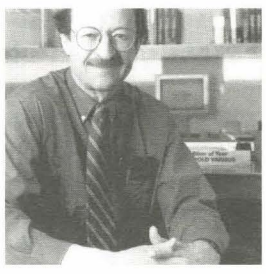
# Caltech336

T F S S M T W T F S S M T W

The campus community biweekly

**March 20, 2003, vol. 3, no. 6**

## Varmus to speak at commencement

Harold Varmus, the chief executive officer of Memorial Sloan-Kettering Cancer Center and the former director of the National Institutes of Health, will be the principal speaker at Caltech's 109th commencement ceremonies, which will take place on Friday, June 13, 2003.

"Harold Varmus is a great speaker, great educator, great administrator and a great research scientist," said Caltech president David Baltimore. "As the head of a cancer institute and the former head of the National Institutes of Health, he understands and can illuminate the research-and-development environment in which many of our graduates will make their lives."

Varmus is a corecipient of the 1989 Nobel Prize in physiology or medicine, awarded for research that demonstrated the cellular origins of the oncogene of a chicken retrovirus. This discovery contributed to an understanding of cell growth in human cancer. Oncogenes are normal genes that control cell growth; under certain circumstances, they mutate and direct the cell to grow at a fierce pace. The research done by Varmus and corecipient J. Michael Bishop has improved the diagnosis and treatment of a variety of cancers.

A graduate of Amherst College, Harvard University, and Columbia University's College of Physicians and Surgeons, Varmus was a faculty member at UC San Francisco for 23 years. It was there that he and Bishop performed much of their research.

In 1993, Varmus was appointed by then-president Bill Clinton to serve as director of the National Institutes of Health. Under his watch, the NIH underwent dramatic growth. He held that post until 1999 and took over the top post at Sloan-Kettering at the beginning of the following year.

In addition to his Nobel Prize–winning work, Varmus also does research on the replication cycles of retroviruses and hepatitis B viruses. The author of four books and 300 scientific papers, he has served as an advisor to pharmaceutical and biotechnology firms, academic institutions, and the U.S. government. Currently, Varmus lends his knowledge to the World Health Organization's macroeconomics and health commission and to a National Research Council panel on genetically modified organisms, and works on the development of mouse models for human cancer.

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## $4 million to aid understanding of cells

Caltech is the birthplace of structural biology, which was invented by Linus Pauling in the 1940s. Unwilling to rest on its laurels, the Institute will seek out new frontiers in the field with the help of a $4 million grant from the Gordon and Betty Moore Foundation. The grant will be used to create a state-of-the-art cryoelectron microscopy laboratory.

Structural biology research at Caltech continues today in the Pauling tradition, using information obtained from high-resolution structures to understand the molecular basis of biological processes.

"Caltech is committed to making every effort to give our faculty the tools they need to be productive," says Caltech president David Baltimore. "This equipment will enable our researchers to push beyond current understandings of intracellular activity to gain a more complete understanding of the life cycle of a cell, which is critical to understanding intercellular dynamics and larger organic systems."

*see Moore grant, page 6*

## Caltech hires security force personnel

Now that all the security and parking officers have made the transition from contract employees to full-time Caltech employees, Gregg Henderson, chief of campus security and parking services, says that the change will bring improvements to the level of security available on campus.

With safety concerns taking a higher priority for most people, Henderson says it made sense from an economic and security position to bring the former contract security members into the Caltech fold. (The security personnel are welcomed in the Personals column of this issue of *Caltech 336*.)

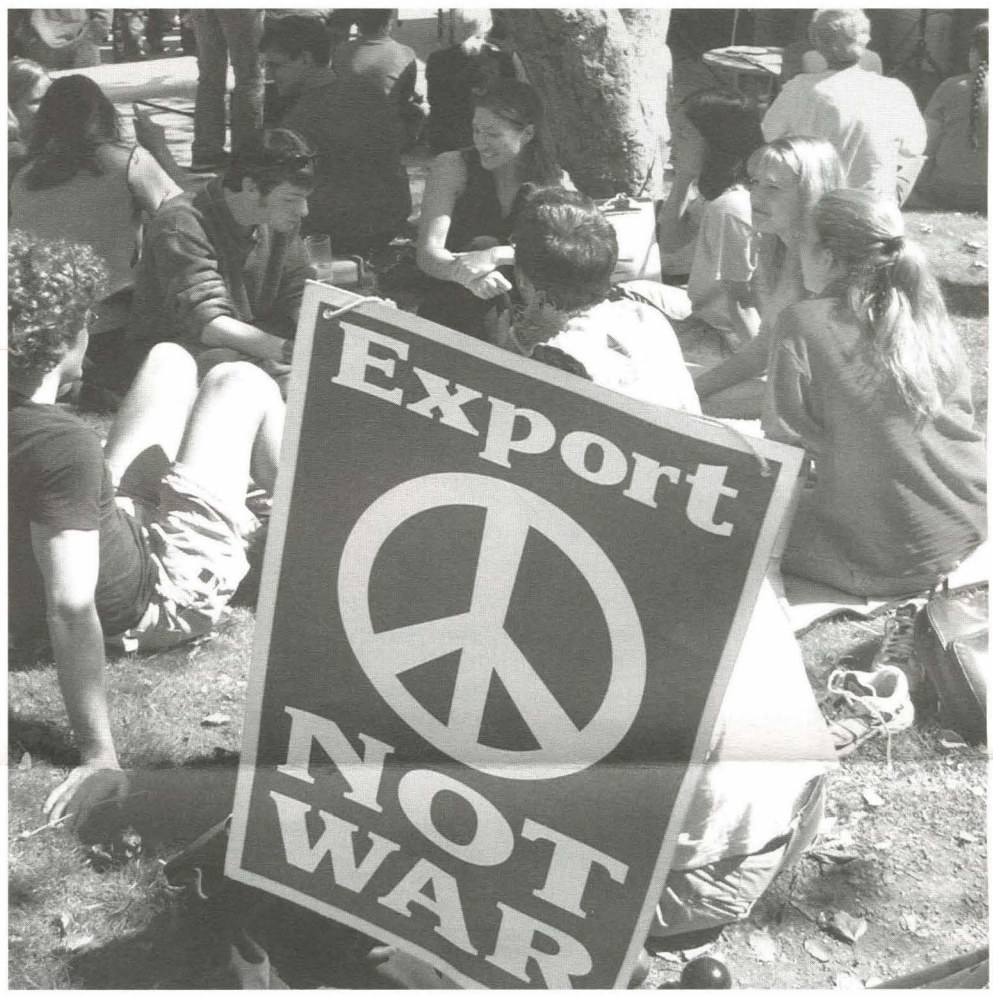
"In order to provide the service that we want to provide to the Caltech community, and to have more control over the people that are providing the service, we felt that it was time to make that move," he says.

