

# Caltech 336

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

The campus community biweekly  
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## Alda gets LIGO primer



Alan Alda (right), host of PBS's *Scientific American Frontiers*, recently interviewed Professors Barry Barish (left) and Kip Thorne on Caltech and MIT's Laser Interferometer Gravitational-Wave Observatory (LIGO). The film crew also visited LIGO Hanford in Washington for the episode, due to air next spring.

## Grant funds TMT plans

The dream of a giant optical telescope to improve our understanding of the universe and its origin has moved a step closer to reality. The Gordon and Betty Moore Foundation has awarded \$17.5 million to fund a detailed design study of the Thirty-Meter Telescope (TMT). This new grant allows Caltech and its partner, the University of California, to proceed with formulating detailed construction plans for the telescope.

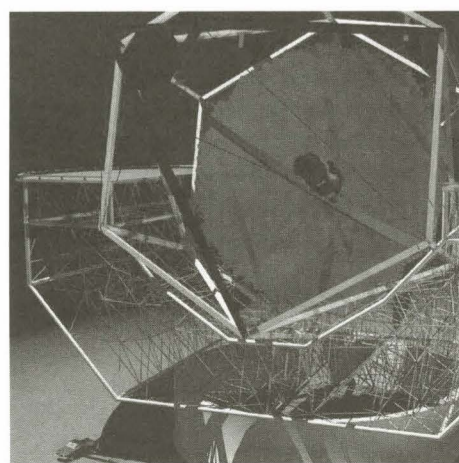
An earlier, more modest study completed in 2002 resulted in a roughed-out concept for a 30-meter-diameter optical and infrared telescope, complete with adaptive optics, which would result in images more than 12 times sharper than those of the Hubble Space Telescope. The TMT—formerly known as the California Extremely Large Telescope—will have nine times the light-gathering ability of one of the 10-meter Keck Telescopes, which are currently the largest in the world.

"Caltech and the University of California will work in close and constant collaboration to achieve the goals of the design effort," says Richard Ellis, Steele Family Professor of Astronomy and director of optical observatories at Caltech. "We've had promising discussions with the Association of Universities for Research in Astronomy and the Association

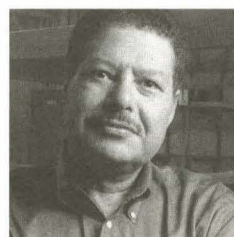
of Canadian Universities for Research in Astronomy, both of whom are considering joining us as major collaborators. Constructing and operating a telescope of this size will be a huge undertaking requiring a large collaborative effort."

According to Ellis, the Gordon and Betty Moore Foundation's early funding will provide crucial momentum to carry the project to fruition. "The major goals of the design phase will include an extensive review and optimization of the telescope design, addressing areas of risk, for example by early testing of key components, and staffing a project office in Pasadena."

see TMT, page 2



Todd Mason, Mason Productions



## Another Swedish accolade for Zewail

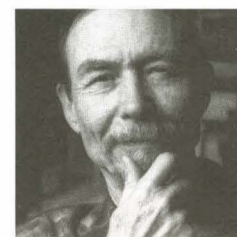
Ahmed Zewail, Caltech's Pauling Professor of Chemical Physics and professor of physics, and winner of the 1999 Nobel Prize in chemistry, has been named a member of the Royal Swedish Academy of Sciences—the organization that awards the Nobel Prizes in physics, chemistry, and economics.

An exclusive recognition of research achievements, membership in the academy falls into one of 10 classes; Zewail was elected as a foreign member of Class IV, chemistry. Besides noting his illustrious research career, the academy cited his contributions to "promoting research and education in the Third World."

"Normally after winning the Nobel Prize, you don't get elected to the academy," he says, "so it was very kind of them to elect me, and I hope we can bring together this and other distinguished academies to promote global science and education."

A native of Egypt, Zewail is a member of numerous academies and societies, and holds 20 honorary degrees from around the world, including one this year from Sweden's Lund University. Currently he is focusing on new research areas and on promoting awareness about the role of science in world peace.

see Zewail, page 6



## Two more medals for Mead

Adding to his long list of honors, Carver Mead, Moore Professor of Engineering and Applied Science, Emeritus, has been awarded the National Medal of Technology by President George W. Bush, and the National Academy of Engineering's Founders Award.

