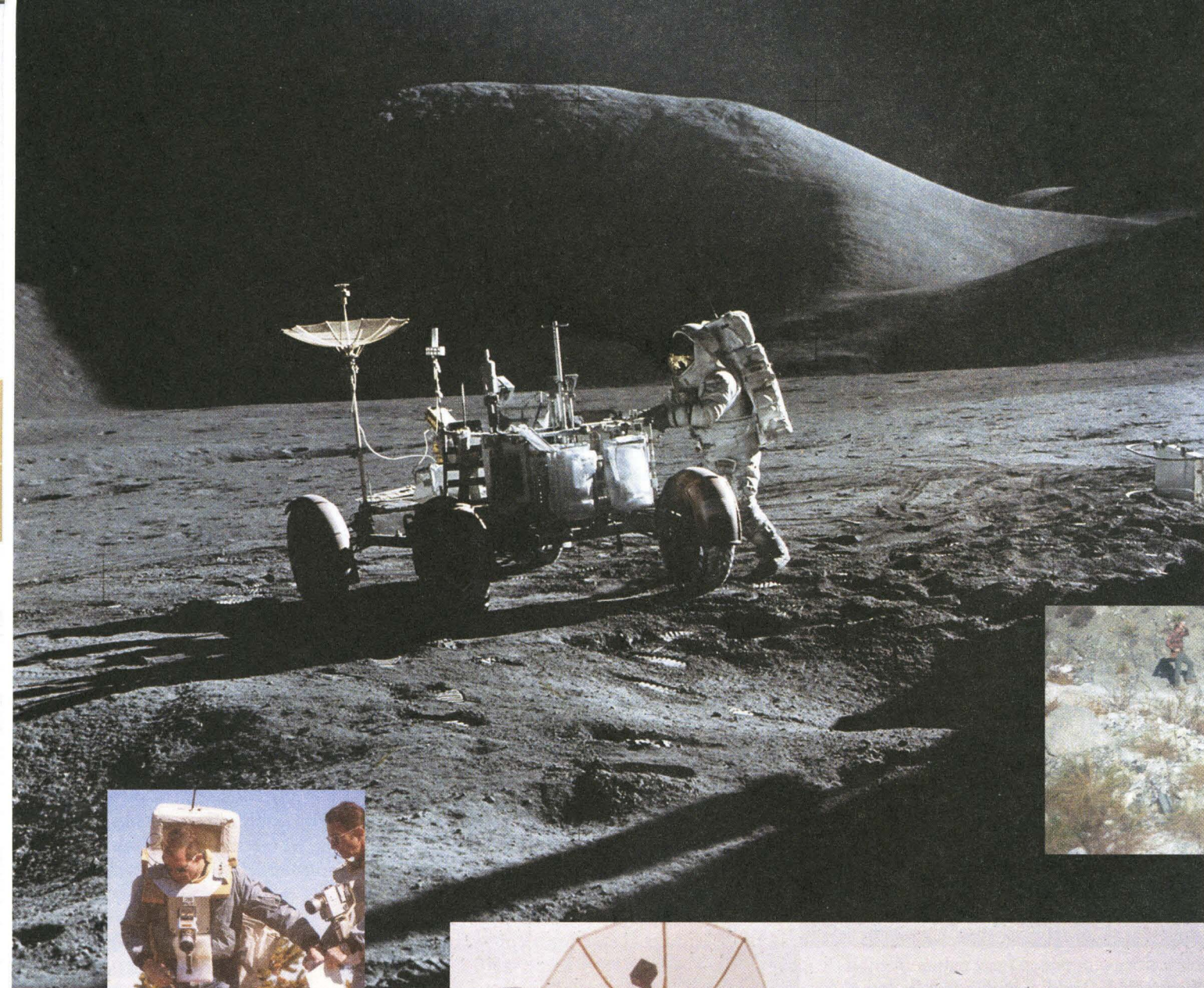
Albert Atwood, Jr. '32, MS '33, died in Pasadena on September 2, 1998, one month shy of his 91st birthday. A senior electrical engineer with Southern California Edison, Al (or "Bill" as he was known to his close friends) was editor of the Caltech yearbook, *Big T*, and founding editor of the *Caltech Alumni Review*, which later evolved into *Engineering & Science*. His wife, Elaine, died in 1988; the couple had no children. He is survived by his sister, Sarah (Sally), who was married to James Dailey, MS '37, PhD '45.

Al always expressed great fondness and appreciation for Caltech, and he supported the Institute in many ways during his lifetime. He was one of the first life members of the Alumni Association (which he joined in the 1940s) and a member of the Associates' President's Circle, and he and Sally participated in many trips and events sponsored by both organizations. In 1991 he joined the Torchbearers of Caltech, signifying that he had made a commitment to support the Institute through a bequest or deferred gift. He also extended support as a Friend of Beckman Auditorium and as a regular contributor to the Alumni Fund, and by making charitable contributions to Caltech's Pooled Income Fund I.

At the time of Al's death, his contribution to this fund was nearly \$400,000, which Caltech may now use in an unrestricted manner. Caltech was also named a beneficiary in Al's will, receiving a bequest in excess of \$2.6 million that, at his request, will be applied to research in the field of electrical engineering.

For more information regarding bequests, please contact the Office of Gift and Estate Planning, Mail Code 105-40, Pasadena, CA 91125; 626/395-2727; planned_gifts@caltech.edu. The office Web site can be accessed at www.gep.caltech.edu

More "Friends" on page 9



A Little Science . . . from page 3

have been the generals and the admirals of the military services, the top test pilots. They were all just absolutely the cream.

For the astronauts' first outing, Silver loaded up one Caltech vehicle with equipment and another with his charges and drove to the Orocochia Mountains in the Southern California desert, where he had often trained Caltech students. He then let the beauty of the setting and the astronauts' natural curiosity work their magic.

We didn't have any tents, we had cots, and everybody brought their own sleeping bags. At the beginning of each day, I laid out the day's exercises. At the end of the day, the "professor" would review with the troops just what they had done that day, go through the rocks they had collected, make comments. At the very end of each day, I had to cook dinner. They did the dishes.

In the field, we used a tree as our landing module [the spacecraft that during the mission would disengage from the larger command module, which would remain in orbit, and land on the lunar surface]. In the film they were sitting in the shade. I never allowed anybody to sit in the shade.

Due to an explosion en route, Apollo 13 never made it to the moon, but did return to Earth safely with its crew. It was Silver's later, 15-month training period with the

Apollo 15 astronauts, and that crew's brilliant geological performance on the lunar plain between the Apennine Mountains and Hadley Rille, a sinuous gorge, that, in Silver's words, "bit a home run." By then, Silver had learned a few things himself.

This time I was a little smarter, a little older. I had learned from Apollo 13 how much these guys had to do. I had to worry about all their constraints, to look at the expectations with equipment, with time, with the suits, the durations of the EVAs [extra-vehicular activity, or excursions outside the landing module], etc. I had to learn what science was being done by hundreds of investigators, which would in turn influence the planning for what we did next. The whole lunar exploration was a growth phenomenon. As the missions became more complex (e.g., utilizing the lunar rover), NASA was extending the launch schedule, so that the training became more and more extended, and that was very helpful.

As the training period expanded, the Apollo 15 geology field trips crisscrossed the country, evolving from exercises into simulations with dozens of scientists and NASA personnel participating. The entire staff of the geology "back room" at Mission Control (the room where the scientists would be monitoring the astronauts' actions during the actual mission) normally came along for the ride. And, for the first time, the astro-

nauts trained with the four-wheeled vehicle they would ride in on the moon to cover more territory and collect a wider variety of geological samples. It was a time of intense activity for Silver.

I was like a person going into battle. For 15 months, I was running exercises in different parts of the country, training the astronauts in different aspects. I was still doing my samples for my lunar analyses, and I taught all my Caltech courses. I was in one mad whirl, trying to meet all the challenges. The crews were telling me what they could do and what they couldn't do. I had to learn from them and still manage to push what they could do on the surface. There were an infinite number of things I couldn't get to, because there wasn't enough time, but you did what you had to do. Do soldiers go into battle perfectly trained? No, they don't—the battlefield is the final training ground.

Earlier lunar landing sites had been selected in part for their flat, straightforward topography that lessened the chances of landing mishaps. But the growing confidence in the astronauts' navigating skills and their landing modules' maneuverability enabled Apollo 15's planners to choose a landing site at the base of the moon's Apennine Mountains, which rise more than 15,000 feet above the Hadley Plain. The site was more than just visually spectacular;

Clockwise from top left: Apollo 15's Jim Irwin prepares for a lunar excursion on the rover, near the foothills of the Apennine Mountains, in 1971; in his basement office in North Mudd, Professor Lee Silver poses with a distant and much younger relative of the "genesis" rock found on the moon—a mineral specimen from Labrador made up of the major component of anorthosite; on a field trip to the San Gabriel Mountains in December 1970, Silver (left) and Apollo 16 astronaut Charlie Duke inspect an outcrop of anorthosite; as field exercises continue to evolve into mission simulations, Irwin and Apollo 15 commander Dave Scott test drive the "Grover" on a training mission in Taos, New Mexico in March of 1971; during the same trip, mock backpacks help Scott and Irwin anticipate lunar conditions. Opposite: Keeping his fledgling geologists well fed, Silver was chef for the inaugural field trip to the Orocochia Mountains in September 1970. Seated around the dinner table, left to right, are Fred Haise (Apollo 13), Caltech postdoc Tom Anderson, John Young (Apollo 16), an unidentified NASA representative, Jim Lovell (Apollo 13), and Charlie Duke (Apollo 16).

*I had to cook dinner.
The astronauts did
the dishes.*

the moon's peaks were presumed to consist of older geologic material than its flat areas, and some scientists thought that rocks gathered from the mountains' periphery might date from close to the time of the moon's origin. Prior to Apollo 15, components of a rock called anorthosite, found on Earth, had been detected in previously collected lunar samples, but no complete specimen had turned up. Apollo 15 astronauts Dave Scott and Jim Irwin had learned to identify anorthosite while on a field trip with Silver in the San Gabriel Mountains, in Caltech's own backyard. Now, at the Hadley Delta, at 10 a.m. on Sunday, August 1, 1971, Scott and Irwin would find the "genesis" rock, a chunk of anorthosite that had apparently originated in the moon's primordial crust, leading scientists to propose a now widely held theory that billions of years ago, a Mars-sized body collided with Earth, giving rise to the moon. Estimated to be 4.5 billion years old, the fist-sized rock remains the most primitive (i.e., least evolved) sample yet taken from the lunar surface. Although lionized by the media, the find was only one instance in a brilliant interval of field geologizing that Silver would subsequently characterize as "hitting a home run." Two days later, en route back to Earth, the two astronauts made the unprecedented request to speak directly with their professor, who was in the back room at Mission Control. It was 4 a.m. Houston time, but Silver was up, "doing geology." "We'll have to get you up here," Scott said to Silver, who in turn congratulated Scott and Irwin on their outstanding field work.

It was the only time that anyone in the back room other than the capsule communicator [who spoke on behalf of Mission Control to the astronauts] had ever spoken directly to the command ship. That was very rewarding. I had a sense of being honored by them, in that moment. Did I break down and cry? Hell, no. I was so glad to hear them. They were on the way home. They were close, and I was so glad.

In a highly romanticized flashback, HBO's aging Professor Silver muses longingly about how it might have been to wander the moon's surface for 25 years, sample bag and coffee thermos in hand. The real Silver did not have script approval.

Those weren't my words. I'm a field geologist, but I also ran—it's closed down now—a sophisticated isotope chemistry lab, and I was interested in the samples and what one could get from doing analytical work in the labo-

ratory. I would have been happy to have been up there, but not for 25 years. I would have wanted to come back and analyze my samples, and to bring back samples for other people to work on. The wonderful thing about the Apollo missions was the fantastic array of talent. The crew made an enormous variety of measurements, and we understood the samples we analyzed in a way we've never ever done with terrestrial samples, because we've never invested that much money in supporting investigations of that kind here on Earth.

After Apollo 15, Silver handed over the major responsibility for astronaut-training duties to other geologists, including Caltech alumnus Bill Muehlberger '49, PhD '54. In December 1971, Silver's former Caltech geology student, Jack Schmitt became the first professional scientist to visit the moon, as lunar module pilot on Apollo 17, the final flight in the series. Silver's close association with the astronauts of Apollo 13, 15, 16, and 17 remains an unforgettable highlight in a long and distinguished career.

You know that Captain Cook was a great 18th century explorer. [Apollo 15 Commander Dave Scott named his command module *Endeavour* after Captain Cook's maiden ship.] On his first expedition Cook took along a very wealthy English aristocrat by the name of Joseph Banks, who had an interest in things scientific. Banks wrote a book about the voyage that made a valuable contribution to our knowledge about the flora and fauna of the part of the Pacific that they explored. He later became president of the Royal Society because of the reputation he obtained riding along with Captain Cook. Well, I was a sort of poor man's Joseph Banks, along with about two or three hundred others. I had an opportunity to participate in a great expedition.

* * *

For further information, Hollywood-style, about Lee Silver and lunar geology, check out HBO's video *From the Earth to the Moon* (Part 10: Galileo Was Right). Also entertaining but less romanticized is Andrew Chaikin's book about the Apollo series, *A Man on the Moon*, published in 1994 by Viking Press.

Friends

Continued from page 7 . . .

ADVANCED NETWORKS AND UBIQUITOUS COMPUTING ARE FOCUS OF NEW CAMPUS TECHNOLOGY CENTER

The David and Ellen Lee Family Foundation has donated \$10 million to the Institute to establish the Lee Center for Advanced Networking, a campus facility that will improve computer networking through innovations such as wireless links.

The center will include broad participation from Institute researchers in a variety of disciplines, among them electrical engineering, computer science, applied physics, and economics. Nine faculty members will be associated with the center, including Professor of Electrical Engineering David Rutledge, who will serve as charter director. Caltech will also use some of the grant to recruit new faculty members, in an effort to expand the scope and depth of the center's research capabilities.

The center will develop research programs and encourage entrepreneurship in the field of advanced networking, sponsor seminars and cross-disciplinary teaching programs, and develop technology exchange programs with industry.

"With this donation, we will develop information space where people can communicate, regardless of where they are geographically, or whether they are mobile or stationary," says Steve Koonin, Caltech's provost. He adds that the center will focus on creating a worldwide distributed computing system that connects people and appliances through wireless and high-bandwidth wired channels.

David Lee is president and chief operating officer at Global Crossing and holds a 1974 doctorate from Caltech in physics with a minor in economics.

"Deregulation in the telecommunications industry and breakthroughs in optoelectronics technologies have caused fundamental, structural changes in global communications," says Lee. "New types of global networks are being built at a fraction of the cost of the legacy networks they replace. A world of seamless, ubiquitous connectivity is now within our reach, with a networked computer in almost every human tool and habitat. It is my hope that this new center will help realize that new future."

CALTECH PRECOLLEGE SCIENCE INITIATIVE RECEIVES AWARD FROM ARTHUR VINING DAVIS FOUNDATIONS

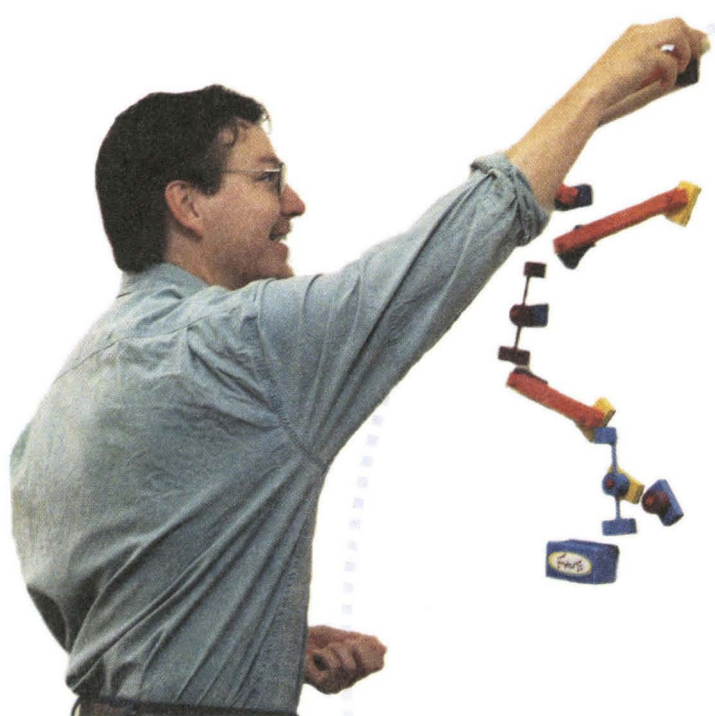
The Caltech Precollege Science Initiative (CAPSI) has received a \$150,000 award from the Arthur Vining Davis Foundations to work with the Pasadena Unified School District (PUSD) on science curriculum for grades 9–12.

The program is an extension of the 10-year collaboration between CAPSI and PUSD, which has resulted in a kindergarten-through-8th-grade inquiry-based science curriculum in all Pasadena schools. Currently the high school component is one year into its four-year development phase. When completed, the curriculum will contain eight multidisciplinary units, each taught in a science laboratory classroom equipped with computers.

The grant from the Arthur Vining Davis Foundations is specifically aimed toward the professional development of the project, thereby teaching the teachers the necessary skills for using the inquiry-based science curriculum in their classrooms. A team consisting of two Caltech scientists or engineers and two teachers from the PUSD is designing each module. Once the units are in place at the schools, each high school teacher will spend an average of 100 hours working with the modules he or she will teach. In the future, these modules will be disseminated to high schools nationally.

The Arthur Vining Davis Foundations are named for the former president of the Aluminum Company of America. The Foundations make grants in five program areas: higher education, secondary education, religion (graduate theological education), health care (caring attitudes), and public television. Grants are made to secondary-education programs that strengthen teachers and teaching in high schools.





BY RYAN POQUETTE

The objects of His Affection

Michael Brown's on an astronomical quest (in both senses of the word). But, unlike many of his peers, Brown—assistant professor of astronomy—is not relying on the latest technology to look back far into the reaches of space and time. Instead, he's curious about what's in our own solar backyard, and he's using a mix of old and new methods to answer his questions.

Last year, Brown—using the 48-inch Oschin Palomar telescope and old-fashioned photographic plates—initiated an ambitious, two-year study entitled the Palomar Outer Solar System Ecliptic (POSSE) survey, to image one-third of the ecliptic plane (see diagram at right for more details). His mission: to image objects in the Kuiper Belt, the band of objects that extends past Pluto into the outer solar system. Kuiper Belt Objects, or KBOs, as they are known in astronomical parlance, get their name from the Dutch-American astronomer Gerard Kuiper, who first hypothesized their existence in 1951.