"These are permanent employees, and obviously they are going to feel more a part of the community," he says. "It's different from when you work for a contract company. People recognize a bond because Caltech staffers and security employees are both coming from the same place, so we see that as a real plus."

As permanent employees, the security officers will be eligible for Caltech-sponsored benefits and pension plans, Henderson says. To enhance safety on campus, the Security Office encourages students and Caltech employees to get to

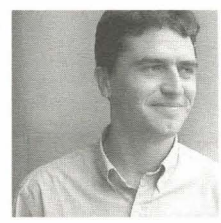
*see Security, page 6*

## Trying to give peace a chance




**Caltech community members congregated by the Red Door on March 5 as part of a nationwide campaign protesting the imminent war in Iraq. Several groups representing alternative views also joined the event.**

## Ultrahigh-Q chip created



In an advance that holds promise for integrating previously disparate functions on a chip, Caltech applied physicists have created a disk smaller than the diameter of a human hair that can store light energy at extremely high efficiency. The disk, called a "microtoroid" for its doughnut shape, can be integrated into microchips for many potential applications.

Reporting in the February 27 issue of *Nature*, Jenkins Professor of Information Science and Technology and Professor of Applied Physics Kerry Vahala and graduate students Deniz Armani, Tobias Kippenberg, and Sean Spillane describe the optical resonator, which has a "Q factor" (quality factor) more than 10,000 times better than any previous similar chip-based device. A figure used to characterize resonators, Q is the approximate number of light oscillations within the device's storage time.

Resonators store optical energy by resonant recirculation at the toroid's exterior boundary, achieving Q factors in excess of 100 million. Examples of resonators include TV tuners and quartz

*see Ultrahigh-Q, page 6*

## Pierce wins Feynman prize

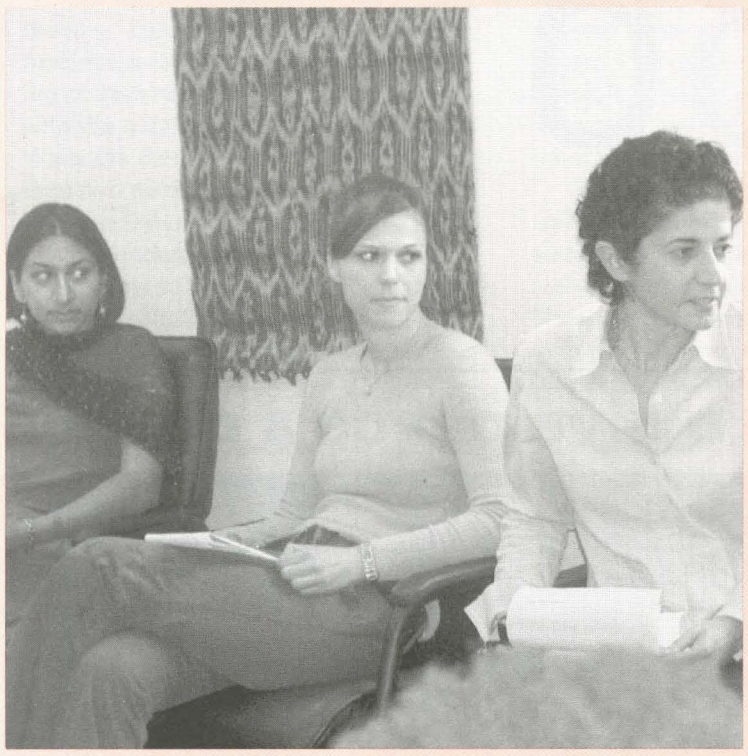
Niles Pierce, assistant professor of applied and computational mathematics, has been awarded Caltech's 2003 Richard P. Feynman Prize for Excellence in Teaching. Provost Steve Koonin presented the award to Pierce at the February 24 faculty meeting.

He was "thrilled and surprised" to learn of the award, Pierce says. "I remember the first day I stepped in front of a chalkboard after I arrived at Caltech—teaching was much harder than I expected."

Nonetheless, his manner and his method have resonated with both undergrads and graduate students. "I wanted to communicate in a way that would cause students to become excited by the ideas of applied and computational mathematics," he says. "Given the tremendous demands placed on Caltech

*see Pierce, page 6*

# NewsBriefs



A March 12 lunch honoring International Women's Day featured Caltech community members discussing the ways women have transformed society in their various countries. From left are junior Iram Bilal, from Pakistan; postdoctoral scholar in biology Marina Brozovic, of Croatia; and moderator Parandeh Kia, director of International Student Programs, which cosponsored the event. Other sponsors were the Women's Center, the Caltech Y, Minority Student Education, the Health Center, and the Counseling Center.

## Personals

### Welcome to Caltech

**February**

**Paul Barton**, **David Beltran**, **Kevin Boardwine**, **Marvin Boone**, security officers, **Andrew Castro**, dispatch/security officer, **Alejandro Cervantes** security officer, all with Campus Security and Parking Services; **Jennifer Dodd**, visitor in physics; **Armando Duran**, security officer, Campus Security and Parking Services; **Cecile Gautheron**, postdoctoral scholar in geochemistry; **Henry Haselgrove**, visitor in physics; **Jonathann Hughes**, security officer, Campus Security and Parking Services; **Dexin Jia**, scientist, chemistry and chemical engineering; **Daniel Mertz**, security officer, Campus Security and Parking Services; **Mary Metz**, department assistant, applied physics; **Jennifer Mortensen**, veterinary technician, Office of Laboratory Animal Resources; **Albert Nguyen**, research assistant I, biology; **Cleantha Paine**, wait staff I, Athenaeum; **Arturo Rizo**, parking officer, Campus Security and Parking Services; **Ueli Rutishauser**, visitor in electrical engineering; **Sandeep Singh**, postdoctoral scholar in aeronautics; **Todd Swart**, dispatch officer, **Willie Torres**, security officer, **Agustin Valadez**, parking officer, **James Valencia**, dispatch officer, all with Campus Security and Parking Services; **Louis Zaharopoulos**, secretary/grants monitor, materials science; **Weiwei Zhong**, postdoctoral scholar in biology; **Brian Zuehls**, dispatch officer, Campus Security and Parking Services.