Mead is renowned in the high-tech community for his many contributions in microelectronics and information technology, including pioneering work on the very large scale integration (VLSI) design for complex circuitry at the microscopic level; and the high electron mobility transistor (HEMT), an amplifying device used in microwave communications and in the Internet. He has also been a leader in computer animation, microchip design, and neuromorphic electronic systems.

Focusing on technologies that will eventually result in human-machine interfaces, Mead's laboratory has led efforts to create silicon models of areas of the nervous system, whose elementary operations can

see Mead, page 6

## Trustee Malcom to speak on diversity

Caltech trustee Shirley Malcom will open the 2003–04 Presidential Lecture Series on Achieving Diversity in Science, Math, and Engineering on Tuesday, November 11. Her free public talk, "Let Nurture Take Its Course: Diversifying the Talent Pool for Science and Engineering," will begin at 4 p.m. in the Beckman Institute auditorium.

As head of the Directorate for Education and Human Resources Programs of the American Association for the Advancement of Science (AAAS), Malcom oversees programs in education, activities for underrepresented groups, and programs for increasing public understanding of science and technology. Nationally recognized for her leadership on issues facing underrepresented minorities and women in the sciences and engineering, she has published numerous articles and monographs on those challenges.

Malcom also cochairs the UN Commission on Science and Technology for Development's Gender Advisory Board, and has chaired numerous national committees on education reform and on access to scientific and technical education and

see Malcom, page 6

## Caltech Today debuts

If any of you are daily readers of the online publication *Tech Today*, no doubt you have noticed that it has evolved into a new online daily, *Caltech Today*.

Although the change in name may be minute, *Caltech Today* represents a substantial upgrade. It draws its news and information dynamically from a wide variety of sources, and offers new features and sections that highlight the latest news releases from the Media Relations office, stories from *Engineering and Science*, *Caltech News*, and *Caltech 336*, and selected events from the Institute's master calendar.

The site has been designed to allow select campus groups to post news and announcements to their own customized sections. It lists Pasadena-area event and entertainment venues via a data exchange with Pasadena CityCenter (an

see Caltech Today, page 6

# NewsBriefs



After a brief hiatus, the track and field facility located at Braun Athletic Center was recently reopened, complete with an Olympics-grade track surface and fresh Bermuda sod. In came a fence around the field and new bleachers; out went the pole-vault and long-jump runways. But the changes were more than cosmetic: "By relocating the runways we were able to get a wider playing area on this field," says Mark Harriman, associate director of athletics. "Now we're able to hold intercollegiate matches on it." Caltech has hosted home soccer games on the new field, as well as rugby, intramural flag football, and ultimate Frisbee. The grass grows on a new soil mix that improves underground drainage. The 400-meter track is open all day to Caltech community members, who may use it for jogging and walking.

## Personals

### Welcome to Caltech

#### October

**Marianne Brouty**, applications programmer, Infrared Processing and Analysis Center (IPAC); **Donna Jones**, administrative assistant, Space Radiation Laboratory; **Elise Kleeman**, lab technician, geology and geochemistry; **Tricia Knopf**, office administrator, Ombuds Office; **Keris Myrick**, associate director of admissions, Undergraduate Admissions; **Martha Oropesa**, general helper, Dining Services; **Esteban Reyes Rios**, catering cook, Dining Services; **C. Lee Rottler**, senior system engineer, IPAC; **Jennifer Turcios**, administrative assistant, Seismological Laboratory; **Ewine van Dishoeck**, Moore Distinguished Scholar in physics; **Sonya Zadeh**, assistant athletics trainer, Athletics; **Vehoosh Zohrabian**, senior administrative secretary, humanities and social sciences.

#### Retirements

**Stephen Speicher**, who worked in information services for the Division of Biology, will retire on November 1 after 13 years with Caltech.

#### Deaths

**Eola Sheehan** died on October 12; she was 92. An assistant registrar, she had retired in 1979 after 12 years at Caltech. She is survived by a sister, Allene Chamness.