Kuiper was not proven right until 41 years later, in August, 1992, when Dave Jewitt, MS '80, PhD '83, (an associate professor at the University of Hawaii's Institute for Astronomy) and Jane Luu (a former grad student of Jewitt's who was then a postdoc at UC Berkeley) imaged the first Kuiper

Belt Object, using U. of H.'s 2.2-meter telescope on Mauna Kea. They made their discovery by using a charge-coupled device (CCD) attachment on the telescope, which made the telescope more light-sensitive and therefore able to pick up very faint objects.

Luu's Berkeley office happened to be three doors down from then graduate student Brown's, and Luu soon called him with the news.

Like any astronomer worth his or her lens, Brown was slightly skeptical at first. "You can always write off the first one as an anomaly," says Brown. However, about a year later, after learning about a few more discoveries, Brown started doing work in the field. "It became apparent that this was going to be one of the most exciting areas of research in planetary astronomy."

Brown's current project is definitely living up to that claim. His study is the most extensive Kuiper Belt imaging project to date; he and his team are attempting to image a total of 2,160 square degrees of night sky—more than 40 times the total amount of sky that has been imaged using

CCD-equipped telescopes. A project like this requires an extensive amount of time on one telescope, a luxury that is hard to come by since telescopes are in high demand in the astronomical community. But, since most astronomers today prefer to use CCD technology instead of photographic plates, Brown was able to secure the use of the 48-inch Oschin Telescope at Palomar and its accompanying plates for a total of eight months—four months each in 1998 and 1999.

Brown and his team think the time will be well spent. "We believe that there should be around 200 objects in the Kuiper Belt that are larger and brighter than any that have been previously discovered," says Brown. "Out of these, we hope to find 70 or so." These objects may not just be asteroids or other neutral objects. The list that Brown hopes to publish—which will more than double the existing Kuiper Belt roster if his expectations hold true—may also include supercomets, or even potential planets.

Ever since Pluto was discovered in 1930, astronomers have wondered if there is a tenth planet in our solar system. Part of the speculation comes from the philosophical belief that the solar system should not have such a sharp edge to it.

Some astronomers have also attempted to use Bode's Law, a controversial rule that predicts the spacing of the planets in the solar system, to try to pinpoint the location where a tenth planet should be. But while most of the planets fit into the Bode formula, there are some noticeable exceptions—including Pluto, which some scientists believe may be a KBO that migrated. In fact, Pluto is not even part of the ecliptic plane; its orbit is at a higher angle in relation to the rest of the planets' orbits.

"I think Bode's Law is a quirky coincidence, but I do believe that

I'm expecting to find objects comparable in size to Pluto, and there's no reason why there shouldn't be something out there that's Earth-sized.

there's some regularity in planetary systems," says Brown. "I'm expecting to find objects comparable in size to Pluto, and there's no reason why there shouldn't be something out there that's Earth-sized."

Many other astronomers have been lured by this idea and joined the quest, but most of them are using CCD-equipped telescopes—which



A FEW OF HIS FAVORITE THINGS. Clockwise from above—Jean Mueller and Kevin Rykoski examine one of the photographic plates. The fourth member of Mike Brown's team, David Monet from the U.S. Naval Observatory in Flagstaff, is not shown; Brown much prefers two wheels to anything else (with the exception of trips to Palomar, of course); during some downtime, Brown plays with the tinkertoy-like contraption that hangs on his chalkboard.

offer a higher degree of sensitivity but have a much more limited field of view. Brown, on the other hand, is determined to find a large quantity of KBOs by using the less sensitive 48-inch telescope with photographic plates, each of which is large (measuring about 2.25 square feet) and captures a lot of sky (36 square degrees). By imaging three separate plates each night, and then repeating those identical imagings the two following nights, Brown is capturing the sky in 108-square-degree chunks—each one containing more than twice the total area that has been imaged by other astronomers since the first Kuiper Belt sighting in 1992.

During the imaging process itself, Brown and his team—including the Palomar staff that does the actual photographing—trek to the observatory, imaging during the two weeks of each month when the moon is in its new moon and crescent phases, so that it doesn't give much light interference. Still, the observers do have to contend with light "pollution" from the city lights in San Diego, which contaminates the imaging area and has to be factored out.

After the plates have been developed, Brown observes which dots on the plate have moved over the three nights. "Observing" may be a misleading term, however, since each plate contains almost one million objects (including KBOs, stars, and anything else in the telescope's field of view and magnitude), and it would be nearly impossible for the naked eye to observe the minute differences in movement on the plate.

This is where the CCD technology comes in. Although Brown isn't using a CCD-equipped telescope, he does send his finished plates to the CCD scanner at the U.S. Naval Observatory in Flagstaff, Arizona. After scanning the plates, a computer compares the images from each 3-night session, identifying and recording which of the million points of light have moved. "By marrying the two technologies—wide-view photographic plates and the CCD scanner—we get



the benefit of covering a larger area, while not having to spend a lot of time examining the plates by eye," Brown explains. Early on in the project, however, he did examine at least one plate by eye, as a test. Since one of Neptune's moons, Nereid, is about the faintest magnitude that Brown hoped to capture in the study, Brown took the plate that includes Nereid's coordinates, and checked to see if it showed up. It did.

But Brown has left the rest of the scanning work to the computer and CCD scanner. And a lot of work it has been, too. During the first four-month run, in 1998, Brown and his team imaged 2,088 square degrees of night sky, a mere 72 degrees short of their goal (they got rained out on two plates).

At this point, the scanner has evaluated all of the plates from the first year of imaging, exhaustively picking out any objects that had moved and downloading the information onto disks. These disks were then sent back to Brown, who in the interim had designed custom software to decipher the data.

Then, in the year 2000, after the second run of images has been scanned and the data has been returned, Brown and his colleagues will be able to compare the information from the two years of imaging and pinpoint the locations of the large objects in the Kuiper Belt.

Although it would be exciting (to say the least) to find a new planet or supercomet, that's not the overall goal of the project. Says Brown, "Our real objective is to find a collection of objects that are bright enough to study with higher-power telescopes like the Kecks and the 200-inch at Palomar." Then, with specific coordinates in hand, Brown and the rest of the astronomical community will have a clear chart to follow, instead of just looking for needles in the astronomical haystack.

SO WHAT'S NEXT ON THE HORIZON FOR MIKE BROWN?

Not surprisingly, Brown has already signed up to lead a team from Caltech in a multi-institutional effort—funded by the National Science Foundation's National Science Board—to advance the burgeoning field of adaptive optics.

The project involves establishing a Center for Adaptive Optics at the University of California, Santa Cruz, to conduct research, educate students, develop new instruments, and disseminate knowledge about adaptive optics to the broader scientific community.

The use of adaptive optics compensates for changing distortions that cause blurring of images—turbulence in Earth's atmosphere, in the case of astronomy—and can give ground-based telescopes the same clarity of vision that space telescopes achieve by orbiting above Earth's atmosphere. Depending on the size of the telescope, adaptive optics technology will make images 10 to 20 times sharper, giving scientists a much better view of objects in space.

As one of 27 partner institutions, Caltech will bring together faculty from astronomy, planetary science, and physics in an effort to advance the use of existing adaptive optics technology at the 200-inch Hale Telescope at Palomar and the two 10-meter Keck Telescopes. In addition to Brown, Caltech participants will include Shri Kulkarni, Chuck Steidel, Mark Metzger, and Keith Matthews from astronomy, and Christopher Martin from physics.

"This effort will breathe new life into ground-based observing by giving us more sophisticated tools to view distant planetary systems," says Brown. "We can learn and experiment at

Palomar, then utilize Keck for the really big discoveries."



Going to see the King. Ahmed Zewail with his wife, Dima, and sons, Hani (left) and Nabeel.

Ahmed Zewail . . . from page 2

confidence that it would."

What does it take to win a Nobel Prize? Caltech's newest Nobel laureate said that the prizes go to "a whole spectrum of people, from someone who is a genius, to someone who is extremely innovative and creative, to someone who is lucky, to someone who has done systematic scholarly work for 40 years." Which one is he? "I won't tell you." Who will? "Vince can."

Vince McKoy, Caltech professor of theoretical chemistry, said that Zewail "has incredibly perceptive insight and a flair of genius." McKoy is one of many people who speak of Zewail and Caltech's famous Nobel laureate Linus Pauling in the same breath. "There's a sense of continuity between what Pauling and Zewail have done." Pauling revealed the structure of the chemical bond, "and Zewail picked up the ball and went running further downfield by showing how bonds are made and broken," said McKoy.

"That is the great excitement," Caltech President David Baltimore, a Nobel laureate himself, told the press on October 12. "To be able to see what

happens when fundamental processes occur . . . that's the kind of discovery for which a Nobel Prize is given." Zewail added that he is "just so pleased" that both Pauling's prize concerning the structure and his concerning the dynamics of the chemical bond are from Caltech.

Zewail's path to the forefront of the international science arena has been elegant and swift, like the atoms he observes performing intricate molecular dances. With a wealth of experience in igniting home chemistry projects as a boy in Egypt ("my mother thought I was going to burn down the house"), he sailed to the top of his class at Alexandria University. The classical science education he received there groomed him for a promised tenure-track position in the field of his choice: math, physics, chemistry, or geology. He chose chemistry but was most interested in "applying physics and math to the world of chemistry, not in a traditional way."

That goal was "crystallized" when he decided to get his PhD at the University of Pennsylvania—to "see the molecular world of chemistry." He had heard of Caltech, but to this young Egyptian, "institute" sounded less prestigious than "university." As it turned out, Penn provided the "ideal" transition from classical science studies to the postdoctoral work he did at UC Berkeley. Had he come to Caltech initially, he says, he would have felt he had to "behave like a Feynman."

He stayed at Berkeley for postdoctoral work for two reasons: to think more about research rather than about getting a PhD and "the secret reason—I wanted to buy a big American car to take back to Egypt with me." At Berkeley, he published three papers "immediately" and was advised to apply to the top handful of American universities, if for no other reason than to enjoy traveling around for the interviews. Impressed by the flood of offers that followed, and lured by the "American magnet," a system that rewards good work, Zewail stayed.

"The most important reason why I decided on Caltech was, once the offer was made, I was well received by the staff, administration, and faculty." He also felt he could make his own way specializing in dynamics in a department strong on structure, a Linus Pauling legacy. And the Mediterranean climate didn't hurt. That was 1976.

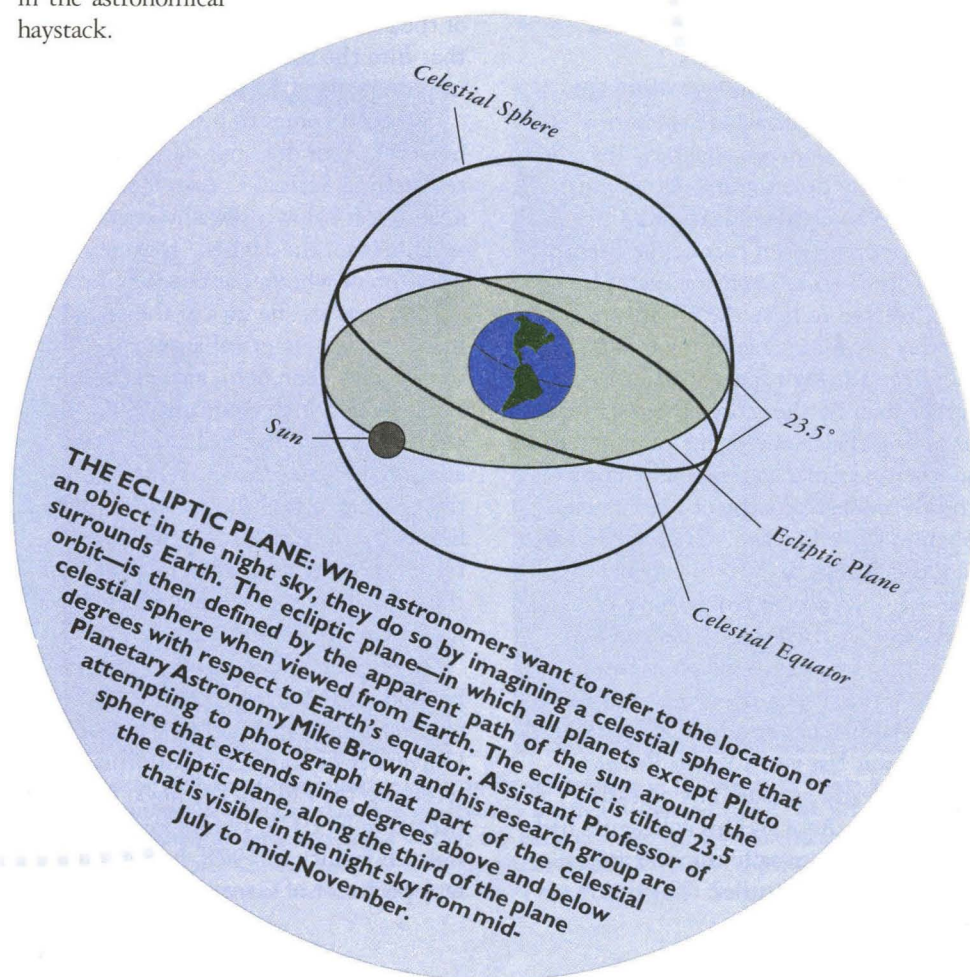
Zewail was off and running, earning tenure in a year and a half, making full professor by 1982, seated in the Pauling Chair by 1990. Now with a Nobel Prize under his belt, what's next? "First of all, I'm not retiring," he said. "And I'm not going to Hollywood."

One thing that the prize will help him do, said Zewail, is "excite young people about science in the United States and Egypt," especially fundamental science. He will visit high schools such as the one in Alexandria that already bears his name and to which he will donate a portion of his Nobel Prize money.

In the coming years, Zewail looks forward to more breakthroughs as his research team from six Caltech laboratories observes fundamental processes of complex chemical and biological systems on the femtosecond time scale. He will remain active in research and in publishing papers, which he considers to be his babies (363 to date). Tracking the progress of two papers within a week of receiving the prize, he reached a surprised editor who said, "You on the phone? Impossible! I thought you'd be out wining and dining." He will continue to push the envelope of what is possible.

"You see, if it's all what you know, and it's possible, then you're not going to see the thrill, and the fun, and the new surprises. That's the point."

HILLARY BHASKARAN



The Reel Thing

Lecturer in German Andreas Aebi finds film dubbing challenging, rewarding

BY MARCY DREXLER

When he isn't guiding his students through the convoluted byways of German syntax, or drilling them on the declensions that can drive native English speakers to distraction, Andreas Aebi enjoys confronting another kind of cross-cultural challenge. Since 1983, he has participated in the dubbing of 20 German-language versions of American films, including *Star Wars*, *Return of the Jedi*, *The Flintstones*, *Schindler's List*, and last year's World War II epic, *Saving Private Ryan*. Whether he's translating the words of a Biblical cartoon character or giving a mentally impaired hero a new language, Aebi finds the dubbing director's job a rewarding but demanding form of cultural as well as linguistic alchemy.

For the Caltech lecturer in German, last year's animated feature *Prince of Egypt* (*Prinz von Aegypten* in German), posed the knotty problem of an ancient narrative shared by multiple religious traditions. "Since the story of Moses was being told, we had to make sure it was correct according to all the different translations of the Bible," Aebi says. *Prinz* also raised the question of whether a dubbed film should even try to accommodate a particular audience's cultural expectations. "Should people hear what they were taught in Sunday

school?" Aebi asks.

A team of religious consultants assisted with the *Prinz* dubbing, but usually Aebi must operate without such expert advice. When the Caltech instructor was asked to transform Tom Hanks's slow-witted Southern Everyman in *Forrest Gump* into his German-speaking double, for instance, his only guide was a mandate to preserve the film's quintessentially American atmosphere.

"We pride ourselves on dubbing an American movie so that the German movie is the same as the original, or as close as possible," Aebi says, adding that the American film industry has a vested interest in well-made foreign-language versions of its films. "Some Hollywood movies that would have been in dire straits in this country grossed substantially more in foreign markets, so the major studios are paying a lot more attention to quality products than they did before."

The process of film dubbing begins when a distributor buys the rights to produce a foreign-language version of an American film. The distributor hires a producer, who in turn hires a dubbing supervisor or director. (Although the original film's producer has no control over the final foreign-

language version of his or her film, a sloppy or unfaithful rendering of a movie like *Saving Private Ryan* is not likely to result in future deals for the guilty distributor.)

Aebi's task of transatlantic translation begins at his home in Pasadena, when he receives the "raw" script—the initial, straightforward translation of the English text into German by a seasoned script translator. During the next 10 days, he will begin the process of transforming the script into user-friendly form for a German-speaking audience. Checking the script for references the audience might not understand, he makes sure that the original's distinctive style survives, substituting a more colloquial word here, a less literal translation there. In the case of jokes, which frequently get derailed crossing national borders, the tinkering often requires that the dubbing director decide whether an untranslatable joke should be salvaged or dropped entirely, which would then necessitate writing new dialogue to fill the sound gap.

After initially assessing the raw script, Aebi goes to Berlin for a series of meetings with writers. Together, they will go over the script line by line. "Sometimes one person reads aloud, sometimes everybody takes a role," Aebi says. "Everybody listens for how it sounds—and makes changes." (Almost every line of the 400-page *Saving Private Ryan* script was altered, he says.) The corrected raw script then goes to another writer, called the adapter, who ensures that the German dialogue will match the on-screen characters' lip movements.

Then it is on to the recording studio, also in Berlin, where the script continues to undergo changes. Together the dubbing director and actors must find ways to express ideas that are sometimes not even part of the literal script. In *Forrest Gump*, for example, Aebi elected to have the German actor portray the main character's mental handicap through speech patterns rather than by the more obvious choice of giving the character the pronounced southern German accent that completes the German stereotype of a provincial or slow-witted person. "He's not Bavarian, but American," Aebi explains. "So the use of an accent would have been peculiar. We used syntax instead to show his slowness—only straightforward German sentences, very simple."

