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Caltech News

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In This Issue

A Presidential Interview

A Poetic Undertaking

An Oily Enterprise



Caltech News



ON THE COVER

With Caltech embarking on an ambitious olive oil (not to be confused with oil drop) experiment, *Caltech News* asked artist Cathy Hill to adapt Vincent Van Gogh's *The Olive Pickers* to the occasion. The related story begins below.

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Up Front

BLACK GOLD, TECHER TEA



Oil entrepreneurs Ricky Jones '08 (left) and Dvin Adalian '09 hang out under an olive tree along Caltech's Olive Walk. Their impromptu foray into olive oil production this past winter has launched a new cultivation initiative on campus.

We may live in an era of diminishing petroleum resources, but two enterprising Caltech students recently alerted the Institute to the fact that it is sitting on valuable oil reserves. Not Brent Sweet Light black crude, alas, but Pasadena virgin light green—of the olive persuasion.

The Caltech campus has been home to dozens of Mission olive trees for approximately 80 years, but they've rarely been picked. While they've been admired for the shade they provide, they've also been blasted for the squishy, inky slime that they deposit on sidewalks when their overripe fruit drops to the ground. But the tradition of not-so-benign neglect is changing, thanks to sophomore Dvin Adalian and junior Ricky Jones.

The two students—both members of Ruddock House, where Ricky is president—were seeking relief from typical first-term stress last October, when they stepped outside for a study break, surveyed the parallel lines of trees along the eponymously named Olive Walk, and agreed that it would be an admirable diversion to concoct a batch of olive oil. Several hours later, exhausted from beating most of the olives off one tree with a large stick and then washing them, Adalian and Jones had dumped their impromptu crop into an ice chest and were preparing to leave it outside,

when Caltech president Jean-Lou Chameau and his wife, Carol Carmichael, out on a weekend stroll, stopped to chat. A longtime proponent of environmental sustainability, Chameau made the two students an offer they seemingly couldn't refuse: if Adalian and Jones could actually distill a respectable amount of olive oil, he and Carmichael would cook dinner for them.

Inspired by the prospect of a home-cooked meal, Dvin and Ricky scoured the Internet for olive oil production methods, then returned to the task a few days later. They put the cleaned and pitted olives in blenders and created a mush, which they then cooked in pots for a couple of hours in three kitchens in Ruddock. "It made a pungent odor that many didn't appreciate," admitted Jones. "It looked like excrement." But the noxious side effects of food processing weren't enough to stop Kraft from churning up Cheez Whiz or Hormel from spinning out Spam, and they weren't about to deter Adalian and Jones either.

To extract the oil, they first tried using a cinder block to press the resulting sludge through a plastic bag with tiny holes. When that didn't work, they borrowed some window screens and pressed the mixture through them, squeezing out 40 liters of liquid—mostly water—into a garbage

can. They skimmed the oil off the top, yielding half a liter of oil. "As it looked more and more like olive oil, we were getting more and more excited," Jones said.

But the final product didn't exactly look pristine—there was still some solid material floating around—so they consulted Bruce Hay, associate professor of biology. He put their mixture in one of his centrifuges, allowing the students to further refine the liquid and extract pure olive oil. They gave out samples to friends and family, and, at 10 p.m. one evening, they dropped by the president's house and presented a vial of oil to Chameau and Carmichael. And two weeks later, just after Thanksgiving, the promised dinner took place, complete with a tasting of the Caltech olive oil and some store-bought competitors.

"It had a different flavor from commercial brands, but I think it was on a par with them," Jones said. Added Adalian, "I thought it was good." Independent consumers were even more enthusiastic. "It was delicious," said Carmichael.

As word spread throughout campus about the students' epicurean feat, interest in expanding the olive oil enterprise started to grow. Dean Currie, vice president for business and finance,

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"A New Kind of World"

Growing up in northern France, in the province of Normandy, Jean-Lou Chameau seems to have discovered his principal affinities early in life: hard work, working with people, new experiences, and, last but not least, mathematics and science. He brought this outlook with him when he left the Old World for the new in 1976 to pursue graduate work in engineering at Stanford, and it has served him well throughout a career that has included faculty positions at Purdue University and Georgia Tech, time spent running a company, and, over the last decade, a move into the upper echelons of academic administration. In 1997, he was appointed dean of the college of engineering at Georgia Tech, and four years later he became the university's provost. Last summer, he was named the ninth president of Caltech. Chameau assumes the job at a time when issues that he has long championed—forging interdisciplinary and institutional collaborations and promoting global sustainability, to name two—have emerged as major themes on both the national and international stage. It's an environment in which, as he says, scientists and engineers have an increasingly complex and vital role to play, and to which Caltech, through its faculty, students, staff, and graduates, is poised to make unique and far-reaching contributions. He talked about these topics, and a variety of others, in an interview with Caltech News editor Heidi Aspaturian.

You gave a speech in 2000 in which you said that you thought the 21st century would constitute a Renaissance period for engineers. What did you mean by that?

Basically, I think it's simple. We live in a world that is being driven more and more by science and technology. That means that people educated in those disciplines have and will continue to have an advantage in life, as well as crucial opportunities to influence the world positively. I focused on engineering in my original lecture, because I was the dean of engineering at Georgia Tech at the time, but I think the comment applies equally well to people working in the sciences. We are dealing with very difficult, very complex problems. Recently, we had [New York Times columnist and Pulitzer Prize-winning author] Tom Friedman on campus talking about energy and how it relates to an amazing range of issues, including economic development, quality of life, health policy, and national and international security. It's so clear that we are really at a critical juncture for global society in the next 50 to 100 years, and that dealing with most of the critical issues facing us will require a very deep understanding of science and technology and how best to apply that knowledge. I think you can draw some valid parallels here with the Renaissance era, when Western Europe emerged from the Middle Ages to face a new kind of world. The issues today are very different, but we are once again finding ourselves at a unique inflection point in history. The forces shaping it are such that I think that scientists and engineers are likely to play an unusual, unprecedented role. And I hope that will be the case.

You've been on campus for just over six months now, so—here comes the inevitable question—how would you describe your initial impressions of Caltech? Has anything come as a particular surprise to you?

I had a good feel for what Caltech would be like before I started as president. I knew a number of faculty members, and I was well prepared by the faculty and trustee search committees when I arrived on campus last summer. Since then, I've been spending quite a bit of time getting to know students, getting acquainted with staff, and meeting one-on-one with each faculty member, so every day I'm learning more. If there has been one big discovery—and a very positive one—it is that I have found Caltech's students to be even more exciting and stimulating than what I had in mind. I knew they would be very smart, but they are so much more. They are irreverent, they are eccentric, they are dynamic, they are interested in all kinds of things, and I think that Caltech is perhaps unique in the concentration of talented and unusual people that make up its student body. At most universities, you expect to find a wide range of capabilities among the students, and here that range is very narrow—they are all extraordinarily capable. The chance to be with them and to experience that pleasure is very interesting and rewarding.

I think too that there is an outside perception that Caltech students for the most part are only interested in science, math, and engineering. I shared that idea to some

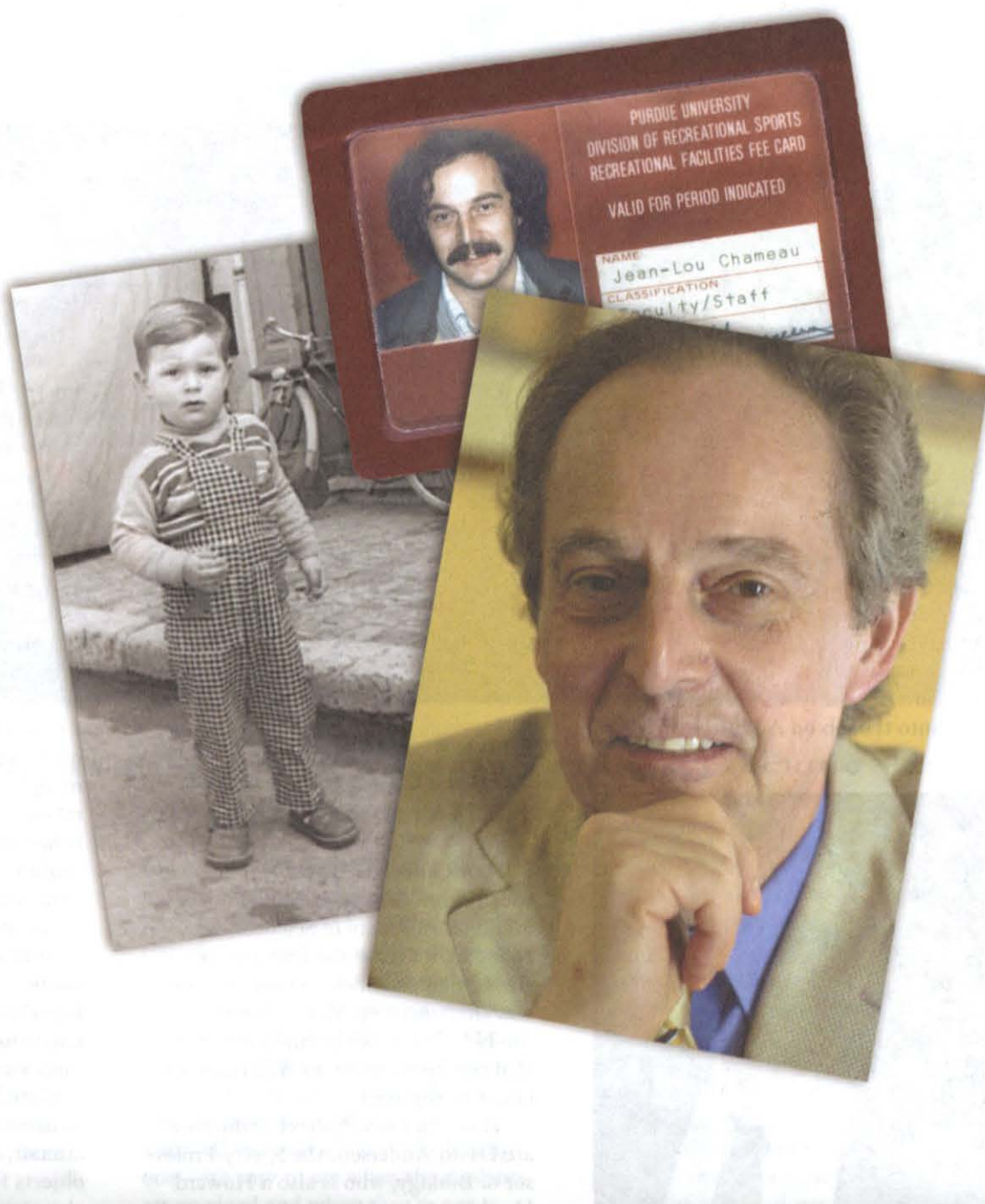
extent before I came, so it has also been a wonderful surprise to find that this campus also has outstanding musicians, and people who love sports and the theater and many other activities. What I like is that Caltech provides extracurricular opportunities for them that are in many respects as good as what they would have at a larger university. In fact, they're likely better, because they are all available on a smaller scale, which makes for closer and more meaningful interactions. That, too, is a very positive thing.

How are you going about meeting students?

My first sustained encounter was at Freshman Camp, and since then I have tried to find ways to interact with both undergraduate and graduate students as much as I can, and to make sure that students have opportunities to communicate easily with me, both formally and informally. I've been to dinners at the student Houses, attended musical and sports events, a meeting of the Caltech Entrepreneur's Club, and this year's Theater Arts production of Shakespeare's *A Winter's Tale*, among many other activities.

Overall, it is very simple for me: if you are in academia, it is because you have an interest in students. Otherwise there is no reason to be here! I have spent more or less time with students at different stages of my career, but the opportunity to spend time with them has always been a driver—a strong motivating factor, if you will—for me. Caltech offers some great advantages here because, while you will never get to know all of the students, the Institute's small size makes it possible to establish genuine connections with many of them. Georgia Tech is not a huge university, but it was large enough that it was hard for me to actually know many students. Here at Caltech, I expect that the numbers will be much larger, and that I will also have a chance to get to know what some of their interests are, and what's important to them. I will get to know some of their families too. I find it to be a wonderful new opportunity.

Continued on page 6 . . .



The Making of a President. Top, clockwise from left, Chameau as a pensive youngster in his native Normandy; as a young Purdue University professor in the 1980s; and as a newly appointed president waiting to be introduced to the Caltech community last summer. Above, at Frosh Camp in September, he indulges in one of his favorite activities: spending quality time with students. Dean of students and acting vice president for student affairs John Hall is seated to his left.

STOLPER NAMED CALTECH PROVOST

Edward Stolper has been appointed Caltech's ninth provost, reprising a role he temporarily assumed in 2004 when he served for a time as the Institute's acting provost. Stolper, a member of the Caltech faculty for 28 years, will step into the job on August 1. In a



tidy piece of symmetry, he succeeds Paul Jennings, PhD '63, who is himself completing a second tour of duty as the Institute's top academic officer and who took over from Stolper after Stolper stepped down as acting provost three years ago.

Professor Paul Wennberg, head of the faculty search committee for the new provost, observed that "Ed Stolper is an engaging and energizing presence in our community. His passion for and intimate knowledge of the Institute greatly impressed the search committee." And in a letter to the Caltech community announcing the appointment, the Institute's president, Jean-Lou Chameau, noted that the search committee had described Stolper as remarkably effective at recruiting, developing, and retaining outstanding faculty, and at engaging the faculty in promoting diversity.

"While maintaining an active research program, Ed simultaneously undertook significant administrative roles, proving himself to be an effective and visionary leader," said Chameau. "Ed is committed to the continued excellence of Caltech's educational and research programs and is an effective and eloquent advocate for students, faculty, and staff."

Stolper, who was named Caltech's Leonhard Professor of Geology in 1990, studies the origin and evolution of igneous rocks on the earth and other planets, and chaired the Institute's division of Geological and Planetary Sciences from 1994 to 2004. He joined the Caltech faculty as assistant professor of geology in 1979 after earning

his BS from Harvard, his MS from the University of Edinburgh, and his PhD from Harvard. He was promoted to associate professor in 1982 and to professor of geology in 1983. His honors include election to the National Academy of Sciences in 1994 at the relatively youthful age of 41.

EIGHT WITH CALTECH CONNECTIONS NAMED TO NATIONAL ACADEMY

Four Caltech faculty and four Institute alumni have been named to the National Academy of Sciences, accounting for more than ten percent of the 72 new members, whose election was announced on May 2. Election to the NAS is one of the highest honors that can be accorded an American scientist or engineer.

This year's new Caltech inductees are David Anderson, the Sperry Professor of Biology, who is also a Howard Hughes Medical Institute investigator; William Johnson, PhD '75, the Mettler Professor of Materials Science; Charles Plott, the Harkness Professor of Economics and Political Science; and Mark Wise, the McCone Professor of High

Energy Physics. Their election brings total Institute membership in the NAS to 76 faculty and three trustees.

David Anderson's work has led to the identification of stem cells in the embryonic nervous system, and to the discovery that embryonic arteries and veins are genetically distinct even before the onset of heartbeat. More recently, in collaboration with Boswell Professor Emeritus and Crafoord Laureate Seymour Benzer, he has undertaken a new initiative to develop and apply novel molecular biological tools to mapping and manipulating the neural circuits involved in innate animal behaviors, particularly fear. The work could have implications for enhanced understanding of underlying emotional states in humans.