**Coleman Carter**, a senior engineer in geological and planetary sciences who had retired in 1991 after 30 years at Caltech, died on August 8; he was 75. He is survived by three children, Tracy, Chris, and Coleman Jr.

**Tom Charnig**, who was a member of the technical staff in IPAC, died on September 26; he was 59. Hired in 1979, he had retired in 2001. He is survived by his wife, Nancy.

## Honors and awards

**Deniz Armani**, a fourth-year grad student in the research group of Jenkins Professor of Information Science and Technology and Professor of Applied Physics **Kerry Vahala**, has won first prize at the Leading Edge Student Symposium, held as part of the 36th Annual Symposium of the Southern California Chapter of the American Vacuum Society (AVS). The title of his presentation was "Ultra-High-Q Toroid Microcavity on a Chip" and described research on the first ultra-high-Q microresonator on a chip (see the February 27, 2003, *Nature*) and related applications. Other grad student coauthors on the presentation were **Sean Spillane**, **Tobias Kippenberg**, **Lan Yang**, and **Andrea Martin**, all of applied physics. Armani received a \$500 prize and will also attend the AVS international meeting in Baltimore.

**Babak Hassibi**, assistant professor of electrical engineering, has been awarded a David and Lucile Packard Fellowship in Science and Engineering. The fellowship of \$625,000 will be paid over five years beginning this October. An assistant professor at Caltech since 2001, Hassibi received his BS from the University of Tehran in 1989 and his PhD from Stanford in 1996.

**David MacMillan**, professor of chemistry, has been selected to receive a 2003 Camille Dreyfus Teacher-Scholar Award from the Camille and Henry Dreyfus Foundation. MacMillan received his BSc from the University of Glasgow (Scotland) in 1991 and his PhD from UC Irvine in 1996. He joined Caltech as associate professor in 2000, becoming professor in 2003.

**Brian Stoltz**, assistant professor of chemistry, has been named a Cottrell Scholar by the Research Corporation "for excelling in both teaching and research." Stoltz received his BS from Indiana University of Pennsylvania in 1993 and his PhD from Yale University in 1997, and joined Caltech's faculty in 2000.

**Alexander Varshavsky**, Smits Professor of Cell Biology, has been chosen by the Israel Cancer Research Fund to receive its Excellence in Clinical Research Award. Smits Professor at Caltech since 1992, Varshavsky earned his BS from Moscow State University in 1970 and his PhD from the Institute of Molecular Biology in 1973.

### Frosh add silver to gold

Incoming Caltech frosh **Emily Russell** and **Yernur Rysmagambetov** have each added a silver medal to the gold won by freshman **Pavel Batrachenko** (*Caltech 336*, September 18) at the 34th International Physics Olympiad in Taiwan.

Russell, a physics major from New York, was also named the competition's Best Female Participant. She is a recipient of both a Lingle and an Axline scholarship. Rysmagambetov, who is originally from Kazakhstan, plans to major in computer science.

Day one of the rigorous competition was devoted to solving "A Swing of a Falling Weight," "Neutrino Mass and Neutron Decay," and similar complex theoretical physics problems. After a day of rest, day two consisted of solving five-hour experimental problems utilizing equipment such as laser beams or diodes and photodetectors.

The Olympiad was held in Taipei, Taiwan, August 2–11. Founded in Warsaw in 1967, the Olympiad has become an annual event for secondary-school students around the world.

### Honors for waste reduction

Caltech was one of several San Gabriel Valley businesses and organizations honored by the California Integrated Waste Management Board's 11th Annual Waste Reduction Awards Program (WRAP). Part of the state's Environmental Protection Agency, the board asks via its award applications about everything from electronic and landscape waste to paper and unwanted furniture.

According to **Delmy Emerson**, Caltech's associate director for buildings and grounds, the Institute has had a waste-reduction campaign in place since 1993, and diverts away from landfills an average of 450 tons of material yearly. Caltech has received WRAP awards in previous years.