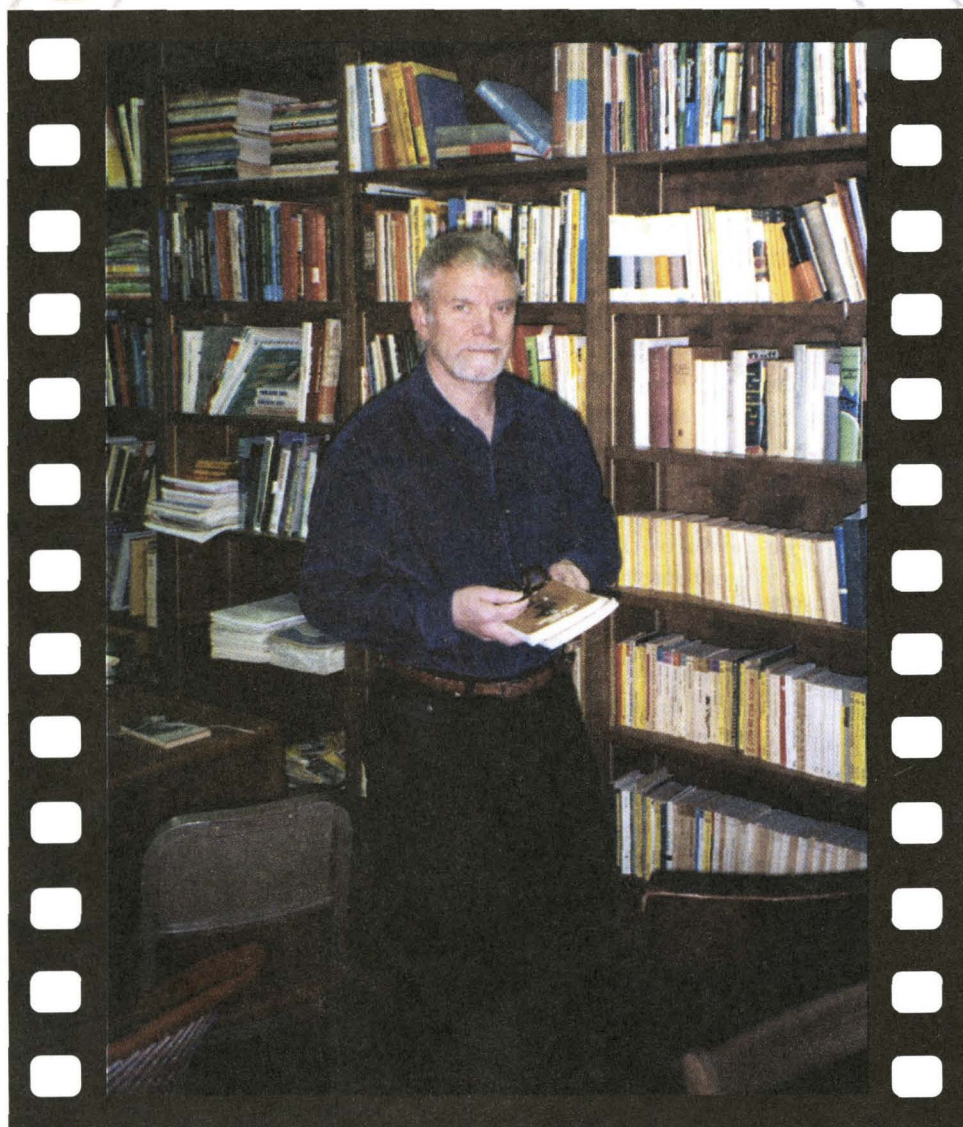
Perhaps Aebi's toughest assignment to date was last year's *Saving Private Ryan*. Already pressured by an early release date, Aebi and his colleagues had to deal with unusually complex technical and personal hurdles. The first

writer assigned to adapting the script for the recording session, a German veteran of the Normandy invasion, couldn't cope with the emotional realism of the work and had to be replaced. Flu raged through the cast and crew, forcing replacement of many of the actors originally cast in the script's 84 separate speaking roles. The tricky logistics of distinguishing during the combat scenes between the American and German soldiers—all of whom would be speaking German—was finally resolved by having the Americans use English-language forms of military address—"Sergeant," "Captain," and so forth.

The "mix"—the final recording sessions where the dubbed lines are balanced with the original background sounds and music—also posed its share of problems. In the original version, the sounds of the soldiers' shouts and groans, bullets whizzing, and shells exploding sometimes obliterated the dialogue. "Americans are used to louder movies, and don't expect to understand every word said during a battle scene," Aebi says. "European films live much more off dialogue than special effects, so people are used to understanding the words. With *Saving Private Ryan*, we compromised a little and pushed some of the sounds aside, but not much. In that film the sound effects are more important than the language."

When it comes to historical detail, however, Aebi does not cut corners. In researching *Schindler's List*, it was necessary to track down Jewish-German accents from the 1940s. "It's not a question of whether anybody will be able to hear it," he says of the painstaking quest for historical accuracy. "It has to be right." For Aebi, authenticity is synonymous with credibility. "For *Saving Private Ryan*, we had a military advisor, a former marine lieutenant in the German army," he says. "In a movie like this, if you don't use the correct term for the kind of antitank weapons the Germans used, people will dismiss it as 'just Hollywood.'"

Aebi grew up a long way from Hollywood, in Bern, Switzerland. He came to Los Angeles in 1968 to study at the University of Southern California, receiving his PhD in medieval German literature in 1974. Before joining the Caltech faculty in 1978, he was assistant professor of German at Occidental



Taking a break from movies, Andreas Aebi hangs out in his office with one of his other favorite mediums—his books.



College. In 1983 a chance encounter with a film producer at a Swiss consulate reception led to a job supervising the German dubbing of *Return of the Jedi*, and Aebi's Hollywood era had begun. Since then he has been dubbing director or supervisor for all sorts of films, from lighthearted cartoons like *Casper* to courtroom dramas like *Presumed Innocent*. Aebi works on as many as three movies a year, turning down projects when he doesn't have the time—or doesn't like the piece. One scans his résumé in vain for a slasher or terrorist movie.

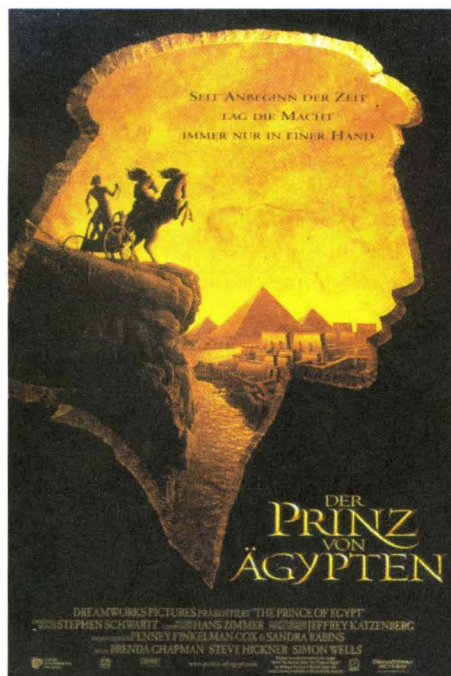
His Caltech students have enjoyed their teacher's sideline, accompanying Aebi to local mixes for an instant lesson in obsessive attention to detail, Hollywood style. "They couldn't believe it when we had to go over the same scene five times and they couldn't hear a difference," he says with a chuckle. Sometimes they even get to pitch in, on one occasion supplying a German student drinking

chorus. Above all, Aebi's film work provides a real-life example of how language builds bridges between cultures. It is a message that Aebi is happy to bring to his Caltech students, who, after all, are focused on studies other than languages. To the same end, Aebi organizes a German-language film series at Caltech every year.

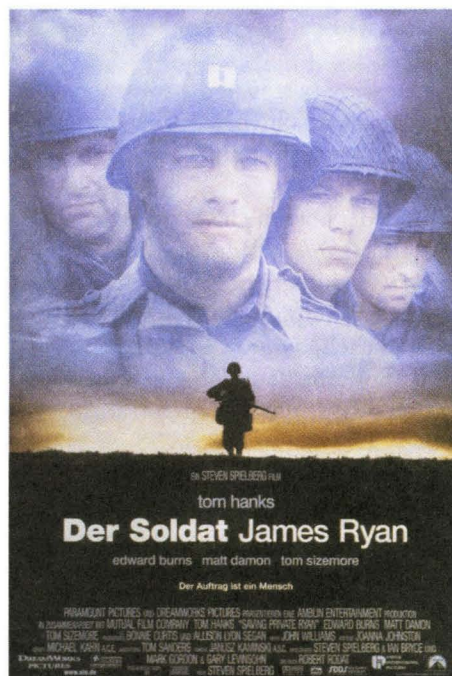
It may be his belief in the importance of promoting understanding between cultures that enables Aebi to routinely trade summer vacations with his family for three exhausting weeks in a darkened Berlin recording studio. "*Saving Private Ryan* was important because it was an antiwar movie, one of the strongest ones ever made," he says. "It was important to make that message come out right in Germany, to make sure the film would not be dismissed there as an anti-German movie."

His latest project, the German-language version of *Snow Falling On Cedars*, based on the bestselling 1995 novel by David Guterson and scheduled for release this fall, also has an emotionally charged theme—the experience of Japanese-Americans during World War II.

As for his efforts on *Der Soldat James Ryan*, Aebi's students know how well their teacher succeeded. Reading German newspaper accounts of the film's reception, they found that 94 percent of the German audience—an extraordinary percentage, says Aebi with pride—responded positively to the film. By Caltech standards, the grade for that piece of cross-cultural communication would be about an A+.



Increasingly, the Hollywood film industry relies on foreign releases of its movies to boost a film's profits, but dubbed-language versions are expected to retain a Hollywood flavor. "We pride ourselves on dubbing an American movie so that the German version is the same as the original, or as close as possible," Caltech Lecturer in German Andreas Aebi says. Aebi supervised the German-language versions of the box-office hits *The Prince of Egypt* and *Saving Private Ryan*.



LITERATURE PROF OFFERS NEW TAKE ON TARZAN

Whether Edgar Rice Burroughs was writing his successful Tarzan novels or promoting his early-20th-century suburb, Tarzana, he always seemed to be making the world safe for bwana.

That's the conclusion of Catherine Jurca, assistant professor of literature at Caltech. Jurca is writing a book tentatively titled *White Diaspora: The Suburb and the Twentieth-Century American Novel*. One chapter examines Tarzan in light of Burroughs's activities as a suburban real-estate developer in Los Angeles.

In the 1912 novel *Tarzan of the Apes*, Tarzan is driven primarily to protect his jungle house from a tribe of unruly Africans and also to find other white people "like himself," Jurca explains in an earlier article in the *Modern Language Quarterly*. Thus "*Tarzan of the Apes* begins to look more like a novel of white flight than white rule." Though isolated since infancy from Western civilization, the savage jungle king grows into a strapping example of idealized Western manhood. The transition is fostered by his parents' house and its contents, which teach him about his noble Anglo-Saxon identity and birthright.

Jurca's main interest is in the ways that the original Tarzan series exemplified ways of thinking that led to the ascendancy of suburbia—particularly the urge many white Americans apparently felt to get away from the central city and minorities. "The primacy of white community and isolation from minorities have been central to the development of the American suburb, as exemplified in Burroughs's 1920s subdivision of Tarzana—named, after all, for a character whose name means 'White Skin' in the language of the apes," she says.

When Burroughs got rich and famous in Chicago for writing the Tarzan books, he moved West and bought up several hundred acres in the San Fernando Valley, northwest of downtown Los Angeles—a property he named Tarzana. "Burroughs actively encouraged 'the sort of folks to come here whom I want for neighbors,'" according to the journal article. His ambition was abetted by the racial covenants that subjected all property sold in the subdivision to the following constraints: "That said premises or any part thereof shall not be leased, sold, or conveyed to or occupied by any person not of the Caucasian race."

Of course, such covenants have not been enforceable for many decades, but the similarities in attitude toward race seen in Burroughs's Tarzan character and the people the author hoped to lure to his suburb may speak volumes about the thinking that originally went into the expansion of American suburbia.

Burroughs apparently wasn't all that successful in subdividing and creating his own haven north of Los Angeles. But decades later, Tarzana and countless other suburbs indeed became for a time the predominantly white enclaves that Burroughs envisioned. According to a recent article in the *Los Angeles Times* Sunday opinion section, the San Fernando Valley was the embodiment of white suburbia in the 1960s, with more than 90 percent of its inhabitants being white.

"True to the namesake who personifies 'White Skin,'" Jurca writes, "Tarzana evolved along the lines of other 20th-century suburbs, as a place designed to ensure that Anglo-American civilization could thrive in isolation and where ordinary white people could become extraordinary Anglo-Saxons."

But this may be temporary—at least in the case of the San Fernando Valley. As the *Times* article pointed out, the suburbs of the Valley have become a bit more ethnically diversified in the last couple of decades. Tarzana, according to the *Times* demographics Web site, currently has a population of 71,680—80 percent of whom are white.

Though Jurca feels the original Tarzan novels are troubling in their attitude toward race, she points out that the myth and the character have been quite pliable in the hands of later artists. For example, the recent Disney film, far from embodying a segregationist message, has Tarzan make a vivid and compelling argument for diversity and cooperation.

Also ironically, the modern community of Tarzana has been more receptive to the Tarzan association in recent years, Jurca says. In past decades, the community wasn't too keen on the connection.

"Tarzana residents didn't really take to being associated with an ape-man, however noble," says Jurca, who grew up there. "For years the Tarzana public library refused to carry Burroughs's books. But all this has changed, especially with the film, as the Tarzan connection becomes a useful way to distinguish what is essentially a very unextraordinary postwar residential community from all the other unextraordinary postwar communities that constitute the San Fernando Valley."

ROBERT TINDOL

E s p e c i a l l y W e l l S u i t e d



f o r t h e J o b

BY DARYN KOBATA

Ask Dick Van Kirk '58 to talk about one of his most memorable experiences, and he only needs to cast his mind as far back as July 4, when he found himself in Raleigh, North Carolina for the 1999 Special Olympics World Games competition. Along with his wife, Janet, Van Kirk accompanied 70 developmentally disabled athletes from Southern California, who competed among 7,000 participants from 150 countries and earned a total of 32 gold medals. One medalist, 28-year-old Melges Scott of South Central Los Angeles, braved 90-degree weather to win the marathon and set a new Special Olympics record. Van Kirk was deeply touched when, after receiving his gold medal at the awards ceremony, Scott came over, embraced him, and said, "Thanks, Dick—this has been the best Fourth of July of my life!"

Such moments have been part of Van Kirk's life since 1995, when he joined Special Olympics Southern California (SOSC) as president and CEO. After many years in the corporate sector, he has found the change to be an interesting and gratifying one. "This is the best job I've ever had, and I've had some good ones!" he says. The former Caltech letterman now has a position that combines his lifelong love of sports with his years of experience in management consulting. He notes that his current work is "simpler and more straightforward" than corporate management and comes with a single agenda: to help the athletes. Most of all, he has found, "The best

For many Americans, the Special Olympics name is a familiar one, evoking images of smiling children bravely overcoming their disabilities to cross the finish line. Established in 1968 by Eunice Kennedy Shriver, the organization provides athletic training and competitions for more than one million people worldwide with mental retardation or closely related developmental disabilities. Its mission is to give them opportunities to develop physical fitness and to discover their gifts and abilities on and off the athletic field. As Van Kirk puts it, "We give them the chance to be the best they can be." In the United States, the parent organization oversees 52 independent chapters, including Southern California, which serves more than 12,700 people from 8 to 80 through its 33 area programs.

Growing up with a father who played amateur basketball, Van Kirk took to sports from a young age. While at Caltech, he was voted most valuable player in track and football, set a school long-jump record that still stands, and gained a measure of local fame as "quarterback of the last team ever to beat Oxy."

After graduating with a degree in mechanical engineering, Van Kirk worked in production management for several years. He also ran on a championship track team, the Southern California Striders, with one Rafer Johnson, who would go on to win a gold medal in the 1960 Olympic decathlon. Between production jobs, Van Kirk returned to Caltech for two years to serve as associate director of development.

Van Kirk's sports background turned into a career boost when, as director of management services at Arthur Young and Company (precursor to the Big Five giant Ernst & Young), he was tapped to become a consultant to the 1984 Olympic Organizing Committee, and eventually became the Games' vice president of technology. Subsequent consulting projects, including the Goodwill Games, World Cup Soccer, and the 1996 Atlanta Olympics, gave him more opportunities to continue honing his sports management expertise.

In 1994, after nearly three decades with Ernst & Young, Van Kirk found himself a couple of years away from

mandatory retirement. Thinking about his next move, he spotted an ad for Special Olympics Southern California in the *Los Angeles Times*, and recalled that his daughter had volunteered with the group in high school. He also had heard about the organization from Rafer Johnson, a founder of Special Olympics in California, when he and Johnson worked together on the 1984 Olympics. "Rafer is the best human being I've ever met—he's a genuine

Culver City to lower the rental expenses, and implemented new budgeting and reporting systems. Additionally, he worked to alleviate tensions that had built up between SOSC and its area offices, promoting the theme "They are us, we are them" and maintaining an open-door policy.

Today, Van Kirk says, both staff and board of directors are firmly committed to Future State 2000, an overall strategy to raise financial and human re-



Top: Dick Van Kirk '58, the president and CEO of Special Olympics Southern California, gives the welcoming speech at SOSC's 1999 Summer Games in Long Beach. **Above:** Van Kirk with Jenny Lynne Skinner, who was named Southern California's outstanding female athlete for 1999.

nice, caring person and a role model. I knew if he was involved with Special Olympics, it had to be good."

Van Kirk sent in his résumé and included a book he had coauthored, *The Complete Guide to Managing Special Events*. "I think it must have made my résumé stand out," he says. He was offered the job out of a field of about 200 applicants, and joined the organization—fittingly enough, on Rose Bowl Day—January 1, 1995.

Once on the job, Van Kirk faced two tasks: overcoming some financial and organizational problems, and trying to win over staff members, many of whom were wary of someone from "outside the family" coming in and making changes. He recruited a new board of directors, moved the head office to

sources for the Southern California programs. "Lots of people label me a 'numbers man,'" he says. "But in the case of the athletes, every number is a person whose life will be better if they join Special Olympics. That's why numbers are important—if what we're doing is good, then I want to bring in as many people as possible!"

And Van Kirk has found that his job offers far more than just a new management challenge. Being immersed in the Special Olympics environment has taught him much about the developmentally disabled and their capabilities, and changed his attitude toward them from "benign neglect to active advocacy. Until you're actually involved in something, it's hard to understand or be motivated by it." He



Back in his days as a Tech letterman, Van Kirk carried the ball 13 yards for a touchdown against Whittier at the Rose Bowl.

part of the job is being with the athletes. There's this sort of magic when you talk to them and see them in action. Their openness and love are overwhelming. You can't understand it until you experience it."

Alumni Update

speaks movingly of Paul Hoffman, now a spokesperson for the organization.

"Paul tells about being a teenager and shooting baskets alone in his driveway because the other kids were afraid to play with him—they thought they'd 'catch' whatever he had." Participating in Special Olympics gave him the confidence and self-esteem to succeed not only in sports, but in many areas of life. Hoffman now has a full-time job and is one of two athletes on the SOSC board of directors. "Now he's literally one of my bosses!" Van Kirk says.

In his role as chief advocate, Van Kirk has connected with another entity that once figured prominently in his life—his alma mater. On several occasions, the Institute has lent facilities such as a basketball court and meeting rooms to SOSC's Pasadena program, and Van Kirk is "grateful and proud" for the support. He hopes to see more Caltech community members get personally involved, as volunteers in coaching, management, or other areas that might interest them. Many of the Special Olympics programs are run strictly by volunteers, and not having enough puts a major constraint on growth. "The Pasadena area, frankly, is struggling. We have about 100 athletes, but we estimate there are many more potential athletes in the area. Caltech has lots of good resources, and there's great potential for involving more athletes."