William Johnson's research includes studies of metallic materials such as liquid alloys, bulk metallic glasses, nanostructured metals, and metal-matrix composites. He also works on applications of metallic glasses for structural materials in sporting goods, aircraft, military hardware, and other objects for which custom-designed characteristics are an advantage. Those who use liquid-metal golf clubs and tennis rackets are indebted to his discoveries.

The only economist elected to the NAS this year, Charles Plott conducts

research that focuses on the behavioral foundations of economics and political science; laboratory experimental methods; and regulation, deregulation, and policy design. His fundamental work on experimental economics has isolated the equilibration process of large, multiple market systems and information flows in markets. He has contributed extensively to the design of special, electronic market processes that are used throughout the world, and his work is widely used in the development of regulatory mechanisms.

Mark Wise is involved in the field of high-energy physics, where he has developed information on the essential characteristics of particles and how they interact with each other to create the physical world. Among his accomplishments are the discoveries of heavy quark-mass expansion and heavy quark symmetry in quantum chromodynamics, which led to a quantitative theory of the decays of c- and b-flavored hadrons. These predictions are important for determining from experimental data the values of some of the parameters that occur in still another law that describes the weak interactions of quarks.

In addition to Caltech's four faculty, four alumni have been elected to the NAS. They are David Agard, PhD '81, investigator with the Howard Hughes Medical Institute, and professor in the department of biochemistry and biophysics at UC San Francisco; Steven Block, PhD '83, professor of applied physical and biological sciences at Stanford University; Harold Stark '61, professor of mathematics at UC San Diego; and Clifford Will, PhD '71, McDonnell Professor of Physics at Washington University in St. Louis. Caltech professor Johnson, who is also an alumnus, can now claim membership in all three categories.

The NAS is a private organization of scientists and engineers dedicated to the furtherance of science and its use for the general welfare. It was established in 1863 by a congressional act of incorporation signed by Abraham Lincoln that calls on the academy to act as an official adviser to the federal government, upon request, in any matter of science or technology.

More than 200 alumni, students, faculty, and friends turned out for "It's All about ME," a celebration of the centennial of Caltech's mechanical engineering department, on March 30–31. The two-day event, chaired by Hayman Professor of Mechanical Engineering Chris Brennen and retired environmental and energy CEO Tom Tyson '54, PhD '67, included a reenactment of some of the highly popular Mechanical Engineering 72 design competitions and Summer Undergraduate Research Fellowship (SURF) presentations, as well as a poster session highlighting graduate and undergraduate research achievements, and talks by faculty and alumni speakers. At right, senior Cindy Ko shares a white-knuckle moment with junior Chris Schantz and a ramp-scaling robot during a reprise of an ME 72 competition, and, below, attendees gather for a reception on the Athenaeum patio.



RECOGNITION

For an up-to-date list of awards and honors bestowed recently upon Caltech faculty and staff, go to <http://today.caltech.edu/today/on-campus.tcl> and scroll down to Honors and Awards in the right-hand column, as well as to the Archives link in that section.

INAUGURAL WILL COINCIDE WITH COMMENCEMENT

Jean-Lou Chameau, who has served as Caltech's president since September, will be inaugurated in a simple ceremony at the start of Caltech's 113th annual commencement on June 8.

A presidential inauguration offers an institution a chance to connect with all of its constituencies, and can be used to set the tone for what's to come. Accordingly, Chameau has said that his inaugural, at which he will officially assume the mantle as the head of the institution, should reflect his priorities and not be lavish.

A campus committee suggested combining his inauguration with commencement when students and their parents, faculty, staff, trustees, and other friends of the Institute would be in attendance anyway. A casual outdoor lunch will be held earlier that week to allow members of the Caltech campus community who do not attend the commencement ceremonies to participate in the celebration.

"I think those who've gotten to know me over my first few months at Caltech, and certainly those on the search committee, will understand my reluctance to focus attention on myself especially if it involves a significant expenditure of resources," Chameau said. "It feels right that my inauguration ceremony should be one that places a greater emphasis on the accomplishments of students and one that brings together the members of the Caltech community."

The inauguration will be brief, but will include the key elements of a traditional ceremony. Delegates representing national and local universities and institutions, including those that Chameau attended or worked at, will be invited. Trustee Chairman Kent Kresa will place the traditional academic regalia on Chameau. The passing of Robert Millikan's academic hood to the new president has become a Caltech inaugural tradition. (Although he never accepted the title of president, Millikan was the first administrative head of modern-day Caltech.)

Chameau will speak briefly on his Caltech experience to date and outline his goals. Consistent with his emphasis on the students, Chameau has requested that a student speaker be part of the official program. The traditional commencement ceremony will immediately follow.

As reported in the last *Caltech News*, Pulitzer Prize-winning author Jared Diamond will be the commencement speaker at this year's ceremony.



PLANETARY ASTRONOMER MIKE BROWN AWARDED FEYNMAN TEACHING PRIZE

Planet hunter and Pluto demoter Mike Brown has been awarded Caltech's most prestigious instructional award, the Feynman Prize for Excellence in Teaching. The prize, which is presented annually to a faculty member for "exceptional ability, creativity, and innovation in both laboratory and classroom instruction," commemorates the invigorating classroom style of Nobel Laureate and physicist Richard Feynman, who taught on campus for more than 30 years.

The discoverer of Eris, Quaoar, Sedna, and a bevy of other dwarf planets roaming the outer solar system, Brown received an outright cash bonus of \$3,500 and by now has no doubt also discovered that an equal amount has been added to his annual salary.

"I'm thrilled," said the Feynman Prize's fourteenth recipient after Caltech's provost Paul Jennings, PhD '63, announced his selection at a recent Institute faculty meeting. "I never interacted with Feynman, but the people who have won the award in the past are the teachers I have a huge amount of respect for. So it's a fantastic honor."

The Feynman Prize is endowed through the generosity of Ione and Robert E. Paradise, with additional contributions from Mr. and Mrs. William H. Hurt. It annually honors a professor who demonstrates, in the broadest sense, unusual ability, creativity, and innovation in undergraduate and graduate classroom or laboratory teaching. Winners are selected by a committee of students, former winners, and other faculty.

According to Jennings, Brown was singled out for the award because of "his extraordinary teaching ability, his skill in exciting his students, and his evident caring about his students' learning."

"Mike is first recognized for his contribution to Geology 1, Earth and Environment, which he has taught since spring 2005," said Jennings, adding that although Brown is a professor of planetary astronomy, "he volunteered to teach Ge 1 because he wanted to learn the geology material himself." Brown's autodidactic tendencies certainly paid off for his students, one of whom informed the Feynman Prize committee that "Attending [his] fun and engaging lecture to break the monotony of core classes was the best part of our day."

Like many outstanding teachers, Brown confesses to sometimes finding that "teaching is terrifying. It's the most stressful thing I do. I have given countless presentations over the years about my research, but it is nothing like the classroom experience. Around here, you always feel like you're just keeping your head above water when you lecture students. You can't teach and not have some off days, and you know all too well when you're having one—it's easy to see when the students are engaged and when they're not."

"I guess that's why I try so hard to teach well—I hate that feeling of knowing the students realize I'm having an off day."

Teaching a survey course for nonmajors at Caltech poses particular challenges and opportunities, he adds. "At a state university, you often find 'rocks for jocks' courses, which are designed for people who aren't going into science but are just trying to get their degrees. Here, we don't have any nonscientists, so the question is what is going to expand their horizons." His answer has been to design a course that focuses on the field as an observational science. "In geology, you take what you're given—you can't drill to the center of Earth to see what's there, or go back in time to see what happened—so the laboratory experience is different from the one in chemistry or physics or biology."

As for Brown's graduate-level course, Formation and Evolution of Planetary Systems, students credit their professor for making them feel as if they are part of the scientific process. As one graduate student put it, "We could watch the formation of the solar system unfold in front of us, like a good book that we couldn't put down."

The latest chapter in Brown's research career has to do with his ongoing investigations in the Kuiper belt region of the outer solar system. In March, he and graduate students Kristina Barkume, Darin Ragozzine, and Emily Schaller reported in the journal *Nature* that one of the Kuiper-belt objects Brown previously discovered shows signs of having been struck by a smaller body 4.5 billion years ago. The discovery sheds new light on the dynamics of solar-system formation, and could help lead to a better understanding of how both the sun's family of planets and more distant solar systems formed. As is often the case where scientific publications are concerned, Caltech's press release reporting the discovery carried an embargo on the announcement date, prompting one journalist to inquire, "How can you embargo something that happened 4.5 billion years ago?" It's the sort of conundrum Richard Feynman would have appreciated.

CALTECH TO COHOST "FIFTY YEARS OF SPACE EXPLORATION"

On September 20 and 21, Caltech's Graduate Aeronautical Laboratories (GALCIT), Northrop Grumman Space Technology, and JPL will host an international conference celebrating the 50th anniversary of space exploration, which began with the launch of the Sputnik satellite in 1957. The event will offer an in-depth look at the past, present, and future of space flight and exploration, from the perspectives of an internationally recognized group of speakers, including Institute trustee and former astronaut Sally Ride and the first scientist and, thus far, last man to walk on the moon, former astronaut Harrison "Jack" Schmitt, PhD '57. To find out more or to register for the fall event, which will also include a reception, dinner, and exhibitions, please go to <http://www.galcit.caltech.edu/space50/>.



Chameau . . . from page 3

Has there been anything else about the environment here that came as a particular surprise to you?

Learning the extent to which Caltech historically has been and still is engaged in ambitious, very large-scale projects has been somewhat surprising. Again, it's a case in which appearances are deceptive. From the outside, you wouldn't necessarily think we would be involved in projects with the scope of the Keck and Palomar Observatories, or LIGO, or managing the Jet Propulsion Laboratory. There is, I think, a particular excitement that goes along with being able to accomplish so much while appearing from the outside to be relatively small. To me, it's an especially interesting aspect of the Institute.

You spent ten years in high-level academic administration at Georgia Tech. What are you bringing from that experience to this job at Caltech?

In my job as dean of engineering and then provost at Georgia Tech, I think I was always a person who got considerable satisfaction and motivation out of the fact that I was always working with and helping smart people. I enjoyed dealing extensively with faculty, staff, students, alumni—all of the university's stakeholders—and fostering relationships, developing new initiatives, seeking consensus, and being a bit of a cheerleader for the institution as well. I think that at different times in their evolution, organizations need different people to lead them, and that Caltech was looking for a person with those kinds of skills and qualities at this stage in its development. It didn't have to be me, but I'm happy that it is. And overall, I am a person who tries not to look back too much. My inclination is to look ahead and move forward, and I am approaching Caltech in the spirit of seeing it as a new adventure, a new realm. I tend to believe that whatever earlier experiences you have had will, ideally, prepare you well for whatever new challenges you undertake, and that is essentially the perspective I am bringing to this job.

Would you say then that you find the dealing-with-people aspect one of the most rewarding parts of being an administrator?

It is, definitely. I always say to people: if you do not find this kind of interaction rewarding, do not get into a leadership position. If you want to take a leading role in an organization, and especially in a university environment, you have to be willing to serve and be comfortable with being rewarded by the accomplishments of other people and the institution, rather than by your own achievements. Sometimes, people who seek these leadership roles tend to forget that. There is a bit of glory that comes with such positions, but they basically consist of hard work and serving people. And if that isn't in your mind or in your way of enjoying life, you should not do it.

This idea of working hard, and enjoyment of working with people, came early in my life. I come from a relatively modest family and background, and I was taught from a young age that hard work was expected of me. This applied to school too: My parents did not themselves have a higher education, but they always pushed me toward getting a good education.

Were you interested in math and science from a young age?

In high school and early on in college, I really loved mathematics. My dream would have been to be a mathematician, but I felt I was not quite good enough, and also my parents told me that I would make more money as an engineer. And then I did well on the entrance exam for an elite engineering school in France, and was offered admission. It was one of those offers you just don't refuse, so I became an engineer—not by design, but without regrets.

How did you happen to come to graduate school in the United States?

It was totally, purely by accident. When I was an undergraduate, I happened to hear a talk by a former student—a Frenchman—who had received his PhD from

The Evolution of an Engineer. At left, Dean of Engineering Chameau works with Georgia Tech students in 1999, and, below, right, ponders a problem in Lego design with Caltech undergraduates at Frosh Camp '07.

Caltech. He described how you could get fellowships to study in the United States. This was the first time it had occurred to me that such a thing was possible, and I thought, "Well, why not?" I looked into it, and I ended up going to Stanford. At the time I thought I might be in the United States for one year at the most; now it has become a lifetime.

Looking back, was there any sense of culture shock when you encountered the United States?

If I had landed in the middle of Kansas or South Dakota—and I have since been to these places—there would probably have been more of one. But, you know, I started in the Bay Area, near San Francisco, and there was not much sense of dislocation. I think for some people there is—I had friends who came at the same time that I did, who never really adjusted well and, in fact, did not stay. But I think I am the type of person who enjoys new situations—getting to know new people, places, and ways of doing things, and encountering different cultures, so it was never an issue for me. The West Coast and Northeast regions of the United States are really areas where Western Europeans in particular quite quickly feel at home. Other parts of the country might require more time to adjust to, but I think it also depends on the person.

Overall, it is very simple for me: if you are in academia, it is because you have an interest in students. Otherwise there is no reason to be here!

Have you personally ever found it a disadvantage to be foreign-born and to have come to America as a young adult? Some parts of this country are still pretty insular.

I will say no. You will always find a person here and there, from time to time, who has, let's say, some reluctance to interact with someone of foreign origin, but this can occur anywhere in the world. It happens here, it happens in France, in China. On the rare occasion when this has happened to me, I don't pay much attention to it, and I don't view it as reflecting what the majority of people think or do. Some people do get sensitive when they encounter these attitudes and, especially since 9/11, some people have told me that they have felt less welcome in the United States—but this has never been true in my case, and I think that I have almost always found my background to be an advantage. I think that fundamentally your success with people is not a function of where you come from. If you can relate well to people and be open with them, then they will react well to you.

You were certainly a strong proponent of overseas study programs for students at Georgia Tech and active in establishing new exchange programs there. Would you like to do more of this at Caltech?

The Institute already has a number of such programs with different universities, and I think there is a desire among faculty to respond to the rising level of student interest. I don't know exactly what the numbers should be yet, but I definitely want to encourage it. As you can imagine from my own history, I'm a strong believer in the idea that it's advantageous for young people to have the opportunity to experience at least two different cultures, particularly in our increasingly global society. At the same time, I think it has to be a meaningful experience. Going overseas for a few weeks on vacation



is fun and enriching, but what you want to offer students is enough time to appreciate other cultures and discover for themselves how people in other parts of the world act, think, and behave, and how they might approach and solve problems differently. Georgia Tech was different from Caltech in that it has the largest engineering program in the country, graduating almost 1,300 undergraduate engineers a year. Many of them, especially those with bachelor's degrees, will go into industry, and it is very important for such students to have overseas experience, because that is what their employers will expect from them. At Caltech, we are talking about much smaller numbers, and a good number of our students will be going on to advanced degrees and research positions. I still think it is very valuable for them to benefit from cross-cultural experiences, but there are different ways to achieve that, depending on the university. Our small size is an advantage for developing deep and meaningful experiences. Conceivably, we could see students spending six months or a year doing research in a lab in England or Hong Kong, or whatever environment is most appropriate to them. That would be one of several possible ways to offer the experience.

Promoting and sustaining collaborations—with industry, across disciplines, and with other universities—has figured prominently in your administrative and academic career. Can you talk about how they emerged as interests for you?

