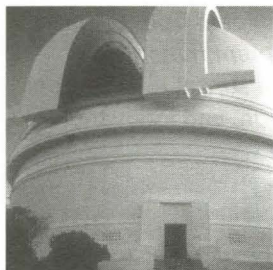


Caltech336

T E S S M T W T E S S M T W

The campus community biweekly
June 16, 2005, vol. 5, no. 12



Palomar opens house

Share the wonders of exploring the universe when Caltech's Palomar Observatory opens its doors to the public on Saturday, June 25.

The free open house, from 9 a.m. to 4 p.m., will include tours of the 200-inch Hale and 60-inch telescopes, talks by Caltech and JPL astronomers, solar observing (weather permitting), exhibits, and prizes. In addition, Cleveland National Forest rangers will be on hand and the Palomar Mountain Volunteer Fire Department will display a vintage 1929 fire truck.

see *Palomar*, page 2

Join the Ath

Many benefits come with membership at the Athenaeum, the venerable faculty club at Caltech. Soon more Caltech and JPL staff will be able to enjoy them, now that the membership committee has voted to offer all regular employees the keys to the club.

Christopher Brennen, the Hayman Professor of Mechanical Engineering at Caltech, says he presented the idea of an all-inclusive policy to his colleagues on the membership and Athenaeum house committees.

"It's one of those remnant policies that's hung around and no one had addressed," he says, calling the previous policy antiquated and inappropriate. "I was quite outspoken but everybody agreed that a change was overdue."

According to Brennen, Caltech staff members, regardless of their job status, contribute greatly to Caltech's research and teaching missions and should therefore have the option of joining the club.

"The point is that there are many staff members who play critical roles at the Institute," Brennen adds, citing as one example the employees in the mechanical engineering machine shop who teach students the basics of machining. "Their contributions are essential components of several ME classes."

Such employees can be found throughout the campus, and one of them is Nick Scheckel, who works in the Seismo Lab. He signed up soon after the Athenaeum membership campaign came into full swing this month, to his wife Benita's delight.

"I have wanted to be a member of the Athenaeum since he started working at

see *Athenaeum*, page 6

Campus grows

Just outside the windows of Bonnie Khang-Keating's office in Campus Planning, past the bright yellow daylilies and beyond the jacaranda's lavender blooms, stands the newly renovated Chandler Dining Hall.

Now complete, the Chandler project is the first of several major construction projects that Khang-Keating, the Institute's director of architectural and engineering services, is guiding from paper to reality.

"I think the most rewarding projects I've worked on were for universities," says the USC- and UCLA-trained architect. "They tended to have a well-defined goal and a clear vision of what the buildings would accomplish."

These are the same qualities she sees in Caltech's plans for the new buildings and laboratories, specialized research centers that will undoubtedly contribute to future scientific and technological breakthroughs. These are also the qualities that convinced her to take the job a year ago, she says.

Reporting to Art Elbert, the associate vice president for campus planning, she oversees about 15 architects and engineers who serve as project managers. Elbert also brings extensive experience in major construction campaigns, having led the recovery at Cal State Northridge after the *temblor that rocked that area in 1994*. The cost for the rebuilding totaled about \$400 million in 1997-98 dollars, he says.

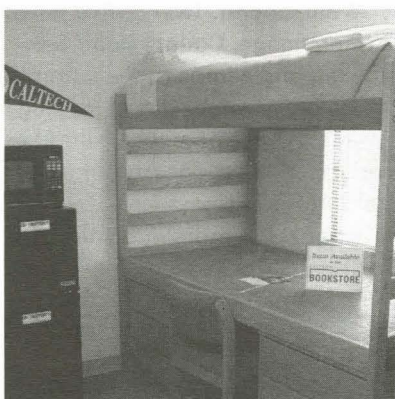
"This is an unusual time at Caltech and it represents a rare opportunity," Elbert says. "It is the most dramatic building campaign that we will have at Caltech, probably for a very long time."

Today, projects on the table include the Cahill Center for Astronomy and Astrophysics, the Annenberg Center for Information Science and Technology, and the renovation of the South Undergraduate Houses. Construction of two temporary student-housing compounds is complete.

Before joining the Institute, Khang-Keating worked at architectural firms HOK International and NBBJ, and later headed her own architectural business for five years before hearing about the Caltech position.

"I was looking for a different career opportunity and to contribute to the building of a campus," she says. As an architect, Khang-Keating favors buildings that serve the needs of people over structures that

see *Construction*, page 6



Living space in the Temporary Undergraduate Housing.

Kudos², graduates!



Paper streamers rain down on Beckman Mall at the closing of Caltech's 111th Commencement ceremonies on Friday, June 10. More than 500 Caltech graduates received their bachelor's or advanced degrees that day. See page 5 for more Commencement coverage.

Female grads rule chemical engineering

"I am not a novelty. It is not amazing that girls are engineers—it's normal," says Victoria Loewer, a member of Caltech's just-graduated class of 2005. Loewer is referring to the fact that she is a member of the first all-female class of chemical engineering majors, a milestone in the Institute's history.

This class reflects a change in today's scientific, technological, and academic environments. More than 30 percent of undergraduates at Caltech are women.

Loewer's fellow graduates are Maryam Ali, Michelle Giron, Haluna Gunterman, Shannon Lewis, and Joan Karen Sum Ping. These students do not see their unprecedented accomplishment as anything special.

"I doubt if any of us thought much about sitting in chemical engineering classes that were 100 percent female as opposed to 35 percent for most other courses. It felt no different," says Gunterman, who hails from Placerville, California.

"And while we may think nothing of it, there is some fun in being able to see people's shocked expressions when they hear of a 100 percent female graduating class, in chemical engineering of all majors, and at Caltech of all places." She intends to pursue a PhD in chemical engineering at UC Berkeley this fall.

Loewer, from Arlington, Virginia, took the environmental engineering track as a Caltech chemical engineering undergraduate, and is contemplating focusing on materials when she enters the chemical engineering PhD program at MIT in the fall.

Maryam Ali is from Islamabad, Pakistan. Her area of interest is biomaterials and she plans to attend graduate school in chemical engineering at Auburn University.

Michelle Giron, from Los Angeles, is particularly interested in materials. She plans on attending Cornell University to pursue a PhD in chemical engineering.