## Historian Martin Ridge dies

Martin Ridge, professor of history, emeritus, died September 22. He was 80. A native of Chicago, he graduated from Chicago Teachers College with a bachelor's degree in 1944, and then earned his master's and PhD degrees at Northwestern University. After serving on the faculty at Westminster College, San Diego State University, and Indiana University, Ridge joined Caltech in 1980, where he remained until he retired in 1995. He was also a senior research associate at the Huntington Library.

Ridge was an authority on American history and the westward expansion. He authored or coauthored a number of books, including *Ignatius Donnelly: Portrait of a Politician*, *California Work and Workers*, *The American Adventure*, *Westward Expansion: A History of the American Frontier*, and the first two volumes of *Liberty and Union: A History of the United States*, and edited several others. Among Ridge's honors were the Ray Allen Billington Prize, the Best Book Award from the Pacific Coast Branch of the American Historical Association, Phi Alpha Theta's Best Book Award, and the *New Mexico Historical Review's* Gilberto Espinosa Prize. He was a former president of the Western History Association and the Pacific Coast Branch of the American Historical Association, and former editor of the *Journal of American History*.

He is survived by his wife, Sally, of San Gabriel; and sons Wallace and Drew.

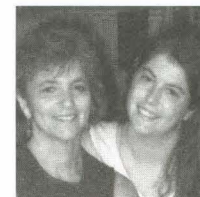
## Find job satisfaction

Noted speakers and consultants Beverly Kaye and Sharon Jordan-Evans will lead a discussion exploring ways in which employees can enjoy greater workplace empowerment and satisfaction. "Both Sides Now: The Dual Role of Managers and Employees in Workplace Satisfaction," a free event for Caltech and JPL community members, will take place on Wednesday, November 12, from 3 to 5 p.m. in Beckman Auditorium.

Kaye and Jordan-Evans are coauthors of *Love 'Em or Lose 'Em: Getting Good People to Stay and Love It, Don't Leave It: 26 Ways to Get What You Want at Work*. Kaye is an international authority on career development and talent retention, whose management and career development programs are used by major corporations. The recipient of numerous honors, Kaye completed graduate work at MIT's Sloan School of Management and earned her PhD at UCLA.

Jordan-Evans has more than 15 years of experience coaching leaders in improving morale and commitment. A former senior vice president and consulting partner for Drake Beam Morin, Inc., she is president of the Jordan Evans Group, a consulting firm dedicated to organizational effectiveness. She has a master's degree in organization development and is a professional certified coach.

For more information, contact Gail Anderson at [gail@caltech.edu](mailto:gail@caltech.edu) or ext. 8734. Sponsored by the Caltech Management Association, Business and Finance, and JPL Human Resources.



Jessica Edwards, right, with her mother, Susan Lubman-Edwards

## Running for life

When Jessica Edwards started looking into marathon training programs, she found one close to her heart.

A graduate student in biology and Ricketts House resident associate, she hoped to get back into shape while giving something to the community. "Doing *gemilut chasidim* [Hebrew for "charitable actions"] has always been really important to me," says Edwards.

And when she received a mailer on the Leukemia & Lymphoma Society's Team In Training program, she knew it was the right one—her mother has been in remission from lymphoma for nine years. "I thought it was the best piece of 'bulk mail' that I'd ever gotten," she says.

As a Team In Training member, Edwards is getting ready for her first-ever marathon in Honolulu on December 14. The program provides coaching and will even pay her way to Hawaii—in return for raising funds to help cure often deadly blood-related cancers.

So far, Edwards has raised \$1,675 toward her \$5,000 target, and her November 3 deadline is closing in quickly. In addition, she feels the urgency that comes from a personal brush with cancer. As she began fund-raising, she says, "I suddenly realized that more friends and family members than I knew have been touched by these diseases."

She's running the race to honor her mother and other loved ones who have overcome or are currently battling cancer. "These people are the real heroes on our team, and we need your support to cross the ultimate finish line—the final cures!"

For more information or to make a donation, visit [www.teamintraining.org/personalpages](http://www.teamintraining.org/personalpages) and search for Participant ID 121090, or contact Edwards at [edwards@caltech.edu](mailto:edwards@caltech.edu) or (626) 395-6479.