My interest in industrial collaborations partially came about because I left academia to become president of a private company in the mid-1990s. It was also in part because cultivating relationships with industry is natural for engineers. Without citing specific names, I think one of our successes at Georgia Tech was to help forge relationships with corporations and industry that were designed to be long-term. I don't think that universities should be extensively involved in short-term projects with the public sector. It is not what we do: we are here to educate, to do research, and to look at issues and trends over a long time-horizon. To do that well, I think it is best if you develop relationships with corporate partners that will last for a number of years, and show these partners how their competitiveness will benefit over time from a long-term partnership and outlook. That's what I promoted the most at Georgia Tech, and we had good success on that front with a number of large companies.

That's one end of the spectrum. At the opposite end, of course, is the fact that universities are getting more and more involved in the commercialization of their research and discoveries. They must make sure that the process is as effective and painless for the faculty as possible, and that it is also an intellectually and personally enriching experience for them. This is something that Caltech already does very well. The Office of Technology Transfer, led by Fred Farina, who is a Caltech alum, and prior to him, Larry Gilbert, has been a great model for how this kind of thing should be done. It was very pleasing to see an article in the *New York Times* in January where Caltech's program was singled out as being among the best of its kind in the country.

Interdisciplinary and institutional collaborations were efforts that I helped to initiate because, again, they seemed like both the right and the logical thing to do. Dealing with my colleagues in the 1980s and the 1990s, I started to realize—and it is even more true now—that the most effective way to approach many of the issues we were facing was to bring people from many disciplines and perhaps from different institutions together, and that historically universities were not necessarily well organized to facilitate research along these lines. So a number of us began to think about how best to engender and promote that kind of environment and how to get things moving in the right direction. That's basically the way it happened. There is always in life a bit of vision, a bit of strategy, and a bit of simply reacting to needs and opportunity. Very often you will develop a strategy or put something into place simply in response to a need, and after it works, people will ask, "How did you happen to have that grand vision?" But it was no grand vision: it was a need, and what you've actually done is to meet it.

One very useful thing I have learned from these experiences is that all these types of collaborations work best when they are driven by faculty interest. The administration should support, promote, and facilitate these partnerships and programs, and work to remove hurdles that might exist, but I think the main movers should always be the faculty.

Global sustainability has been another of your ongoing research and administrative interests. This area is on everyone's radar screen now, but when you first got into the field in the early 1990s, that was not the case. What motivated you, and how did your involvement come about?

I did get interested in this area early, although others were certainly thinking about it too. That was less a case of being driven by need and opportunity and more a matter of really believing in something. I was a civil engineer at Purdue University in the 1980s, a time when civil engineers were starting to get more and more involved in environmental issues. Part of my research involved working with firms that had some activities in those areas, and at some stage, I started to feel that basically we were addressing the wrong problems. We were trying to solve the problems after the fact, rather than trying to prevent them from arising in the first place. You're polluting something, you create an environmental hazard, and then you try to clean it up. So out of this came the idea—and for me, initially, it came in an educational context—that we ought to try to educate scientists and engineers to think more broadly about these types of challenges, and encourage them to see if they can design systems and processes

that are a bit easier on the environment, that use less energy, fewer resources, and so on. Although I approached it from the engineering standpoint, I realized that there were people in areas like ecology, and in particular, architecture, who were also seriously thinking about and working on these questions. The 1992 International Environmental Summit in Rio de Janeiro also helped focus global attention on these issues, and so you had all these factors beginning to come together at the same time. By this time I was at Georgia Tech, and talking to colleagues there as well, and we got the idea of starting a university program—the Center for Sustainable Technology—to look at those issues. I left soon after that to take a job in industry, and when I returned to the campus in 1995, the center and its programs were really in the process of taking off, and had become quite significant—it's now the Institute for Sustainable Technology and Development. Once I became dean of the college of engineering in 1997, my role became very much more that of a facilitator to keep promoting the ideas, while there were lots of more talented people who got directly involved in doing the research and educational aspects of these programs.

How did you and your colleagues go about generating interest in the field at Georgia Tech?

Talking about it! Well, as you might expect, there were initially some arguments as to whether it was a worthwhile idea. You fast forward to 2007, of course, and even the president of the United States is finally acknowledging that we have issues to deal with. But this was not the case 10 or 15 years ago. Even in the early 1990s, we had many more skeptics than supporters, so keeping attention and discussions focused on the many positive and pragmatic reasons why we should be looking seriously at these questions turned out to be very important. I recall several corporations, including a few based in Atlanta, who were initially not happy with having a local university initiate a program along those lines. But here we are now, more than a decade later, and I know that at least from a marketing standpoint, they have become supporters. For me, I think there was also some appeal in doing something positive and productive that ran a bit counter to the usual thinking. In life you always like to do things that are a little bit at odds with what other people think, and it was nice for a while to be engaged in something that was not in the mainstream.

Not in the mainstream. Would you say that you consider yourself a bit of a contrarian?

I have to say—well, I don't see myself quite in that light. Part of having French roots—the French culture—is that we like to question things and be skeptical (very often, too much!). I always like to try to look at the opposite side of the coin. It doesn't mean that I will end up on that side but I like to know what is over there. You frequently learn a lot by playing the devil's advocate: there is usually information that comes out as part of that discussion that is useful to a decision.

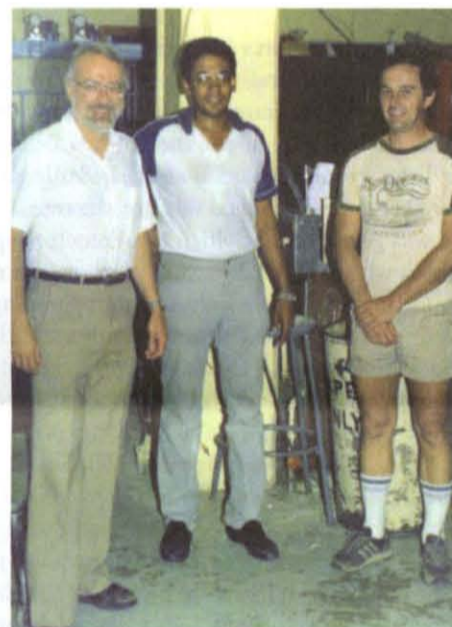
Sustainability has gone from being a tough sell to a universally acknowledged hot-button issue. What role do you envision playing at and with Caltech in helping to keep the current level of interest alive?

I think that our role here is to keep raising the flag—to make sure that this area remains a priority for the Institute in our scientific undertakings, in our education, and also more and more in the way we run our campus—the way we develop new facilities, maintain existing ones, use energy, and take care of our physical plant. We are very good at preaching in academia, and I think we should keep being good at it through our research and education. At the same time, in an area like this, especially, you are not very credible if you don't also try to practice what you preach.

Is there a scientific or historical figure you particularly admire? Or both?

There is one scientist whom I never met—obviously, since he died in the early 19th century—who has always greatly appealed to me. That is the French mathematician Évariste Galois, who is viewed as one of the founders of modern mathemat-

Continued on page 8 . . .



Chameau, who began his academic career as a professor at Purdue, is shown here (right) in 1986 with fellow civil engineering professor Robert Holtz (left), and graduate student Siva Sivakugan.

Chameau . . . from page 7

ics, particularly modern algebra. He died at the age of 20 in a duel over a young lady. He was a mathematical genius, and the legend—which seems to be a bit exaggerated—is that he wrote down a major part of his most important work in the night before he died. He was my hero for a while when I was young, partly because of my early ambition to be a mathematician and partly because when you're very young you think that dying in a duel is a kind of romantic ideal. More seriously, or maybe just more maturely, I have always greatly admired Albert Einstein as someone who was never afraid to think differently, both as a scientist and as a human being. Being at Caltech, where he spent some time and where his influence can still be felt, has been very exciting and inspiring.

We work on long-term problems, but it is important to show the public and all of our stakeholders that what we do has a relationship to the world at large and to the issues societies and the world are facing.

Historical figures I am drawn to? There is one in particular—the French leader and politician Charles de Gaulle. I was born in 1953, so I did not live through the period when he rallied France and the French Resistance during World War II, but of course I grew up knowing about the heroic role that he played. The fact that he had the courage and the strength to go against the ruling establishment during World War II and to say that the real France was not the one being led by the government in Vichy, and that he was going to embolden the French people to fight on—there are few people in the world who demonstrate that kind of guts and vision and sheer determination under any conditions. So while I am far from agreeing with some of the things he did when he went on to serve as France's president, I admire some of the politically risky actions he took then as well. He was willing to stand up and say it was time to disband France's colonial empire. These qualities of his have always impressed me.

How about ideas or books that may have had a strong influence on you? What have you read recently?

I am fairly eclectic in terms of what I read, but I haven't had that much time to read books lately! I really like Tom Friedman, and have recommended his book *The World Is Flat* to others. I also like very much Jared Diamond's books, *Guns, Germs, and Steel*, which won the Pulitzer Prize, and *Collapse*, about the conditions under which societies ultimately succeed or fail. I am really delighted that he will be giving the graduation address for my first commencement at Caltech.

As for novelists, I would say the Russian writer Dostoevsky, and the French novelist Émile Zola. My favorite Dostoevsky novel is *The Gambler*, which perhaps says something about me.

That would be the one he dictated to the stenographer he later married—as with Galois, another real-life romantic tale.

Ah yes, well, perhaps that says something about me, too.

The Pasadena Weekly has reported that both you and your wife, Carol, are Grateful Dead fans. Did you ever attend one of their concerts?

Yes, I did once in Chicago, as a matter of fact, in the early to middle 1980s.



On the day he was named Caltech's president (left), Chameau was welcomed to campus by members of the presidential search committee, including Atkins Professor of Chemistry and Nobel Laureate Bob Grubbs and Professor of Physics Nai-Chang Yeh. A few months later, at his first Caltech convocation, it was his turn, along with Pauling Professor of Chemical Physics and Nobel Laureate Ahmed Zewail, to welcome entering students.

What are some of your other extra-curricular interests?

I love cooking, and in fact for a while I considered a career in restaurant work, but it's just too hard. It's easier being an academic! But I'm finding outlets for my culinary interests on campus. One of my most enjoyable informal venues for meeting students has been at the cooking classes organized by Caltech's office for student affairs. The olive oil concession is going well. [See *UpFront*, page 2.] This fall we will have a harvest festival with this project as a centerpiece. I love skiing too. I haven't done any this year, but I am definitely planning to next year.



Chameau and his wife, Carol Carmichael, met when both were working at Georgia Tech.

By then you will have spent more than a year at Caltech. Looking ahead, where would you like to see the Institute, if not in the next year, in, say, the next ten years?

First I should say that I am not the type of person who comes to a new place and position with "the grand vision." Usually, it does not work, and it would be very foolish at a place like Caltech with a great history of success. So, at the moment, like any Caltech student, I am learning, trying to get to know the outstanding people we have on campus and getting acquainted with their accomplishments. I have also been devoting quite a bit of time to understanding the Institute's finances. We must ensure that our faculty and students have the support they require to fulfill their aspirations, and to do so we need to manage our resources better. In particular, I think we should increase our focus on building the Institute's endowment, and I intend to be very consistent about this in our development plans. In these efforts, we will need the help of all our friends and alumni.

When I think about Caltech a decade from now, I keep coming back to a remark that Professor Ahmed Zewail made at this year's Freshman Convocation, when he described the Institute as "a place where we dream with focus and freedom." For me that comment summarizes very well what Caltech is about and where it should be in about ten years. Now, even more than in the past, the Institute needs to keep its emphasis on doing big things—making the significant discoveries and contributions that can change the world. This goal should be driving us, but achieving it is getting to be a more and more difficult task in the current environment. I would like Caltech to have the resources it needs to ensure it can continue doing those unusual and outstanding things regardless of the national situation.

I also see us doing more and more work across disciplines, in both fundamental and applied scientific areas because, as I mentioned earlier, the crucial issues facing our nation and the world are less and less likely to be problems that can be addressed without bringing together insights, techniques, and expertise from different research fields. We should continue to capitalize on Caltech's historic strengths in pursuing fundamental science, but with connection to the issues the nation and the world are facing. In addition to our continued leadership in areas like space exploration, geophysics, astronomy, engineering, physics, biology, and others, I think we will be talking more about energy, the environment, scientific medicine, bioengineering, and so forth. Now, trying to address these critical issues for society doesn't imply that you are addressing them for tomorrow morning. We work on long-term problems, but it is important to show the public and all of our stakeholders that what we do has a relationship to the world at large and to the issues societies and the world are facing. This is a message that we have to find new ways to articulate, and it has to be delivered consistently, by the president, by the faculty, as well as by students and staff who are involved in such efforts.

We also need to provide a "Caltech experience" to our students that reflects the uniqueness of the Institute and leverages its strengths. Caltech is small, and our "smallness" should lead to an experience on campus that clearly differentiates us from other universities, including the opportunity for one-on-one interaction between faculty and students. Our students' opportunities for growth and personal development, academic and nonacademic, should be unparalleled. We can develop a true community of scholars and leaders who care about the world. I also hope that this community can become more diverse. This can only enhance our culture and future opportunities as we prepare for a more and more complex and global world.

Finally, I would like Caltech to have an organizational infrastructure that operates at the same level of excellence as its educational and research programs. No university can currently make that claim, and I see no reason why the Institute, which has achieved so many scientific breakthroughs in its history, should not be a pioneer in this realm as well. Achieving this objective can only further the ability of our faculty and students to "dream with focus and freedom."



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THE CAMPAIGN

CAMPAIGN HIGHLIGHTS

Pulitzer Prize-winning journalist Thomas L. Friedman visited campus earlier this year as the inaugural speaker of the **Chen-Huang Sustainable Energy Seminar Series**. In a conversation held in Beckman Auditorium with Nate Lewis '77, MS '77, Caltech's Argyros Professor and professor of chemistry, Friedman commented on various aspects of energy independence and policy and their relationship to the environment and to national security.

Speaking before a campus-wide audience of several hundred listeners, Lewis and Friedman also discussed technological developments that can help meet the challenge of producing sustainable and cost-effective clean energy. As foreign affairs columnist for the *New York Times*, Friedman writes extensively on these topics. Most

has established the **Joseph J. Jacobs Institute of Molecular Engineering for Medicine**. The project's \$10 million lead gift was provided by the late Joseph J. Jacobs, founder of Pasadena-based Jacobs Engineering Group, Inc., and his wife, Violet. An additional gift from Arrowhead Research, Inc., has also supported the institute.

"The generosity of the Jacobses will allow Caltech to partner with the national and the local medical community in cutting-edge research in molecular engineering," says Paul Jennings, PhD '63, provost and professor of civil engineering and applied mechanics.

By facilitating collaboration between Caltech and medical experts worldwide, the Jacobs Institute will enable the development of revolutionary methodologies for diagnosing and treating



New York Times columnist Thomas Friedman (center), the first speaker in Caltech's new Chen-Huang Sustainable Energy Seminar Series, is joined (from left) by Caltech chemist Nate Lewis, Marina Chen, president Jean-Lou Chameau, and Chi-Fu Huang.

recently, he is the author of *The World Is Flat: A Brief History of the Twenty-First Century*.