**March**

**Kimberly Van Auken**, database curator, **Thasneem Yao**, administrative assistant, **Xiaowei Zhang**, MRI scientist, all with biology.

**April**

**Alexei Borodin** will join Caltech on April 1 as a professor of mathematics. Noted for his work in the area of asymptotic Riemann-Hilbert problems, his interests include analysis, group theory, combinatorics, and algebraic geometry. He received his MS from Moscow State University in 1997 and his MSE and PhD from the University of Pennsylvania, both in 2001.

### Retirements

**Edna Costa** will retire on April 1. A member of the telecommunications support staff for the Administrative Technology Center, she has been with Caltech for 22 years.

**Susan Walker**, deputy director of gift and estate planning in the Development Office, will retire on April 1, after nearly 29 years at Caltech. With the exception of three years in the office of the vice president for institute relations, she has spent her entire Caltech career in Development, joining gift and estate planning in 1987. She received her license as a certified financial planner in 1994, and served for a lengthy period of time as acting director of gift and estate planning. She also served on the Caltech Credit Union's supervisory committee, the Caltech Y's board, and the President's Committee on Institute Art at Caltech.

### Deaths

**Al Hibbs**, a senior staff scientist at JPL who had retired in 1986 after 35 years at the Lab, died on February 24; he was 78. A graduate of Caltech (BS 1945, PhD 1955, both in physics), Hibbs had also taught on campus, lecturing on subjects ranging from government to physics. After receiving his BS, he and his Caltech roommate, Roy Walford, became national sensations by working out a system for beating roulette in Reno and Las Vegas, then using their winnings to buy a yacht and cruise the Caribbean. At JPL, Hibbs held a number of administrative positions and became well-known to American television audiences as the "voice" of the Surveyor, Mariner, Viking, and Voyager interplanetary missions. He also hosted the TV programs *Science in the News* and *Exploring*, receiving a Peabody Award for the latter. He was the author of more than 100 scientific papers and coauthored *Quantum Mechanics and Path Integrals* with Richard Feynman. Predeceased by his first wife, Florence, he is survived by his second wife, Marka; two children by Florence; and two of Marka's children.

**Ruth Toy**, a former assistant to the dean of graduate studies and prior to that an administrator in engineering and applied sciences, died on March 3; she was 95. She had worked at Caltech for 25 years, retiring in 1974. Predeceased by her husband, Albert, she is survived by a daughter, Peggy McLeod; a son, Steward; and a grandson, David. "Mrs. Toy touched many people, and she will be greatly missed by her family and friends."

## Honors and awards

**Jack Beauchamp**, Ferkel Professor of Chemistry, has been named the recipient of the American Chemical Society's 2003 Frank H. Field and Joe L. Franklin Award for Outstanding Achievement in Mass Spectrometry. The honor, which recognizes Beauchamp's development of "innovative ways to analyze molecules, methods that can help track pollutants in the environment, identify compounds in space, and detect explosives," will be presented on March 25, at the society's national meeting in New Orleans. Beauchamp received his BS from Caltech in 1964 and his PhD from Harvard in 1967, the same year he joined Caltech.

**Ares Rosakis,** professor of aeronautics and mechanical engineering, has been selected to receive the 2003 M. M. Frocht Award, which is given annually by the Society for Experimental Mechanics Honors Committee to honor "outstanding achievement as an educator in the field of experimental mechanics." The award will be presented at the society's annual conference, which will take place this year June 2–4 in Charlotte, North Carolina. Rosakis came to Caltech in 1982, the same year he received his PhD from Brown University. He received his bachelor's degree from Oxford in 1978.

## Undergrads win Bishop Prize

**Rachel Medwood** and **Kirsten Welge**, a pair of Caltech juniors, have been selected as recipients of the 2003 Bishop Prize. Medwood, who is majoring in economics and computer science, has been studying the Russian language and Russian literature at Occidental College and will now travel to Moscow to study Russian with the American College Teachers of Russian program. She will also travel to a number of cities in the Russian Federation and to Kiev, Ukraine, where her family came from.

Welge, who is majoring in history, will travel to Achill Island in the Republic of Ireland, where she will participate for six weeks in an archaeological field camp. She will also travel to important Irish medieval sites.

Established in 2000 by the Bishop family to honor Dr. Amasa Bishop, who received his BS in physics from Caltech in 1943, the Amasa Bishop Summer Study Abroad Prize covers round-trip air fare and all tuition fees and living expenses up to $6,000 each for two juniors to study abroad during the summer.

Amasa Bishop served as chief of the U.S. Atomic Energy Commission's Controlled Thermonuclear Branch and went on to become the commission's scientific representative to Europe.

## Caltech writer explores life and art

**Merrill Joan Gerber**, a lecturer in writing at Caltech since 1989, will see her 24th book, *Gut Feelings: A Writer's Truths and Minute Inventions*, published this month by the University of Wisconsin Press. A collection of personal essays and three stories that blur the line between fiction and memoir, the book is an exploration of Gerber's vision as a writer, and the ways in which life provides the raw material for art. She writes of her apprenticeships with renowned writing teachers Andrew Lytle and Wallace Stegner, her experiences at the artists' retreat Yaddo, in Saratoga Springs, New York, and topics ranging from the mysteries of love and marriage to painful encounters with suicides and family deaths. "Most of my work comes from the close observation of family life," she has said regarding her fiction. "Of course, life is chaotic, and in fiction, you take control of the material and shape it, redesign it, to give it meaning."

Gerber's other books include the travel memoir *Botticelli Blue Skies: An American in Florence* and the prize-winning novels *King of the World*, which won the Pushcart Press Editors' Book Award, and *The Kingdom of Brooklyn*, which won *Hadassah Magazine*'s Ribalow Prize. Her most recent novel, *Anna in the Afterlife*, was named a "best book of 2002" by the *Los Angeles Times*. Her widely published short stories include "I Don't Believe This," which was selected for *Prize Stories: The O. Henry Awards 1986.*

## All Mozart, all evening

With an exceptional group of talented vocalists, the Caltech Chamber Singers student ensemble will stage the complete second act of the opera *The Marriage of Figaro* as part of their 17th annual All-Mozart Concerts. This year's performances will take place on Friday, April 4, and Saturday, April 5.