### TMT, from page 1

With such a telescope, astrophysicists will be able to study the earliest galaxies and the details of their formation as well as pinpoint the processes leading to young planetary systems around nearby stars.

"The key new capabilities promised by the Thirty-Meter Telescope will include unprecedented angular resolution, necessary to resolve detail in early galaxies and forming planetary systems, and of course the huge collecting area for studying the faintest sources, which are often the most important to understand, but are beyond the reach of current facilities," adds Chuck Steidel, professor of astronomy, who chaired a science committee charged with making the case for the proposed facility.

Following the design study, the final phase of the project, not yet funded, will be construction of the observatory at an as-yet-undetermined site in Hawaii, Chile, or Mexico. The end of this phase would mark the beginning of regular astronomical observations, perhaps by 2012.

The Gordon and Betty Moore Foundation was created in 2000 with a multi-billion-dollar contribution from its founders. The mission of the foundation is to seek and develop outcome-based projects that will improve the quality of life for future generations. The majority of the foundation's grant making concerns large-scale initiatives in four general program areas: the environment, higher education, science, and San Francisco Bay Area projects.

November 3–9, 2003

M T W T F S S

Monday, November 3

- High Energy Physics Seminar**  
469 Lauritsen, 4 p.m.—Topic to be announced. Shufang Su, University of Arizona. Information: [www.theory.caltech.edu/people/helen/seminar1.html](http://www.theory.caltech.edu/people/helen/seminar1.html).
- Inorganic-Electrochemistry Seminar**  
147 Noyes, Sturdivant Lecture Hall, 4 p.m.—“Nanoscale Patterning on Semiconductor Surfaces,” Jillian M. Buriak, professor and senior research officer, National Institute for Nanotechnology (NINT), department of chemistry, University of Alberta.
- Applied and Computational Mathematics Colloquium**  
101 Guggenheim Lab, Lees-Kubota Lecture Hall, 4:15 p.m.—“Making Images of Shear Stiffness in Tissue from Interior Wave Propagation Measurements,” Joyce McLaughlin, Ford Foundation Professor, Rensselaer Polytechnic Institute. Refreshments, 3:45 p.m. Information: [www.acm.caltech.edu/colloq.shtml](http://www.acm.caltech.edu/colloq.shtml).

Tuesday, November 4

- SciFinder Scholar Workshop**  
Sherman Fairchild Library, multimedia conference room, 2 to 3:30 p.m.—Intended as a follow-up to the “Introduction to SciFinder Scholar” class, this workshop will be a hands-on session for specific search and structure questions. Laptop computers will be provided for attendees. Registration: <http://library.caltech.edu/learning/form.htm>.
- Institute for Quantum Information Seminar**  
74 Jorgensen, 3 p.m.—Topic to be announced. Guifré Vidal, postdoctoral scholar in physics, Caltech.
- General Biology Seminar**  
119 Kerckhoff, 4 p.m.—“Building and Unbuilding the Immune System,” Paul Kincade, Immunobiology Program, Oklahoma Medical Research Foundation.

- Mechanical Engineering Seminar**  
206 Thomas, 3 p.m.—“What Is the Pressure in a Virus, and Why?”, Professor Bill Gelbart, chair of the department of chemistry and biochemistry, UCLA.

Wednesday, November 5

- Mathematical Physics Seminar**  
351 Sloan, noon—“Spectrum of Non-Selfadjoint Semiclassical Operators in 2 Dimensions,” Michael Hitrik, assistant professor, department of mathematics, UCLA. Information: [www.math.caltech.edu/events/mathphys.html](http://www.math.caltech.edu/events/mathphys.html).
- Astronomy Colloquium**  
155 Arms, Robert Sharp Lecture Hall, 4 p.m.—Topic to be announced. Ralf Bender, professor of astronomy, University of Munich. Information: [www.astro.caltech.edu/~gma/colloquia.html](http://www.astro.caltech.edu/~gma/colloquia.html).

- Chemical Research Conference**  
153 Noyes, Sturdivant Lecture Hall, 4 p.m.—“The Determination of the Mechanisms of Complex Chemical and Biochemical Reactions,” John Ross, Camille and Henry Dreyfus Professor of Chemistry, Emeritus, Stanford University.