Reflecting on the perhaps inevitable question about how his experiences at Caltech compare to those at SOSC, Van Kirk pauses for a moment. "I think sometimes people in the Caltech environment can get an exalted sense of importance," he says. "It's easy to get a nice view of yourself and not think much of others who aren't as gifted. Special Olympics has helped me gain a fuller appreciation of all people. Certainly, Caltech people have special gifts, they're achieving great things. But Special Olympics also is doing work that benefits humankind. We are all special, and none of us is special—that's a great equalizer. Being here has opened my eyes to what we all have to bring to the table."

To learn more about Special Olympics Southern California or find out how to get involved, call (310) 215-8380, or visit the organization's Web site at <http://www.sosc.org>.



GET READY, THERE IT GOES. In Bucharest this past August (left), Pete Mason '51, PhD '62, prepares to view and photograph the last total solar eclipse of the century. Mason was one of 40 Institute alumni and friends who took part in the Association's 10-day travel/study program, led by Caltech Assistant Professor of History Warren Brown. Embarking from Vienna, the group cruised down the Danube to Budapest, then flew on to Romania's capital, where they witnessed the eclipse, toured the medieval city, and attended a reception at the home of the U.S. ambassador. Above, from left, NASA Director Dan Goldin, a guest at the reception, chats with Fred Hameetman '62, group leader Brown, and Lee Silver, PhD '55, the Institute's Keck Foundation Professor of Resource Geology, Emeritus.

ANDREW SHAINDLIN NAMED EXECUTIVE DIRECTOR OF ALUMNI ASSOCIATION

Andrew (Andy) Shaindlin has been named the executive director of Caltech's Alumni Association, succeeding Judy Amis, who retired last year. He comes to the Institute from the University of Michigan, where he has been working in alumni relations since 1996, most recently as the senior director of alumni programs.

"I consider it a professional honor to join an institution with an alumni body as accomplished as the graduates of Caltech," says Shaindlin. "I look forward to working with staff and volunteers to provide high-quality programs that meet the needs of Caltech alumni worldwide."

At Michigan, Shaindlin's major responsibilities included directing one of the nation's largest alumni travel programs, overseeing the university's new Alumni Career Center, and administering the Alumni University education program.

From 1989 to 1996, prior to joining Michigan, Shaindlin served as director of alumni education, and before that as assistant director of alumni relations at Brown University. He also held various posts with the nationwide college-entrance testing preparation program Princeton Review from 1987 to 1989, ending his tenure there as director of the Princeton Review of Long Island.

"Andy brings with him more than 10 years of professional alumni-related experience. I am confident that he will make a lasting contribution to the Institute, to the Alumni Association, and to the Caltech community," said Jerry Nunnally, Caltech's vice president for institute relations.

Shaindlin's achievements include founding ALUMNI-L and MINARY-L, both of which are Internet discussion forums for alumni educators and alumni professionals. He has published various articles on the electronic classroom. Programs he has overseen have been winners of several Council for the Advancement and Support of Education (CASE) awards, including the Circle of Excellence and Individual Alumni Programs Awards.

Shaindlin received his BA degree in international relations in 1986 from Brown. He and his wife, Martha, have a three-year-old daughter, Chloe.

YOU'RE ALL A CLASS ACT—LETTER FROM THE ASSOCIATION PRESIDENT

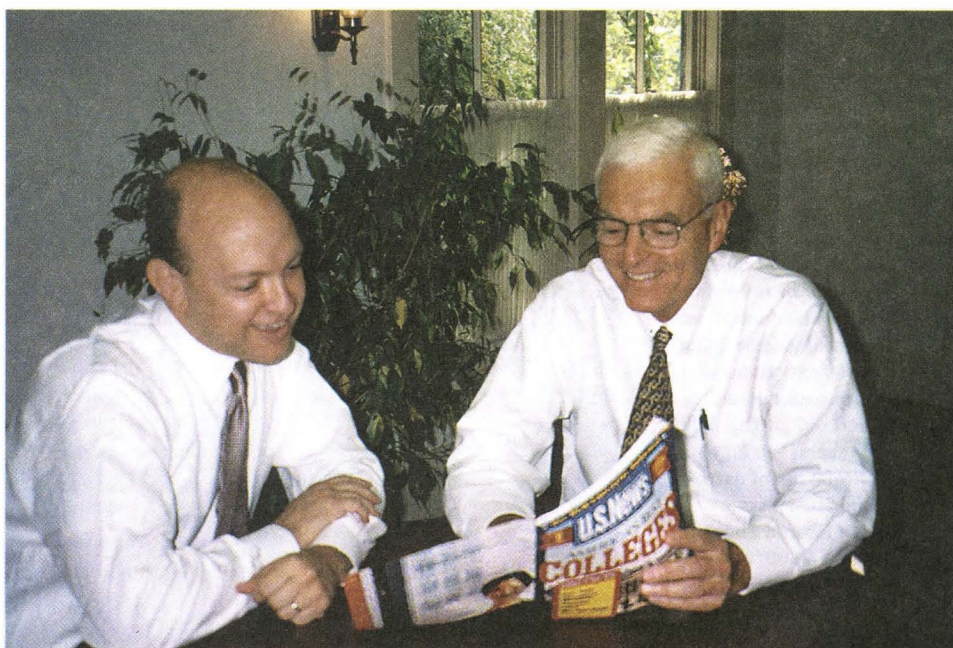
Congratulations on being an alumna/alumnus of the best university in the nation! By now you have probably heard that Caltech has been ranked first among all universities in the nation by *U.S. News & World Report*, whose cover-story issue on the 1999 rankings for American colleges and universities appeared on newstands on August 30. The story can also be found at <http://www.usnews.com/usnews/edu/college/rankings/cocal.htm>, and the accompanying editorial by David Gergen at <http://www.usnews.com/usnews/issue/990830/30edit.htm>.

This year the magazine revised its evaluation criteria, and Caltech's attributes of a small, talented student body, a high proportion of full-time faculty, a large amount of funding per student, academic support for students, and alumni support received more weight, enabling Caltech to jump ahead of Stanford, MIT, and the Ivy League schools to the head of the class.

But as Caltech alums, you deserve more than congratulations. You deserve thanks for the contributions, time, and support that hundreds of you give year after year to advance Caltech's values of openness, inquiry, and truth. In addition to being a recognition of the sound policies and actions of the Institute's administration and board of trustees, and of the exceptional educational opportunities that the faculty provides to students, the *USNWR* designation is a direct result of the work of many alumni. The magazine measures alumni support in dollars and in the fraction of

Continued on page 16 . . .

Below, Andy Shaindlin (left) and Kent Frewing '61 savor the news that Caltech has been ranked the number-one university in the nation by *U.S. News & World Report*. Shaindlin is the new executive director of the Alumni Association; Frewing was elected Association president for 1999–2000 in June.





Theresa Davis

Theresa Davis Named To Head Alumni Fund

Theresa Davis has been named the director of Caltech's Alumni Fund, succeeding Torrie Kirkham. Davis has served since 1997 as the associate director of Corporate Relations at the Institute, where she focused on fundraising efforts with corporations in the Midwest. Before joining the Institute, Davis served as the director of annual giving at Mount St. Mary's College in Los Angeles. She has also held positions with Arizona State University, the Broadway Department Stores, and the Mahoning County Welfare Department in Youngstown, Ohio.

Davis holds a bachelor's degree in marketing from Arizona State University and is a member of the CASE (Council for the Advancement and Support of Education) District VII board of directors.



The Association's second annual Alumni College—on the theme of "The Universe: Origins and Destinies"—drew a large and enthusiastic group of alumni to campus, who packed their summer classroom (right) to listen, learn, and ask lots of questions during two days of talks on such topics as star formation, the evolution of galaxies, and the search for extrasolar planets. Interested attendees also included one of the field's modern pioneers, Lee A. DuBridge Professor of Astrophysics, Emeritus, Jesse Greenstein (pictured above). Alumni College 2000, focusing on the humanities and social sciences, will be held on campus June 23–24.



Frewing . . . from page 15

alumni donating to their colleges.

However, these generic indices do not begin to recognize the thousands of hours that many of you give in volunteer time to help with identifying and recruiting outstanding high school students, organizing and soliciting classmates for the Alumni Fund, donating to the Institute, and increasing the visibility of Caltech in your local communities. When, more than 40 years ago, I returned home for the first holiday of my Caltech freshman year, hometown college students thought that I had moved from my local high school to a polytechnic high school. In those days, Caltech wasn't well-known north of the Tehachapis. Thanks to you, and to all of the Caltech community, the Institute is now known worldwide for the excellence of its education and research.

In his *USNWR* editorial, commentator David Gergen notes that science and engineering research and education is an essential requirement for our nation's continued economic success, and that this research has generated practical benefits such as improved health, higher crop yields, and faster communication. At a time when corporate support for basic research is decreasing, comments Gergen, federal funding for such research should be increasing. Instead, precisely the opposite is happening. Gergen points out the irony in this context of Congress's recent budget cuts for national science programs, including major cuts for NASA and the agencies that fund much of Caltech's research and education.

As I toured Venice and Tuscany this summer, I could identify with Gergen's assertion that state sponsorship of science and the arts in Renaissance Italy had a major influence on the intellectual flowering that took place there in

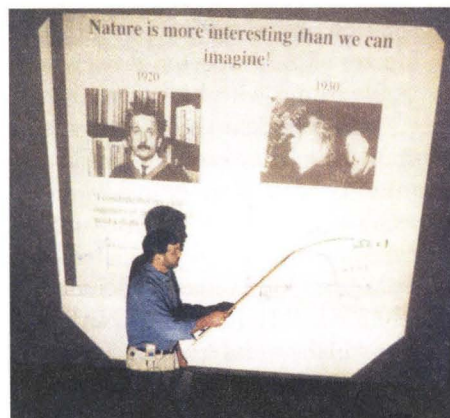
the 15th and 16th centuries. I was continually amazed by the depth and breadth of the genius that erupted from small communities, which were frequently decimated by plague, but which had leaders with the finances and the vision to sponsor the architectural, scientific, and artistic triumphs that have lasted for half a millennium.

Just as in *Quattrocento* and *Cinquecento* Italy, the teaching and research strength represented by universities such as Caltech must be maintained if the dynamic and innovative society that we now enjoy is to continue into the 21st century. And it has been your contributions, support, and advocacy of Caltech that has built the kind of institution that can provide that innovation and produce the graduates who guarantee innovation in the future. So congratulations on your affiliation with the *numero uno* national university, but mostly thanks for your help in making it happen. Let's try for another next year.

Kent Frewing

SAVE THE DATE !

The alumni reunion for the Division of Physics, Mathematics and Astronomy will take place May 18–19, 2000.



His own equations had predicted it, but, said Professor of Physics Andrew Lange (above) in his Alumni College lecture, even Einstein was stunned by the discovery—made at Pasadena's Mount Wilson Observatory in the 1920s by astronomer Edwin Hubble—that the universe is expanding. In his talk, "Understanding Creation: Cosmology at the Dawn of the 21st Century," Lange offered his listeners an overview of some of the key developments and most recent findings in 20th-century cosmology, all of them testifying to the truth of Einstein's statement about nature's infinite capacity to stymie and surprise.

Alumni Activities

November 6, 1999, Orange County Chapter meeting with David Baltimore and Alice Huang.

January 1, 2000, Tournament of Roses Parade Event. Includes reserved seating for viewing the parade, reserved parking, and lunch at the Athenaeum. If you are interested in attending and are not a California resident, please call the Association at 626/395-6592.

January 22, 2000, Board of Directors and Committee meetings.

CALL FOR FEYNMAN TEACHING PRIZE NOMINATIONS

Think back over your time at Caltech, to that professor who stands out in your mind. He made electrochemistry come alive in a way no one else could . . . she stirred up a passion for microbes that you didn't know you had. How about nominating him or her for an award that recognizes such pedagogical talent?

Each year, the Richard P. Feynman Prize for Excellence in Teaching is awarded to a professor who demonstrates "unusual ability, creativity, and innovation in undergraduate and graduate classroom and laboratory teaching." Past recipients of the Feynman Prize include Emlyn Hughes, physics; Barbara Imperiali, chemistry; David Middlebrook, electrical engineering; Yaser Abu-Mostafa, electrical engineering and computer science; Erik Antonsson, mechanical engineering; and Tom Tombrello, physics.

The prize, a cash award of \$3,000 and an equivalent raise in the awardee's annual salary, is made possible through an endowment from Caltech Associates Ione and Robert E. Paradise, in appreciation of Feynman's contributions to excellent teaching. Winners receive the prize at a regular Caltech faculty meeting during the second term, and are also honored with a dinner or other celebration attended by the Paradises, Institute administration, and colleagues.

All professorial faculty of the Institute are eligible for the prize, and any member of the Caltech community, including alumni, faculty, students, and staff, may make a nomination. Letters of nomination and detailed supporting material should be directed to the Office of the Provost, Mail Code 206-31, Caltech, Pasadena, California 91125, by December 15.

Class Notes

1937

Joseph Peterson
1823 Michigan Avenue
Pasadena, California 91104-1453

In response to John Austen's question, "Do you still have that Cord that hit the buttons in the streetcar zones?"—no, I do not have that Cord: I sold it to students and used the proceeds to buy a ring for my girlfriend, now my wife, Shirley. We are coming up on our 60th wedding anniversary, so I don't look at it as a bad deal at all! I would sure be interested to learn what happened to the car in the years since. If you want to correspond with your class scribe, my phone number is 626/794-8079; my fax number is 626/794-9998; and my e-mail address is Jjptrsn@aol.com.

John Austen writes from Bethlehem, Pennsylvania, "Helen and I will be celebrating our 69th wedding anniversary August 19, 1999! I am still working as executive director of the Easton Area Industrial Land Development Company, a multi-million-dollar nonprofit corporation that has one objective: improve the labor situation in our area. I'm still riding my bicycle for 10 miles most days at 11 to 13 mph—that is as fast as I can pump. We just came back from our 24th vacation in Bermuda, where I swam 1/2 mile before breakfast."

Bruce Dunbar is still living in Fallbrook, California. "Nothing new to report. I've been retired 21 years now and have the usual health problems of an 83-year-old."

Carl Johnson lives in San Marino and in 1997 celebrated the 50th year of Johnson & Nielsen Associates, the Los Angeles structural engineering consulting firm he founded. He says, "I recently retired, but am active in a number of new environmental technologies."

Wendell Miller writes from San Luis Capistrano, "I am in good health, play golf twice a week and the other available time is spent working in the yard with my wife, who is my age and in good health. We had four children and have nine grandchildren. We have been blessed!"

Walter Moore updates us on his life: "Reta and I moved to Austin, Texas, in 1947, where I taught civil engineering at the University of Texas until I retired in 1980. We have enjoyed Austin, the university, and many summers in Pagosa Springs, Colorado, where we have a second home. Our four children have a total of five children, and are doing well in Colorado, New Mexico, Arizona, and Edmonton, Canada."

James Seaman IV is in a long-term care facility, and, although he is totally deaf, has excellent long-term memory and loves to write and receive letters. After 40 years on Lorain Road in San Marino, Jim's wife, Beth, will be moving to the Alhambra PEO Home Unit at 700 N. Stoneman Ave., Alhambra, California 91801, phone 626/300-0400. Post polio is weakening her remaining muscles. She loves visits from "the old gang" too.

Wilbur Snelling is still living in Palm Desert, California, and Scotland, and enjoying this section of *Caltech News*.

George Tsubota writes from Nagoya, Japan, "I am in very good health. I enjoy playing golf three or four times per month. My mail number has changed from 468 to 468-0004."

1941

John Deniston
19300 Farview Dr
Bend, OR 97701
DenistonJJ@aol.com

Greetings, all! We have had a pretty good set of responses since the last Class Notes. Some of you wrote short letters, notes, or comments on a wide variety of things.

Sid Gally writes, "No big news here, just chugging ahead with volunteer activities, such as the Pasadena Historical Museum and Friends of the Caltech Libraries. . . . Our son and family are in Tokyo, where he translates and teaches. They are in the process of buying a house in Yokohama, which will have room for us to visit. One daughter teaches at an international school in Jakarta, where the economy and society are sort of unstable, but she is going back for another year. Our other daughter and family are in another interesting country, Berkeley, California." Sid's e-mail is skg@pacbell.net.

George Bramhall writes from Boulder, Colorado, "Thankfully, all is well with George and Betty, their three sons and six grandchildren. Retired, enjoy volunteering, and keep moving with bike 'racing,' cross-country skiing, and orienteering. This spring we are spending three months in Vermont fixing up a 125-year-old schoolhouse." Contact George at 303/449-0137, or ghbram@ibm.net.

Bob Galeski has written from Alberta, Canada, "I am retired, do a bit of consulting, play golf, and fuss in the garden. We had eight children, and now have 24 grandchildren. Our first great-grandchild is due in December." Bob is at 45 Sunrise Way, RR#1, Priddis, Alberta, Canada TDL 1.

Joe Weiss updates us from Santa Ana: "Since retiring in 1986 from the electrical connector industry, I have been traveling (as often as possible), managing properties for the family, golfing (whenever I can), and getting on the air as W6GOW—the ham radio call I have had for over 60 years. I have also been serving my second year as class of '41 chair for the Caltech Alumni Fund. Y'all give! With best regards to class members." 714/544-5819.

Bruce Lawrence writes from Pacific Palisades that after graduating in physics, he took a commission in the U.S. Navy and was assigned to the aircraft carrier USS *Independence*, which was torpedoed off Tarawa. He spent the next 20 years in naval R&D weapons and tactics, and the following 20 years in national defense R&D in the areas of strategic defense, arms control, and high-energy lasers. After retirement, he says, "My wife and I have enjoyed three round-the-world cruises, and are looking ahead to our next one in year 2000." 310/454-6368; Blaw@aol.com.

Homer Jacobson informs us from Tarrytown, New York, that he retired from Brooklyn College (department of chemistry) in 1986 after a career of teaching and producing a modest output of papers on polymer theory, self-reproducing machines, and virus chemistry. Since then, Homer has been composing frivolous poetry (limericks) and aphorisms, and taking care of his 6-year-old child. He wonders if any other alums from '41 or '42 have had a child since August 1992. Homer would be happy to hear from Dabney and other classmates. 914/332-7625; jacobson@bestweb.net.

Jerome (Jerry) Green would like to see the Class Notes carry more information of a brief biographical nature, with emphasis on career history since graduation. There is a fair amount of that already, but the door is certainly open for experimentation. An interesting idea that would be easy to try out. You can reach Jerry at 805/687-6203.