Institute alumna Marina Chen, PhD '83, and her husband, Chi-Fu Huang, were inspired to endow the Chen-Huang Sustainable Energy Seminar Series after hearing Lewis give a presentation on his alternative energy research to the East Coast Associates. With the crucial need for society to develop alternative and sustainable energy sources, Caltech is playing a key role and fostering innovative research in a number of areas. The seminar series will augment these efforts by bringing distinguished speakers to campus to offer perspectives on the many dimensions of energy, from the supply chain to end use and policy implications.

To address today's most challenging problems in clinical medicine, Caltech

disease. The focus will be on molecular engineering, biotechnology, and the design of new biomaterials that may lead to innovative treatments for conditions such as heart disease, spinal cord injury, cancer, diabetes, Parkinson's disease, and lung disease. David Tirrell, McCollum-Corcoran Professor and professor of Chemistry and Chemical Engineering, and chair of the Division of Chemistry and Chemical Engineering, is serving as the institute's inaugural director.

Jacobs, who died in October 2004 at the age of 88, was a lifelong industry leader and philanthropist who made substantial contributions to humanitarian and social issues throughout his career. A longtime member of the Caltech Associates, he developed an interest in many areas of Institute research through his interactions with faculty.

DARYN KOBATA



Caltech's buildings and grounds crew learned about the ins and outs of olive cultivation from expert Craig Makela, of the Santa Barbara Olive Company, in a talk on campus this spring.

Olives . . . from page 2

asked Delmy Emerson, director of buildings and grounds, to look into the potential for olive oil production on campus. Until two years ago, Emerson's staff had been spraying the trees to suppress their olive production. Now she'd have to learn how to set them free.

In late November, she embarked on her own olive oil experiment. "We collected 250 pounds of olives from Caltech trees and produced three gallons of oil" with the help of a nonprofit olive oil producer in Ojai, she said. Buildings and grounds designed its own labels—calling the oil Caltech's First—featuring a photo of the Olive Walk. In December, samples of the oil were presented to members of the Caltech Board of Trustees and the administration, who agreed that a full-scale harvest in 2007 should proceed.

"Doing a full harvest was something we thought was possible," said Carmichael, who directed Georgia Tech's Institute for Sustainable Technology and Development and now holds the title of senior counselor for external relations and faculty associate in engineering and applied science at Caltech. "But I don't think we'd have the confidence to go forward without Delmy doing the research."

The plan is to have student, staff, and faculty volunteers participate in a one-day harvest in the fall, when the majority of olives will be ripe for plucking. Buildings and grounds staff will do the picking, while students, staff, and faculty will load olives into crates.

In March, Emerson brought to campus Craig Makela, the president of the Santa Barbara Olive Company, to survey the state of Caltech's olive trees and give her grounds crew a few tips on pruning, watering, soil preparation, and pest control. He observed that Caltech's olive trees had been allowed to grow about 30 feet higher than the ideal harvesting height of 20 feet, which meant that the grounds crew would have to climb ladders or work out of cherry pickers. He also said that the trees were overwatered and would need to be adorned with fly traps and sprayed with an organic insecticide known as Spinosad to protect them from destructive olive fruit flies.

While the trees seemed to fall a bit short of Makela's agricultural ideal, the ebullient olive meister quickly predicted that the harvest would be successful—as long as the olives were picked by hand. Beating them off with a stick, he warned, would cause bruising. "We will pick about 60 to 70 trees, and I will return to you several hundred gallons of extra virgin, cold-pressed, hand-picked, organic olive oil," he told an audience that included Emerson, her building and grounds team, interested students, and other administrators, including Carmichael. "You should have the oil by the end of this year or the beginning of next year."

Based on Makela's projections, Emerson thinks that there should be enough olive oil to sell in the campus bookstore and maybe online to alumni. Carmichael noted that the olive oil could also be served with meals in the Athenaeum. "It's a process, but it'll be fun," Emerson said. "We know we can make money," which, she said, will benefit students and staff through scholarships or other programs. "We think it's doable. If we put our efforts together, we can do it at cost and create revenue."

We'll find out this fall whether the ancient art of olive cultivation, which dates back some 7,000 years, has a future on Caltech's high-tech campus. Carmichael, for one, thinks that an olive harvest will yield benefits beyond the bottled product. She points out that picking the olives means that they will no longer litter the Caltech walkways, and that the opportunity to gather a campus crop offers a "community-building benefit. The idea is to have an activity that brings people out and makes them more aware of the physical environment. So many of us have our minds so much on work that we don't realize how beautiful the campus is and how productive it can be."

MIKE ROGERS



From Psi to Poetry

BY BARBARA ELLIS

Caltech doesn't usually turn out poets, but Jessica Goodfellow, MS '89, is making a name for herself as one, despite the fact that she lives in Japan, where her intricate English-language poetry is, to say the least, not in heavy demand. There's also her choice of unconventional subject matter. Goodfellow, 41, left Caltech without completing her planned PhD in economics in order to focus on a writing career, but while you can take the poet out of the Institute, it's not so easy, it turns out, to take the Institute out of the poet. Dark matter, string theory, Bergman's rule, and Zeno of Elea are among the subjects and themes that permeate her poetry. Such topics may be familiar to Techers, but they aren't usually put into verse. Yet Jessica's poetry is beginning to gain an audience; in the last four years she's received the prestigious Chad Walsh Poetry Prize, won a highly competitive contest to have a poetry collection published, and been nominated three times for a coveted literary prize, the Pushcart. And this past March, two of her poems were heard nationwide when Garrison Keillor read them on his *Writer's Almanac* segment on National Public Radio. In the intensely competitive literary niche that is poetry, that's not a bad start.

Goodfellow's poems often blend the vocabulary of the math and science she studied in school with the religious imagery of her childhood. The second of eight children in a close-knit family, Jessica grew up just outside Philadelphia, where her father was an electrical engineer and her mother a schoolteacher. She attended the city's public schools before going to Provo, Utah, to study at Brigham Young University, an institution affiliated with her family's Mormon faith. After earning a bachelor's degree in economics, with a minor in math and communications, she came to Caltech in 1987 to study for an economics PhD, attracted by the work of experimental economics pioneers such as Charles Plott, Harkness Professor of Economics and Political Science. But she soon realized that she "wasn't that interested after all" in microeconomics, econometrics, and game theory, and that what she really wanted to do was creative writing. Her mother had once told her that as a young child she made up poetry even before she could write ("She said that I used to recite poems to her and ask her to write them down"), and she had composed poems all through school, and even had several of them published in literary magazines for children and teenagers. "My favorite poets at that time were T. S. Eliot, Louise Glück, Mark Strand, and John Ashbery," she recalls. But "because I was good at it," her teachers and parents encouraged her to study math and economics, "and as I was one of those overly obedient children who tried to please every authority figure in my life, I didn't rebel," she says. "Until I came to Caltech."

The "obedient" daughter found it very difficult to announce her decision to give up on her PhD, but "people were a lot more accepting than I had expected." Her professors suggested she take a leave of absence to think things over, and encouraged her to come back, but in the end she left the Institute with her MS in 1989. "I really enjoyed my time at Caltech," says Goodfellow, "and I met some of the most interesting, intelligent, and well-read people I have ever come across." Through her Caltech friends and roommates, she also learned about areas of science that had barely been touched on during her high school and undergraduate years. "To my surprise, I real-



Poet's Corner. Jessica Goodfellow and her sons Taiyo (left) and Hugo settle themselves next to a stylized stone lion at a historic Shinto shrine in Kobe, Japan, where the family lives.

ized that some subjects had not even been covered at Brigham Young. For example, we studied Lamarck, and how to classify species, but didn't learn about evolution."

To fill in the gaps, Jessica began to read popular science books, and found herself particularly drawn to the history of Western thought. "Starting with the ancient Greeks, when science and belief systems were not separate areas of study, I followed as well as I could the development of thinking, to where the scientific discoveries began to conflict with religious ideas—and we all know the repression of ideas that followed from those conflicts," she says. "I think I was trying to find a historical parallel for the conflicted feelings I had as I grew up, when I began to perceive a growing dichotomy between the faith in which I was raised and the scientific subjects I was encouraged to study."

*God created the whole numbers:
the firstborn, the seventh seal. . . .*

*It took humankind to need less than this;
to invent fractions, percentages, decimals. . . .*

*Only humankind could find the whole numbers,
infinite as they are, to be wanting. . . .*
—From “The Invention of Fractions,” read on NPR

After Caltech, Jessica looked around for work that would support her while she focused on her writing. “Japan was doing very well economically at the time, and there was a big demand for businessmen to learn English,” she recalls. So in 1990, she moved to the historic Japanese port city of Kobe, where she taught English in the afternoon and evening and “worked at my writing in the mornings.” She started on a novel, but “it was horrible, and I never got near the end.” It wasn’t a waste because “you have to work it all out of your system before you can write decently,” but since then she’s concentrated on poetry and short essays.

Returning to the states in 1992, Goodfellow put her quantitative skills back to use as a math teacher and, later, as an advisor in a Newport Beach investment firm. But working analytically with figures all day left her unable to write creatively in the evenings. “I would occasionally attempt to, but the results were abysmal,” she admits. In 1996, she returned to Japan to marry Naohiko Ueno, a Japanese doctor whom she had met shortly after arriving there in 1990.

*Courtesans of tenth century Japan knew
the keening of the caged copper pheasant,
solo double-note aria for a missing mate,
could be silenced with a mirror.*
—From “In Praise of Imperfect Love,” also read on NPR

Today Jessica, her husband, and their two young sons make their home in Kobe, where Ueno, now an MD/PhD, combines his work at Kobe Seaside Hospital with a visiting professorship at Kagoshima University Graduate School of Medicine. At present, he conducts clinical research into how chains of amino acids called brain-gut peptides may be implicated in conditions such as diabetes, obesity, and anorexia.

“When I returned to Japan I got part-time work teaching English and studied Japanese,” says Jessica, who today also runs a small English-language editorial business out of her home, “but mostly I was bored out of my mind. It was at that point that I got serious about poetry as a future, and decided to try and publish my work.”

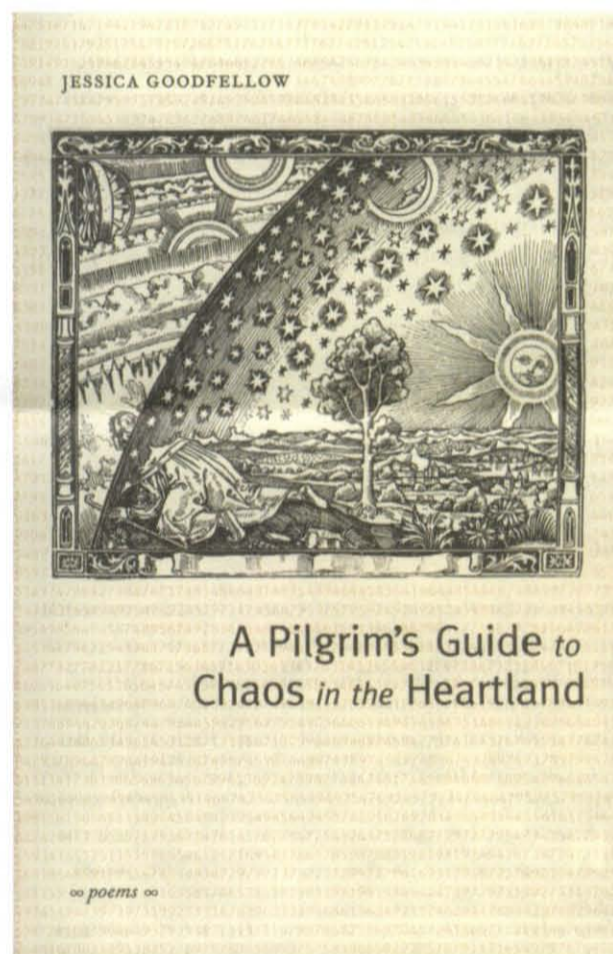
Writing poetry keeps Goodfellow linked with the literary world in the United States and counteracts some of the isolation she feels in her adopted country. “I don’t have a lot of time to write, so being faced with a blank page and no idea where I am going to start is especially daunting,” she says. “It’s useful to always have a theme that I am working on. Usually a poem starts with an image or a line, and I build up from that. Sometimes I get spontaneous inspiration, but mostly it comes from sitting down with a pen and paper and willing something to come.” There’s also a lot of waste in poetry, she adds. “You hack away and hack away. In some ways, it’s like doing a scientific experiment. It’s mostly failure before you get anything.”

Once she’d set herself the goal of gaining a readership, Jessica began submitting poems to American literary journals, and saw several of them published. Her first major success came when the *Beloit Poetry Journal* (BPJ) of Farmington, Maine, published her six-part poem *A Pilgrim’s Guide to Chaos in the Heartland* in early 2004 and later awarded it the Chad Walsh Poetry Prize for that year. The \$3,000 prize was, at the time, the most lucrative in the poetry field. “It came out of the blue,” Jessica recalls. “When I opened the letter in my kitchen, I started jumping up and down with excitement, and began gasping for air. The kids got quite worried and said, ‘Mommy, are you okay?’” Taiyo, now six, and Hugo, five, were also thrilled when they heard her poems on NPR (via an internet stream), although Taiyo was somewhat disappointed that Keillor had not chosen either of the poems that mention him.


*At the motel, he watches me
lower the blinds against
the white noise, the presence
of all possibilities in the night.
“It’s such a lovely dark, Mama,” he says.*
—From *A Pilgrim’s Guide* part 1, “Road Trip”

The *Pilgrim’s Guide* follows a woman and her son as they drive through America’s tall-grass prairie states. The poem is based on Goodfellow’s childhood experience, harking back to a time when her family drove every few years from Pennsylvania to her maternal grandparents’ home in Southern California. “That’s how I got to see South Dakota and Kansas, whose imagery haunts me—the extreme weather conditions, the emptiness and flatness, and the excess of nothing,” she says. From the beginning of the poem cycle, numbers begin cropping up at seemingly arbitrary spots within the words and become more and more prevalent until the final poem, “015Random N6umber Tab8le,” consists almost entirely of digits.

Continued on page 12. . .



All the poems excerpted in this article with the exception of “What You See If You Use Water as a Mirror,” can be read in full in the above chapbook, *A Pilgrim’s Guide to Chaos in the Heartland*, published by Concrete Wolf and available from its website (www.concretewolf.com) for \$10. “Imagine No Apples,” which is printed in its entirety on page 12 against an apple-peel backdrop, first appeared in *Phoebe: A Journal of Literature and Art*, while “The Beach at Big Salt” had its debut in the magazine *RATTLE*. And while it would certainly be nice, it won’t be necessary to travel to Japan to photograph these flowering cherry-tree branches, which were blossoming in April not far from the Caltech campus in Pasadena’s Old Town.



Poetry. . . from page 11

The original inspiration for this, says the author, came by accident while she was working on her computer with then two-year-old Taiyo on her lap. "He was busy banging at the number keypad while I typed, and I got tired of stopping to delete his insertions, so I decided to just finish the project and come back and delete all the numbers when he was asleep. When I returned to do that, I was surprised at how readable the document was, with its 'random' number additions; it was actually a challenge to find them all because my eyes would just skip over them without any loss of comprehension. That got me thinking about all the randomness that occurs in our lives and how we process the information without letting it overwhelm or deter us; in many cases people don't even take any notice of it. So that started the poem for me." The former Caltech student crafted her poem with mathematical precision, using one random number table to choose the digits, and a second table to tell her where in the poem to insert them.