Shannon Lewis also focused on materials while at Caltech. Originally from from Alexandria, Virginia, she will enter the PhD program in materials science and engineering at the University of Texas at Austin in the coming year.

Joan Karen Sum Ping is from Tombeau Bay, Mauritius. As a chemical engineering undergraduate, she took the environmental engineering track and plans to pursue a JD at George Washington University Law School.

"This is the first group of Caltech students to graduate under a revised chemical engineering curriculum that was designed to be more responsive to increasing job diversity in industry, and allows students to emphasize one of the many different

see *Grads*, page 6

NewsBriefs



André Mallié, director of dining services, and Margo Marshak, vice president for student affairs, cleave the ribbon at the grand reopening of Chandler Dining Hall last Monday.

Personals

Welcome to Caltech

May

Brian Blood, research technician associate, biology; **Alberto Chavez**, dishwasher/general helper, Athenaeum; **Shang-Lin Chen**, system administrator/programmer, geological and planetary sciences; postdoctoral scholars **Stephanie Connon**, in JPL's in-situ instrument systems section, and **Mathieu Daeron**, in geology; **William Chiwai Leung**, assistant mechanical engineer, Architectural and Engineering Services; **Jaime Rivas Rodriguez**, dishwasher/general helper, Athenaeum; **Curtis Smith**, cook, Campus Life.

June

Riley Ceria, assistant research engineer, submillimeter astronomy; **Kathleen Jackson**, senior secretary, Fellowships Advising and Study Abroad Office; **Raymond Olguin**, stock person/cashier, Caltech Bookstore.

September

Sergei Gukov will join Caltech effective September 1 as associate professor of theoretical physics and mathematics. Regarded as an excellent lecturer and one of the best string theorists of his generation, he received his BS from the Moscow Institute of Physics and Technology in 1997 and his PhD from Princeton University in 2001.

Gil Refael will join Caltech as assistant professor of theoretical physics, effective September 1. He received his BS from Tel Aviv University in 1997 and his PhD from Harvard University in 2003, and he is noted for significant contributions in areas of quantum condensed matter theory.

Honors and awards

Tom Schmitt, Caltech's associate vice president for human resources, received the College and University Professional Association for Human Resources Southwest Region Chapter Roadrunner Award at the regional conference, held April 24-27 in Little Rock, Arkansas. The honor recognizes "a Human Resource professional who is a positive role model." Schmitt joined Caltech in 1997 as assistant vice president for human resources.

Denise Nelson Nash, director of public events, has been selected to receive the Raymond Pitts Human Relations Award in Education, to be presented at the Pasadena Human Relations Commission's annual awards ceremony, on Wednesday, June 15, beginning at 6 p.m. in the Donald Wright Auditorium of the Central Library, located at 285 East Walnut Street, in Pasadena. A graduate of Scripps College, Nash has been with Caltech since 1998.

TechMart debuts

TechMart, Caltech's new e-procurement system, will go live on Monday, June 20. Prior to this debut, Procurement Services will host the TechMart Supplier Fair, the biggest event of its kind ever held at Caltech. It will feature 28 companies whose catalogs are on the TechMart system. This event, complete with giveaways, raffles, and food, will take place on June 16, from 9 a.m. through 2 p.m., on the Bechtel Mall.

"We thought this TechMart Supplier Fair would be a fun way to introduce the campus community to these companies who have invested in this mutually beneficial partnership," says Bill Cooper, director of Procurement Services. "We expect to reach approximately 80 such partnership agreements, resulting in tremendous purchase cost savings to the Institute."

As a follow-up to the fair, Procurement Services will hold a TechMart Open House on June 20, from 2 to 4 p.m. in Room 101 of the Keith Spalding Building. TechMart users are invited to celebrate the "go live" and meet their procurement support personnel. As TechMart represents a fresh new way of doing business, the day's menu will feature cool and energizing refreshments.

Art and science to meet again

Continuing the exploration of the relationship between science and art that has been taking place in Southern California in recent years, Caltech and the Armory Center for the Arts will partner for the first time to present an exhibit.

AxS: At the Intersection of Art and Science, the first in a series of collaborations between the two institutions, will open with a panel discussion and reception on Saturday, June 25. The discussion will take place from 5:30 to 7 p.m. in the Athenaeum Card Room. Moderated by Stephen Nowlin, director of Art Center College of Design's Williamson Gallery, the panel will comprise artists Jim Campbell and Eric Johnson and Caltech robotics graduate student Ann Marie Polsenberg Thomas discussing the connections between art and science. The reception will be held from 7 to 9 p.m. at the Armory Gallery, 145 North Raymond Avenue (near Pasadena's Old Town).

Curated by Nowlin and Jay Belloli, the exhibition will showcase artists who explore the shifting boundaries between two of humanity's oldest disciplines: art and science. Noted technology-based artist Campbell will create a site-specific installation at Caltech, in the lobby of the Athenaeum. He will also have work featured at the Armory Gallery, which will also include pieces by Johnson, Russell Crotty, Natalie Jeremijenko and Robert Twomey, Nancy Macko and Robert Valenza, Karl Mihail and Tran Kim-Trang, Olga Seem, and Catherine Wagner. These artists explore the physical and biological sciences and mathematics through photography, painting, and sculpture. The exhibition will also encompass collaborative education programs, such as an introductory robotics class for teens, taught by Polsenberg Thomas, and studio classes.

AxS: At the Intersection of Art and Science will run through September 4. For more information, visit www.armoryarts.org/gallery/upcoming.html.

Geneticist Norman Horowitz dies

Professor of Biology, Emeritus, Norman Horowitz, best known for his work on the "one-gene, one-enzyme" hypothesis and for the 1976 Viking lander experiments to search for life on Mars, died on Wednesday, June 1, at his Pasadena home. He was 90.

Horowitz was a pioneer in the study of evolution through biochemical synthesis. In 1965, after a distinguished career studying the genetics of the red bread mold *Neurospora crassa*, he began collaborating with JPL in the search for life on other worlds, spending five years as chief of JPL's bioscience section.

A member of the scientific teams for the Mariner and Viking missions to Mars, Horowitz, along with two colleagues, designed a Viking instrument that could detect biochemical evidence of life. Although the experiment results were negative, that information in itself was a robust scientific result that continues informing astrobiology to this day. He wrote a 1986 book titled *To Utopia and Back: The Search for Life in the Solar System*.