Robert Hall writes from Schenectady, New York, "Activities include being the chair for an adult learning program at Union College, keeping

up with new developments in astrophysics, and trying to figure out what goes on inside my PC. Oh yes, I do a bit of mentoring for school kids on 'Fun with Physics' at our local museum. Now and then, a bit of sailing." 518/393-1527; rhall8@compuserve.com.

John White lives with Gina, his wife of 47 years, in Lincoln, Massachusetts, "a small town of 6,000 compatible souls, tucked between Lexington and Concord. . . . noted for its innovative conservation techniques by which we preserve old farmlands, Thoreau's old haunt Walden Pond, and endless woodland trails. We are proud of our schools, fine library, and small New England churches. We feel blessed that our three grown children, who live in nearby towns, can still swim in the local pond with the seven grandchildren." Jack retired in 1985 after 25 years as a management consultant and senior VP with Arthur D. Little, Inc. His work included strategic planning with clients ranging from aerospace companies to Chrysler, Fiat, Coca Cola, and the California State Board of Education. After retiring, Jack and Gina lived for a time in Florence, Italy, pursuing their respective passions for art and literature. Since returning, Jack has built a studio and pursued sculpting, plaster casting, and painting. He has also joined the board of the DeCordova Museum, nationally known for its contemporary New England art and 25-acre sculpture park. Jack says, "I believe Caltech's emphasis on a broad education, on learning how to learn, has helped my professional life to feel like a seamless web of interests in which math, physics, and chemistry all contributed to my pursuits in management, economics, and even art as well." 32 Stonehedge Road, Lincoln, MA 01773.

1942

John McClain Jr.
550 Kentwood Drive
Oxnard, CA 93030
jandemcc@aol.com

Many thanks to all of you who returned your postcards—it does make keeping the rest of the class up to date easier, as my ESP ain't what it used to be!

First off I need to clarify my request re: the class gift. I can assure you that the great staff in the Fund office is well aware of all class monetary gifts. What they are trying to put together is a list of the gifts that each class has given upon graduation to perpetuate the fond memories they have of trodding the Halls of Ice Plant in Pasadena for four or more (as the case may be) years. For example, the clock on Throop (moved to Kerckhoff) was given by the class of 1940, and various benches for weary alums to rest on were given by various classes. Now, what did we give? I have already eliminated

[A] A new copy of the *Better Homes and Gardens* cookbook for Ma Wheeler,

[B] Volume 2 of *How to Play the Hammond Electric Organ by the Numbers* for Doc Clark, and

[C] A zoot suit for Apollo.

While these might have improved life on the campus temporarily, they would not fit the criteria of "lasting gift." I did come across one interesting item in my recent wanderings on the campus. Behind Dabney Hall of Humanities there is a plaque "in memory of Harvey Eagleson." It looks as if the Blacker/Humanities guys were more impressed than the Dabney/Mechanical guys because nowhere on the campus could I find a bronze bow tie inscribed "In memory of Donald S. Clark."

It appears that there are still a number of members of the class that are active in their chosen fields (not me, I'm enjoying retired life to the fullest). **Harrison "Buzz" Price** is running around the country designing theme parks. **George Sutton** is still working on revising his book, *Rocket Propulsion Elements*, which is used in many colleges around the country. He has also been listed in *Who's Who in the World*; congratulations, George.

Bob Clark lives in Oxnard and lectures to schools around Ventura County on "The Legacy of the Wright Brothers." **Ted Bartlett** reports from Mansfield, Ohio, that they are still able to travel, most recently to an Elderhostel in Greenland, and he still goes downhill skiing! **Ken Schureman** is "just living quietly in Arizona." Knowing Arizona I can understand. **Bob Anderson** was married in April and he and his wife are living in Pasadena. Pretty lucky because he is near the campus for various events.

Had cards from those two Fleming cutups **Hank Roesse** and **Warren "Squeak" Gillette**. Hank is in Willows, California, building airplanes and visiting Ireland almost every year. He says he is "getting older, creakier, and crankier every year, and still waiting for my Nobel Prize." Squeak is in Longmont, Colorado. He and his wife spent two and a half months in Palm Springs earlier in the year.

Myron Pollycove is a visiting medical fellow with the United States Nuclear Regulatory Commission, where he is currently investigating the effects of low-dose ionizing radiation on health. **Ralph Willits** has broken out the fishing rods and golf clubs in Medford. **Roy Van Orden** missed the Seminar Day festivities as he and his family were in Montana at a grandchild's graduation.

It looks as if **Carter Hunt** is a hold out as far as modern communication equipment is concerned. He says, "no fax, no e-mail, no computer, but at least I do have a telephone."

George Almassy and his wife celebrated their 55th anniversary in Half Moon Bay. He's still trying to take four strokes off his golf game to shoot his age. If I did that it would be for nine holes!

I had a nice note from **Don Jephcott**, whom I had missed at Seminar Day because we left early to prepare for our trip to the Columbia River. Don is still busy on the advisory boards of two state agencies on building safety.

Elliott Green is still active in SAE after retiring from Lockheed. His last job there was as vice president and general manager of product support.

An interesting letter from **John Rubel** related that he is enjoying retired life—reading lots of books; researching his family history; skiing, hiking, going to the gym daily; and writing. If my memory serves me, John is really good at the latter. His article several years ago on "Millikan's Militia" in *Engineering and Science* [see *E&S*, Volume IV, Number 4] was a real classic. John, like most of us, is most grateful for modern medical science. He's had a couple of TURPs, a hernia repair, an angioplasty that worked, a knee repair, and a big operation on his spine. All these have been so successful that he still skis!

An always welcome note from **Joe Franzini**, though sad as it contained the obit of **George Osborne**. George had quite a distinguished career in Orange County and has a building named after him there.

The rest of you seem to be enjoying yourselves and so have we. Right after Christmas we had a delightful duck dinner with **Neville Long** '44 and his wife, Anne, in their home in Orinda. At the end of January, **Kirk Lewis** '47 and I, along with members of the Ventura County Maritime Museum, visited the site of the "Honda Disaster" (the grounding of seven destroyers in 1923). Both of our fathers were involved in that event. In March, we went to Dallas to visit Esther's sister and family. We have just returned from a trip to Oregon on a Lindblad Special Expedition. We were on the MV *Sea Lion* for a trip up the Columbia and Snake rivers and back, essentially along the trail of Lewis and Clark. The food was excellent and the daily shore excursions were educational, not too strenuous, and fun. The ship's crew was professional and very friendly. The naturalist, geologist, and Lewis and Clark historian were all well informed and gave excellent presentations on their respective subjects. When we got on board we found that **Paul Allen** and his wife, Nancy, had been aboard the preceding week with a group from Stanford. We stayed in

Lake Oswego the night we got back and had a great dinner with **George Lind** and his wife, Mary.

I always try to save the best for last, so if you’ve gotten this far let me say again—those of you who are missing the Half Century Club luncheon and the following Seminar Day are missing a really great time and a chance to renew old friendships (and I mean really *old* friendships). Once again our really great Alumni Office staff did an outstanding job for those events.

As Walter Winchell used to say, “That’s 30 for tonight,” and I say, “Thanks for all them cards and letters and keep ‘em comin’.”

1954

Roland Miller
575 Rivergate Way
Sacramento, California 95831
rolmil@sprintmail.com

For all of those who couldn’t make it, you missed a fantastic 45th-year reunion. A group of us started off Friday afternoon with a tour of JPL led by **Ray Newburn**, who was an excellent guide. Ray has postponed his retirement to work on the STARDUST mission, which launches to comet Wild 2 next February. It will arrive at Wild 2 on January 2, 2004, and, we hope, will return a sample of cometary dust to Earth in January 2006. In addition to the “propaganda,” as Ray calls it, we were treated to some insights on what JPL has been doing. Great job, Ray!

That evening we gathered at the Alumni House for predinner cocktails and hors d’oeuvres, followed by a fabulous catered dinner. Once again, we of the class of ’54 showed our uniqueness by having our own dinner instead of joining the other reunion classes. Everyone had great fun catching up with all their classmates’ latest doings.

Our class also hosted a beer and wine party and invited the two classes before and after ours to join us. Unfortunately, not many members of the other classes attended, but we had no problem consuming all the food, beer, and wine at the constant urging of chairperson **Sam Vodopia**, who somehow thought there might be a lot left over. All in all, it was a great reunion. Congratulations to Sam and his committee, who all worked very hard on the reunion. We had 43 of our classmates show up. Unfortunately, 11 of those who couldn’t make it are deceased, with **Fred Garrison** having passed away only a week before the reunion and **John Kidder** since he last wrote me in September. To those of you who missed it, we hope to see you for the 50th reunion.

Now, some news about our classmates. I recently found out that **Jerry Mitchell** lives only a few miles from me here in Sacramento and we didn’t know it. Jerry has retired from teaching chemistry at Sacramento City College and now spends much of his time playing the piano for the elderly in retirement and nursing homes. He says the piano was actually his first love, and he is really enjoying himself.

Frank Dryden took a fantastic trip to Egypt from October 6 to November 12, 1998. He writes, “Marianne joined me for the last three weeks and we had a wonderful four-day trip up the Nile from Luxor to Aswan, followed by a flight to Abu Simbel at the other end of Lake Nasser, just prior to our return to Pasadena.” Frank continues to do consulting from his base in Pasadena.

The person who traveled the farthest to be at our reunion was **Bob Ryan**. He wrote me from Paris, where he now lives, to say he would be there. Bob went on to say, “I have been retired from the Office of Naval Research and living in Paris since September 1993. During these five years, I have translated, coauthored, and/or revised four books on wavelets and/or harmonic analysis. The latest was published by Springer in New York last November. Another one will be finished soon, and three more are on my desk.” Busy guy for a retiree.

Keith Campbell writes that he and his wife,

Marilyn, built and moved into a new home in Farmington, New Mexico, almost three years ago and are enjoying it greatly. They designed it to meet their retirement needs, with an art studio for Marilyn and workshop space for Keith. (Sounds almost like what Betty and I are doing in Washington.) He says that the landscaping is mostly natural high-altitude desert—no lawn to mow.

Some people write me letters or e-mail about their activities and others take the easy way out. **Fred Anson** sent me his résumé. It is too long to print here, but let me say that he received his PhD from Harvard in 1957 and then returned to Caltech in a faculty position. He was chairman of the Division of Chemistry and Chemical Engineering from 1984 to 1994 and is presently the Elizabeth W. Gilloon Professor. He also wrote a short note to say, “We have purchased a home in Santa Barbara where we spend weekends now and plan to retire to within the next two to three years.”

Dick Dondanville wrote me a nice e-mail note saying he has been retired for six years from Unocal Corporation and is “still searching for something to do that is mentally and scientifically challenging, and can be done on a laid-back schedule. I find volunteer work to be low paying in all aspects. People are paid to do interesting work, but they are also expected to be there on Monday morning. In the meantime, I do a lot more grandparenting, oil painting, geology, homeowner’s association work, landscaping, scuba diving, financial management, and whatever else catches our interest.”

Another e-mail came from **Ron Fuchs**, who says, “Since 1996 I have been emeritus professor of physics at Iowa State University in Ames, Iowa. Although officially retired, I’m still active in condensed matter physics research, and am presently working on the theory of electron energy-loss spectroscopy in composite systems. I spent last year at Cambridge University, visited Mexico this year to give lectures and work with collaborators, and look forward to going to Hong Kong next year to attend a conference. For more information about my family, research, and other activities you are invited to visit www.public.iastate.edu/~fuchs/.” Sounds like you’re keeping pretty busy, Ron.

Ed Gauss sent me a message from Niwot, Colorado. (When I asked if Niwot was a typo, he explained that it was not. Niwot was an Indian chief, and several geographic features are named for him. It is a bedroom community near Boulder with a population less than that of a quarter mile of the Pasadena Freeway.) Ed says, “These days I am a sculptor. I do wild things, mostly bears. My unique ‘geodesic’ style could only have been created by a Caltech graduate.” He brought to the reunion a metal sculpture of a beaver, which was an excellent work of art. His work can also be seen at www.indra.com/~sculptor.

Ralph Handen sent a short note from Grants Pass, Oregon. It says, “Retired (happy face).”

Richard Hodges writes that he retired to San Diego in March this year. “Wife Phyllis and I have been spending our time visiting our four far-flung children and two granddaughters, while our home is being remodeled. We’ve also become avid “birders,” which keeps us busy and outdoors—added 29 species to our list since retiring.”

As for yours truly, Betty and I have been busy building our new house in a little place on the Olympic Peninsula in Washington called Sequim, about 15 miles east of Port Angeles. This area has a unique weather situation for Washington in that it gets only about 15 inches of rain a year, which makes it a favorite retirement place. It should be finished about October, when we expect to move up there. I can’t wait until I can walk out of my back door right onto the 12th tee of the golf course.

It looks as if I’m bumping up against my thousand-word limit again, so I’ll have to save the rest for next time. So far, the response from our class has been great. Keep the cards and e-mail coming.

1960

Peter Rony
1501 Highland Circle
Blacksburg, VA 24060
540/951-2805
rony@vt.edu

Chuck Antoniak (c.antoniak@ieee.org) retired from Lockheed as it merged with Martin Marietta in 1995. He now teaches part time (as needed) at Cal Poly Pomona, specializing in “Probability and Statistics, especially Bayesian, for engineers and scientists.” He also does some very selective consulting and expert witnessing in statistics.

William Arveson (arveson@math.berkeley.edu) has been a faculty member in the math department at Berkeley since 1968. Before that, he had a three-year stint at Harvard. He went to graduate school at UCLA. **John Cooper** (jcooper@bucknell.edu) is “completing his 32nd year at Bucknell, teaching physical chemistry and doing research in the kinetics and structures of Co (III) complexes containing reactive ligands.” He adds, “I will hang on as long as I can/need to, so long as I am being creative and inventive, at least until I am 65 in 2003.”

Jim Farmer (jlfarmer@byu.edu) notes that his current post and e-mail address will be OK until September 2000, when he will probably be retiring and moving to the Boston area.

Gary Goodman (goodman@ez2.net) adds the following to his dossier: “Besides my regular job at Haas Automation (developing software for CNC tooling machines), I am also finishing my first year of teaching astronomy two nights a week at Oxnard College. I am also vice president of observations at the Ventura County Astronomical Society (VCAS). I have also used my telescope to take some pretty good deep-sky pictures. What else? I am still riding my bicycle when I get a chance.”

Alfred Hales (hales@ccrwest.org) has been “married to Virginia (Ginny) since 1962. Three children—Andy, Lisa and Kathy. Andy is married and lives in France with wife Catherine and our first grandchild. Lisa is married and lives in Berkeley with husband Jim and our second grandchild. Kathy lives in Los Angeles. We have a small vacation house on Orcas Island and like to spend as much time there as we can, at least outside of the winter months. My mother died in 1998 and we just sold her Arden Road house adjacent to Caltech. A bit of history: when Caltech ‘stole’ the Oxy tiger in 1958 we hid it at this house! I taught at UCLA for many years, then took early retirement in 1992 to move down to San Diego to be director of IDA’s new Center for Communications Research. We do math research on secure communications in support of the NSA.”

Ernest Isaacs (ernesti@pacbell.net) reports that “I run regularly, and I am planning to do a marathon in honor of my 60th birthday this year.” **Anthony “Earl” Johnson** (midwife@gte.net) says, “I worked for IBM for 20 years and took an opportunity to retire early, but I haven’t actually retired. Currently, I am employed by GTE Communications Corp. as webmaster for several of their Intranet sites. In my spare time, I assist my wife in her midwifery business, i.e., delivering babies at home . . . and, no, I don’t get involved in the deliveries; I provide the computing support.” Your class agent wonders what people did during the last 29,950 years, when computers were not available.

Gordon Long (gordondalong@yahoo.com) has “gradually transitioned into retirement and is looking for a new lifestyle of volunteering. Presently, I shelve books at a local library for several hours a week. Tektronix was my employer for over 32 years but needed to eliminate my job in 1992. I did some consulting for a while but that died away after I could collect pension when reaching 55 years. Now I can draw on IRAs since MP 60 occurred last March. Renate has been my partner since ’67 and we have two children. Hope to hear from others.”

Norm MacLean (nmaclean@gte.net) “retired last December from TRW after 32 years, but I have been working as a consultant for them in the same capacity. Not as many hours though, as I have already taken off to ski a week in Mammoth, a week in Switzerland, a week in Utah, and a week in Italy.”

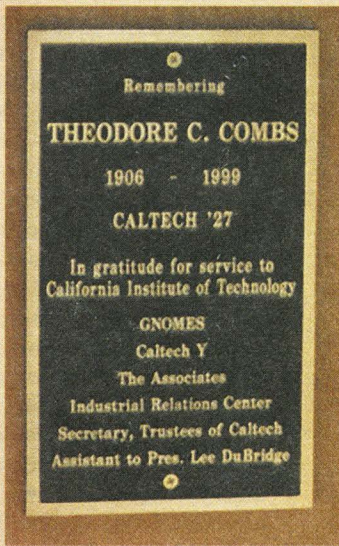
Jerry Meyer (jameyer@pop3.holonet.net) “received BS and MS degrees in chemical engineering in ’60 and ’61.” He joined Chevron in 1964 as a process engineer for the Richmond Refinery—following three years service in the United States Air Force—and worked there in various capacities (including president of Chevron Research Company) until his retirement in 1993. Today, as principal of J. A. Meyer Associates, he consults on the management of technology and data analysis, with special interest in new approaches, such as automated rule-based systems and partial least squares. In 1995 Jerry was elected to the National Academy of Engineering. He married Diane while at Caltech and has two children and four grandchildren.

Laura, the oldest daughter of **Cameron Mosher** (cam@cammosher.com, <http://www.cammosher.com>), lives with her husband, Bryon, in Danville, Virginia, with five of Cameron’s grandchildren. He adds, “My youngest daughter, Kindra, lives in Lynchburg. The rest of my family of five grown children and two grandchildren is here in the west (Utah and California). Amazing how life paths develop. A bunch of college men at the citadel of science and engineering in their 20s. Now where are we all personally and professionally? I love life and its unpredictability!”

Meredith Mitchell (m-b-m@ix.netcom.com) wins the highly coveted “‘60 geezer” award with the following assertion: “I was 31 when I entered Caltech—the second oldest student studying electrical engineering at the time. The oldest fellow student was Frank Weber (now deceased), who was in his 50s. It was challenging.” **Bob Norton** (rlnorton@pacbell.net) writes that “this year marks the 30th anniversary of my arrival at JPL. While I did leave for a while, before returning in 1983, it’s amazing to think that 30 years have gone by. Two years ago, I had double bypass surgery, and then a year ago we moved into a lovely condominium in South Pasadena. Being this close to Caltech is very nice, and I’ve really enjoyed being able to use the Caltech library on occasion. I’m looking forward to enjoying retirement in a few years.”