Says Don Caldwell, director of the Chamber Singers, "Mounting such a production is a major endeavor not usually undertaken outside of a music school environment. But this year's group of students includes an exceptional array of vocal talents who are up to the challenge."

He notes that only once before, in 1989, has the concert been devoted to one of Mozart's operas. That year, the group also staged *Figaro*, featuring two staff members (the group became all-student in 1993) and two students, one of whom was Dean Elzinga, who played the Count. Elzinga has since become a professional singer who has performed at the Metropolitan Opera and around the world.

This year's performance of *Figaro*, sung in English, will feature graduate student Ding-shyue Yang as Figaro; graduate student Tashica Williams as the Countess; senior Karl Hammond as the Count; freshman Theresa Grieco as Susanna; sophomore Abigail Elliott as Cherubino; and sophomore Jesse Escobedo as Antonio. A chamber ensemble conducted by Caldwell will accompany the concert, which will also include Mozart's *Missa Brevis* in D Major, K. 194.

According to Caldwell, K. 194 is one of the early Mass settings, written when Mozart was a mere 18 years old and employed by the archbishop of Salzburg. "Although constrained by the archbishop's

*see Mozart, page 6*

## FOCAL presents cultural historian Jeffrey Herr

The Friends of the Caltech Libraries will hold its spring membership luncheon on Wednesday, April 9, featuring guest speaker Jeffrey Herr, arts manager for the cultural affairs department of the City of Los Angeles. Herr is editor of the recently published *Landmark L.A.: Historic-Cultural Monuments of Los Angeles*, which chronicles the 700-odd historic and cultural landmarks that are protected by the city's Cultural Heritage Commission. Illustrated with black-and-white photos and covering classic monuments from the Hollywood sign to the Watts Towers to the Holiday Bowl, the book examines the city's diverse historic legacy through the physical features that define its character.

*Landmark L.A.* will be offered for sale at the event, with proceeds benefiting the City of Los Angeles Preservation Internship Program, which provides internship opportunities for college students studying historic preservation. Herr will sign books before and after lunch.

A no-host reception, beginning at 11:30 a.m., will kick off the luncheon. The cost is $30 each for FOCAL members and two guests and $35 for nonmembers. For reservations, contact K. C. McBride at (626) 395-6411 by Friday, April 4.

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# March 24–30, 2003

M T W T F S S

## Monday, March 24

**Quick Review for Electronic Theses**
Sherman Fairchild Library, multimedia conference room, noon—Caltech requires that theses be submitted in both paper and electronic versions. This presentation will offer a brief overview of techniques useful in the production and publication of electronic theses. The session will include tips on formatting, intellectual-property considerations, turning paper to pixels, creating PDFs, how to submit a thesis, and availability (who can see it and when) issues. Information: 395-6713 or kathleen@library.caltech.edu.

**Special Chemical Engineering Seminar**
106 Spalding Lab, Hartley Memorial Seminar Room, 4 p.m.—"Cellular Adhesion: Statics and Dynamics," Dr. Pierre-Gilles de Gennes, Institut Curie, France. Refreshments, 113 Spalding Lab, 3:30 p.m. Information: www.che.caltech.edu/calendar/seminars.html.

**William Bennett Munro Memorial Seminar**
25 Baxter, 4 p.m.—"How Are Couples in Rural Malawi Trying to Avoid Infection with HIV?", Professor Susan Watkins, department of sociology, and associate, Population Studies Center, University of Pennsylvania. Refreshments.

## Tuesday, March 25

**Beckman Institute Seminar**
Beckman Institute auditorium, 10:30 a.m. to noon—"Counterintuitive Approaches to Subproteomics: Old Tricks for New Dogs," Dr. Gary Hathaway, member of the professional staff and director of the Protein/Peptide Microanalytical Laboratory, Beckman Institute, Caltech. Refreshments, 10 a.m. Information: 395-2791 or www.its.caltech.edu/~bi/seminars.html.

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**Ulric B. and Evelyn L. Bray Seminar**
25 Baxter, 4 p.m.—"Emotions, Cognition, and Savings: Theory and Policy Analysis," Antonio Rangel, assistant professor of economics, Stanford University. Refreshments.

**Carnegie Observatories Colloquium Series**
William T. Golden Auditorium, 813 Santa Barbara Street, 4 p.m.—"The Origin of Gas in the Galactic Halo," Dr. Bart Wakker, department of astronomy, University of Wisconsin–Madison. Refreshments, 3:30 p.m.

## Wednesday, March 26

**Quick Review for Electronic Theses**
Sherman Fairchild Library, multimedia conference room, noon—Caltech requires that theses be submitted in both paper and electronic versions. This presentation will offer a brief overview of techniques useful in the production and publication of electronic theses. The session will include tips on formatting, intellectual-property considerations, turning paper to pixels, creating PDFs, how to submit a thesis, and availability (who can see it and when) issues. Information: 395-6713 or kathleen@library.caltech.edu.

**Special Chemical Engineering Seminar**
106 Spalding Lab, Hartley Memorial Seminar Room, 4 p.m.—"Frustration Effects in Polymer Systems," Dr. Pierre-Gilles de Gennes, Institut Curie, France. Refreshments, 113 Spalding Lab, 3:30 p.m. Information: www.che.caltech.edu/calendar/seminars.html.

## Thursday, March 27

**Quick Review for Electronic Theses**
Sherman Fairchild Library, multimedia conference room, noon—Caltech requires that theses be submitted in both paper and electronic versions. This presentation will offer a brief overview of techniques useful in the production and publication of electronic theses. The session will include tips on formatting, intellectual-property considerations, turning paper to pixels, creating PDFs, how to submit a thesis, and availability (who can see it and when) issues. Information: 395-6713 or kathleen@library.caltech.edu.

## Friday, March 28

**Quick Review for Electronic Theses**
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## Ride to speak on piquing interest in science

Sally Ride knows the highs and the lows of being first: the highs of flying on the space shuttle *Challenger* as NASA's first female astronaut, and the lows of being the first person to serve on two NASA investigative boards—one for the *Challenger* explosion, the second for the recent *Columbia* tragedy.

Ride will discuss her experiences in space and her efforts to promote girls' interest in science, math, and technology at the next Congressional Science Scholar Forum on Saturday, March 29. Presented by Congressman Adam Schiff in conjunction with Caltech, the free public talk will take place at 10 a.m. in 210 East Bridge.