Horowitz is most renowned in biochemistry for a 1945 paper that is still considered the origin of evolution studies at the molecular level. In addition, a seminal experiment by Horowitz and a colleague fostered acceptance of the one-gene, one-enzyme hypothesis that had been considered a radical theory of the chemistry of life.

A Pittsburgh native, Horowitz earned his BS at the University of Pittsburgh in 1936 and came to Caltech for graduate study in the Division of Biology. After completing his PhD in 1939, he became a postdoctoral researcher at Stanford under George W. Beadle.

When Beadle became chair of Caltech biology in 1946, Horowitz returned to his alma mater as a faculty member, remaining for the rest of his career. Chair of the biology division from 1977 to 1980, he also endowed the Horowitz Lecture Series and created the Pearl S. Horowitz Book Fund in honor of his wife, who died in 1985.

His honors included membership in the National Academy of Sciences and the American Academy of Arts and Sciences, and a medal from the Genetics Society of America.

Horowitz is survived by a daughter, a son, and two grandchildren.

Palomar, from page 1

Walking is required to reach many of the events, but buses and tour guides will be available for some. Food and beverages will be offered for purchase, along with Palomar Observatory and astronomy souvenirs.

The observatory is located at 35899 Canfield Road on Palomar Mountain. To reach Palomar, exit Interstate 15 at state highway 76 eastbound. Twenty-five miles from the interchange, County Road S-6 exits to the left and climbs to the summit, ending at the observatory gates. Parking will be limited. Please note that Palomar has no service stations; check your fuel before starting the drive.

For directions and more information, visit <http://friendsofpalomarobservatory.org> or call (760) 742-2111.



Staying at the forefront of science and innovation

President David Baltimore

This message is adapted from the president's Commencement remarks.

The pressures to stay at the forefront of science, education, and innovation have never been greater, while the challenges continue to grow sharply. This is as true at the national level as it is for Caltech itself. The emergent international pressures are especially noteworthy. In his recent book, *The World is Flat*, Thomas Friedman lays out what has become a new world, in which global competition has grown to include technology and science. Earlier, in the 1990s, popular concerns about globalization focused on the movement and outsourcing of unskilled labor out of the United States. Today, high-end engineering is done in China, cutting-edge science is pursued in South Korea, and complex engineering and development tasks are apportioned between India and the U.S.

In its inaugural report issued last February, the Task Force on the Future of American Innovation warned that in recent years, with the decline of federal investments in the physical sciences, math, and engineering, and the loss of domestic students in those fields, the U.S. is "losing its competitive edge," while the fastest-growing economies in the world, especially those in East and South Asia, are well on track to catch up with the U.S.'s research and development investment, number of patent applications, and ability to achieve the next breakthroughs in science and engineering.

This is a situation where the best defense is a powerful offense. We need to educate more scientists and engineers as we catalyze new programs in the basic sciences that will fuel innovation. These are exactly the areas where our most difficult challenges lie. The U.S. Office of Science and Technology Policy has estimated that the insufficient number of trained professionals and researchers is already becoming a limiting factor in scientific and technological enterprises. National Science Foundation statistics present a significant contrast: in 2000, we awarded 60,000 bachelor degrees in engineering, whereas China (in 2001) awarded more than 200,000 bachelor degrees in engineering. We have seen a drop in the percentage of white men receiving BS degrees in science and engineering over the past two decades. Still, there is a hopeful trend in that the percentage has increased for women and underrepresented minorities.

While we work on increasing and diversifying our domestic pool of scientists and engineers, we must continue to ensure that our universities are open and welcoming to international students and scholars. Since September 11, 2001, universities across the country have experienced a significant downturn in applications from foreign countries. Even this year, with quicker visa procedures, applications from China have continued to fall.

see Baltimore, page 6

June 20–September 25, 2005

M T W T F S S

Monday, June 27

Thesis Seminar
153 Noyes, Sturdivant Lecture Hall, 9:30 a.m.—“The Synthesis and Study of Redox-Rich, Amido-Bridged Cu₂N₂ Dicopper Complexes,” Seth Harkins, graduate student in chemistry, Caltech.

Tuesday, June 28

Caltech Library System Presents: Chemical Structure Searching
Sherman Fairchild Library, multimedia conference room, noon to 1:30 p.m.—Learn to search with chemical structures (both drawn and with templates) for property data and chemical reactions using Beilstein, Gmelin, SciFinder Scholar, and the Combined Chemical Dictionary. Registration: 395-4008, annpi@library.caltech.edu, or <http://oliphant.library.caltech.edu/forms/cls-classes>.

Wednesday, June 29

Abbott Laboratories Organic Chemistry Symposium
153 Noyes, Sturdivant Lecture Hall, 3 p.m.—“New Reaction Development,” Dr. Steven King, Abbott Laboratories. Refreshments.

Abbott Laboratories Organic Chemistry Symposium
153 Noyes, Sturdivant Lecture Hall, 4 p.m.—“Catalysis for Organic Chemistry,” Professor Gregory C. Fu, department of chemistry, MIT. Refreshments.

Thursday, June 30

Caltech Library System Presents: Chemical Structure Searching
Sherman Fairchild Library, multimedia conference room, 2 to 3:30 p.m.—Learn to search with chemical structures (both drawn and with templates) for property data and chemical reactions using Beilstein, Gmelin, SciFinder Scholar, and the Combined Chemical Dictionary. Registration: 395-4008, annpi@library.caltech.edu, or <http://oliphant.library.caltech.edu/forms/cls-classes>.

Friday, July 1, and Monday, July 4

Independence Day holiday

Thursday, July 21

Von Karman Lecture Series
JPL, von Karman Auditorium, 7 p.m.—“Comets: Time Capsules to Our Solar System’s Past,” Dr. Richard Grammier, Deep Impact project manager, JPL.

Friday, July 22

Von Karman Lecture Series
Pasadena City College, 1570 E. Colorado, the Vosloh Forum (south of Colorado on Bonnie), 7 p.m.—“Comets: Time Capsules to Our Solar System’s Past,” Dr. Richard Grammier, Deep Impact project manager, JPL.