*I am becoming the center of some circle,
all points equidistant from me,
interchangeable. I am zero-
ing in on randomness.*

—From *Pilgrim's Guide* part 5, "Crop Circles"

When the *Beloit Poetry Journal* proposed to read this poem at one of its events, Goodfellow was curious about how they were going to handle the numbers—she was chiefly concerned with the visual impact when she had written it and had never considered the verses being read aloud. The *BPJ* solved the problem by using several voices to articulate the different numbers. Jessica later heard that "Apparently it got quite frenzied, and was likened to a composition by Philip Glass, an iconoclastic musician known for his 'minimalist' style. It's rather interesting; one writes a poem, and then it goes out into the world and has a life of its own."

*See how matter curves around the emptiness,
how it cups and gently holds
the space where things are absent.
Matter buckles and spirals around it,
proving what is missing is more potent
than what isn't.*

—From "The Beach at Big Salt"

Encouraged by the favorable reception for *Pilgrim's Guide*, Goodfellow began working on a collection of poems incorporating the scientific, mathematical, and religious themes that she had noticed appealed to many of her readers. She began by writing down "all the concepts on a math theme that I thought had the possibility of being forged into a poem, then, when I had a subject on my mind, I would look at the list and invariably one mathematical or scientific concept would fit with it." In the resulting series of poems, the tale of Adam and Eve's fall from paradise is assimilated to the apple's legendary fall on Newton's head (see "Imagine No Apples," above right); the pathos of barren Sarai, the biblical Abraham's wife, opens out into a meditation on physical and metaphysical emptiness ("In the time before zeros / merchants marked nothing with nothing / leaving spaces to show where something was missing. / But what shape was the space?"); and both geometric and interpersonal dynamics are explored in "Spatial Relations" ("Tonight I understand why / you were trying to learn, / like Zeno of Elea, not / to distinguish between a body / and the space in which it is.") In the "The Beach at Big Salt" (excerpted above), Jessica describes dark matter in words no astronomer would use, yet they're not inaccurate in their simultaneous invocation of the spiritual and material essence of this mysterious phenomenon.

In January 2006, she felt ready to enter fifteen of both her newer and previously published poems in a chapbook competition (chapbooks are artfully designed booklets of poems or essays printed on letterpresses in limited editions). Most poetry journals run such competitions annually, and a couple hundred chapbooks are published each year, but there are thousands of would-be poets competing to win because, according to Jessica, "it's an easy and cheap way to get published." To her astonishment, she won the first one she entered—the 2005 Concrete Wolf Chapbook competition. (Of course, she then had to withdraw from all the others.) Her chapbook, entitled *A Pilgrim's Guide to Chaos in the Heartland* in honor of the poem she still considers her finest, was published in the fall of 2006. She later learned that her use of scientific imagery had resonated with the Concrete Wolf judges, one of whom had studied math, and the other, chemistry, in college. "They were impressed by my poems because they found it difficult to use science in their own writing," she says. The judges praised her "energetic use of language and her intellectual capabilities" and singled out an "invigorating and playful" style that "will leave you craving more from this uniquely captivating poet."

*In Shinto, the eight elements
of beauty include impermanence
and perishability. Choose one
as your watermark. No,
that is the wrong one.*

—From "What You See If You Use Water as a Mirror"

IMAGINE NO APPLES

All beginnings wear their endings like dark shadows.
—Chet Raymo, astronomer-physicist

*All beginnings wear their endings like dark apples.
A is for apple. B is not for apple.
C, also not for apple. And so on.
Everything always ends up apple, or not apple.
Pick any beginning and there's the apple,
never falling far enough from the tree:
the apple and the omega.*

*All beginnings wear their apples like dark shadows.
For example, Eve in the Garden
stood beneath the Tree of Knowledge,
biting into forbidden fruit.
Beguiled but enlightened, sated and falling
she dragged all humanity with her by bruised heels—
suddenly everyone banished from paradise.*

*All apples wear their shadows like dark endings.
For example, Newton in the garden
dozed beneath a tree, dreamt of seeking knowledge,
awoke to see a red globe falling.
Drowsy but enlightened with heaviness,
he saw one sad secret of the universe revealed—
suddenly everyone stuck to this planet.*

*All dark shadows wear their endings like beginnings.
But suppose not. Imagine no apples:
everyone still naked; all of physics stymied.
No one to say, "Oh, this is gravity,"
or "Ah, this is sin."
Would we be better off, would we be happier,
sinless and floating, or if not actually floating,
still capable of hoping to rise.*

Today Jessica has moved on to a new theme—water and the act of emptying ("loss in many guises," as she expresses it)—and is hard at work on what she hopes will be a cycle of about 60 poems. Her goal is to publish an actual book, whose press run will be significantly larger than a chapbook print run of 100 to 200 copies, but "I'll be competing against English professors, established poets, and people who have already had several chapbooks published," she says. "What You See If You Use Water as a Mirror," one of her first poems in the series, has already appeared in the *BPJ*, on the *Versé Daily* website (www.versedaily.org), and in the anthology *Best New Poets 2006: 50 Poems from Emerging Writers*, published by the University of Virginia's literary magazine, *Meridian*. Although her new theme isn't science- or math-based, "sine waves and other such images keep creeping in," she confesses. The language also invokes Japanese imagery, something that is just "starting to come through" after her many years in Japan.

Jessica has achieved success despite having no formal poetry training. Her advice for other would-be poets is to "work with other writers, professors, or peers. Careful readers can show you your mistakes a lot faster than you will notice them on your own, though you would probably get there eventually. On the other hand, "there's a level of intuition in writing poetry that a person has or doesn't have. I'm not sure you can learn it, but I think you can struggle toward it." Jessica also recommends joining a writing group, as she did when her family was living for a time in Florida. She has since founded one in the Kansai region where she lives, because "it's illuminating to have feedback from the right people at the right time." There are currently six other native English speakers, all of them married to Japanese men, in the group, but it's open to anyone writing in English.

It took courage to give up her PhD program and leave Caltech, but Jessica doesn't regret her decision to pursue a calling that has captivated her since childhood. Despite the awards she's garnered, and the poems she's published, she continues to describe herself as a writer. "Poet is a designation I don't feel worthy of at this time," she insists. Perhaps these lines from a prose poem, "Strategy of Change," ostensibly written about a friend, sum up her thinking best:

*Having no method of invention but the process of elimination—
unorganized and random—if you were to say all her efforts
amounted to nothing, she'd not find it surprising. This does not deter her;
she doesn't believe in entropy, continues her ceaseless creating.*

Alumni Update

FROM THE ALUMNI ASSOCIATION PRESIDENT— WHAT CALTECH COMMUNITY REALLY MEANS

When each of us first arrived as a student at Caltech, we learned about the Honor Code and this entity called “the Caltech Community.” From my very first days on campus, it was clear to me that the Caltech community included not only students, but also faculty and staff members. What was not immediately obvious was that it also included alumni and other friends of the Institute. Frankly, that fact wasn’t really apparent to me even after I graduated, or even when I joined the Alumni Association’s Board of Directors in 2000. It didn’t strike me until this very year during my term as president of the Alumni Board.

Over the past year, I have witnessed time and again the amazing camaraderie and strength of the Caltech community across the generations. It was evident when the women’s and men’s basketball teams won their first games (two athletic conference wins for the women!) and I received dozens of e-mails from alumni all over the world who had read the news and were beaming with pride. It came home to me again as I was preparing for our Volunteer Leadership Conference and realized that we have more than 700 alumni volunteers who donate their time and energy to engaging with students and alumni in both the United States and abroad. And perhaps the most obvious manifestation of the Caltech community spirit came during this year’s return of the infamous Interhouse party. More than 300 alumni showed up to share in the revelry and to celebrate the rebirth of a great tradition.

When I’m on campus for CAA board meetings, I always make time to meet with students one-on-one. Each meeting makes me realize that today’s students are much more aware than I was as a student that Caltech is a community that extends beyond graduation. They ask me for help with campus initiatives, seek advice on how best to contact alumni in various industries, ask for advice on graduate school options, and just share Caltech stories and inquire about mine. I thought I was pretty savvy about networking during my student days, but today’s Techers are far more so. They seem instinctively to understand the importance of building relationships across the generations, not only for career purposes, but also for establishing personal connections and engaging in plain old conversational camaraderie. As a CAA board member, I have had the opportunity to expand my generational friendships to include alumni from the 1940s all the way through the current decade. As a result, I have come to realize how much I have in common with alumni whom I never would have met if I hadn’t stayed involved with the Caltech community. I now have dozens of friends and mentors whom I will cherish for years to come.

So, why is all of this important to you? Because what I’ve discovered is that even if you haven’t stayed in touch with the Caltech community, you can rekindle that bond at any time. Seven hundred of your fellow alumni spend time planning events and engaging with students every year. At least a thousand more attend events and get together with other alumni socially and intellectually, on a fairly regular basis. Still, that leaves thousands more of you who are missing out. You’re missing out on the opportunity to reconnect and rediscover what you loved about Caltech (now that most of the pain has faded away!). There are so many ways to get started: by just going to the CAA website (alumni.caltech.edu) and finding an event in your area to attend; by coming back to campus for Alumni College, Seminar Day, or reunions; or by signing up for a travel adventure with other Institute alumni. And if you find yourself inclined to do something different or to share a personal passion, please suggest an event you would like to host. Just go to our website and you’ll find out from the Volunteer Toolkit how easy it is to get started. Maybe you’ll be the one to convince other alumni that yodeling really is a fun group activity!!? Particularly if you can yodel the *Ride of the Valkyries*.

Although several hundred of you volunteer already, we always have space for new faces and new ideas. Reunions are a great way to get started, as you get the chance to pick a fun event to host and connect instantly with dozens of your classmates. This year we introduced Association-sponsored House reunions, and we are looking for alumni who want to reminisce about their favorite House traditions and to suggest ideas for events.

Regardless of how you decide to reconnect with the Caltech community, remember that each of you makes the community the unique entity that it is—and it only gets stronger when you take your place as an active participant.

See you around the Community soon,



From left, the Alumni Association’s Jennifer Schmidt joins volunteer honorees Ralph Lin ’02 and Ayeh Bandeh-Ahmadi ’02.



ALUMNI ASSOCIATION ESTABLISHES VOLUNTEER SERVICE AWARD

Throughout the United States and in many other parts of the world, volunteers are an integral part of the Caltech Alumni Association’s programs and services. Several hundred Institute graduates regularly give their time and expertise to recruit potential students, network with fellow Techers, plan events, host gatherings, and promote goodwill among members of the Caltech community.

To honor the hard work, innovation, and commitment of our volunteers, the Alumni Association has established the Volunteer Service Recognition Award, an honor that will be conferred annually upon alumni who exemplify excellence and dedication to fellow alumni, students, and the Caltech community. The recipients of the inaugural 2007 award are Ayeh Bandeh-Ahmadi ’02 and Ralph Lin ’02, both of Washington, D.C., Keith Karasek ’74 and Michelin Sloneker ’95, both of Chicago, and Kristin Polito ’95 and Antony Chan ’93, both of Pasadena.

Please donate your time and talents! The Alumni Association has volunteer opportunities across several program areas and all across the country, even overseas! Volunteers are needed to help plan regional events, recruit new Caltech students, coordinate Seminar Day and Reunion weekend, organize career services, and serve the Institute as a whole. Contact volunteer@alumni.caltech.edu for more information, or visit our Volunteering page at <http://alumni.caltech.edu/volunteering>.



Award-winning volunteers Keith Karasek ’74 (left) and Michelin Sloneker ’95 (right), flank the Alumni Association’s Jennifer Schmidt and Karen Carlson.

“PLENTY MORE ROOM”—2007 ALUMNI COLLEGE WILL LOOK AT “TRENDS IN NANOSCIENCE”

In 1959, Richard Feynman told an audience of physicists (in a talk subsequently published in February 1960 in Caltech’s *E&S* magazine) that “there’s plenty of room at the bottom.” The future Nobel laureate was expounding on the potential for nanoscience, “a new field of physics,” to change the very way in which we think about science and engineering.

Save the dates to join fellow alumni and friends of Caltech for Alumni College 2007: “Plenty More Room: Trends in Nanoscience,” on Friday and Saturday, September 7 and 8. The event will offer an in-depth look

at scientific progress in exploring and exploiting the potential of the micro-world and will examine the Institute’s role in these developments, 48 years after Feynman’s original remarks. How are scientists fulfilling and expanding on Feynman’s visionary challenge of the last century? And how will their discoveries change the world tomorrow?

For additional information, contact Jennifer Schmidt at jennifer@alumni.caltech.edu or 626/395-6592 or visit http://alumni.caltech.edu/learning/alumni_college.

ALUMNI ASSOCIATION
CALIFORNIA INSTITUTE OF TECHNOLOGY
STATEMENTS OF FINANCIAL POSITION
SEPTEMBER 30, 2006 AND 2005
ASSETS

	2006	2005 (restated)
Assets		
Cash and cash equivalents	\$ 170,716	\$ 158,617
Accounts receivable	26,679	9,884
Prepaid expenses	7,337	18,226
Caltech pooled investment accounts	7,311,683	6,740,584
Computer equipment		
Total Assets	\$ 7,516,415	\$6,927,311
LIABILITIES AND NET ASSETS		
Liabilities		
Accounts payable	\$ 35,746	\$ 7,368
Unrestricted Net Assets	7,480,669	6,919,943
Total Liabilities and Net Assets	\$ 7,516,415	\$ 6,927,311

STATEMENTS OF ACTIVITIES AND CHANGES IN NET ASSETS

Support, Revenues and Other Income		
Membership dues	\$ 74,990	\$ 66,945
Life membership dues	195,025	92,390
Seminar day	68,830	68,245
Alumni college (continuing education)	39,230	15,545
Class reunions	34,914	22,458
Regional programs	20,480	29,831
Travel study programs	19,000	-
Net investment returns - pooled accounts	688,878	1,156,633
Interest income	6,311	4,178
Miscellaneous income	5,556	2,510
Total Support, Revenues and Other Income	1,153,214	1,458,735
Expenses		
Program Expenses		
Seminar day	93,985	88,023
Alumni college (continuing education)	56,864	38,823
Class reunions	82,311	58,575
Regional programs	98,048	99,014
Travel study programs	2,920	-
New opportunities - undesignated funds	17,500	1,200
Communications - electronic	20,573	34,142
Communications - print	50,337	75,171
Membership	11,371	16,135
Undergraduate admissions support	37,029	53,032
Career services	15,140	25,941
Sponsorships	7,500	11,558
Total Program Expenses	493,578	501,614
Administration Expenses	98,910	80,225
Total Expenses	592,488	581,839
Change in Net Assets	560,726	876,896
Net Assets, Beginning of Year	6,919,943	6,043,047
Net Assets, End of Year	\$ 7,480,669	\$6,919,943

STATEMENTS OF CASH FLOWS

Cash Flows from Operating Activities		
Cash received from service recipients	\$ 441,230	\$ 270,236
Cash paid to suppliers and employees	(553,221)	(573,151)
Interest and dividends received	122,908	122,265
Net Cash Provided by (Used in) Operating Activities	10,917	(180,650)
Cash Flows from Investing Activities		
Net change in Caltech pooled investments	1,182	147,565
Net Increase (Decrease) in Cash	12,099	(33,085)
Cash and Cash Equivalents, Beginning	158,617	191,702
Cash and Cash Equivalents, Ending	\$ 170,716	\$ 158,617
Reconciliation of the Change in Net Assets		
To Net Cash Provided by (Used in) Operating Activities		
Change in Net Assets	\$ 560,726	\$ 876,896
Adjustments to reconcile the change in net assets		
to net cash provided by (used in) operating activities		
Realized and unrealized gains on investments	(572,281)	(1,038,546)
(Increase) Decrease in:		
Accounts receivable	(16,795)	(6,897)
Prepaid expenses	10,889	(9,612)
Increase (Decrease) in:		
Accounts payable	28,378	(2,491)
Net Cash Provided by (Used in) Operating Activities	\$ 10,917	\$ (180,650)

T e c h
T a l k

Dear Editor,

Enjoyed *The Writing's in the Walls*, on the remodeling of the four student houses. You asked for reminiscences—here are a few that never made it into *Legends of Caltech*, to which I contributed, along with editing the yearbook and doing all kinds of other nonscientific things in the years I was there.