The forum is aimed toward science and math students and teachers from local high schools and community colleges, giving them the chance to hear personal views from scientists.

A Caltech trustee, Ride became the first American woman to orbit Earth when she flew on *Challenger* in 1983. She rode aboard the shuttle again the next year, and was training for a third mission when the craft exploded in 1986. Ride was chosen to help investigate the *Challenger* explosion, and this month was also appointed a member of the investigative board for *Columbia*.

Ride left the astronaut corps in 1987 and is now a professor of physics at UC San Diego. Long concerned about the lack of female scientists, she responded by founding Imaginary Lines, a company that supports girls' interest in science, math, and technology through national programs and events such as the Sally Ride Los Angeles Science Festival, also taking place at Caltech on March 29.

All students who live or attend school within the 29th Congressional District are invited to attend the forum. For more information, call Pearl Fu in Schiff's office at (626) 304-2727, or Elizabeth Krider in Caltech's Government and Community Relations Office at (626) 395-8179.

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# March 31–April 6, 2003

M T W T F S S

## Monday, March 31

**Aeronautics Seminar**
101 Guggenheim Lab, Lees-Kubota Lecture Hall, 1 p.m.—"Inventing the Joint Strike Fighter," Dr. Paul Bevilaqua, Lockheed Skunk Works. Information: www.galcit.caltech.edu/seminars.shtml.

**Electrical Engineering Seminar**
239 Moore, 4 p.m.—"The Topsy-Turvy World of Negative-Index Metamaterials," Professor David R. Smith, department of physics, UC San Diego. Refreshments.

**Geological and Planetary Sciences Seminar**
155 Arms, Robert Sharp Lecture Hall, 4 p.m.—"Osmium Isotopes, the Central Limit Theorem, and the Distribution of Geochemical Heterogeneity in the Earth's Upper Mantle," Anders Meibom, science research associate, School of Earth Sciences, Stanford University. Information: www.gps.caltech.edu.

**High Energy Physics Seminar**
469 Lauritsen, 4 p.m.—"First Results from KamLAND," Robert McKeown, professor of physics, Caltech. Information: www.theory.caltech.edu/people/helen/seminar1.html.

**Inorganic-Electrochemistry Seminar**
147 Noyes, Sturdivant Lecture Hall, 4 p.m.—"New Approaches for the Selective Functionalization of Hydrocarbons with Homogeneous and Heterogeneous Catalysts," Professor T. Donald Tilley, department of chemistry, UC Berkeley.

## Tuesday, April 1

**Quick Review for Electronic Theses**
Sherman Fairchild Library, multimedia conference room, noon—Caltech requires that theses be submitted in both paper and electronic versions. This presentation will offer a brief overview of techniques useful in the production and publication of electronic theses. The session will include tips on formatting, intellectual-property considerations, turning paper to pixels, creating PDFs, how to submit a thesis, and availability (who can see it and when) issues. Information: 395-6713 or kathleen@library.caltech.edu.

**Mechanical Engineering Seminar**
206 Thomas, 3 p.m.—"Intelligent User Interfaces for Engineering Software," Professor Thomas Stahovich, Carnegie Mellon University.

## Wednesday, April 2

**Astronomy Colloquium**
155 Arms, Robert Sharp Lecture Hall, 4 p.m.—"Deep Surveys with Chandra and XMM: The X-ray Evolution of AGN and Galaxies," Professor Richard Griffiths, department of physics, Carnegie Mellon. Information: www.astro.caltech.edu/~gma/colloquia.html.

**Ulric B. and Evelyn L. Bray Seminar**
25 Baxter, 4 p.m.—"Indescribable Contingencies," Luca Anderlini, professor of economics, Georgetown University. Refreshments.

**Chemical Physics Seminar**
147 Noyes, Sturdivant Lecture Hall, 4 p.m.—"$H_3^+$ and Other Protonated Ions, Strong Acid in the Cosmos," Takeshi Oka, Millikan Distinguished Service Professor of Chemistry and Astronomy and of Astrophysics, University of Chicago.

## Thursday, April 3

**Caltech Library System Presents: Chemical Compound Data Searching**
Sherman Fairchild Library, multimedia conference room, 2 p.m.—Illustrative examples of searching for chemical compound data in both print and online resources, including Combined Chemical Dictionary, DIPPR, J. Phys. Chem. Ref. Data, ChemFinder, Crossfire, and Scifinder Scholar. Approximately one hour of formal instruction, followed by optional hands-on practice. Registration: http://library.caltech.edu/learning/form.htm.

**Caltech-Huntington Seminar Series in American Studies**
237 Baxter, 4 p.m.—"A Peculiar Society of Their Own: Manners, Race, and Violence in Philadelphia, 1793–1857," Samuel Otter, associate professor of English, UC Berkeley. Refreshments.

**Chemical Engineering Seminar**
106 Spalding Lab, Hartley Memorial Seminar Room, 4 p.m.—Topic to be announced. Professor Michael Rubenstein, department of chemistry, University of North Carolina at Chapel Hill. Refreshments, 113 Spalding Lab, 3:30 p.m. Information: www.che.caltech.edu/calendar/seminars.html.

## Friday, April 4

**High Energy Theory Seminar**
469 Lauritsen, 11 a.m.—Topic to be announced. Petr Horava, associate professor, physics department, UC Berkeley. Information: www.theory.caltech.edu/people/seminar/schedule.html.

**Inorganic-Organometallics Seminar**
151 Crellin, 4 p.m.—"Nitrene Capture and Functionalization via an Fe(I)-Fe(III)-Fe(I) Cycle: The Synthesis and Characterization of Four Coordinate Iron(III) Imido Compounds," Steven Brown, graduate student in chemistry, Caltech.

**Kellogg Seminar**
Lauritsen Library, 4 p.m.—Topic to be announced. Elizabeth Jenkins, assistant professor, department of physics, UC San Diego.

## Postol to discuss missile defense

With imminent war and national security in the forefront of the country's consciousness, the Caltech Y Social Activism Speaker Series spring lecture could not be more timely. MIT professor Theodore Postol will speak on "Science and Technology Issues in the National Missile Defense Program," on Wednesday, April 2, at 8 p.m. The free public lecture will take place in the Beckman Institute auditorium.