Tuesday, July 26

Social Cognition/Neuroscience Series
25 Baxter, 4 p.m.—“Reward Prediction by Primate Prefrontal Neurons,” Professor Masamichi Sakagami, Tamagawa University.

Thursday, August 18

Von Karman Lecture Series
JPL, von Karman Auditorium, 7 p.m.—“Technology of Tomorrow Today: An Overview of Space Technology Spin-Offs,” Dr. Karina Edmonds, senior technology transfer specialist, Innovative Technology Assets Management Office, JPL.

Friday, August 19

Von Karman Lecture Series
Pasadena City College, 1570 E. Colorado, the Vosloh Forum (south of Colorado on Bonnie), 7 p.m.—“Technology of Tomorrow Today: An Overview of Space Technology Spin-Offs.” See Thursday, August 18, for further details.

Monday, September 5

Labor Day holiday

Wednesday, September 14

Organic Chemistry Seminar
153 Noyes, Sturdivant Lecture Hall, 4 p.m.—Topic to be announced. Professor Nicola Pohl, chemistry department, Iowa State University.

Thursday, September 15

Von Karman Lecture Series
JPL, von Karman Auditorium, 7 p.m.—“Exploring Mars,” Dr. Daniel McCleese, chief scientist, Mars Exploration Program, JPL.

Friday, September 16

Von Karman Lecture Series
Pasadena City College, 1570 E. Colorado, the Vosloh Forum (south of Colorado on Bonnie), 7 p.m.—“Exploring Mars,” Dr. Daniel McCleese, chief scientist, Mars Exploration Program, JPL.

Ongoing campus events

Mondays

Lunchtime Pickup Ultimate Frisbee
Fox Stanton Track and Field, 12:15 p.m.—The Caltech Penultimate Frisbee players make up an informal recreational group that plays pickup games of Ultimate Frisbee at lunchtime on Mondays, Wednesdays, and Fridays. No experience is needed, and complete novices are welcome. (When the field is reseeded this summer, games will take place on the Beckman Lawn.) Information: <http://mailman.its.caltech.edu/penultimate>.

Floorball Club
Brown Gymnasium, 9 p.m.—Caltech Floorball Club holds pickup floorball games on Mondays from 8 to 10 p.m.

Tuesdays

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). Sponsored by the Caltech Women’s Club. Open to Caltech/JPL community members only. Information: 578-0890 or s_l_miller@hotmail.com.

CIT Knitters Group Meeting
256 Mudd Laboratory, South, noon—All levels of knitters and related handcrafters are welcome. We make items for others and ourselves. Information: 395-6905.

Caltech Tai Chi Club
Meets on Tuesdays at 7:30 p.m. and on Fridays. Sessions are free. During June and July, the club will meet in Dabney Lounge. Locations for the June 24 and July 1 meetings are still to be determined. For location information, contact Peter Mugglebee at 797-4281 or taichi@caltech.edu.

Wednesdays

Wednesdays in the Park
Tournament Park, 10 a.m. to noon—Every Wednesday there’s conversation and coffee for parents and caregivers, and playtime and snacks for children. Stop by and make new friends from around the world. Open only to Caltech/JPL community members. Sponsored by the Caltech Women’s Club. Information: 791-4225 or mcsutton10@hotmail.com.

Lunchtime Pickup Ultimate Frisbee
Fox Stanton Track and Field, 12:15 p.m.—See Monday listing for details.

Thursdays

Baby Furniture and Household Equipment
234 S. Catalina, 10 a.m. to 1 p.m.—Loans of kitchen and household necessities and baby furniture are made to members of the Caltech and JPL communities. Open on Thursdays from 10 a.m. to 1 p.m. No appointment is necessary. Information: 584-9773 or furnpool@caltech.edu.

Fridays

Lunchtime Pickup Ultimate Frisbee
Fox Stanton Track and Field, 12:15 p.m.—See Monday listing for details.

Caltech Tai Chi Club
Meets on Fridays at 7 p.m. and on Tuesdays. Sessions are free. During June and July, the club will meet in Dabney Lounge. Locations for the June 24 and July 1 meetings are still to be determined. For location information, contact Peter Mugglebee at 797-4281 or taichi@caltech.edu.

Conference to ponder consciousness

How do you recognize consciousness? The recent Terri Schiavo court battle over right-to-die issues hinged on whether her persistent vegetative state was reversible or permanent, and brought to the forefront the perplexing question of exactly what consciousness is.

This issue and many others in neuroscience will be discussed at the ninth annual meeting of the Association for the Scientific Study of Consciousness (ASSC), to be held at Caltech from June 24 to June 27.

The conference will promote interdisciplinary dialogue from the perspectives of neuroscience, psychology, philosophy and ethics, computer science, and cognitive ethology. Leading experts from Caltech, the Salk Institute, the University of Sussex, Oxford University, Harvard Medical School, Institut Pasteur, UC Davis, and UC Berkeley will discuss the latest research, including “Emerging Ethical Issues in Consciousness Research,” “Emotion, Feeling, and the Brain,” “A Brain-Body Perspective on Pain,” and “Color and Consciousness.”

Caltech presenters will be Christof Koch, Troendle Professor of Cognitive and Behavioral Biology and professor of and executive officer for computation and neural systems, who works with new scientific tools that look inside functioning animal and human brains; Boswell Professor of Neuroscience Richard Andersen, who is creating brain-implant technology that will allow paralyzed patients to use artificial limbs by thinking about moving them; and Professor of Biology Shinsuke Shimojo, who uses psychophysical and behavioral studies to examine how the brain enables us to perceive objects and respond to them.

Sponsors of the ASSC conference include the Mind Science Foundation, founded in 1958 by philanthropist Tom Slick to explore the vast potential of the human mind. The public is invited to attend. Visit <http://assc.caltech.edu/assc9> for more information. The cost is \$300 for non-ASSC members and \$140 for student ASSC members (contact Patrick Wilken at pwilken@gmail.com for membership inquiries). The media may attend at no cost.

CampusEvents

Monday, June 13

TechMart Training

Caltech's web-based e-procurement system, which brings Amazon.com-like simplicity to the ordering of supplies and services, will begin its roll-out to campus this month with campus-wide training. Users will be notified of the date, time, and place of their assigned training session. Every effort will be made to accommodate schedule conflicts.