Peter Rony (your class scribe) is “getting caught up in the e-commerce craze. As an alternative to the House of Toroids (see ’60 Class Notes, Volume 32, No. 2, 1998), I am considering the registration of the domain name, e-toroids.com. What I plan to do with it is anybody’s guess. Still, this domain name is not uncharted territory—last year, I co-authored a book, *The Domain Name Handbook: High Stakes and Strategies in Cyberspace*, which documents the domain name system (DNS). A question: Has anybody done any work yet on our 40th reunion?”

Neil Sheeley Jr. (sheeley@doubled.com) reports that “after graduation, I spent five more years at Caltech earning a PhD in physics and making observations of the sun from Mount Wilson under the supervision of Professor Bob Leighton. In the intervening years, I’ve done similar ground-based solar observations from the McMath solar telescope on Kitt Peak in Arizona (where I still do observing in my spare time); worked on solar experiments for the Naval Research Laboratory’s Skylab Space Station; worked in Skylab mission operations at the Manned Spacecraft Center (now JSC) in Houston; and worked with SOLWIND observations obtained from Earth orbit, from a satellite that was later shot down by the USAF as a demonstration that President Reagan could take with him to a summit meeting. Since 1996, I have been working with the coronagraph observations obtained from the SOHO spacecraft. I



KEEPING THE MEMORY GREEN—
This past summer, friends of the late Ted Combs '27 gathered to honor him with a memorial plaque at the Caltech Centennial Redwoods near Yosemite National Park. While secretary of the Caltech board of trustees, Combs, who died in March, discovered that the grove had been given to the Institute by lumber magnate Arthur Fleming, an early trustee and major benefactor. Combs later wrote a history of the grove, as well as of the Gnome Club and the Alumni Association, both of which counted him as a member. From left: Combs's daughter, Marian Combs Nichols, and friend Ken Fowlkes; and fellow alums and Gnomes Patricia Stoddard '82, MS '88; Vic Veysey '36; John Gee '53; and Le Val Lund '47.

am still enjoying my work on the sun and bike riding to Mt. Vernon in my spare time. I have seen **Kent Frewing '61** occasionally, and went to the 1990 Caltech reunion, where I saw **Lee Hood, Tom Tisch '61**, etc. Also, I have had contact with **Bob Thompson** via e-mail. I read *Caltech News* and *E&S* (my life membership in the Alumni Association was a bargain—for \$100 in 1968!)”

For us '60 graduates who are close to retirement, **John Shier** (johnkat2@minn.net) shared some thoughts about his own experience. “You mentioned a while back that substantial numbers of CIT '60 men are retiring. I am one of them. I am quite enthused about this change in my status, which I regard as an opportunity to explore parts of myself that may have been suppressed or neglected hitherto. My last day as a ‘worker’ was May 14, 1999. It managed not only to be a Friday but a payday as well. It really did feel like being released from a burden. I hadn’t expected it would be like that. This fall I started my new part-time job as an adjunct professor of electrical engineering at Mankato State University. MKSU is not a household word, but we have hired some of their grads and if you make an effort you can get a good education there. I will be teaching ‘solid state’—transistors and such—the stuff I have been practicing for 29 years.”

Tom Tebben (ttebben@aol.com) states that “in 1994 I retired from 27+ years doing information technology consulting with Arthur Andersen. The former Linda Peterson and I celebrated 36 years of marriage in June. Our daughter, Christine, lives in Portland and had her son Ian Michael—our first grandchild—on May 15th. She works for Multnomah County (Oregon) on family and children issues, and is married to an attorney. Our son, Steve, is a sergeant in Salt Lake City with the Utah Department of Corrections. Linda and I are thoroughly enjoying life in Menlo Park, California. We spend our time playing tennis and traveling. I am on the board of our tennis club and recently joined the board of a nonprofit education organization. I am also starting to do some volunteer work with the Peninsula Humane Society. Linda works one day a week at *Sunset* magazine testing recipes. Last week, we had dinner with **Sam Trotter**, who lives in Little Rock, Arkansas, with his wife, Jan. He continues to do information technology consulting solo. We also have occasional contact with **Doug McLane** and his wife, Celia. Doug is a project engineer with Spectrum Glass near Seattle.”

Donald Wilson (dcwombat@olympen.com) reports from Washington State, “My wife and I retired last June and moved up here from Palo Alto, where she was a teacher and I was a microwave engineer. We live in the Olympic rain shadow, so we don’t get the rainfall most people associate with western Washington. We have a magnificent view

of Puget Sound and the Cascades. We have three grown and married children and six grandchildren. We do a bit of traveling, enjoy the grandkids, and are becoming involved in the community here. I have joined the local Unitarian-Universalist fellowship, and am on the social justice committee. The fellowship supports shelters for local people who would otherwise be homeless, and provides advocacy for state legislation that provides services to children and youth. My wife and I have also signed up to do tutoring in the local public schools—she is working with primary school students, and I with high-schoolers on their algebra and geometry. We are also fortunate to have fairly extensive local offerings available in the performing arts, and we have attended those (we are not performers ourselves). Tomorrow we will leave for a week at our first Elderhostel experience. We seem to be adjusting to retirement pretty well.”

James Wooster (wooster@gte.net) lives in Sumner, Washington, and retired in 1996 after 35 years with Boeing as an engineer and an engineering manager. He is busy helping his wife, Pat, with her music interests; keeping in touch with their three grown children; and pursuing hobbies, including old cars, travel, choral singing, and reading. During late 1998 and early 1999 he fell off the retirement wagon by serving temporarily as executive director for the Northwest Sinfonietta, a chamber orchestra based in Tacoma, but is now back to his retirement routine and enjoying it immensely.

1962

Bruce Abell
 7 Morning Glory Circle
 Santa Fe, New Mexico 87501-8522
 bruce@santafe-strategy.com

Here’s the second round of notes for the class of 1962. Who would have thought this bunch would turn out to be so interesting?

Stuart Linn writes, “My life has not been quite so fluid as those of many of our classmates.” He merely got a PhD at Stanford, did a postdoc in Geneva, where his group codiscovered DNA restriction enzymes, then went to Berkeley, where, for the past seven years, he has been head of biochemistry and molecular biology. He’s keeping the link to Caltech active by directing the doctoral research of a recent Caltech grad, **Priya Rai '97**. Stu’s three children are Matthew, a mechanical engineer in Berkeley; Allison, a journalist in Eugene; and Meagan, who is still in high school. When he can, Stu tries to flee to his cabin hidden in the Caribou Wilderness near Mount Lassen, and his wider travels have taken him most recently to Tibet.

Jim Davis writes that he and his wife spent the entire month of March in Andalusia, Spain, and would probably be interested in living there for an

extended period of time but for the absence of their children and grandchildren. They loved the place: customs, lifestyle, food, culture, etc. Back home, he continues doing consulting work.

Danny Romm retired in 1993 (how’d he do that?) from his job as an information systems manager at ARCO. His home base is in Seattle, but he’s traveling a lot. He’s the proud papa of two: Gary, a UCLA graduate who’s trying to make his mark as a theater actor/director, and Janelle, a student at Colorado State. Somewhere along the line, Danny picked up a JD degree from the University of Illinois, but is letting it lie fallow. One of the most avid bridge players at Caltech, he has been trying to get fellow Seattleite **Hal Wyman** back to the bridge table, with little success. But here’s a warning: If Danny asks you to play, be aware that he has won several regional duplicate bridge events and finished in the top 10 in the premier national pairs event.

Another retiree, **Bob Bump**, concluded 37 years of R&D for Hewlett-Packard on May 1. It should be an active retirement, since in the fall of 1998 Bob says he “gave in to one of the cyclist’s temptations: biking across the U.S.” He began in San Diego and finished 22 days later in St. Augustine, Florida, averaging about 115 miles/day. Any of us who have biked will be impressed, even though Bob says that racers do it in nine days. But he stopped to smell the roses and rest the Bump rump.

Dave Kauffman, a fellow New Mexican and former president of our state’s chapter of the Alumni Association, is associate dean of the School of Engineering at the University of New Mexico in Albuquerque. He also continues as a professor in the chemical and nuclear engineering department, where he’s been for 22 years. His career path took him to the Air Force for four years, then to a PhD in chemical engineering at Colorado, and work for Shell Oil in California and Texas. He and his wife, Stephanie, participate in musical activities (I saw and heard them singing in a choral group with the New Mexico Symphony). Stephanie teaches English in a community college, and their daughter works as a veterinary technician and office manager in Santa Fe.

Les Ingber is director of R&D for DRW Investments, with offices in the Chicago Mercantile Exchange Center. He writes that he’s applying to financial markets the math-physics and numerical algorithms that he developed for several multi-year projects in neuroscience and military analyses. Some code and reprints are in <http://www.ingber.com/>; a mirror home page can be found at <http://www.alumni.caltech.edu/~ingber/>.

Almost retired: **Carl Rovainen** writes that “after PhD training in neurobiology at Harvard, I moved with Leslie (from Pasadena and Radcliffe) to

Washington University Medical School in St. Louis in 1967. We intended to stay for a year and a half tops and then go someplace interesting.” They found no need to leave, and 32 years later are still there. Sons Toivo, Ahiti, and Torsti are on their own, so Carl, Leslie, and the two dogs enjoy the empty nest and a house on the Meramec River. Carl had endocarditis and mitral valve surgery three years ago, and is now easing into retirement. His recent activities include traveling (trek in Nepal with Torsti, tropical biology tour in Guyana); old time music (he now has four banjos and five accordions, up from one of each in Ricketts); viewing stones from Ozark gravel bars; and the St. Louis GO Club. Carl and Leslie continue their long-term friendship in St. Louis with cobbiologist, classmate, and professor **Garland Marshall** and his wife, Suzanne, who is a world-class quilter.

David Grimes is the long-time director of classical guitar studies at Cal State Fullerton, which has one of the leading programs in the country. He worked for a while at JPL after graduation, but he was already bitten by the guitar bug, having heard a Segovia recording during his junior year. So he studied guitar and in 1971 started touring as a performer. In recent years he’s been performing extensively in Europe, and in the summer of 1998 played in Greece, Bulgaria, Montenegro, and Serbia. Next year he plays and conducts ensembles in Greece, Bulgaria, France, Spain, Denmark, and Germany. He has published seven books, including a three-volume set, *Treasures of the Baroque*, of his arrangements of works originally written for baroque lute and guitar. He currently serves as president of the Guitar Foundation of America, the world’s largest professional organization for classical guitarists. David and Cathy live in Huntington Beach with far too many cats.

Chuck House recently left the West Coast with a bang, throwing a “farewell party for his house” in Santa Barbara for several hundred friends and family members. He and his wife, Jenny, have relocated to horse country in Mendham, NJ, where he’s executive vice president for research and products at Dialogic, a computer telephony company recently bought by Intel. Chuck is a recent past president of the Association for Computing Machinery and enjoyed occupying the pulpit and stirring things up. He passed through Santa Fe earlier this year, and we reminisced about some relatively innocent adventures in the summer of ‘60.

Larry Altman, who works at Mobil, is anticipating retirement after the Mobil-Exxon merger is completed in the last quarter of 1999. “What we will do after retirement has not been decided,” he writes. If he follows a course similar to his classmates, he’ll travel, make wine, consult, and play the banjo. We look forward to an update next year.

Larry Kugler has been on the math faculty at the University of Michigan–Flint for 33 years. His wife, Marianne, is a program officer at the C. S. Mott Foundation, and their two daughters are teachers.

A couple of years ago I encountered the name of **David Casseres**, a class of ‘62 Ex, in a magazine and made contact with him. Some of you will remember David for his 12-string guitar and his goatee, neither of which was common at Caltech in 1958. He wrote back that he spent quite a few years as a technical writer (after graduating from Reed), then morphed into one of the “last self-taught software engineers” while working at Apple. He worked on printing software for a few years, got sick of it and fired himself from that group, and wound up in a research group dealing with information technologies. As of 1997 he was back to software products, trying to get some text-information intelligence into the Mac system. David got married in 1975; he and his wife have a 14-year-old daughter. You may be able to contact him at casseres@apple.com.

Pete Ford, long-time professor of chemistry at

UC Santa Barbara, and Mary Howe-Grant were married in the spring of 1999. Pete also sent the sad news thar **Bill Palke**, also on the UC Santa Barbara chemistry faculty, died suddenly and without warning of a heart attack on May 10.

A number of classmates checked in to confirm or change their addresses, but offered no news. They are: **Lowell Hill** (Ex), **Dick Brandt**, **Dave Benson**, **Doug Smith**, **Dick Zacher**, **Lon Bell**, **Neil Gretsky**, **Steve Bruenn**, **Bob Williams**, **Lyn Hardy**, **John Russ**, and **Dave Osias**. I'm happy to hear from people, but next time send news!

1973

Stephanie Charles
217 Ada Avenue, Unit 4
Mountain View, California 94043
sjcharles@juno.com

My thanks to all of you who wrote to let me know what you are up to. If you haven't been in touch, it would be great to hear from you. You can reach me at sjcharles@juno.com. Meanwhile, here is some news from classmates I have heard from since the last Class Notes column.

Masayuki Ono has been at Princeton since he graduated from Caltech. He works on fusion research at the Princeton Plasma Physics Laboratory, which is a Department of Energy (DOE) laboratory managed by Princeton. He is presently serving as the project director of the National Spherical Torus Experiment (NSTX), the latest fusion facility to come into operation under the Office of Fusion Energy Science Division of DOE. He notes that **Jerry Navratil** is the chair of the NSTX Program Advisory Committee.

Randy Kubena was recently promoted to principal research scientist at HRL Laboratories, in addition to his duties as department manager of the MEM (MicroElectroMechanical) Sensors Department. His wife is a principal in the L.A. Unified School District, and they have two children: Ryan (age 9) and Rebecca (age 3).

Tony Chan is in the second year of a three-year assignment as chair of UCLA's math department, where he has been since 1986. He is trying to improve the public image of math, and this has led to interviews in the *L.A. Times* and the *TWA Ambassador* flight magazine. You can read about them at <http://www.math.ucla.edu/newsevents/media.html>.

Wilfred Kitzler has spent the last two years helping to form NeoVac, a small company in Santa Rosa, California, that does sputter deposition of thin films onto polymer webs for display and electroluminescent lighting applications. NeoVac has completed the start-up phase of its business and is now adding additional manufacturing capability.

John Fraser's company, ATL Ultrasound, Inc., was recently purchased by Philips, so he went from a three-person company to a 2500-person company to one of the largest companies in the world without ever having had a job interview. ATL elected John a technical fellow in perpetuity this year, an award that includes three-month sabbaticals every two years. John says no one has ever taken more than one, but he thinks he will be able to manage it. He is also heavily involved in Boy Scouts and runs a rock-climbing program with 10 to 20 students per year.

Jacques Beser is vice president of satellite navigation at 3S Navigation in Irvine, California. He reports that his son David (age 17) is a great student, baseball player, and football player.

Deborah Chung is working in structural electronics, a new field of electronics she has created, which focuses on electronics made from structural materials such as carbon fiber composites and concrete. The electronic functions include sensing strain, damage, and temperature of electronic circuitry. Her recent discovery of apparent negative resistance in carbon fiber composites is an outgrowth of this research.

Herb Ward is working on software aspects of

the STAR experiment at RHIC at Brookhaven National Laboratory. Though he left Caltech before graduating, he says that he values the culture that he got at Caltech during his one-and-a-half year stretch.

Jonathan Ng has been practicing medicine and law in San Jose, California, for almost 20 years. His wife, Shirley, works in his office, and he has two daughters who are college-bound (but not considering Caltech).

Bob Plaag retired from Boeing in July of 1998 and is enjoying his new life, new directions, and even self-employment.

1975

Rich Gruner
3163 Colby Avenue
Los Angeles, California 90066
rgruner@law.whittier.edu

Claude Anderson was promoted in 1998 to the position of professor of computer science at the Rose-Hulman Institute. His seventh child was born the same year.

David Atkinson has been living in St. Louis, Missouri, for 12 years, where he works for the Reinsurance Group of America. He and his wife have a 20-year-old son and 16-year-old daughter. David's work has produced a degree of unexpected fame. He writes that he learned a personal lesson about the inaccuracies of the press when he was mistakenly included in a list of the 50 highest-paid St. Louis executives. His coworkers, friends, and neighbors were surprised, but not nearly so much as David.

Frances Garrett is still working for the Los Angeles County Sanitation District as a senior engineer in Water Reclamation Plant Operations. She has been married to Bill Garrett for 14 years and has three children: two boys, ages 13 and 10, and a girl, 9.

Daniel Hale writes that he was married in 1996 and his first child, a girl, was born in late 1997. He lives in Oceanside, California. Daniel and his wife work at home writing software on a consulting basis; he specializes in programs related to scientific instruments.

Doug Herbert has two children, a boy, age 3 1/2, and a girl, 1 1/2. He writes that synergy among the children keeps him and his wife busy. Doug is retired from flying in the Air Force, but still works for the military as a civilian.

Jeff Kelber is a professor of chemistry at the University of North Texas in Denton, Texas. Jeff, his wife, and his 15-year-old son live in Plano, Texas.

John Land joined the San Diego office of the law firm of Fish & Richardson in April 1995, where he continues to practice intellectual property law. Fish & Richardson has 160 attorneys and seven offices worldwide.

Roland Lee has been an associate professor of radiology at the University of New Mexico since 1997. He is the director of neuroimaging and magnetic source imaging at the VA Medical Center in Albuquerque.

James Ogg has been a professor of geology and geophysics at Purdue since 1996. He continues his work on improving the global geological timescale. James is married to Gabi, a German paleontologist, and has two children, ages 7 and 4. According to James, his children are more fluent in German than English.

Kevin Ruddell writes that after almost 10 years at Microsoft, where he wrote part of Windows 95 and worked on Internet security projects, he took a break to care for his two daughters while his wife works as a physician in rehabilitative medicine. Kevin describes his work on Internet security as "the digital version of locksmithing." He has discovered that caring for small children is unexpectedly labor intensive, but a wonderful experience. He is especially enjoying reading to them the children's literature that was not available when he was a kid.

1983

Lisa Martin
225 Waltham Street
Lexington, Massachusetts 02173-4903
lmartin@cfia.harvard.edu

Thanks to the efforts of **Mike Weston**, our class now has its own Web site! The address is <http://www.misosoup.com/caltech83>. If you would like to have your e-mail address included on this site, or have minor corrections to anything listed on it, please send this information to Mike at mike@misosoup.com. More substantial updates should continue to be sent to me.

It's possible to keep up with some of our classmates just by reading the newspaper. **Sandra Tsing Loh's** one-woman show, *Bad Sex with Bud Kemp*, appeared at the Second Stage Theater in New York and was covered in the *Los Angeles Times* (among other places, I'm sure). Some of you may have heard Sandra's segment, "The Loh Life," on National Public Radio. I count myself among the 30-somethings who wake up in the morning hoping to hear her biting and always on-target commentaries about life in the 90s.