Since the September 11 terrorist attacks, new awareness of American vulnerability has intensified the debate over missile defense. Proponents point to the threat of nuclear attack by North Korea, Pakistan, and other nations, while critics argue that such a defense system will not stop terrorist attacks, may upset diplomatic relations with countries such as Russia and China, and does not justify the enormous cost.

Professor of science, technology, and national security policy at MIT, Postol is a leading expert on the National Missile Defense program, which is designed to detect and intercept incoming nuclear warheads before they reenter the atmosphere. Despite the $120 billion that the United States has poured into the program over more than 40 years, Postol's research has revealed what he believes are deep flaws—most of which, he contends, have been concealed by the Department of Defense. Even aside from these issues, the fundamental question remains: can a missile defense system work? Postol will address this question, describe how the missile defense system is designed to operate, and show how test results were used to make a false case for the program's successful functioning.

No tickets or reservations are required for this event. For more information, contact the Caltech Y at (626) 395-6163 or caltechy@caltech.edu, or visit http://sass.caltech.edu.

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# CampusEvents

## Monday, March 24

**Baby Furniture and Household Equipment Pool**
234 S. Catalina, 10 a.m. to 12:30 p.m.—Loans of kitchen and household necessities and baby furniture are made to members of the Caltech community. Information: 584-9773.

## Tuesday, March 25

**Preschool Playgroup**
Tournament Park, 10 a.m. to noon—Song and storytime, crafts and free play for toddlers and preschoolers (from walking to age 4). Information: 792-7808 or julia@astro.caltech.edu.

**Men's Tennis**
at Johnson & Wales University, Providence, Rhode Island, 3:30 p.m.

**Caltech Tai Chi Club**
Winnett Lounge, 7 p.m.—Meets Tuesdays and Fridays weekly. Sessions are free. Information: www.its.caltech.edu/~taichi.

## Wednesday, March 26

**Baby Furniture and Household Equipment Pool**
234 S. Catalina, 10 a.m. to 12:30 p.m.—Loans of kitchen and household necessities and baby furniture are made to members of the Caltech community. Information: 584-9773.

**Wednesdays in the Park**
Tournament Park, 10 a.m. to noon—Conversation and coffee for parents and caregivers, and playtime for children. Information: 355-3874 or lcklavins@hotmail.com.

**Watch Your Back! Safety Training**
118 Keith Spalding Building, 3 p.m.—This course includes a brief discussion on back anatomy, and proper methods and realistic approaches to handling and moving materials. There will be a video presentation and hands-on lifting. Space is limited. Please call 395-6727 or e-mail safety.training@caltech.edu to reserve a place.

**Women's Tennis**
vs. Mount Holyoke College, South Hadley, Massachusetts, 4 p.m.

**Banff Mountain Film Festival**
Ramo Auditorium, 7:30 p.m.—The Banff Mountain Film Festival world tour brings some of the world's best mountain films and videos to thousands of people who cannot make the annual trek to the Canadian Rockies. Fee: $10 in advance; $12 at the door; $5 for Caltech students. Tickets and information: 395-4652, 1 (888) 2CALTECH, or events@caltech.edu. Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Further festival information: www.banffcentre.ca/mountainculture/tour.

## Thursday, March 27

**Video Compression for Presentations, Web, and CD/DVD**
NewMedia Classroom, 363 S. Hill Avenue, 10 a.m. to noon—Learn why and how video is compressed for playback on a computer. There will be hands-on exercises with Cleaner 5 software, and demonstrations of other compression software such as Premiere and Sorenson Squeeze. Fee: $50. Reservations: 395-4320 or wenyee@caltech.edu. Information: muri.caltech.edu/nmc/index.htm.

**Caltech Architectural Tours**
Athenaeum, 11 a.m. to 12:30 p.m.—Meet in the entry hall of the Athenaeum. Led by members of the Caltech Architectural Tour Service. Reservations: Susan Lee, 395-6327 or suze@caltech.edu.

**Baseball**
at Cal State Monterey Bay, 2 p.m.

**Men's Tennis**
at Brandeis University, Boston, Massachussets, 3 p.m.

**Amnesty International Monthly Meeting**
Caltech Y lounge, 7:30 p.m.—Caltech/Pasadena AI Group 22 holds its monthly meeting to discuss current activities and plans. All are welcome. Refreshments. Information: (818) 354-4461 or lkamp@lively.jpl.nasa.gov.

## Friday, March 28

**Caltech Tai Chi Club**
Winnett Lounge, 7 p.m.—Meets Tuesdays and Fridays weekly. Sessions are free. Information: www.its.caltech.edu/~taichi.

## Saturday, March 29

**Baseball**
at Simpson College, doubleheader, 11 a.m.

**Sally Ride Science Festival**
Beckman Auditorium, 11:30 a.m. to 4:30 p.m.—America's first female astronaut will host "Reach for the Stars," the second annual Los Angeles Science Festival for girls in grades 5 through 8. The event includes speeches by Sally Ride and *Los Angeles Times* science columnist K. C. Cole, workshops for the girls, special events for parents and teachers, and a street fair. Fee (includes full participation, souvenirs, a snack, and lunch): in advance, $20; $25 on the day of the event. Registration: (800) 561-5161 or www.SallyRideFestivals.com.

## Sunday, March 30

**Lagerstrom Chamber Music Concert**
Dabney Lounge, 3:30 p.m.—The Imbroglio Quintet will perform *Le Tombeau de Couperin*, by Maurice Ravel; *Quintette*, by Jean Francaix; *Dix-Sept Variations*, by Jean-Michel Damase; and *Saudades do Brasil*, by Darius Milhaud. Admission is free.

## Monday, March 31

**Baby Furniture and Household Equipment Pool**
234 S. Catalina, 10 a.m. to 12:30 p.m.—Loans of kitchen and household necessities and baby furniture are made to members of the Caltech community. Information: 584-9773.

**Men's Golf**
vs. University of La Verne, Brookside Golf Course, 1 p.m.

## Tuesday, April 1

**Preschool Playgroup**
Tournament Park, 10 a.m. to noon—Song and storytime, crafts and free play for toddlers and preschoolers (from walking to age 4). Information: 792-7808 or julia@astro.caltech.edu.

**Men's Golf**
vs. Pomona-Pitzer Colleges, at Red Hill Country Club, 1 p.m.

**Women's Tennis**
at Cal State L.A., 2:30 p.m.

**Caltech Tai Chi Club**
Winnett Lounge, 7 p.m.—Meets Tuesdays and Fridays weekly. Sessions are free. Information: www.its.caltech.edu/~taichi.