Wednesday, June 22

Caltech/JPL Toastmasters Club Meeting

Building 167 conference room, JPL, 5:30 p.m.—Enhance your speaking skills in a supportive and positive learning environment. The Toastmasters Club meets every second and fourth Wednesday of the month. Guests are welcome. If you are coming from outside JPL, please contact Frank Maiwald, at (818) 687-9487, three days before the event. Information: www.jplcaltechtoastmasters.com.

Voices of Vision Series

Beckman Auditorium, 8 p.m.—The prominent writer, historian, lecturer, and teacher David McCullough will discuss the subject matter of *1776*, his most recent book, for which he drew on voluminous correspondence and more than 50 diaries written during the American Revolution. McCullough has twice received the Pulitzer Prize. A book signing will follow the lecture. Admission is free.

Thursday, June 23

Motivation

Brown Gym classroom, 8:30 a.m. to 12:30 p.m.—Learn ways to become a self-motivator and to inspire others while maintaining the energy, drive, and enthusiasm that elicits staff cooperation and achieves results. This workshop is intended for both supervisors and nonsupervisors. Registration: 395-8055 or diane.williams@caltech.edu. Information: http://cit.hr.caltech.edu/Education/super&non_super/motivation.htm.

Caltech Architectural Tour

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.

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. Visit our website at www.its.caltech.edu/~aigp22.

Saturday, June 25

Palomar Observatory Open House

Palomar Observatory, 9 a.m. to 4 p.m.—Palomar Observatory's open house will feature tours of the 200-inch and 60-inch telescopes, presentations by Caltech staff and astronomers, solar observing (weather permitting), and exhibits in the updated Visitor's Center. Information: www.astro.caltech.edu/palomarnew/friends/openhouse.html.

Thursday, June 30

Understanding Basic Investment Concepts

Winnett clubroom #1, 10:30 a.m.—The Human Resources Benefits Office invites you to attend a workshop presented by TIAA-CREF. This presentation reviews the basic concepts and strategies for making reasonable investment decisions. All Caltech personnel are welcome.

Friday, July 1

Independence Day holiday

Credit Union Closure

All branches of the CEFCU will be closed in observance of the Independence Day holiday.

Monday, July 4

Independence Day holiday

Credit Union Closure

All branches of the CEFCU will be closed in observance of the Independence Day holiday.

Friday, July 8

Fidelity Investments One-on-One Meetings

Human Resources, 399 South Holliston, 9 a.m. to 1 p.m.—Consulting sessions are available to assist with retirement savings. Topics may include investments, advantages of tax-deferred savings, and retirement planning. Appointments are available by calling Fidelity at (800) 642-7131.

Sunday, July 10

Skeptics Society Lecture

Baxter Lecture Hall, 2 p.m.—“Doubt: A History,” Jennifer Michael Hecht, assistant professor of history, Nassau Community College. Donation is \$8 for nonmembers. \$5 for members and non-Caltech students. Free to the Caltech/JPL community. A book signing will follow the lecture. Tickets and information: 794-3119 or skepticmag@aol.com.

Tuesday, July 12

Amnesty International Letter Writing

Athenaeum Rathskeller, 7:30 p.m.—Caltech/Pasadena AI Group 22 will host an informal meeting to write letters on human-rights abuses around the world. All are welcome. Refreshments. Information: (818) 354-4461 or lkamp@lively.jpl.nasa.gov. Visit our website at www.its.caltech.edu/~aigp22.

Sunday, July 17

Amnesty International Book Discussion Group

Vroman's Bookstore, 695 E. Colorado Boulevard, second floor, 6:30 p.m.—This month's book is *Hearing Birds Fly*, by Louisa Vaughn. All are welcome. Sponsored by Caltech/Pasadena AI Group 22. Visit Group 22 at www.its.caltech.edu/~aigp22.

Tuesday, July 19

How to Write Letters, Memos, and Reports

Brown Gym classroom, 8:30 a.m. to 4 p.m.—This workshop will help you improve the clarity of your writing and reduce the time it takes to produce a finished business document. Emphasis will be placed on helping you develop model documents to be used on your job. Registration: 395-8055 or diane.williams@caltech.edu. Information: http://hr.caltech.edu/Education/super&non_super/Write_Letters.htm.

Thursday, July 28

Amnesty International Monthly Meeting

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Sunday, August 21

Amnesty International Book Discussion Group

Vroman's Bookstore, 695 E. Colorado Boulevard, second floor, 6:30 p.m.—This month's book has not yet been determined. All are welcome. Sponsored by Caltech/Pasadena AI Group 22. Visit Group 22 at www.its.caltech.edu/~aigp22.

Thursday, August 25

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. Visit our website at www.its.caltech.edu/~aigp22.

Friday, September 2

Fidelity Investments One-on-One Meetings

Human Resources, 399 South Holliston, 9 a.m. to 1 p.m.—Consulting sessions are available to assist with retirement savings. Topics may include investments, advantages of tax-deferred savings, and retirement planning. Appointments are available by calling Fidelity at (800) 642-7131.

Monday, September 5

Labor Day holiday

Credit Union Closure

All branches of the CEFCU will be closed in observance of the Labor Day holiday.

Tuesday, September 13

Amnesty International Letter Writing

Athenaeum Rathskeller, 7:30 p.m.—Caltech/Pasadena AI Group 22 will host an informal meeting to write letters on human-rights abuses around the world. All are welcome. Refreshments. Information: (818) 354-4461 or lkamp@lively.jpl.nasa.gov. Visit our website at www.its.caltech.edu/~aigp22.

Sunday, September 18

Amnesty International Book Discussion Group

Vroman's Bookstore, 695 E. Colorado Boulevard, second floor, 6:30 p.m.—This month's book has not yet been determined. All are welcome. Sponsored by Caltech/Pasadena AI Group 22. Visit Group 22 at www.its.caltech.edu/~aigp22.

Thursday, September 22

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. Visit our website at www.its.caltech.edu/~aigp22.

Sunday, September 25

Skeptics Society Lecture

Baxter Lecture Hall, 2 p.m.—“Indivisible by Two: Great True Stories of Twins,” Nancy Segal, professor of psychology, Cal State Fullerton. Donation is \$8 for nonmembers, \$5 for members and non-Caltech students. Free to the Caltech/JPL community. Tickets and information: 794-3119 or skepticmag@aol.com.