Frank Evans is an assistant professor of atmospheric science at the University of Colorado, where he is ambivalently awaiting a tenure decision in 2000. He is developing a new technique of submillimeter-wave remote sensing of ice clouds and studying the effect of three-dimensional cloud structure on solar radiation. Frank and **Sue Gross** ('85) are happily married and blissfully childless.

Daniel Jew spent almost three years in Hong Kong, working as a senior computer engineer for Hopewell Engineering & Construction Ltd. He returned to the United States in January. In 1998 he married Dan "Danielle" Ouyang, a Chinese citizen who was also working in Hong Kong. While Daniel looks for the "perfect permanent position," he is pursuing his second master's degree (in applied computer science and technology) at Azusa Pacific University.

Mark Maier went to work for Hughes Aircraft in El Segundo after graduation. "During my nine years there I finished a PhD in EE at USC, knocked off various climbs in the U.S. and South America, got married to Leigh Clawson (PhD '88), and decided I wanted to live somewhere completely different. So, I took a faculty position at the University of Alabama in Huntsville (the campus without the football team). While there I coauthored a book, *The Art of Systems Architecting*, with Eberhardt Rechtin ('46, PhD '50), and led a student satellite project (SEDSAT-1) that launched in October '98. Those of you working on satellites that take 10 years and cost a few hundred million ought to try one you transport in the back of a Suburban, it's fun! We decided to move again, this time to the Aerospace Corporation in their Northern Virginia offices. Leigh and I have two young boys (Stuart, 7, and Charlie, 2), who have many of the quirks of their mother and father." (What quirks could he possibly mean?)

Gloria Badilla Jew writes that "within the last year [I] have gone from working full-time as an outreach coordinator for the NASA/JPL STARDUST mission (a sample return mission to a comet), to working as an independent consultant. I have made this change so I may spend more time with my 3-year-old daughter Nikki. . . . My consulting efforts include supporting various outreach efforts for NASA/JPL and I also assist small businesses with their program management efforts. Though this is a major life change, it has been very enjoyable and the whole family has flourished by this decision."

Björn Matthias sends another update. His family has "bought an old house (small by American standards). . . . It's in the same little village 25 km south of Heidelberg (or 25 km north of Karlsruhe) that we've been living in for the past eight years." He is spending his weekends and evenings fixing up the house and remnants of a barn, something those

of us with old houses can well appreciate! His son Philip, 7, has announced that he wants to play the drums, and daughter Jessica, 10, is "getting to be rather proficient on the flute." Björn's position as program manager (for simulation of electromagnetic effects) in ABB Corporate Research "evaporated" at the end of 1998 when the R&D area was absorbed by another. But Björn says that returning to running the local group in Heidelberg that deals with the same subject is a relief and much more rewarding.

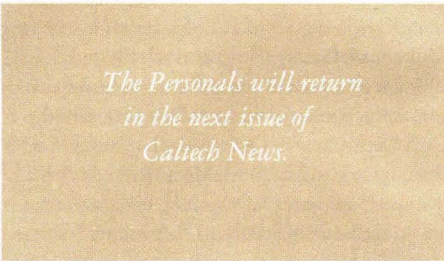
Beverley Robertson finds herself back in San Marino, just a couple of miles from Caltech. "I never in a million years thought I'd be back here again." Beverley's husband, Charles Conn, teamed up with Bill Gross ('81) to start up an Internet company called CitySearch, based in Pasadena (www.citysearch.com). The company has done very well, merging with Ticketmaster Online and going public in December. Beverley has been globe trotting, moving from Cambridge, Massachusetts, to Toronto, Canada, then to Sydney, Australia, before landing in San Marino. Beverley has three children (nearly one per city): Alexander, born in 1990; Cameron, in 1992; and Hannah Isabel, in 1998.

Mary Glover tells us, "I have a wonderful husband, Bob (who should have been a Techer but went to Hawaii instead), two boys (Sean, 6, and Patrick, 3), and three stepdaughters (Sarah, 19; Megan, 15; and Ellie, 13). I'm currently trying to run a home photography business while volunteering at Sean's school and on our homeowner's association board."

A few of you sent in postcards or e-mails with nothing but an address, so I'm going to take the liberty of inferring what you're up to (tell me if I got it wrong!): **Ming-Chung Chu** is in the department of physics at the Chinese University in Hong Kong. **Pui Tong Ho** is going to law school at UCLA. **Ram Basu** is the audience services and PC systems manager for Caltech Public Events. **Richard Pogge** is in the astronomy department at Ohio State University. **Gregory Sayles** is working for the EPA in Cincinnati. **Julie Kornfield** is associate professor of chemical engineering at Caltech, and **Ellen Howell** is at the Arecibo Observatory in Puerto Rico.

Sadly, **Luis Monsalve's** mother sent a postcard saying that her son passed away on October 9, 1998.

Keep those postcards and e-mails coming! The response to this column has been wonderful. I'll be on leave in 2000 on a John Simon Guggenheim Fellowship, so I'll have plenty of time to keep on writing these updates!



1925
ROBERT J. STANTON SR., Ex, of Thousand Oaks, California, on January 19. After leaving Caltech at the end of his junior year, he spent his professional life in the printing business as a partner in Male and Stanton, Printers and Stationers, in Los Angeles. After retirement, he resided at Lake San Marcos in north San Diego County. Predeceased by Audrey, his wife of 73 years, he is survived by a daughter, Barbara; a son, Robert Jr. '53, PhD '60; and their families.

1926
PERCY E. PARKER, of Fullerton, California, on January 24, 1998; he was 92. He was a district superintendant for Southern California Edison. He is survived by his wife, Flora.

JOHANNES A. VAN DEN AKKER, PhD '31, of Appleton, Wisconsin, on February 2; he was 94. He taught physics at Washington University in St. Louis from 1930 to 1934, moving in 1935 to the Institute of Paper Chemistry (IPC), in Appleton, and remaining there as a professor of physics until 1970. He was a Fulbright Scholar in 1961–62 and received a gold medal from the Technical Association of the Pulp and Paper Industry (TAPPI) in 1968. After retiring from IPC he became a consultant for what is now the Fort James Corporation, and in 1995 he became one of the first inductees into the Paper Industry Hall of Fame. A fellow of the American Association for the Advancement of Science, TAPPI, and the American Physical Society, Van den Akker was a member of the American Institute of Physics, the Optical Society of America, the American Association of Physics Teachers, Sigma Xi, Tau Beta Phi, and Phi Gamma Delta. His achievements included research on the spatial distribution of X-ray photoelectrons as well as work on ultraviolet spectrophotometers and analog computers. He was the coauthor of 10 books, contributed to the first and second editions of the *Encyclopedia of Physics*, and published many articles in technical journals. He is survived by Margaret, his wife of nine years; a daughter, Valerie Emmert; two grandsons, a granddaughter, and two great-granddaughters; and a stepson, David Pelton.

1927
HOWARD R. STARKE, of Honolulu, Hawaii, on September 13; he was 94. A former cement executive, he was known for his achievements in advancing technology in the chemistry of cement. After graduating from Caltech, he joined the Riverside Cement Company in California, where he and two colleagues developed a low-heat cement for use in the construction of massive structures such as Hoover Dam. In 1960 he became involved in the design, engineering, and construction of the Hawaiian Cement Company's plant at Barbers Point, serving as the company's first president until 1965, when he assumed construction and management responsibilities for the Hellenic Cement Company's plant in Patras, Greece. He later established another plant in Palma de Mallorca, Spain. After 43 years in the industry, he retired to Hawaii, where he indulged his passion for growing cattleya orchids. He is survived by his wife, Angela.

1930
ERNEST LEVINE, MS '31, on January 21. He is survived by a daughter, Susan.

1931
LAVERNE D. LEEPER, MS '32, of Arcadia, California, on May 4; he was 89. He served in the Pacific during World War II as an officer in the Army Corps of Engineers, and after the

war he spent a long and distinguished career as a civil engineer with C F Braun and Co. in Alhambra, and then as a staff engineer at Caltech. He is survived by his wife of 55 years, Mary; his brother, Roy; his children, James, Mary Catherine, Jeannette, and John; and two grandsons.

ALFRED S. VOAK, of Upland, California, on June 23; he was 91. After his father died in 1932, Voak took over his mail route and worked it until 1941. During World War II he was employed by Firestone Corporation in Los Angeles as a quality-control engineer and then by Consolidated Engineering Corporation, also in California. Later he started his own business in Upland, California, with a \$1,000 loan from Frank H. Ford '31, and manufactured precision potentiometers. He also married Ford's sister, Helen. After retiring, he became interested in Meals on Wheels, in which he played a major role for 26 years. For his service he received the Drum Bear Award from the Salvation Army in 1989 and the city of Upland's Award of Merit Commendation in 1995. Predeceased by Helen, his first wife; their son David; a grandson, Joseph; and his second wife, Mildred, Voak is survived by his and Helen's other son, Kenneth, as well as by three grandchildren and two great-grandchildren.

1932
GEORGE O. SHULL, of Hemet, California, on July 17, 1998. He is survived by his wife.

1934
ALEXANDER C. CHARTERS JR., MS '36, PhD '38, of Santa Barbara, California, on May 17; he was 85. During World War II, he was chief of the Free Flight Aerodynamics Branch at the Army's Ballistic Research Laboratory in Aberdeen, Maryland. The Aeroballistic Range he developed there was designated a National Engineering Landmark in 1982. In 1951 he was chief of the Hypervelocity Ballistic Range at what is now NASA's Ames Research Center. He designed and built the DELCO Gun for DARPA in 1961 while at the General Motors Defense Research Laboratory in Santa Barbara. In 1989 the Hypervelocity Impact Society awarded him its Distinguished Scientist Award. He retired at the age of 80. He is survived by Vivian, his wife of 63 years; his son, Crane; his daughter, Marylin Glenn; and nine grandchildren and 12 great-grandchildren.

FRANKLIN F. OFFNER, MS, of Bannockburn, Illinois, on May 1; he was 88. A professor emeritus of biophysics, biomedical engineering, and electronics at the Technological Institute of Northwestern University, he held more than 60 patents. While earning his doctorate in physics at the University of Chicago, he developed prototypes for the electrocardiograph (EKG) and the electroencephalograph (EEG)—his name becoming so synonymous with the latter that it was often referred to as the Offner Machine—and in 1939 he founded Offner Electronics to manufacture such biomedical equipment. During World War II he developed heat-seeking missiles, and he made the original proposal for the Sonabuoy, a radio-transmitting buoy that can detect submarines and that is still used today; he also developed an electronic fuel control that allowed multiple jet engines to work together, the principles for which are still used today. After the war, Offner returned to the biomedical field, and in 1961 he sold his company to Beckman Instruments. Two years later, Offner retired and joined the faculty of Northwestern University. A founding fellow of the American Institute of Medical and Biological Engineering, he was a fellow of the IEEE and a member of the National Academy of

Engineering. His awards included the Laureate of Technology, Lincoln Academy of Illinois (1966); the IEEE's Centennial Medal (1984); and the University of Chicago's Professional Achievement Citation (1991). In addition to his scientific interests, he had a passion for painting and the arts, at one point studying in Paris. He is survived by his wife, Janine; two sons, Laurens and Robin; and two daughters, Alexandra and Sylvia.

CHARLES E. WHITE, of Hemet, California, on February 4. He is survived by his wife, Jean.

1935
JOHN RITTER, of Sacramento, California, on January 19; he was 88. Retiring in 1967 from the state of California as a supervising highway engineer, he had helped design the Santa Ana, Riverside, and Garden Grove freeways before moving to a Division of Highways headquarters assignment in Sacramento. During World War II he served in the Pacific, in the U.S. Navy's Construction Battalion. Predeceased by Eileen, his wife of 57 years, he is survived by a son, Tom; two daughters, Eleanor Reynolds and Margaret Dollbaum; and seven grandchildren and two great-grandchildren.

ALLAN R. SCOVILLE, MS '36, on January 23, 1998.

1936
ANGUS E. TAYLOR, PhD, on April 6, in Berkeley, California. He was a retired mathematics professor and academic administrator. Following 28 years in UCLA's mathematics department, including six years (1958–64) as department chairman, he served the University of California system for a decade as vice president for academic affairs and then as university provost. He was also chancellor of UC Santa Cruz (1976–77). He did research in the field of functional analysis, contributing to the theory of Banach spaces of analytic functions and the spectral theory of linear transformations in complex Banach spaces. He authored several books of mathematics, including *Calculus* (with G. E. F. Sherwood, 1942 and later editions), *Calculus with Analytic Geometry* (1959), *Advanced Calculus* (1955), *Introduction to Functional Analysis* (1958), and *General Theory of Functions and Integration* (1965). He was an avid mountaineer. Predeceased by his wife, Patsy, he is survived by two sons, Gordon and Kenneth; a daughter, Kathleen Okamoto; and six grandchildren.

1937
HARRY H. MILLER, of The Dalles, Oregon, on September 21, 1997; he was 82. After graduating from Caltech he received his medical degree from Harvard in 1941. He served as an air force flight surgeon in the European theater during World War II and was discharged with the rank of major. After the war he returned to Boston and completed his residency at Boston City Hospital and also attended Tufts Medical School, receiving a master's degree in surgery in 1951. Appointed to the staff and faculty at Tufts New England Medical Center, he completed research in surgical oncology. He was appointed chief of tumor service, receiving numerous teaching awards and being selected many times by his residents as teacher of the year. Retiring in 1982 as associate professor emeritus of surgery, he returned to his ranch in Dufur, Oregon. He enjoyed the outdoors. A lifelong Episcopalian, he was an active supporter of learning and higher education, serving on the Wasco County ESD Board, including as chairman from 1985 to 1987. He also served on the facilities and budget committees at Columbia Gorge Community College. He was the founding president of the Mid-Columbia Health Foundation, and past president of the

Kiwanis. Predeceased by Allegra, his wife of 53 years, by a brother, Charles, and by a sister, Sarah, he is survived by his wife, Song Hi An Miller, a former New England Medical Center colleague whom he married in 1994; four sons, Harry Jr., John, William, and Charles; four grandchildren; and a brother, William.

JOHN S. RINEHART, MS, of Santa Fe, New Mexico, on April 9; he was 84. A noted physicist, his primary fields of expertise were metal/explosive systems, meteorites, and geysers. After receiving his PhD from the State University of Iowa, he worked in both the government and universities, and during World War II he helped develop the proximity fuse, for which he received the Presidential Certificate of Merit. After retiring he continued to work as a consultant. He was a member of several professional societies as well as the Cosmos Club, Washington, D.C., and he was active in his local archaeological society. He is survived by his wife, Marion; a daughter, Margot Swovelan; a son, Eric; and three grandchildren.

1938
RICHARD B. FORWARD, of San Diego, on January 9; he was 82. After graduating from Caltech, he entered the U.S. Navy and during World War II received the Distinguished Flying Cross while serving as a pilot aboard the aircraft carrier *Lexington*. Retiring in 1960, he earned a teaching credential from San Diego State and then taught math and physics for 14 years at Mar Vista High School in Imperial Beach, California. Forward and his wife retired to Whispering Pines, in Julian, California, where he was active in the Julian Lions Club, serving as secretary for many years. He is survived by his wife, Ruth; a daughter, Merrily Cox; two sons, Charles and Richard; five grandchildren; and two sisters, Edna Forward and Mildred Colvin.

ROBERT H. OLDS, MS '39, PhD '47, of Campbell, California, on March 12; he was 84. Part of a cadre of young scientists recruited to work on the atomic bomb at White Sands, New Mexico, he became disillusioned and, questioning the morality of the effort, left the project. Working for the U.S. Navy at China Lake Naval Test Station and later Lockheed Missiles and Space, he was involved in some of the early rocket-propulsion studies that underlay the NASA space program; his work included initial plans for a space station and the exploration of Mars. After retiring he undertook a second career as a teacher of physics and mathematics at both West Valley and DeAnza Colleges. "Being the consummate 'rocket scientist' he loved all forms of knowledge from music to philosophy and all aspects of science: he was a true renaissance man." Predeceased by his wife, Marian, and his son, Christopher, he is survived by three children, Lynne, Alexis, and Laurie; a sister, Helen Stephenson; and two very special friends, Bart Sears and Frank Nolan.

1939
R. KENNETH COLLINS, on March 22, in Santa Ana, California. After graduating he was an executive with Westinghouse Electric in Los Angeles, and during World War II he worked on a number of classified projects. He later worked with JPL on projects fundamental to the first space launch, and he was also "instrumental in the development of the world's first desalinization plant in Kuwait." In the late 1960s he relocated to San Mateo, where he was an executive with and advisor to several of the first companies in what later became Silicon Valley. He retired to San Juan Capistrano in 1995. He is survived by Billie, his wife of 60 years; a son, Michael; a daughter, Leanne Miller; and two granddaughters.

GEORGE PUTNAM “PUT” HINDS JR., MS, of Houston, on May 5; he was 81. After working for Shell Oil Company for 43 years in California and Texas as a chemical engineer specializing in catalysis research, he retired in 1982. He is survived by Viola (“Pixie”), his wife of 59 years; three daughters, Flora Roberts, Georgia McGlasson, and Elisabeth Hinds-Brofft; seven grandchildren; and a sister, Jane Allee.

1940
YUJI A. TAJIMA, MS ’41, on November 14, 1997.

JOHN B. WILLIAMSON, of Santa Maria, California, on March 6; he was 83. He worked in the field of reinforced plastics, where his lifelong interest in astronomy and space proved beneficial; he helped develop oblative materials for use in rocket motors. He also developed the Williamson Flow Test. He is survived by Betty Mae, his wife of 57 years; two sons, John and Frank; two daughters, Hazel Sirota and Anne Patterson; and five grandchildren and two great-grandchildren.

1941
FREDERICK W. CLARKE III, of Rockford, Illinois, on February 5; he was 80. Founder and president of Rogers and Clarke Manufacturing, which specialized in optical equipment, Clarke began his career in Minneapolis with Honeywell’s optical division, participating in the wartime production of bomb and tank sights, binoculars, periscopes, and camera lenses and other precision optical components. He moved to Rockford at the conclusion of World War II, when the optical division was sold to W. F. and John Barnes, and he and partner Gil Rogers acquired the division and founded Rogers and Clarke. Over the next 40 years the firm gained global recognition as a leader in precision optical equipment, optical materials, production methodology, and design. Clarke sold the business in 1988 and retired. Throughout his Rockford career he took an active interest in local education and community issues, serving on the boards of Rock Valley Community College and Rockford Memorial Hospital. He was also a member and former president of the University Club of Rockford and the Optical Society of America, and a Harris Fellow of Rotary International. During retirement he supported several entrepreneurial activities in areas such as medical products and telecommunications, the latter giving him the opportunity to work closely with both his sons. An avid hunter and fisherman, he spent increasing time at the family’s summer home near Hayward, Wisconsin. He is survived by Mary, his wife of 53 years; his sons, Frederick IV and George; and five grandchildren.