## Wednesday, April 2

**Baby Furniture and Household Equipment Pool**
234 S. Catalina, 10 a.m. to 12:30 p.m.—Loans of kitchen and household necessities and baby furniture are made to members of the Caltech community. Information: 584-9773.

**Wednesdays in the Park**
Tournament Park, 10 a.m. to noon—Conversation and coffee for parents and caregivers, and playtime for children. Information: 355-3874 or lcklavins@hotmail.com.

**Emergency Preparedness Training**
118 Keith Spalding Building, 3 p.m.—This course will describe the campus emergency operations plan, including information about the emergency operations center, evacuation, fire prevention and protection techniques, behavioral principles during an emergency, and personal preparedness. Space is limited. Please call 395-6727 or e-mail safety.training@caltech.edu to reserve a place.

**Advanced Self-Defense for Women**
Caltech Women's Center, 6 to 9 p.m.—A 15-hour comprehensive training class covering weapon defense and multiple attackers. Session schedule: April 2, 7, 9, 14, and 16. Participants must have taken introductory and intermediate training before registering for this class. Reservations: emery@studaff.caltech.edu. Information: www.womenscenter.caltech.edu/programs.htm#self.

## Thursday, April 3

**Scanning Essentials**
NewMedia Classroom, 363 S. Hill Avenue, 10 a.m. to noon—Learn the proper techniques for scanning to get the result you want the first time in this hands-on workshop. Resolution and output, basic photo enhancements in Photoshop, and saving your file in the right format will be demonstrated. Registration and information: 395-3420, carolynp@caltech.edu, or http://muri.caltech.edu/nmc/index.htm.

## Friday, April 4

**Men's Tennis**
at Cal Lutheran University, 2 p.m.

**Women's Tennis**
vs. Cal Lutheran University, 2 p.m.

**Baseball**
vs. Whittier College, 3 p.m.

**Caltech Tai Chi Club**
Winnett Lounge, 7 p.m.—Meets Tuesdays and Fridays weekly. Sessions are free. Information: www.its.caltech.edu/~taichi.

**17th Annual All-Mozart Concert**
Dabney Lounge, 8 p.m.—The Caltech Chamber Singers and Chamber Orchestra will present Act II of *The Marriage of Figaro*, and *Missa Brevis*, K.194. The concert is free. Information: 395-4652, 1 (888) 2CALTECH, or events@caltech.edu. Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at www.events.caltech.edu.

**Soweto Street Beat Dance Theatre**
Beckman Auditorium, 8 p.m.—Soweto Street Beat is a melding of African contemporary, neo-African, modern African, Afro-fusion, and new traditional dance. Suggested for ages 8 and older. Tickets and information: 395-4652, 1 (888) 2CALTECH, or events@caltech.edu. Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at www.events.caltech.edu.

## Saturday, April 5

**Track and Field**
SCIAC 4-Way, at University of Redlands, 10 a.m.

**Baseball**
at Whittier College, doubleheader, 11 a.m.

**Toying With Science**
Beckman Auditorium, 2 p.m.—Through juggling, balancing, mime, original music, and audience involvement, Garry Krinsky demonstrates basic scientific concepts and delves into the imaginations of scientists who explore the world. Suggested for ages 5 and older. Tickets and information: 395-4652, 1 (888) 2CALTECH, or events@caltech.edu. Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at www.events.caltech.edu.

**17th Annual All-Mozart Concert**
Dabney Lounge, 8 p.m.—The Caltech Chamber Singers and Chamber Orchestra will present Act II of *The Marriage of Figaro*, and *Missa Brevis*, K.194. The concert is free. Information: 395-4652, 1 (888) 2CALTECH, or events@caltech.edu. Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at www.events.caltech.edu.

## Sunday, April 6

**Men's Tennis**
vs. faculty and alumni, 2 p.m.

**Women's Tennis**
vs. alumni, 2 p.m.

**Coleman Chamber Concert**
Beckman Auditorium, 3:30 p.m.—The Guarneri String Quartet performs works by Mozart, Foss, and Beethoven. Tickets and information: 395-4652, 1 (888) 2CALTECH, or events@caltech.edu. Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at www.events.caltech.edu.

BANFF MOUNTAIN FILM FESTIVAL

## Film Fest returns

Faster, steeper, higher, deeper! For those who like to ride the roaring rapids, scale the steepest peaks, or visit some of the most majestic ranges in the world, the Banff Mountain Film Festival World Tour is coming back to Caltech. Featuring eight award-winning films from the 27th annual festival, held in Banff, Alberta, this year's event will take place on Wednesday, March 26, at 7:30 p.m. in Ramo Auditorium.

The films that will be screened represent a wide variety of stories about mountain sports, mountain culture, and the environment. Not just about adrenaline (though there will be plenty), these tales from around the world also offer inspiration and rare glimpses of places and cultures not readily accessible to most people.

Some highlights of this year's world tour are *Matter of Doubt*, a personal account of Jean-Christophe Lafaille's complex quest for the summit of Annapurna, despite his haunting past on the mountain; *Shepherd Women of Shambala*, the story of one person's journey into the lives of Ismail Muslim shepherd women in the rugged Karakoram mountains of Pakistan; and *Anomaly*, which follows 16-year-old champion ski racer Kevin Connolly, born without legs, as he prepares for the U.S. Disabled Alpine Championships.

The festival is presented by the Caltech Alpine Club and the Outland Mountain Shop. Tickets are $10 in advance ($5 for Caltech students) and $12 at the door. To order tickets, contact Caltech Public Events at 1 (888) 2-CALTECH, (626) 395-4652, or events@caltech.edu. Individuals with a disability can call 395-4688 (voice) or 395-3700 (TDD). Tickets are also available at Outland Mountain Shop, (626) 568-8828.

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### Moore grant, *from page 1*

The future of structural biology lies in bridging the microscopic resolution between the atomic scale (accessible through X-ray crystallography and nuclear magnetic resonance spectroscopy) and the domain above 0.5 microns that is accessible via optical microscopy.

Through cryoelectron microscopes, the tiny "specks" that make up a cell's machinery for manipulating DNA, making protein molecules, and interacting with the outside world come into focus. While the field has been around for more than two decades, today's cryoelectron microscopy and its computational methods are undergoing a revolution that allows new sorts of analyses and much-higher-resolution images, bordering on the low-resolution limits of X-ray crystallographic structures.