Coleman Chamber Concert

Beckman Auditorium; 3:30 p.m.—The Emerson String Quartet will perform works by Mozart, Shostakovich, and Mendelssohn. Information: <http://events.caltech.edu/events/event-2382.html>.

Summer Dance Series

Modern Jive for Beginners

Thursdays, June 16 through August 11, in Dabney Lounge (except June 23, when the class will meet in the Beckman Institute courtyard), 7:30 p.m.—Modern jive can be danced to hip-hop, Latin, pop, and just about anything. We'll teach you the dance and some moves that are guaranteed to impress. No partner or experience required. Fee: \$3 per class.

Argentine Tango for Beginners

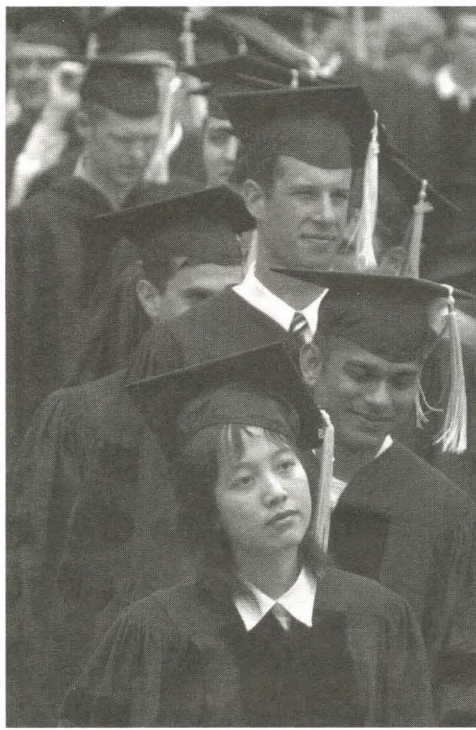
Mondays, June 20 through August 15, in Dabney Lounge, 7:30 p.m.—Turn up the heat this summer by learning to tango. No partner or experience necessary. Professionally taught. Fee for students: \$6 per class, \$40 for the series; for nonstudents: \$8 per class, \$56 for the series.

Salsa Classes

Wednesdays, June 22 through August 17 (no class on July 13), in Dabney Lounge, 7:30 p.m.—Learn the fundamentals of salsa dancing. Free basic instruction starts at 7:30 p.m. If you already know the basics, come to the intermediate class at 8 p.m. Free practice starts at 9:30, and the advanced class takes place at 10. Fee: Caltech and JPL affiliates and SURF students pay \$7 per class; others pay \$10 per class. Special discount available for five lessons paid in advance.

For ongoing campus events, see reverse page.

Graduates (right) line up single file on the big day before marching across the stage; thousands of family members and well-wishers turned out on the Beckman Mall (below) for Caltech's 111th Commencement.



Commencement 2005

Gray skies hovered overhead, but cheery smiles abounded on the Beckman Mall as graduating students, their families, and friends gathered for Caltech's 111th Commencement.

Organist and alum Les Deutsch opened the festivities with a prelude, before the candidates, faculty members, and administrators paraded in to the accompaniment of Caltech's Convocations Brass and Percussion Ensemble, conducted by Bill Bing.

Kent Kresa, chairman of the Board of Trustees, welcomed the crowd and highlighted some notable Institute accomplishments of the past year. He then introduced Caltech alum (BS '83) and performing artist Sandra Tsing Loh, the keynote speaker.

Loh drew appreciative laughter and knowing nods as she related her own experience as a struggling physics major held in thrall by the authority and weighty expectations of "Caltech fathers"—not just the Holy Trinity of Arthur Amos Noyes, George Ellery Hale, and Robert Millikan, but also her own dad, Institute alum Eugene Loh (PhD '54).

Having then forged her own path despite her father's initial dismay, Loh was uniquely suited to both understand the grads' hefty accomplishment and encourage them to risk defying parental and institutional pressure in favor of their own instincts. Illustrating her point with the "obligatory Feynman story" ("a Caltech commencement tradition"), she showed