ROBERT G. COOPER, of Ojai, California, on February 2; he was 78. He received an MS in chemistry from UCLA and a California teacher’s certificate, and during World War II he served from 1944 to 1946 as an ensign in the U.S. Navy. Following a brief stint with Richfield Oil, he taught at a variety of schools, including Occidental College, Palos Verdes Junior College, and Stillwater Cove Ranch School, although he spent most of his career at the Ojai Valley School. He began teaching in 1950 at the school’s Lower Campus, where he was assistant headmaster. Later he became the first director and headmaster of the Ojai Valley School Upper Campus, and the Ojai Valley School Science Center is named in his honor. He is survived by Helen, his wife of 56 years; two daughters, Susan Shaver and Bonnie de la Roche; three sons, Robert, Carl, and James; and seven grandchildren.

KENYON B. HOWARD, of Boise, Idaho, on January 14; he was 80. After working briefly for Standard Oil, he moved to Lindsay, California, where he founded several companies, one for testing soils and water, a second for assembling electrical components, and a third for developing and maintaining law-enforcement radio communication systems. He later took up teaching science and math at the College of the Sequoias, where he shared his computer expertise with the college community. Retiring from teaching, he earned a law degree and became a member of the California Bar. He did pro bono work, especially for senior citizens, and he was active in Kiwanis and in the Tulare County Bar Association, where he served as bulletin editor and a member of the board of directors. A ham radio operator, he participated in county disaster preparedness. He is survived by his wife, Mary; three children, Leigh, John, and Fred; two brothers, Cloyde and Elton; and a sister, Lilma.

ROBERT P. ROUTT, on December 28, 1997.

MARTY SCHEINBERG, MS, in December 1997.

1942
WALLACE E. HICKS, of Arcadia, California, on April 11. After a 24-year career with the Naval Undersea Research Center in Pasadena, he “got to retire at age 53 and got to do all the ‘fun’ things he had always wanted to do.” He is survived by his wife, Dorothy.

GEORGE HOLZMAN, PhD ’48, of Vancouver, Washington, on August 27, 1998. He is survived by his wife, Sara.

1943
SIDNEY GOTTLIEB, PhD, on March 7, in Washington, Virginia; he was 80.

1944
WILLARD A. DODGE JR., MS ’47, of Novato, California, on January 20, 1997; he was 73. He served for many years as a Public Utilities Commission project engineer in San Francisco. He is survived by a son, Russ; a daughter, Linda; and three grandchildren.

CHARLES B. MILLER, of Idyllwild, California, on May 6; he was 78. During World War II he served as an officer on an escort carrier, and after the war he attended Claremont Graduate School, graduating in 1948. He spent over 36 years engineering and managing pipelines for petroleum products. A member of the Mayflower Society and an officer in the Sons of the Revolution, he was also an active officer and peak-climber in the Sierra Club. His special interests were family, hiking, camping, travel, genealogy, and classical music, and he climbed most of the peaks in the Sierra Nevada. In Idyllwild, he served as a board member of the Idyllwild Water District and as an officer in both the 39ers and the Friends of the San Jacinto County Parks. He is survived by his wife, Mary Ann; four daughters, Vicki, Deidra, Suzanne, and Laurie; and seven grandchildren.

JOHN B. NELSON, of San Rafael, California, on July 10. After graduating from Caltech, he went on to earn his MS in mechanical engineering from MIT in 1947. He spent 43 years with Chevron, working in the engineering and construction of pipelines, refineries, and field production facilities, with responsibility for the planning and execution of numerous domestic and overseas construction projects that took him and his family to Utah, Alaska, New Brunswick, England, Holland, and Italy. He retired in 1990. A participant in community affairs at all levels, he was active with the Audubon

Canyon Ranch at Bolinas Lagoon. He was also a long-time member of the Caltech Associates. “A native of Hawaii, he was a world sojourner, loving the outdoors and exploring it everywhere and in many ways—by foot, bicycle, and kayak.” Predeceased by his daughter Kirstin, he is survived by his wife, Karyn, and a daughter, Joanna.

RICHARD B. RIDDELL, MS, of Santa Barbara, California, on March 3; he was 76. After serving as an officer in the naval reserve from 1942 to 1946, he earned a BA in music in 1948 from the Lamont School of Music, in Denver, and then his master’s degree in 1951 from the New England Conservatory, in Boston. After singing professionally for several years, he entered the more practical world of engineering. Specializing as a consultant in petrochemical engineering, he worked for several large U.S. companies as well as in Canada and other areas outside the United States. “In later years, he expressed his regret that he had not pursued a teaching career in music.” He is survived by his wife, Marilyn, to whom he was married for many years and had known for 59 years; by three daughters, Mary Riddell, Carol Meier, and Catherine Handzel; by Marilyn’s children, Gregory, Geoffrey, Peter Turk, and Melissa Coffman; and seven granddaughters.

FLOYD E. “BO” WEAVER, of Newport Beach, California, on November 7, 1998; he was 76. In the early 1940s he received a football scholarship to Stanford, where he majored in engineering, and then transferred to Caltech during World War II. He served with the Seabees, was stationed in Okinawa, and attained the rank of lieutenant JG. Following the war, he worked as a structural engineer for the state of California, and then started his own engineering company in Santa Ana. He also continued his education, earning his MS at USC. He moved his family to Newport Beach in 1957, and he opened a new office there in the mid-1960s. One of the original members of the San Onofre Surf Club, he surfed for four decades. He also belonged to the Santa Ana Country Club and the Kichigai Anglers Sportfishing Club. Predeceased by his sons Jeff and Buff, he is survived by his wife, Dorothy; a son, Casey; two granddaughters; and a brother, Alvin.

DAVID R. SHEFCHIK, in October 1997.

1946
JULIAN D. COLE, MS, Eng ’46, PhD ’49, of Loudonville, New York, on April 17; he was 74. During his career he was a faculty member at Caltech, a scientific liaison officer in London for the Office of Naval Research, a faculty scholar at Boeing, a faculty member and department chair at UCLA, and, from 1982, a professor at the Rensselaer Polytechnic Institute, where at the time of his death he was the Margaret A. Darrin Distinguished Professor of Applied Mathematics. A 1971 recipient of Caltech’s Distinguished Alumni Award, he was in 1976 elected simultaneously to the National Academy of Engineering and the National Academy of Sciences. He was in addition a Fellow of the American Physical Society, the American Institute of Aeronautics and Astronautics, and the American Academy of Arts and Sciences, and his numerous awards included the Theodore von Kármán Prize, the Air Force’s Award for Meritorious Civilian Service, the Fluid Dynamics Award, and the National Academy of Sciences Award in Applied Mathematics and Numerical Analysis. His books included *Perturbation Methods in Applied Mathematics* and *Multiple Scales and Singular Perturbation Methods*, both with Jirair Kevorkian; *Transonic Aerodynamics*, with

L. Pamela Cook; and *Similarity Methods for Differential Equations*, with G. W. Bluman. A hiker, a skier, and a runner who ran nearly every day of his life, he enjoyed food, wine, music, and horse racing as well, and he was a voracious reader. He is survived by his wife, Sue, who is also a faculty member in applied mathematics at Rensselaer, and by his children.

1947
HAL W. BANBROOK, of Chatsworth, California, on May 5; he was 75. He had served as a meteorologist in the U.S. Navy during World War II in the Pacific theater, and after graduating from Caltech he earned a master’s degree in mathematics from UC Berkeley. The recipient of awards for technical innovation and of several patents, he spent his career as a research scientist at Litton Industries developing algorithms for guidance and control systems and other advanced projects. Predeceased by his wife, Lorraine, he is survived by a son, Mark; two daughters, Linda Morris and Jane Taylor; and six grandchildren.

THE VAULT OF THE SKY. In common with an artistic restoration, observations of the cosmos at new wavelengths uncover hidden beauties. Our back-page poster, an image mosaic created at the Caltech/JPL Infrared Processing and Analysis Center (IPAC), depicts a particularly spectacular star field, located close to the center of the Milky Way Galaxy, within the constellation Scorpius, roughly 26,000 light-years from Earth. The image, which contains a number of bright emission nebulae, dark dust clouds, and many thousands of stars, was obtained by the Two Micron All-Sky Survey (2MASS). Initiated in 1997 as an infrared counterpart to the landmark optical sky surveys carried out at Palomar Observatory (which surveyed the northern sky in the 1950s, and is currently wrapping up a second optical survey), the 2MASS project is uniformly scanning the entire sky in three near-infrared bands, using two 1.3-meter telescopes, one at Mount Hopkins, Arizona, and the other at Cerro Tololo InterAmerican Observatory, Chile. Led by astronomers at the University of Massachusetts, with data processing and construction, and distribution of the data products carried out at Caltech by IPAC, the project is funded by NASA and the National Science Foundation. The image shown here, a composite three-color near-infrared image in each of three filter band-passes, is derived from observations made this past spring in Chile. The region is a mixture of old stars and recent active star formation, particularly near the galactic center. At optical wavelengths, much of this field is obscured by dust in the galaxy, but, as seen by 2MASS in the near infrared, the dust obscuration is about 11 to 30 percent of what it is in the optical, revealing a vast number of stars and other sources in regions of the galaxy that are inaccessible in the visible part of the spectrum. The survey will continue through the spring of 2001.

Mosaic image construction by Gene Kopan (IPAC).

THURSTON E. SYDNOR, Ex, on February 9, in Port Townsend, Washington; he was 80. A mathematician, he taught calculus for 35 years at Pasadena City College and, upon retiring, donated his extensive mathematics library to Millikan Library. He is survived by his wife, Patricia; two sons, Robert and William; and a daughter, Mary Stanton.

1948
DANIEL H. DEUTSCH, PhD '51, on November 17, 1997.

HARRY LASS, PhD, of Altadena, California, on January 26; he was 84. Early in his career he taught at UC Santa Barbara and the University of Illinois and worked as a mathematician for the Motorola Research Lab in Riverside. From 1956 to the present he served as a research specialist at JPL. At the age of 70 he began attending the Glendale University College of Law, and he graduated in 1987. He subsequently passed the California State Bar Exam. Predeceased by his wife, Dorothy, he is survived by a daughter, Leslie; a son, Steven; and a brother, Charlie.

RAYMOND A. MAURUS JR., of Torrance, California, on March 18. During World War II he served in the Pacific as a paratrooper with the 11th Airborne Division Reconnaissance Platoon. After graduating from Caltech he worked for AiRE Research Manufacturing for 37 years. He is survived by his wife, Patricia; two sons, Robert and Steven; and two granddaughters.

THORNTON A. WILSON, MS, of Seattle, Washington, on May 10; he was 78. The former chairman and chief executive officer of Boeing, he was responsible for producing the 747 jetliner. Originally joining Boeing in 1943, Wilson participated in the design of the then-radical B-47 swept-wing bomber and later became project engineer for the B-52 bomber program. He also headed the Minuteman ICBM program. He rose to company president in 1968, and CEO a year later, and he was appointed chairman in 1972. He consolidated the company's business and helped establish it as the leading supplier of commercial jetliners, and during his leadership he oversaw the development of the 757 and 767. He retired in 1986. He is survived by his wife, Grace.

1949
PAUL D. SALTMAN, PhD '53, of La Jolla, California, on August 27; he was 71. A professor of biology at UC San Diego, he was known for his research into the chemical, biochemical, and nutritional role of trace metals such as iron, copper, zinc, and manganese, research that has led to progress in preventing anemia, enhancing physical performance, and reducing heart disease. He was also known for his ability as a science communicator, both with his students and with the public at large. During his career he won the first Career Teaching Award from the San Diego Division of the UC Academic Senate in 1994 and also created the half-hour series *Patterns of Life* for National Educational Television and an additional six-part series for the Public Broadcasting System, and wrote the first of the National Endowment for the Humanities' Courses by Newspapers, "America and the Future of Man." A debunker of nutritional purism, he insisted that Americans ought to eat what they want, so long as they maintain an ideal body weight and obtain the approximately 40 nutrients essential to health, a perspective spelled out in his 1987 *UCSD Nutrition Book* and reflected in the shellacked Hostess Twinkie that stood on a pedestal in his office, a trophy awarded when students at UCSD's Muir College named him "most valuable professor" in

1984. An athlete all his life, he played basketball and boxed in high school, played basketball in college, and skied, played tennis, and surfed with his family, becoming a charter member of the San Onofre Surfing Association. Between earning his BS and his PhD at Caltech, he was encouraged by Nobel laureates Marie and Pierre Curie, to attend the Collège de France in Paris, for which she arranged a scholarship. After receiving his PhD, Saltman joined the biochemistry faculty at USC, where he remained for 14 years. He then joined UCSD as professor of biology and provost of Revelle College, serving in the latter position from 1967 to 1972, and as vice chancellor of academic affairs from 1972 to 1980. A recipient of Caltech's Distinguished Alumni Award in 1973, he was named Honorary Alumnus of the Year for 1999 by the UCSD Alumni Association, which in June established in his honor the Paul D. Saltman Chair in Science Education. He was a member of the Gnome Club. He is survived by Barbara, his wife of 50 years; two sons, David and Joshua; and five grandchildren.

1950
WILLIS A. ROSSER JR., MS '52, of Tucson, Arizona, on March 5; he was 75. Serving with the Eighth Air Force during World War II, he survived 50 missions over Germany and was awarded the Distinguished Flying Cross. After receiving his degrees from Caltech he spent over 40 years as a research scientist in the aerospace industry, retiring from Hughes Aircraft in White Sands in 1989. He is survived by Ivy, his wife of 50 years; three children, Robin, Rosemary, and Frances; four grandchildren; and a sister, Juby Bell.

JACK K. WILLIS, on August 13, 1997.

1952
GEORGE W. MAYLE, MS, of Fall River Mills, California, on November 19, 1998. He is survived by Nancy, his wife of over 54 years; a daughter, Diane; and a son, Glen.

1954
BRADLEY D. RISING, MS, on December 25, 1997.

1955
DOUGLAS D. CAMPBELL, PhD, of Vancouver, British Columbia, on February 16; he was 75. A geologist, he helped open mines in B.C., the Yukon, Saskatchewan, and the Northwest Territories, and he participated in the planning, construction, and completion of hydroelectric projects in B.C., Quebec, and Asia. He is survived by Joyce; his children, Doug and Fiona; and a sister, Betty.

1957
RICHARD E. SKINNER, MS, of Portland, Oregon, on March 22; he was 65. A self-employed engineer as well as a licensed tax consultant and real-estate broker, he had for the past five years owned WSW Construction Inc. He is survived by his wife, Dorothy; two sons, Eugene and James; and two grandchildren.

WILLIAM G. WOODS, PhD, on January 10, 1998.

1959
JOHN C. EVERITT, on May 13, in Cupertino, California. Semiretired from his engineering career, he was a very successful competitive trap shooter and had been president of the Sunnyvale Rod and Gun Club for several years. He is survived by his wife, Marjorie; a son, James; and a daughter, Susan.

TOSHI KUBOTA 1927-1999

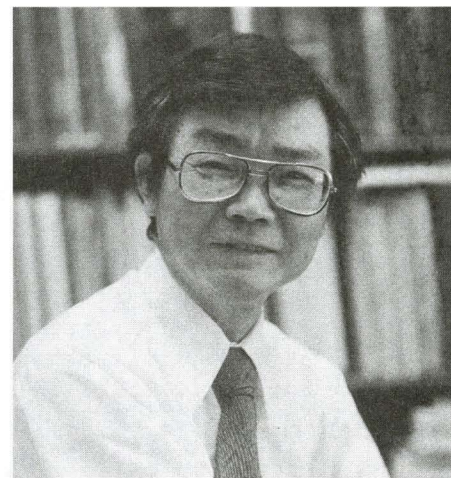
Caltech alumnus Toshi Kubota, professor emeritus of aeronautics at the Institute, and a member of the faculty since 1959, died on February 1 of this year. He was 72.

Born in Westmorland, California, Kubota was educated at the University of Tokyo, Japan, where he received his bachelor of engineering degree in 1947. From there he came to Caltech to begin his graduate studies, earning his MS in 1952 and his PhD in 1957. After earning his doctorate, Kubota remained at Caltech as a research fellow for two years before becoming an assistant professor in 1959. He became an associate professor in 1963, full professor in 1971, and retired as an emeritus faculty member in 1990.

During his 43 years at Caltech, Kubota conducted extensive research in the field of fluid mechanics, focusing on topics such as hypersonic wake flows, supersonic turbulent shear flows, and supersonic boundary layer separation. He also served as a consultant to several engineering companies, including TRW and Lockheed.

In addition, Kubota held positions in the Society of Sigma Xi, the Physical Society of Japan, the American Physical Society and the American Institute of Aeronautics and Astronautics.

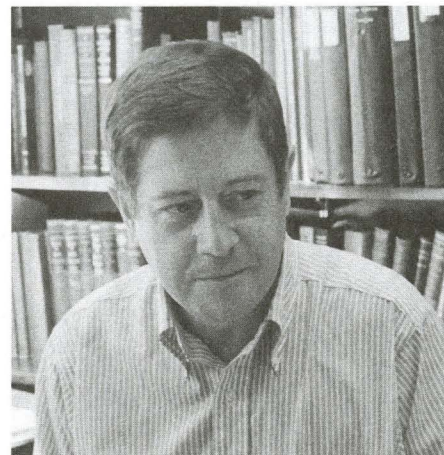
Kubota and his wife, Yoshiko, had three daughters, Misa Sophia, Miya Eliza, and Yuri Susan.



Toshi Kubota in the 1970s.

TERRY COLE 1931-1999

Terry Cole, PhD '58, senior faculty associate in chemistry and chemical engineering, and chief technologist of NASA's Jet Propulsion Laboratory for nearly two decades, died of cancer August 20 at his home in La Cañada Flintridge. He was 68 years old.



Terry Cole during the 1970s.

In addition to his Caltech and JPL posts, Cole was chair of the Summer Undergraduate Research Fellowships (SURF) administrative committee at Caltech.

Appointed JPL's chief technologist in 1980 (a position from which he retired last year), Cole had previously worked as a research scientist and manager at Ford Motor Company from 1959 to 1976. In 1976 he came to the Institute as a Sherman Fairchild Distinguished Scholar.

Cole expanded the SURF program in 1983 when he opened the door at JPL for the first students to work with technical staff at the lab. He became chair of the SURF administrative committee in the fall of 1989, and under his leadership, 1,525

students have participated in SURF. "He reached far and touched many students through his contributions to SURF," said Carolyn Merkel, director of the SURF program.

Born in Albion, New York, Cole received a bachelor's degree in chemistry from the University of Minnesota in 1954, before going on to earn his doctorate in the same field at Caltech. His organizational memberships included the American Chemical Society, American Physical Society, American Association for the Advancement of Science, and American Institute of Aeronautics and Astronautics.

Cole is survived by his wife, Margaret, son Vallance, and daughters Catherine and Sarah.



Caltech **N**ews