I entered Caltech as a freshman in the fall of 1963, and lived in Fleming House in the "old Student Houses" for my first three years, moving out to preserve some sanity my senior year. I don't remember any writing on the walls. I do remember having to pay for walls being painted, and my supposition is that, in those years, the building and grounds people would have immediately repainted any such decorations.

I remember the end-of-quarter bonfire in the courtyard where all the *New York Times* copies from hated Humanities 5 class were burned. I remember waking in the middle of the night to the sound of my door being kicked in, and seeing a Pasadena fireman standing there in full turn-out gear (there was a smoldering fire in the basement area that we affectionately called the "infinite storeroom" that was filling the rooms in that area with smoke).

I remember how rare it was that a student, usually an upperclassman, would have an actual telephone in his room. Televisions were even rarer; I think when I was there, the only one in the house belonged to the resident associate (and we were glued to that, watching the events following the assassination of John Kennedy). Wireless internet—wow!

I remember the upperclassman football player (if ever there was an oxymoron it was "Caltech Football Player") who knocked a hole in an alley wall between Fleming and Dabney by "blocking it."

I remember the student who bathed so seldom that the entire alley he lived in was almost uninhabitable. I remember students fashioning water balloon slingshots to shell the new houses, and occasionally Blacker House. I remember the stories about the synchrotron "losing the beam" and irradiating the second story rooms of Fleming and Dabney that faced it. I also remember students throwing beer bottles high in the air so that they came down resoundingly on the trailers that housed the synchrotron physics graduate students.

I remember that the rooms were painted mostly "landlady green." The facilities people would charge \$5 for each hole in the wall when we moved, so we discovered that the walls were the same color as Crest toothpaste,

and used that as a patching material. I wonder how much dried toothpaste was recovered in the remodeling?

I remember trying to install stage lighting in the dining room (for Inter-house) and discovering that the beams on the ceilings were fake, simply by firing a stud gun into one of them and listening to the projectile rattle around between the floors.

I remember the story we were told by buildings and grounds that the roofing tiles used on the buildings were no longer made, and that therefore the Institute had to buy older homes in Pasadena and tear them down to get replacements. This was the justification for really huge charges for roof repairs.

—Robert D. Parker '67

Galena Forest, Reno, Nevada

I was appalled by Dave Zobel's article *The Writing's in the Walls*, in which he glorifies the graffiti in the student houses. Anyone who sees artistic value in this would be captivated by the views from Amtrak going into south L.A., where every flat surface is covered with gang graffiti. Do we want this on our campus?

I can remember that many years ago when Caltech sought to expand, we received a rather cold reception from Pasadena, in part because the campus was drab and the landscaping was pure ice plant. Today the campus is a showplace, and is even used as an exemplary background in a TV series. But the last time I took my son to Seminar Day I avoided showing him where I once lived (Dabney) because it looked like an inner-city slum. To permit this to happen is bad management.

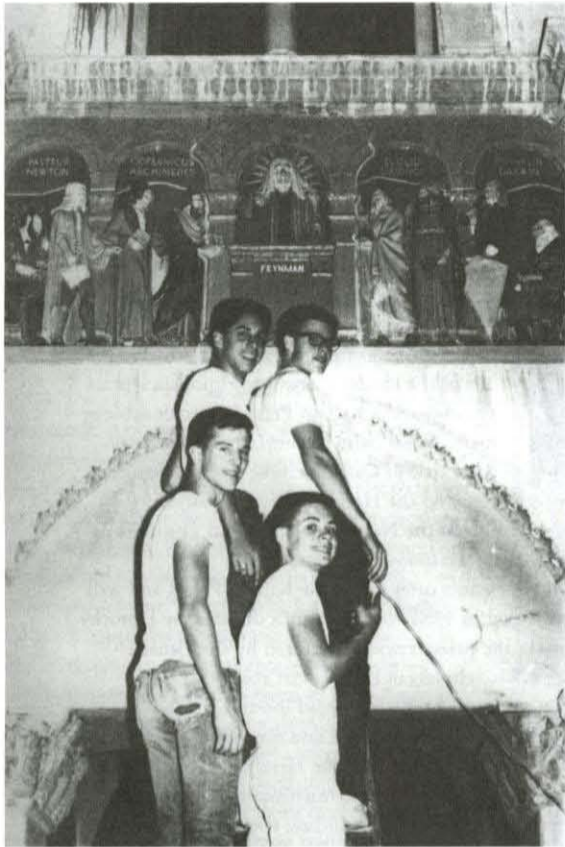
I'm all for freedom of expression, but it used to be worthy of the stature of Caltech. The famous modification of UCLA's signature stunt in the Rose Bowl took genius. Graffiti takes a vacant mind and a spray can. MIT gift T-shirts that said "the other Institute of Technology" and "because not everyone can go to Caltech" were good, but where were our student geniuses when we lost the robotic car challenge to Harvard and Stanford? If the students want to burn off some energy and show their initiative, there are plenty of outlets that are more satisfying than fouling their own nest.

I would suggest that *Caltech News* write an article promoting the Veysey Student Life Discretionary Fund, which is dedicated to encouraging and accelerating the undergraduate student's progress toward an appropriate level of maturity and refinement. These kids obviously did not get that at home, and without such guidance are not fit to represent Caltech after graduation.

Sincerely,

Dan LeMay '51

Fallbrook, California



**QED: SHEDDING
LIGHT ON THE
MATTER OF THE
FEYNMANIZED
FRESCO**

In the last *Caltech News* Dave Zobel '84 opened his meditation on South House wall art (*The Writing's in the Walls*) with the conjecture that the stenciled name "Feynman" on the Dabney courtyard bas-relief featuring luminaries of science quite possibly qualified as the complex's founding graffito. Shortly afterward, he heard from Allen Schwenk '68, who

wrote that he had been present at the creation of that particular embellishment, and was quite sure that he remembered the day, the time, the precipitating incident, and the perpetrators.

"The morning of October 22, 1965," wrote Schwenk, who today is a mathematics professor at Western Michigan University, "about 8:30. . . I came through the Dabney House arch on my way to breakfast. I had to divert around a tall stepladder blocking the way. As I did, I looked up and saw a frosh, I believe it was Mark Bartelt [BS '69, MS '70], painstakingly lettering 'Feynman' onto the frieze above the arch. I was amused, and thought, 'Better enjoy this while it lasts. B and G will probably wash it off next week.' I am charmed to know it is still there. . . . Can you believe an old-timer like me can remember the precise date after 41 years? In truth I looked up the date of the event that occurred the day before, and added one. That was the day we heard the most stunning news of my four years at Tech." That is to say, it was the day Feynman won the Nobel Prize for helping to untangle the intricacies of quantum electrodynamics, or QED. In a follow-up e-mail, Schwenk sounded a slightly more tentative note, commenting that "While I feel very certain about the date, I imagine it could have been a day or two later, but no more. The time and painter may be in doubt. . . . I have not seen [Mark] or communicated with him since graduation. But I found an e-mail address for him. . . . So he might be reached to confirm or deny. Maybe B and G are waiting to send him a bill."

The e-mail trail obligingly led back to the Caltech campus, where Bartelt has worked for many years as the lead system administrator for the Center for Advanced Computing Research. He had not done the deed, he said, but thanks to his mother, who called him about 18 months ago, "to come get your old stuff or I'm throwing it out," he had incontrovertible photographic proof of those who had. He identified the foursome who, as he put it, "Feynmanized the fresco" as (clockwise from top left) Joe Jeffrey, Paul Bartlett, Dave Perasso, and Bob Pelzmann.

So, would that make him the one who took the picture? Confesses Bartelt, "I honestly don't remember whether I did."

The solution for Dave Zobel's crossword, "A Rough Map of the Caltech Undergraduate Houses," published in the last issue of *Caltech News*, appears at right and can also be found online at <http://pr.caltech.edu/periodicals/CaltechNews/articles/v41/solution.html>. (Theme entries are one egg over easy, ridiculed, Myrna Loy, Patch Adams, crickets, flaming out, deep knee bends, Bleecker Street.)

A	H	E	A	D		M	E	R		C	O	N	F	I	R	M		N	B	A	
L	A	S	S	O		A	L	E		A	V	O	I	D	E	R		E	E	L	
D	I	S	S	U	A	D	E	S		N	O	S	T	O	P	S		S	H	E	
O	N	E	E	G	G	A	V	E	R		S	Y				A	U	S	S	I	E
	A	N	T	H	E	M		T	A	O			S	I	R	L	O	I	N		
					D	E	I		R	U	D	D	O	C	K	U	L	E	D		
M	A	K	E	R			N	Y	E		A	E	R	O							
P	I	E	T	A		O	V	A			M	Y	R	N	A	L	L	O	Y	D	
G	L	E	N	N		K	A	Y	E		N	S	Y		M	A	U	M	A	U	
		P	A	G	E	A	D	A	M	S					P	O	R	C	I	N	E
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F	L	E	M	I	N	G	O	U	T		M	I	R			A	B	O	U	T	
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		A	G	A	I	N	S	T		E	M	S		I	T	S	E	L	F		
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I	W	O			C	O	N	T	R	O	L		E	L	A	B	O	R	A	T	E
L	I	L			E	R	A	S	U	R	E		I	S	T		M	O	S	E	S
E	N	D			S	A	M	P	L	E	R		N	E	E		P	R	E	S	S

A l u m n i
N o t e s

1945

Linden R. Burzell, of Vista, California, has been inducted by the American Water Works Association (AWWA) into its Water Industry Hall of Fame. He began his six-decade career in the water industry as a U.S. Navy ensign in 1945, when he was assigned to assist the resident officer administering construction on the first San Diego Aqueduct. He joined the Vista Irrigation District (VID) in 1946 as its district engineer, and by 1951 was general manager and chief engineer. In 1964, he moved to the San Diego County Water Authority (SDCWA) as its new general manager and chief engineer, a position he held for the next 20 years. He has also worked as a private engineering consultant to the Borrego Springs Water Company and the Borrego Water District, and after leaving SDCWA he added both it and the Yuima Municipal Water District to his list of clients. In 1992 he rejoined VID as a director. A registered professional civil engineer, he served for eight years on the Regional Water Quality Control Board and is also a member of the American Society of Civil Engineers and the American Public Works Association. His AWWA honors include the George Elliot Award, the George W. Fuller Award, and the Gold Water Drop Award,

and in 1981 he was named by the American Public Works Association as one of the Top Ten Public Works Leaders of the Year.

1947

Edwin J. Cowan, of Newport Beach, California, writes that he is happily married to Helene, his bride of 17 years, and that since retiring he has traveled to 40 countries. The patio heater he invented in 1961 is now sold worldwide. He founded his former company—Infrared Dynamics, of Yorba Linda, California—in 1966. His current interest is a new company, Shuttle Dynamics, through which he plans to develop an elevated high-speed rail system for shuttling cars on freeways. See www.shuttledynamics.com for more information.

1948

Yuan-Cheng "Bert" Fung, PhD, professor of bioengineering, emeritus, at UC San Diego's Jacobs School of Engineering, received the National Academy of Engineering's Fritz J. and Dolores H. Russ Prize on February 20. The \$500,000 biennial award, which recognizes engineering achievement that significantly improves the human condition, went to Fung "for the characterization and modeling of human tis-



Aerospace industry legend **Simon Ramo**, PhD '36, has received enough medals and awards to weigh down even a four-star general, but in March he received a double honor that had somehow eluded him. To mark the 50th anniversary of his

cofounding of Space Technology Laboratories (STL) in Redondo Beach, the city's mayor presented Ramo with the keys to the city, and a street was also named after him on the grounds of the facility.

Among his numerous accomplishments as an electrical engineer helping develop the field of microwave electricity, Ramo is best known as the co-founder (along with his Caltech classmate Dean Wooldridge, PhD '36) of TRW, the aerospace and technology company acquired by Northrop Grumman in 2002. Ramo, who turns 94 in May, was honored at the ceremony by hundreds of Northrop Grumman employees, old friends and colleagues, and several members of the Caltech community, including Caltech president Jean-Lou Chameau.

Chameau told the audience how Ramo had overcome numerous obstacles as a graduate student, including passing a required French exam without ever having studied the language. "I think I can make the case that the ingenuity, inventiveness, and, yes, audacity that have served Si Ramo so well throughout his illustrious career were forged at Caltech."

TRW formed STL in 1957, the same year that the Soviet Union shocked the world with the launch of Sputnik I, the first artificial satellite. STL won the first spacecraft contract issued by NASA for its Pioneer series, and Pioneer 10, launched in 1972, became the first craft to leave the solar system.

From a single engineering building, Space Technology Laboratories has expanded to a 47-building campus, where 7,300 employees develop a wide range of space, defense, and electronics technologies. Many of those employees came out to cheer Ramo, who was on hand for the ceremony, but did not speak. Afterwards, he was surrounded by many old friends who shook his hand and hugged him.

One of those enthusiastic employees was Alexis Livanos '70, PhD '75, president of Space Technology and corporate vice president for Northrop Grumman. "Si Ramo is not only very bright, but also very effective in providing feedback in an honest and humorous way," Livanos told the crowd. "He's truly an inspiration to all of us."

Asked after the ceremony how it felt to have a street named after him and to be awarded the keys to the city, Ramo replied, "It isn't the awards or street name that matter. It's the friendships. The people." What's the secret to his longevity? "The secret is, it's a secret," said Ramo. "I'm 93 and I don't look a day over 92 and a half."

sue mechanics and function leading to prevention and mitigation of trauma." Known as the "father of modern biomechanics," Fung, according to the academy, has "directly contributed to designs, inventions, and applications that save lives, mitigate the severity of soft tissue injury, enhance the recovery and functionality of injured soft tissue, and improve the effectiveness and longevity of prosthetic orthopedic devices." Among numerous other awards, he received America's highest scientific honor, the National Medal of Science, in 2000. For more on his contributions and career, check out the 2000 *Caltech News* article "Baldeschwieler and Fung Go to Washington," at <http://pr.caltech.edu/periodicals/CaltechNews/articles/v34/natmedals.html>.

1955

Henry P. Schwarcz, MS, PhD '60, professor emeritus in the School of Geography and Geology at McMaster University, in Hamilton, Ontario, has been awarded the Canadian Quaternary Association's 2007 W. A. Johnston Medal for "outstanding professional contributions to quaternary studies." A pioneer in the use of isotope data from speleothems (mineral deposits formed in caves, such as stalactites, stalagmites, and crystal growths) for paleotemperature and other paleoenvironmental reconstructions, as well as their use in dating, Schwarcz has research interests that range from paleoanthropology and archaeological geology to the application of stable isotopes to medical and forensic research. He is a fellow of the Royal Society of Canada and the Geological Society of America, as well as a member of the Geochemical Society, the Society for American Archaeology, the Society of Archaeological Science, and Sigma Xi.