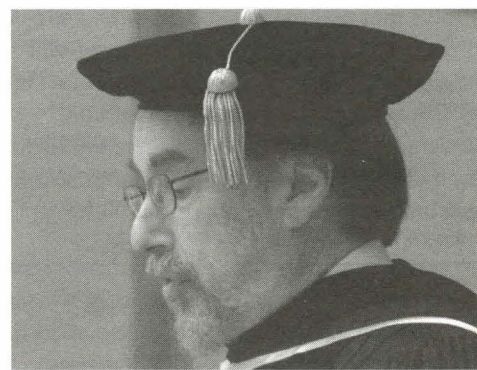
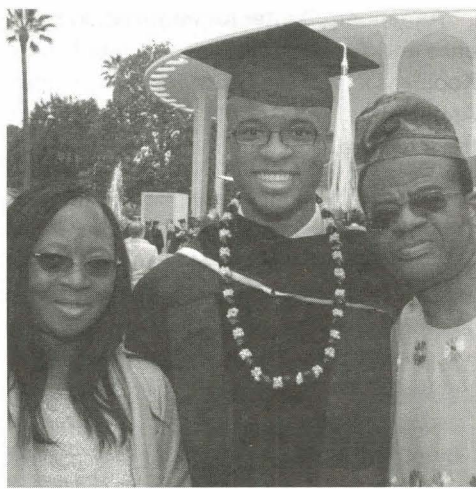
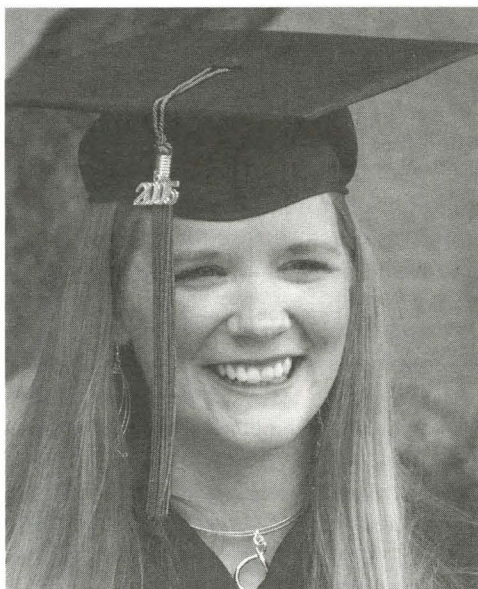
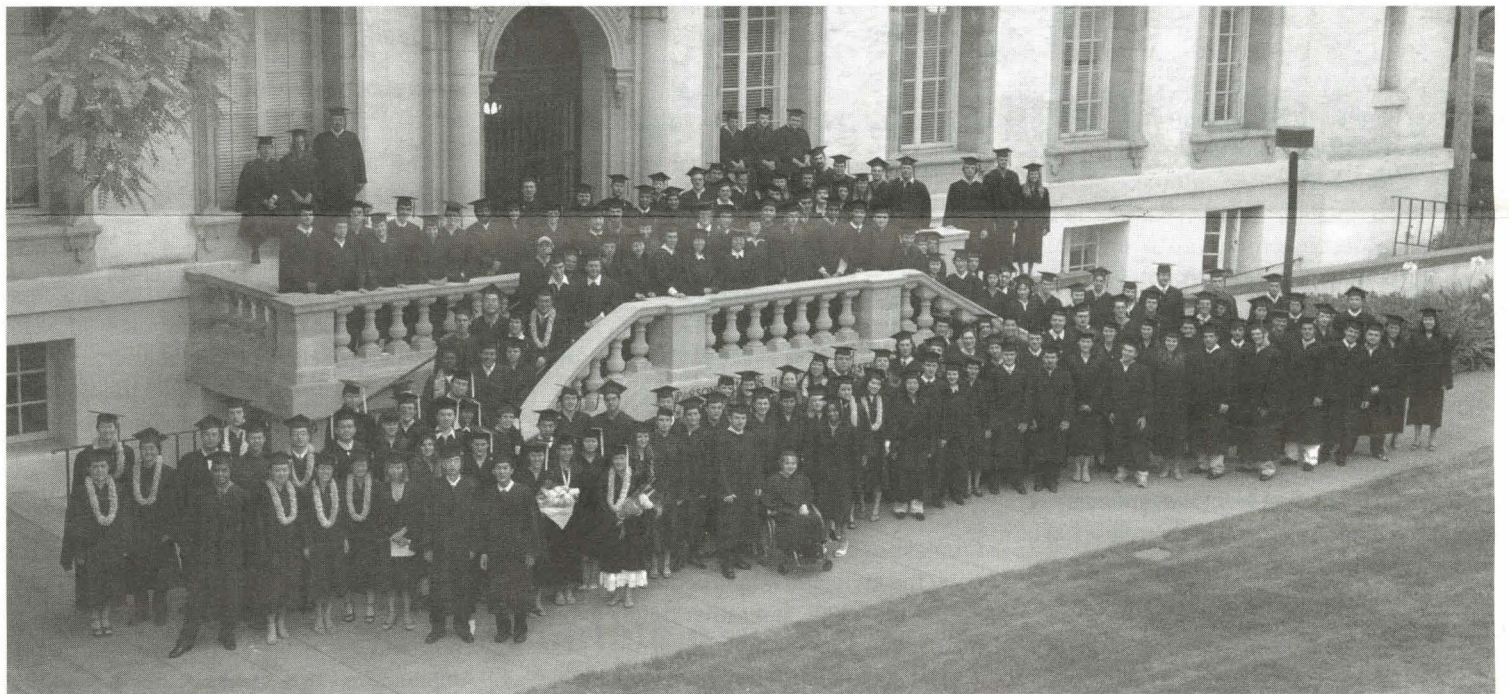
how the fear of questioning one's elders—of even thinking they might actually be, gulp, *wrong!*—could hinder breakthroughs in the pursuit of truth.

"Graduation is the beginning of the hero's journey," she said. "Which is a little bit Oedipal—just a little, I'm not saying kill your father! But the hero's journey does begin by leaving the safety of the village." In conclusion, Loh challenged the about-to-be-grads with a metaphor for Caltech genius: daring to be "card zero of the Tarot deck: the one Fool . . . stepping off a cliff. You. Who proves them all wrong."

Following Loh's address, Donald Caldwell led the Glee Clubs in the second annual rendition of "There's Just One," sung to the music of the "Hallelujah Chorus," before the faculty began presenting the degree candidates. Proud and happy relatives and friends strained to snap photos as each grad shook hands with President David Baltimore and had a well-earned moment in the limelight.

Baltimore then announced the many winners of academic and civic awards—cause for even more familial pride, if that were possible—before drawing the ceremony to a close with some concluding remarks (see page 2 for an adapted version). He then lauded the class of 2005 and sent them off with his best wishes for the future.

For more on Commencement 2005, including the program and video footage of the ceremony, visit <http://pr.caltech.edu/commencement/index.html>.



Caltech alumna Sandra Tsing Loh (upper left) returned to her alma mater to deliver the Commencement address; the class of 2005 poses on the steps of Parsons-Gates (above); Nora DeDontney (far left) exults after receiving her diploma; John Dabiri (center) received his PhD in aeronautics and bioengineering and joined the Caltech faculty as an assistant professor; Institute president David Baltimore (near left); a chorus leads the audience in song (bottom left); departing dean of students Jean-Claude Revel leads the graduating seniors to Beckman Mall (bottom right).



Athenaeum, from page 1

Caltech about 12 years ago," she says. Now that he's joined, she intends to make good use of their joint membership.

"We've already signed up for the family barbecue and I'm going to take the cooking classes and the wine tasting," she says. "My grandmother is a part of a women's group and I've arranged for a luncheon for her there. And I've arranged for a ladies' bridal luncheon, too."

Many new members are expected to join the Athenaeum's current membership of about 4,000 faculty, trustees, alumni, staff, graduate students, and Caltech Associates.

Opened in 1930, the building on the corner of California Boulevard and Hill Avenue has for decades served as an elegant place for meetings, dinners in the luxuriously appointed halls, and private parties.

Membership confers on employees privileges not found elsewhere. Members may dine there Monday through Friday, and they may also host wedding receptions at the Ath, as the club is affectionately called. Two of the biggest events of the year, the Easter brunch and the Mother's Day brunch, draw more than a thousand diners each. The Ath is also a popular venue for end-of-year holiday parties because of its sumptuous winter theme décor.