With the grant, Caltech will be able to purchase two cryoelectron microscopes capable of imaging biological material in an essentially native state. The first cools the sample material to liquid-nitrogen temperatures and will be used for rapid specimen screening. The second cools the samples to liquid-helium temperatures (near absolute zero), and is in several respects a true prototype expected to deliver images of a higher resolution than has ever before been obtainable.

One of the key microscope users will be Assistant Professor of Biology Grant Jensen, whose goal is to extend traditional structural biology to a cellular level in order to allow realistic computer simulations of whole cells in the future. This work can be thought of as a logical next step after sequencing genomes because it aims to reveal how the various gene products come together to form protein "machines," and how those machines arrange themselves into the biochemical "assembly lines" that create life.

Formed in 2000 by Gordon and Betty Moore, the Moore Foundation aims to improve the quality of life for future generations. Gordon Moore received his PhD in chemistry from Caltech in 1954 and later founded the Intel Corporation. The foundation focuses on higher education, scientific research, the environment, and select San Francisco Bay–area projects. Its largest commitment to date has been a pledge to Caltech of $300 million, of which this grant is a portion.

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### Ultrahigh-Q, *from page 1*

crystals in wristwatches, which operate at radio frequencies; and optical-frequency versions used in filters, sensors, and quantum optics.

Attaining ultrahigh-Q and fabricating the resonators on a chip have so far been mutually exclusive, as very few structures have exhibited the atomically smooth surfaces needed for ultrahigh-Q. Due to a novel fabrication step, it is now possible to achieve both high Q and atomically smooth surfaces at the same time, bringing two worlds together.

The fabrication procedure uses lithography and etching techniques on a silicon wafer, in a process similar to that used in making microprocessors and memories. Thus, the resonators can be integrated with a chip's circuitry, with lab-on-a-chip functions, or with other optical components. Wafer-scale processing methods also enable the production of wafers in large quantities, an important feature in many applications such as biosensing, where low-cost, field-deployable sensors are envisioned.

"This is the first time an optically resonant device with an ultrahigh-Q has been fabricated on a chip," Vahala says. The group is exploring ways to further increase the devices' Q value while reducing their size. He believes Q values in excess of 1 billion in even more compact toroids will soon be possible.

The work was supported by Caltech's Lee Center for Advanced Networking and by DARPA.

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### Mozart, *from page 2*

lack of empathy for music of any length," Caldwell says, "the work abounds in melody and invention. The Agnus Dei is one of the composer's most poignant settings."

The free public performances will begin at 8 p.m. in Dabney Lounge. For more information, contact Public Events at 1 (888) 2-CALTECH, (626) 395-4652, or events@caltech.edu, or visit www.events.caltech.edu. Individuals with a disability can call 395-4688 (voice) or 395-3700 (TDD).

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### Pierce, *from page 1*

students, it is quite a challenge to generate intellectual excitement every other day during a hectic academic term. I guess I enjoy that challenge.

"Of course," he continues, "some material is hard to love, and I try to be honest with the students"—taking time to explain to them why he likes certain topics, or why others are necessary, albeit boring. "My favorite lectures are the ones where the material is potentially hard to understand or absorb. It's not much fun to give a lecture if there's nothing challenging to explain and discuss."

Still, in the final analysis, he muses, "I have no idea how to give a lecture. I just get up there and talk and write. I like to explain things clearly. I'm sure my teaching style was influenced by my experiences learning from my mother, who is an extraordinary teacher. Maybe I'm a little unpredictable. I try to feed off the intellectual playfulness of the Caltech student body."

According to the official citation letter from the selection committee, Pierce was chosen for his "enthusiasm, dedication, and charisma" in teaching. "He teaches without oversimplifying and without intimidating, making the material accessible to the diverse group of students. He possesses an uncanny ability to anticipate the frustrations and challenges of the students, and has been able to hold the students' attention, and attendance, throughout the quarter."

After graduating as valedictorian from Princeton University in 1993, Pierce went to the University of Oxford as a Rhodes Scholar, earning his DPhil in 1997. He came to Caltech in 1998 as a senior postdoctoral scholar and joined the faculty as assistant professor in 2000.

The Feynman Prize, awarded annually, consists of a cash award of $3,500 and an equivalent raise in the winner's salary. Past recipients include professors Joseph Kirschvink, geobiology; David Stevenson, planetary science; Donald Cohen, applied mathematics; Emlyn Hughes, physics; Barbara Imperiali, chemistry; R. David Middlebrook, electrical engineering; Yaser Abu-Mostafa, electrical engineering and computer science; Erik Antonsson, mechanical engineering; and Tom Tombrello, basic and applied physics.

Made possible by an endowment from Ione and Robert E. Paradise, with additional contributions from Mr. and Mrs. William H. Hurt, the prize was established in appreciation of Richard Feynman's contributions to excellent teaching.

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**Caltech's turtle population was out in full force recently, taking advantage of the prematurely springlike weather.**

### Security, *from page 1*

know the security officers who patrol their buildings or areas of campus.

The security force is composed of Henderson, deputy chief Loren Kajitani, 19 officers, four supervisors, and three administrative personnel. In addition to providing protection for those who live and work here and their property, the security force patrols the campus parking lots. One of its more popular services is the escort program, which provides an escort for anybody on campus, day or night.

"We run escorts at all times of the day or night, so it is much in demand," Henderson says. Because scientific inspiration can occur at any time, students often need somebody to walk with them to a campus building or to walk them home, as long as it lies within a reasonable walking distance.

Beginning in November 2001, the office added three administrators, including a deputy chief to supervise officers in the field, another to handle parking tasks, and a third to oversee security technology. Four officers were also promoted to supervisor and hired by Caltech.

"We were able to make the transition and keep the same number of officers to maintain that level of services," Henderson says. The selection process was unusual in that the officers were interviewed not only by Human Resources personnel and Security Office administrators but also by a panel of the Security Office's primary clients.

Representatives were recruited from the Safety Office, Residence Life, the Caltech Women's Center, and the Minority Student Education office. "We invited people to sit on a panel to meet the candidates to see if it would be a good fit and get the highest quality," he says. "That's an unusual step that is usually not taken.

"I've had some very positive comments from people that the officers are friendly and helpful and want to be of assistance. It's paid off."

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**Caltech 336**

T F S S M T W T F S S M T W

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