1957

Steve Andreas (formerly **John O. Stevens**) recently published his sixth book, *Six Blind Elephants: Understanding Ourselves and Each Other*. Since earning an MA in psychology at Brandeis University in 1962, he has been researching, teaching, and writing about psychotherapy and personal change. He taught psychology from 1963 to 1970 at Diablo Valley College in Pleasant Hill, California, and since 1977, he has been training and developing methods in the field of Neuro-Linguistic Programming (NLP), "a set of understandings and processes initially developed by a mathematician and a linguist," he writes. "NLP can actually do much of what psychology promised some hundred years ago, but never quite delivered. A previous book, *Transforming Your Self: Becoming Who You Want to Be*, explored the structure of self-concept, and how to use those understandings to rapidly change how you think of yourself." Andreas has produced more than 50 videotaped demonstrations of NLP processes, and written 50 articles and book chapters, many of which can be found at www.steveandreas.com. His major hobby is collecting and researching the paintings of Charles Partridge Adams, an early Colorado impressionist artist (1858–1942), and some of the results of this can be found at www.charlespartridgeadams.com.

1960

Leroy Hood, PhD '68, already a member of the National Academy of Sciences, the American Philosophical Society, the American Association of Arts and Sciences, and the Institute of Medicine, has been elected to membership in the National Academy of Engineering "for the invention and commercialization of key instruments, notably the automated DNA sequencer, that have enabled the biotechnology revolution." One of the highest professional distinctions accorded to an engineer, NAE membership honors those who have made outstanding contributions to "engineering research, practice or education, including, where appropriate,

significant contributions to the engineering literature," and to the "pioneering of new and developing fields of technology, making major advancements in traditional fields of engineering or developing/implementing innovative approaches to engineering education." Cofounder and president of the Seattle-based Institute for Systems Biology, Hood has also joined the board of directors of NimbleGen Systems, a Madison, Wisconsin, biotechnology firm, where he will serve as chairman of its scientific advisory board. He and his institute colleague Valerie Logan have also received one of the first-ever Science Education Advocate Awards of Washington State LASER (Leadership and Assistance for Science Education Reform), which recognizes five individuals, organizations, and project teams "who have exhibited outstanding advocacy for science education in the state of Washington by promoting the importance of science education among the general public and/or the education system." The awards include \$5,000 for each recipient, which can be given to the not-for-profit organization or public-education entity of the recipient's choice for use in science education. Hood is currently a visiting associate in biology at Caltech.

1964

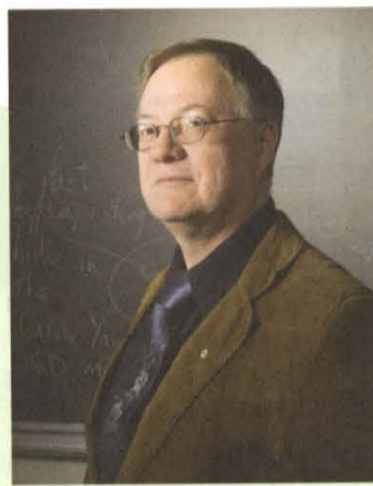
Mason L. Williams has received the 2007 Reynold B. Johnson Data Storage Device Technology Award from the Institute of Electrical and Electronics Engineers (IEEE), in recognition of his "contributions to the modeling and design of high density magnetic recording." Retired in 2005 from Hitachi Global Storage Technologies in San Jose, California, which he had joined in 2002 after 32 years at IBM, Williams played a key role in advancements in areal density (bytes per square inch) of hard-disk drives, including spin-valve read-head technology and perpendicular recording. More than three decades ago, he provided a simple model of the factors limiting this storage capacity and helped guide the development of thin-film disk drives. Only six months into his career, he teamed with Larry Comstock to develop the Williams-Comstock formula, a critical design tool for magnetic recording systems that continues to be used as a basic parameter in designing recording systems. Williams is widely published, holds several U.S. patents, and has been named an IBM Master Inventor. An IEEE fellow, he received his PhD from USC.

1966

Walter Arabasz, MS, PhD '71, director of the University of Utah Seismograph Stations and research professor of geology and geophysics, has been named a member of the Advisory Committee on Earthquake Hazards Reduction, which is part of the National Earthquake Hazards Reduction Program. The 15-member committee will advise the program, which was created by Congress in 1977 to improve earthquake safety. Originally an English major at Boston College, Arabasz did well on his geology midterm, and his professor convinced him to change his major. He joined the University of Utah in 1974 as a research professor in seismology.

H. Wilhelm Behrens, PhD, of Northrop Grumman Space Technology, has been elected a fellow of the American Institute of Aeronautics and Astronautics, "for more than 70 years the principal society of the aerospace engineer and scientist. Our mission is to advance the arts, sciences, and technology of aeronautics and astronautics, and to promote the professionalism of those engaged in these pursuits." Behrens is a Caltech Associate.

Joseph B. Milstein has joined the new Boston-area office of Hiscock & Barclay LLP as a



Richard Bond, MS '75, PhD '79, University Professor in the University of Toronto's department of astronomy and astrophysics, and director of the Canadian Institute for Advanced Research (CIAR) Cosmology and Gravity Program, is the winner of both the 2006 Gerhard Herzberg Canada Gold Medal for Science and Engineering—considered one of the nation's most prestigious science prizes—and a Killam Prize for career achievement. Bond, who currently holds the unofficial title of Canada's most cited astronomer, received the Herzberg Medal, named for

Canadian Nobel laureate Gerhard Herzberg, from the Natural Sciences and Engineering Research Council of Canada on March 19 at a ceremony in Ottawa.

He was honored in the natural-sciences category of the Killam Prizes and will receive a cash prize of \$100,000. Established in 1981 through funds donated by Dorothy Killam in memory of her husband, Izaak, the prizes are administered by the Canada Council for the Arts and "provide support to scholars of exceptional ability who are engaged in research projects of broad significance and widespread interest."

"Winning the Killam Prize was a total shock to me and obviously a great honor," Bond told reporters. "To win both the Killam Prize and the Herzberg Gold Medal in the same year proves that this really is the year of the cosmic microwave background in that three other major awards given to other researchers, including the Nobel Prize this year, were for this area. I guess the Big Bang is here to stay."

Bond should know. He is internationally recognized for his investigations into the nature of the microwave background—the relic radiation of the Big Bang, which gave birth to the cosmos. In the 1980s, he and Cambridge University cosmologist George Efstathiou developed theoretical models showing how minute fluctuations in this otherwise uniformly distributed radiation could provide important clues to the shape, size, age, and composition of the early universe, and this work has played a key role in transforming cosmology into an increasingly precise science over the last two decades.

From 1996 to 2006, Bond served as director of the Canadian Institute for Theoretical Astrophysics (CITA), overseeing the design and development of a series of balloon-based experiments launched to map the microwave background at ever-smaller measurement scales and to probe the structure of the very young cosmos. In 2000, he served as lead theoretician for the 10-day Boomerang Mission flown over Antarctica, which captured an extraordinarily detailed snapshot of our universe's first light, and he is one of the coinvestigators for the European Space Agency's billion-dollar Planck satellite, scheduled for launch in mid-2008. Much of his current research focuses on the role played by dark matter and dark energy—cosmic entities that so far are detectable only through their gravitational influence on other cosmic objects—in shaping the early history and evolution of large-scale structure in the universe.

Named an Officer of the Order of Canada in 2005, Bond is a Fellow of the United Kingdom's Royal Society and a winner of the prestigious Dannie Heineman Prize of the American Astronomical Society, among many other awards and honors. He is a Fellow of the Royal Society of Canada, the American Physical Society, and the Institute of Physics, UK, as well as an Honorary Foreign Member of the American Academy of Arts and Sciences.

partner. Milstein, whose practice focuses on the preparation and prosecution of patent and trademark applications, both nationally and internationally, also counsels clients in patent prosecution strategy, assessing intellectual property for business transactions and/or litigation, and technology licensing, and he has in addition provided advice on the treatment of patent royalties under Internal Revenue Code section 1235. Previously he was a partner with Wall Marjama & Bilinski LLP in Boston, and prior to that, he was an associate professor in the electrical engineering department of the University of Massachusetts–Lowell. He received a PhD in inorganic chemistry from the Polytechnic Institute of Brooklyn in 1971, an MBA from the University of Maryland, College Park, in 1981, and a JD cum laude from New England School of Law in 1999.

Baldomero M. Olivera, PhD, professor of biochemistry and neuroscience at the University of Utah, was honored by the Harvard Foundation for Intercultural and Race Relations as its 2007 Scientist of the Year in March. Past honorees have included Mae Jemison, the first black female astronaut, and math teacher Jaime Escalante, whose outstanding career as an educator served as the basis of the film *Stand and Deliver*. After completing postdoctoral work at Stanford, Olivera, a native of the Philippines, began doing research on the deadly cone snails that live in that nation's waters. His research into neurotoxins isolated from snail venom has led to a better

understanding of the nervous system and to the development of new commercial drugs from snail toxins, such as potent painkillers that can be administered to patients who do not respond to morphine.

David Schwartz, chairman of Bio-Rad Laboratories, has received the 2007 Pittcon Heritage Award, which honors scientists who have made outstanding contributions in analytical chemistry and spectroscopy, at the annual Pittsburgh Conference & Exhibition on Analytical Chemistry & Applied Spectroscopy. Since Schwartz and his wife, Alice, cofounded Bio-Rad in 1952, the company has evolved into a global enterprise, manufacturing and distributing a broad range of products for life-sciences research and clinical diagnostics, and is today known worldwide among hospitals, universities, and biotechnology and pharmaceutical companies.

1967

Gérard Bloch, MS, has joined the GEVERS Group, a European leader in intellectual-property law. "Founded in 1898 by Jacques Gevers," he writes, "the GEVERS Group, with its family feeling, developed an active and dynamic management, combining the skills of professional managers and experts. With an overall staff of 140 people, it includes about 40 patent attorneys and trademark attorneys." GEVERS, he adds, is the world leader in the field of community trademarks, and the Belgian leader in patent matters. He serves as president of BLOCH & GEVERS in Paris, and the firm

continues to offer all the assistance provided previously by BLOCH & ASSOCIES. A graduate of the Strasbourg Law School, Bloch is a member of the European Patent Institute and a member and former vice president of the French Chartered Institute of IP Attorneys.

1970

George E. Apostolakis, MS, PhD '73, professor of nuclear science and engineering and engineering systems at MIT, has been elected to membership in the National Academy of Engineering for "innovations in the theory and practice of probabilistic risk assessment and risk management." One of the highest professional distinctions accorded to an engineer, NAE membership honors those who have made outstanding contributions to "engineering research, practice or education, including, where appropriate, significant contributions to the engineering literature," and to the "pioneering of new and developing fields of technology, making major advancements in traditional fields of engineering or developing/implementing innovative approaches to engineering education." Apostolakis's research interests include probabilistic risk assessment of complex technological systems; risk management involving several stakeholder groups; decision analysis; human reliability models; organizational factors and safety culture; infrastructure security; and risk-informed and performance-based regulation. He is a recipient of the 1999 Tommy Thompson Award, from the Nuclear Installations Safety Division of the American Nuclear Society, and is, among many other professional affiliations, editor in chief of *Reliability Engineering and System Safety*, an international journal; founder and secretary of the International Association for Probabilistic Safety Assessment and Management; and a member and former chairman of the Advisory Committee on Reactor Safeguards, U.S. Nuclear Regulatory Commission.

1972

Michael Mallary, PhD, a member of the research team at Seagate, a worldwide leader in the design, manufacture, and marketing of hard-disc drives, has been named a Fellow by the Institute of Electrical and Electronics Engineers, the world's largest technical professional society, in recognition of "his significant contributions to recording devices, like hard-disc drives." The grade of Fellow, the IEEE's highest designation, is conferred by the IEEE board of directors on persons with "an extraordinary record of accomplishments in any of the IEEE fields of interest." Mallary's career has spanned more than 27 years in the field of magnetic recording. He holds 53 patents and has authored 46 publications.

1974

Terry McMahon, PhD, a professor of chemistry at the University of Waterloo, in Ontario, Canada, has been named the dean of science, effective July 1. Considered a leader in the university's research into gaseous ions, McMahon spent the previous nine years as chair of the chemistry department, and he is known for his hands-on teaching approach that creates an exciting atmosphere in the lab for students. Among McMahon's accomplishments is his work with a custom-built electromagnetic bottle that allows the measuring of black-body radiation-induced dissociation. "We were the first people that were able to show such a mechanism for energy transfer existed," he says. "We were able to do that because of the unique nature of the apparatus." He and his teams have also made a shift into the field of hydrogen bonds. Nored for his career as both an educator and a researcher, he has been at UW since 1984. The duration of his first term as dean will be five years.

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1975

Alex Lidow, CEO of International Rectifier (IR), says, "Saving energy is an important mission that drives our technology and product development at International Rectifier. We're honored to receive this recognition from *analogZONE* and even more gratified with the growing popularity of iMOTION with systems designers." In fact, two innovations from IR's iMOTION integrated design platform family have won Product of the Year awards from *analogZONE*, an online publication for analog design engineers. IR's IRS2136D, a three-phase analog control integrated circuit in the platform developed for air-conditioning applications, has won the Best Green Motor Controller award, and its IRMCF341, a sensorless control integrated circuit in the iMOTION platform developed for direct-drive washing machines, took

honors as Best Consumer Product Innovation. Details on the iMOTION platform, as well as links to design assistance, are posted on the iMOTION website at <http://www.irf.com/product-info/imotion>. Considered a world leader in power management technology, IR produces analog, digital, and mixed-signal integrated circuits, advanced circuit devices, integrated power systems, and components that enable high-performance computing and that eliminate energy waste from motors. Lidow, who received his PhD in applied physics from Stanford, holds a number of patents on power semiconductor technology, and is a Caltech trustee.

1976

Stelios Kyriakides, MS, PhD '80, director, Center for Research in Mechanics of Solids, Structures and Materials, and Temple Foundation Endowed Professor, department of aero-

space engineering and engineering mechanics, both at the University of Texas at Austin, has been elected to membership in the National Academy of Engineering for "contributions to understanding of propagating instability phenomena in structures and materials and its use for technological applications." One of the highest professional distinctions accorded to an engineer, NAE membership honors those who have made outstanding contributions to "engineering research, practice or education, including, where appropriate, significant contributions to the engineering literature," and to the "pioneering of new and developing fields of technology, making major advancements in traditional fields of engineering or developing/implementing innovative approaches to engineering education." Kyriakides has served on UT Austin's College of Engineering faculty since 1980. The recipient of a National Science

Foundation Presidential Young Investigator Award in 1984, he has published more than 100 technical articles and reports and was a 1997 ASME Fellow. His research focuses on instabilities that limit the extent to which solids, structures, and materials can be loaded or deformed.

1979
Carlton Caves, PhD, a member of the physics and astronomy faculty at the University of New Mexico, is one of 11 professors to have been promoted to the rank of distinguished professor, the highest rank bestowed on UNM faculty. Distinguished professors “are individuals who have demonstrated outstanding achievements and are nationally and internationally renowned as scholars.” A fellow of the American Physical Society and a member of the American Association for the Advancement of Science, Caves has received the Einstein Prize for Laser Science from the Society for Optical and Quantum Electronics and has been honored three times for Excellence in Teaching at UNM. His areas of expertise include the physics of information, quantum information theory, quantum chaos, quantum optics, the theory of nonclassical light, the theory of quantum noise, and quantum theory measurement.