The amount of the monthly dues depends on the applicant's Human Resources classification level. Dues can range from \$15.75 up to \$31.50. There are no initiation fees.

Members keep abreast about upcoming events and Athenaeum news through the monthly newsletter *The Update*. The latest issue highlights summer activities like a kid's carnival, a Harry Potter night for children that is timed for the release of the newest book, and a Wine Cellar Dinner, an intimate meal served in the Ath's wine cellar. There are also a Lobster Night and a Hawaiian Family BBQ Luau, complete with Polynesian dancers. The popular afternoon teas will return in the fall.

"This is a great opportunity for all members of the Caltech community to join the company of scholars," says membership committee chair David Levy. "We are hoping that many more members of these communities will want to enjoy a small portion of Caltech history."

He referred to the upcoming celebration of the Athenaeum's 75th anniversary, to take place in 2006. The first formal event ever held at the club took place in February 1931, coinciding with a time when a very special guest, last name Einstein, was working at Caltech and living with his wife at the Ath. That hotel room is now called the Einstein Suite and is one of 28 second-floor rooms available to members and guests.

The membership campaigns at Caltech and JPL began this month and will run through the summer. All Caltech staff members are invited to a reception and information seminar at the Athenaeum on June 22 beginning at 11 a.m.



From left to right: Shannon Lewis, Victoria Loewer, Maryam Ali, Haluna Gunterman, Joan Karen Sum Ping, and Michelle Giron comprise the first all-female chemical engineering class.

Grads, from page 1

areas in which chemical engineers are now working," says Richard Flagan, the McCollum-Corcoran Professor of Chemical Engineering, as well as executive officer for chemical engineering and professor of environmental science and engineering.

"We broadened and diversified the chemical engineering curriculum at Caltech and have attracted women into a profession that was previously male-dominated. This group of graduates is significant in the sense that it shows that we are making progress and have finally turned the corner in bringing women into a discipline that, heretofore, has had relatively small numbers of women. We are extremely proud of these students."

And while some say the current number of women in science is still not

adequate, it is increasing significantly. According to the Department of Education statistics, in 2003 the U.S. population was 50.8 percent female, and more than 56 percent of all undergraduates were women. According to the same data, in 1970 the percentage of engineering bachelor's degrees conferred on women was a meager one percent; in 2001, the percentage had shot up to 20 percent.

The Caltech Division of Chemistry and Chemical Engineering describes its discipline as "the science of change," and says that chemists and chemical engineers are involved not only in understanding but in changing the material world around us. Those words could also describe the impact of this exceptional graduating class.

Construction, from page 1

stand primarily as temples to design. "It's important to improve the physical environment because it accommodates people, it lets them do their work."

She has a deep appreciation for the architecture of the original campus, but in contrast, of the more recent projects on campus, she considers her favorite the Broad Center for Biological Sciences.

"It houses the newest technology and accommodates the needs of advanced sciences and research," she says. "It is a timeless design that does not attempt to copy the style and construction methodology of the 1900s, but rather boldly expresses the design of today."

The schedule for building projects approved by Caltech's Board of Trustees shows that two major projects—the astrophysics building and the IST project—will be under construction at the same time.

South Undergraduate Houses: Construction to restore the historic buildings to their original state began this month. Work will be completed in September 2006.

"The integrity of these buildings is phenomenal," Khang-Keating says of the Mediterranean-style complex. "Preserving and enhancing their integrity is critical."

Temporary Undergraduate Housing: Residents of the South Undergraduate Houses will live in these temporary quarters.

Chandler Dining Hall: While the South Undergraduate Houses are closed for construction, so are their dining halls. Undergraduate students will be able to dine in Chandler. Work is complete.

Cahill Center for Astronomy and Astrophysics: Plans are in the early stages of the design phase at the firm Morphosis, led by Thom Mayne, winner of this year's Pritzker Architecture Prize. Construction is scheduled to begin in late 2006.

Annenberg Center for Information Science and Technology: Dutch architect Rem Koolhaas's firm, the Office for Metropolitan Architecture, will have 14 months to design the structure. Construction is planned for fall 2006.

Baltimore, from page 1

More Asian students are staying home for their education or going to countries that appear more welcoming. This is not only due to changes in the U.S. legal and political climate. The number of Chinese, South Korean, and Taiwanese students pursuing PhDs at universities in their home countries doubled in the nineties, and will continue to grow as the educational capacities of these countries expand. But the legal and visa challenges faced by international students and scholars who do seek to study and work here only add to the disincentives that we must strive to remove.

We have seen a sea change in the priorities established in Washington—and this is directly impacting our ability to stay at the forefront of science and innovation. Five years ago, national security was not topic number one, and we were awash in the tax receipts from the dotcom bubble. Optimism was high about science funding, with the National Science Foundation promising to double its budget. This commitment was significant to institutions like ours because, for the past 30 years, federal funding for basic research in engineering and the physical sciences had experienced little real growth. We were just beginning to feel the effects of the Bush administration's massive tax cuts when 9/11 happened, and suddenly there was money only for national security. The Bush administration sold the country on the idea that the invasion of Iraq would contribute to national security. Hundreds of billions of dollars were poured into conquering, and then trying to reconstruct, what is still a war-torn country. Now we are a debtor country on a massive scale, and the budgets for science this year are all up for cuts.

Security is critical—but just as critical are the support of innovation, the need for science education, the diversification of our national work force, and the need for new solutions to pressing global problems. In fact, the Bush administration is actively erecting barriers against much-needed scientific innovation, like stem-cell research, and turning its back on our scientific responsibility as a nation. For less-developed countries to start down the path of development, they need energy. We in the U.S. squander a large fraction of the world's supply of energy while we contaminate the atmosphere with an increased burden of greenhouse gases. We should be funding a massive program of energy research, yet what is forthcoming is a good deal less than that.

The good news is that institutions like Caltech continue to prepare students to be contributors in the realm of science and technology. We have just graduated another 500 people ready to take on the challenges of the future and contribute to their solutions. Our number is small but our impact is great. I salute the class of 2005 and wish you well in your futures.

Caltech 336

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