1980
Terry Wallace, MS, PhD '83, has been named Los Alamos National Laboratory's principal associate director for science, technology and engineering. He had been acting associate director since Los Alamos National Security took over the lab's management last June. Wallace, a seismology expert, joined the lab's technical staff in May 2003, was named to lead its earth and environmental sciences division that

November, and was appointed associate director for strategic research in February 2005. He previously was a professor of geosciences at the University of Arizona. He was also an associate in the applied mathematics graduate program, curator of the University of Arizona Mineral Museum, and director of the Southern Arizona Seismic Observatory.

Catherine Strader, PhD, has been named senior vice president, science and technology, at Schering-Plough Corporation. In this new position, reporting directly to the company chairman and CEO, she will participate in corporate actions, including business development and licensing, centered on external science and technology. Since joining the company in 1995 as vice president, CNS (central nervous system), cardiovascular and genomics research, Strader has held positions of increasing responsibility and was appointed chief scientific officer in 2006. With more than 150 publications to her credit, she is a recognized expert in the field of receptor biology and led the group that identified the molecular target of Zetia (ezetimibe), a medication that has helped thousands of people worldwide lower their cholesterol. Schering-Plough is a global science-based health-care company providing prescription, consumer, and animal-health products. Through internal research and collaborations with partners, it discovers, develops, manufactures, and markets advanced drug therapies.

1983
Gabriel Rebeiz, MS, PhD '88, writes that in 2005, after 15 years at the University of Michigan, Ann Arbor, he moved to UC San Diego, where he is now a professor in the department of

electrical and computer engineering, and resides in La Jolla with his wife, Kimberly, and their son, Gabriel Jr. At UCSD, he leads a group of 18 PhD students and postdocs doing research in RF MEMS (radio-frequency micro-electro-mechanical systems), microwave and millimeter-wave CMOS/SiGe RFICs, and planar antennas. The director of the DARPA S&T Center for RF MEMS Reliability and Design Fundamentals and a member of the Center for Wireless Communications, he can be reached at rebeiz@ece.ucsd.edu.

Julie Straub, MS '83, has been promoted to executive director of research at Acusphere Inc., a specialty pharmaceutical company that develops new drugs and improved formulations of existing drugs through its proprietary microsphere technology. Since joining Acusphere in 1995, Straub has been involved in every research project at the company, and in her new role she will oversee formulation support, pharmaceuticals, analytical research, and preclinical and intellectual-property activities. Prior to joining Acusphere, she worked at Alkermes Inc., where she was involved in research on microparticle-based drug-delivery systems, receptor-mediated drug-delivery systems, and medicinal chemistry. The inventor on 22 issued U.S. patents and the author of 22 publications, Straub received her PhD in chemistry from MIT.

1984
Jeffrey Pugh, MS, PhD, '88 has joined MySQL AB, developer of the world's most popular open-source database, as vice president of engineering. Based in MySQL's Silicon Valley office, he reports to the executive vice president of products and is responsible for development of the company's family of open-source database server software and tools. He has more than 20 years of experience in leading and managing software teams, including serving as vice president of engineering and technology for Web-based sales-prospecting and lead-generation software at Spoke Software; holding executive technology management positions for Attensity Corporation and TenFold Corporation; and serving as CIO for E. M. Warburg Pincus & Co. LLC, a leading global private equity firm. Before that, he held various software engineering and senior product management roles at Oracle Corporation, where he was on the founding team for Oracle's ERP suite.

1985
Nabeel A. Riza, MS, PhD '90, professor of optics and electrical engineering and head, Photonic Information Processing Systems Laboratory, at the University of Central Florida, has been named an Institute of Electrical and Electronics Engineers (IEEE) Fellow for 2007 via the IEEE Lasers and Electro-Optics Society (LEOS) with the citation, “For contributions to acousto-optic, liquid crystal, and micromirror device applications in photonic signal processing and controls.” The IEEE is the world's largest technical professional society, and its board of directors confers the grade of Fellow, its highest designation, on persons with “an extraordinary record of accomplishments in any of the IEEE fields of interest.” The recipient of numerous honors, Riza has published more than 230 articles and papers, holds 35 patents, is a fellow of the Optical Society of America and the International Society for Optical Engineering, and served as vice president of LEOS from 2002 to 2005. For more information on his research group, see <http://pips.creol.ucf.edu>.

1987
Emily A. Carter, PhD, Arthur W. Marks '19 Professor of Mechanical and Aerospace Engineering and Applied and Computational Mathematics at Princeton, has received the

American Chemical Society (ACS) Award for Computers in Chemical and Pharmaceutical Research. An award symposium was held in her honor in March by the Computers in Chemistry division at the 233rd ACS national meeting in Chicago. Carter's honors include awards, medals, and fellowships of the ACS, the American Vacuum Society, the American Physical Society, the American Association for the Advancement of Science, and the International Academy of Quantum Molecular Science. After 16 years on the chemistry and materials science faculty at UCLA, she moved to Princeton in September 2004 as a professor of mechanical and aerospace engineering and applied and computational mathematics, with appointments as associated faculty in the Princeton Institute for Computational Science and Engineering, in the Princeton Institute for the Science and Technology of Materials, and in the chemistry and chemical engineering departments. She was named Marks Professor in 2006. Her research focuses on understanding how materials fail due to chemical and mechanical effects and how to optimally protect materials against failure.

1989
Dean Elzinga writes, “My partner, Ron Buckmire, and I recently celebrated our 16th anniversary. He was granted tenure at Occidental College in 2004, and we recently bought our first home in the Montecito Heights area of Los Angeles, adjacent to South Pasadena. Ron is now chair of the Oxy Math Dept and I am 10 years into my freelance classical singing career. It took hard thinking to buy a house in costly Southern California, but we love this home and we love 500-acre Debs Park next door. I like to sneak into the park at night with our dog Leenah and catch a peak from the hilltops at downtown L.A. just 2 miles away, rising from the ground like a massive mother ship.”

1991
Jun-Young E. Jeon has been named a partner of the intellectual property law firm of Christie, Parker & Hale LLP. The recipient of an MS in electrical engineering from Cal State Long Beach and a JD from Southwestern University School of Law, Jeon was formerly a senior engineer in corporate patent engineering with the Boeing Company and a lead engineer for the C-17 Aircraft Defensive Systems at McDonnell Douglas Corporation. He joined Christie, Parker & Hale in 1999. A native of Seoul, Korea, and fluent in Korean, Jeon grew up in Southern California, and currently lives there, in Glendale.

1994
Paul Rothmund, senior research fellow in computer science and computation and neural systems at Caltech, has been chosen by the *Forbes/Wolfe Nanotech Report* as creator of one of the top five nanotech breakthroughs of 2006. “The sheer simplicity and versatility” of his “DNA origami” makes it “a revolution in nanoscale architecture,” the report says. “Rothmund developed a technique to fold a single long strand of DNA into any 2D shape held together by a few shorter DNA pieces. He created software to quickly determine what short sequences will fold the main strand into the desired shape, such as the DNA smiley face he built, which is a mere 100 nm across and 2 m thick, or his nanoscale map of the Americas.” The report adds, “They sound silly, but these creations are proof of concept: here is a method for building scaffolding that can be used to hold quantum dots in a quantum computer or proteins in a multi-enzyme factory, to name just a few potential applications.”

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O b i t u a r i e s

1999
Shana O. Kelley, PhD, professor of biochemistry and pharmacy at the University of Toronto, has received the 2007 Pittsburgh Conference Achievement Award from the Pittsburgh Conference and the Society for Analytical Chemists of Pittsburgh. Her current research is on developing new nanoscale sensors for disease diagnosis, and in 2001 she cofounded GeneOhm Sciences, a company devoted to developing new clinical diagnostics. The annual Pittsburgh Conference and Exhibition on Analytical Chemistry and Applied Spectroscopy, held this year in Chicago, recognizes scientists who have made outstanding contributions to those fields. Kelley's other honors include the Research Corporation Innovation and National Science Foundation Career awards, and selection as an Alfred P. Sloan Fellow.

Erik Severin, PhD, has been named regional manager, Asia, for P. Kay Metal Inc., and will head the company's first Asian office, in Shenzhen, China, supporting the market-development efforts of Wong's Kong King and other MS2 distribution partners throughout the Asia-Pacific region. Severin has been working in new business development and with start-up companies for the past seven years, and his PhD research at Caltech, which focused on new materials and instrumentation, led to more than a dozen issued patents and peer-reviewed papers. P. Kay Metal is the developer of the MS2(TM) Molten Solder Surfactant, the process that eliminates dross in electronics manufacturing.

2000
Michelle Armond writes that she and Alexander Ihler '98, who received his PhD from MIT in 2005, were married in August 2006 in a small seaside ceremony in Laguna Beach, California. "Following our wedding, we spent our honeymoon in Japan. In early 2007, we departed Southern California and moved to Chicago. Alex is currently an assistant research professor at the Toyota Technological Institute at the University of Chicago." Armond, who received her JD from UC Berkeley in 2003, has joined the patent law practice at Marshall, Gerstein & Borun LLP, a Chicago intellectual property law firm.

2004
Matthew Allen, PhD, a biochemistry postdoctoral researcher at the University of Wisconsin-Madison, has won the Pathway to Independence award for outstanding postdocs who intend to pursue a career in academia. He is one of 58 scientists who have received the inaugural award from the National Institutes of Health, and after he completes his research at UW, the award will grant him three years of funding for proposed research wherever he decides to work. He is currently looking into improving the sensitivity of MRI scans, and hopes the results will eventually be lifesaving. Allen is also the recipient of the 2007 Paul D. Boyer award, given to the most outstanding biochemistry postdoc.

FOR THE RECORD

Based on a fabricated report, *Caltech News* published an obituary for William J. Schoene '64 in the last issue. We are happy to report that Schoene is alive and well and living in Santa Monica, California.

1928
George R. Crane, on February 13, 2006.

1929
Andrew V. Haeff, MS, PhD '32, on November 16, 1990; Joseph A. Niles, on October 5, 2006.

1930
Tomatsu T. Hiyama, on January 18, 2006; Robert W. Wilson, MS '32, PhD '36, on June 26, 2006.

1935
Jackson Edwards, on September 19, 2006.

1936
Clarence F. Goodheart, on June 4, 2006;

1937
Thomas S. Harper, on January 20, 2006.

1938
Henry T. Nagamatsu, BS '39, MS '40, PhD '49, on May 15, 2006.

1939
William E. Berg, MS '40, on October 27, 2006; Robert W. Winchell, MS '40, BS '41, on June 23, 2006.

1940
Stephen E. Blewett, MS '42, on March 31, 2006; Robert C. Brumfield, MS '41, PhD '43, on December 29, 2002; Frederic C. E. "Fritz" Oder, MS '41, on May 11, 2006; George F. Wheeler, MS, on January 15, 2001.

1941
Paul S. Farrington, MS '47, Eng '48, PhD '50, on May 20, 2006; Richard F. Silberstein, MS '42, on July 26, 2006; John D. Spikes, MS '46, PhD '48 on June 14, 2006; Charles H. "Terry" Terhune Jr., Eng, on August 30, 2006; Thomas H. Wiancko, MS, on November 17, 2006.

1942
Sheldon W. Brown, Eng, on May 15, 2006.

1943
Claude L. Carter, on June 30, 2006; David A.

Elmer, MS '47, Eng. '48, on March 8, 2006; William M. Hamilton, MS, on May 24, 2006.

1944
Holt Ashley, Ex, on May 9, 2006; Clifford I. Cummings, on July 8, 2006; J. Robert Freeman Jr., on July 2, 2006; Robert F. Laabs, on April 15, 2005; Robert P. Phipps, MS, on January 17, 2006.

1945
Halcyon Ball, on October 3, 2006; George S. Budney, on May 21, 2006; Lawrence E. Wilferth Jr., on July 28, 2006.

1946
John O. Crum, MS, on March 10, 1994; Carl Richardson, MS, January 26, 2006; Paul C. Ricks Jr., on April 2, 2006; Morris Skurka, MS, on June 18, 2006.

1947
William C. Cooley, MS, on October 27, 2006; Stephen F. Moran III, on June 21, 2006; Norman C. Peterson, MS, PhD '49, on July 4, 2006; Calhoun W. Sumrall, MS, on May 29, 2006.

1948
Joseph N. Benezra, MS, Eng '49, on November 10, 2006; Albert H. Hedden, MS, on July 4, 2004; Edward A. (Bohjanen) North, on August 4, 2006.

1949
Patrick D. Doherty, on August 2, 2006; Don H. Pickrell Jr., MS '50, PhD '56, on July 11, 2006; John D. Richartz, on November 13, 2006; Albert M. Taylor, MS, on March 3, 2006; William T. Vickrey, on April 25, 2006.

1950
Donald H. Baer, MS, on October 25, 2006; James H. Hottenroth, MS, on February 1, 2000; Ralph L. Merrill, MS, on August 26, 2006.

1951
Charles Bates, on September 28, 2006; Raymond H. Greutert, BS '53; Gerald M. Monroe, PhD, on May 24, 1998; Richard K. Nuno, on August 22, 2006.

1952
Samuel P. Cook, on January 16, 2006.

1955
George Stalk, MS, Eng '55, on September 26, 2006.

1956
Lee M. Sonneborn, PhD, on January 1, 2004.

1957
Joe Lingerfelt, MS '58, on December 30, 2005; S. James Morizumi, MS, on July 28, 2006; Haruo Oguro, MS, on November 15, 2002

1958
Robert M. Worlock, PhD, on July 18, 2006.

1960
Robert L. Norton, on November 19, 2006.

1962
Peter Edgar Hare, PhD, on May 5, 2006; William J. Hogan, on October 19, 2006.

1966
Ralph S. Hager, PhD, on September 29, 2006.

1968
Leonard M. "Bill" Stephenson, PhD, on August 26, 2006.

1977
Stephen R. Walton, on November 11, 2006.

1979
Gregory S. Hoffman, MS '80, on March 25, 2006.

1982
Stuart R. Stampke, PhD, on May 21, 2006.

1987
Lada Popovic, MS, on January 25, 2003.

2002
Neal S. Reeves, on October 11, 2003.

AN AVIARY BY ANY OTHER NAME?

A sizeable number of birds call the Caltech campus their home. Several more species stop over for the winter, some choose to nest here during the spring, and others merely visit for the day or two . . . or three. Our back-page collage showcases a selection of the Institute's feathered friends, starting (top, left) with four raven fledglings who, from the shelter of a window niche above the president's office in Parsons-Gates, are doing their best to proclaim their putative descent from the dinosaurs. Continuing clockwise, we find a red-crowned parrot; a black-throated gray warbler; a Nuttall's woodpecker; a female peacock, or peahen; a mourning dove; an orange-crowned warbler; an Anna's hummingbird; a house sparrow; and in the center, somewhat larger than life (that dinosaur dynamic again), a house finch. Every Tuesday at noon, an ad hoc group of campus birdwatchers scours the campus for birds along a route first devised in 1986 by Alan Cummings, PhD '73, a member of the professional staff in physics, and Ernie Franzgrote, MS '57, a longtime member of JPL's technical staff. Cummings continues to lead the group today, and, as befits a Caltech graduate, he has seen to it that the data from each walk—nearly 900 to date—are recorded and analyzed. To find out more, including how to participate in the weekly walks (logistics permitting), check out the Caltech Birding website at <http://bird-walks.caltech.edu/>.