- Environmental Science and Engineering Seminar**  
142 Keck, 4 p.m.—“Biodegradation, Biotransformation, and Bacterial Behavior,” Rebecca Parales, assistant professor of microbiology, UC Davis. Refreshments, Keck Labs lobby, 3:40 p.m.

- Materials Research Lecture**  
106 Spalding Lab, Hartley Memorial Seminar Room, 4 p.m.—“Ferroelectric Thin Films,” Susan Trolrier-McKinstry, Pennsylvania State University. Refreshments, 113 Spalding Lab, 3:45 p.m. Information: [www.matsci.caltech.edu/seminars.html](http://www.matsci.caltech.edu/seminars.html).

- Earnest C. Watson Lecture Series**  
Beckman Auditorium, 8 p.m.—“From PCs to Petaflops: The Future of Really Big Computers,” Thomas Sterling, faculty associate in the Center for Advanced Computing Research, Caltech. Admission is free. Information: 395-4652, 1 (888) 2CALTECH, or [events@caltech.edu](mailto:events@caltech.edu). Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at [www.events.caltech.edu](http://www.events.caltech.edu).

Thursday, November 6

- Research Techniques for Core Science Writing Course**  
Sherman Fairchild Library, multimedia conference room, 2 to 3:30 p.m.—This session is intended for undergraduates working on their Core 1 ab (Science Writing) requirement; however, all undergraduates are encouraged to attend for an introduction to the library’s resources and services. The focus will be on strategies for searching major science and engineering databases to identify key articles, conference papers, and books. Registration: <http://library.caltech.edu/learning/form.htm>.

- Chemical Engineering Graduate Seminar**  
106 Spalding Lab, Hartley Memorial Seminar Room, 4 p.m.—“In Vivo Imaging and Quantification of Microvascular Blood Flow During Mammalian Development,” Elizabeth Jones, graduate student in chemical engineering, Caltech. Information: <http://cheme.caltech.edu/~gradtalks/feature.html>.

- Physics Research Conference**  
201 E. Bridge, 4 p.m.—Topic to be announced. Hitoshi Murayama, professor of physics, UC Berkeley. Refreshments, 114 E. Bridge, 3:45 p.m. Information: [www.pma.caltech.edu/~physcoll/PhysColl.html](http://www.pma.caltech.edu/~physcoll/PhysColl.html).

- Social and Information Sciences Laboratory Seminar Series**  
25 Baxter, 4 p.m.—“Graphical Models for Game Theory and Economics,” Professor Michael Kearns, department of computer and information science, University of Pennsylvania. Refreshments.

Friday, November 7

- High Energy Theory Seminar**  
469 Lauritsen, 11 a.m.—“A Matrix Model Dual of Type 0 String Theory in Two Dimensions,” Dr. Tadashi Takayanagi, department of physics, Harvard. Information: [www.theory.caltech.edu/people/seminar/schedule.html](http://www.theory.caltech.edu/people/seminar/schedule.html).

- Fluid Mechanics Seminar**  
101 Guggenheim Lab, Lees-Kubota Lecture Hall, 3 p.m.—“Instabilities and Turbulence in Strongly Stratified Flows,” Professor James Riley, department of mechanical engineering, University of Washington. Information: [www.galcit.caltech.edu/Seminars/Fluids/CurrentFluids/index.html](http://www.galcit.caltech.edu/Seminars/Fluids/CurrentFluids/index.html).

- Inorganic-Electrochemistry Seminar**  
147 Noyes, Sturdivant Lecture Hall, 4 p.m.—“The Discovery of New Stereospecific Polypropylene Catalysts Using High Throughput Techniques,” Dr. Howard Turner, research scientist, Symyx Technologies.

- Molecular, Cellular, and Developmental Biology Seminar**  
119 Kerckhoff, 4 p.m.—“New Insights into Hedgehog Signaling During Limb Patterning,” Cliff Tabin, professor of genetics, Harvard University School of Medicine.

- William Bennett Munro Memorial Seminar**  
25 Baxter, 4 p.m.—“‘The Government Beguiled Me, and I Did Eat’: Responsibility and the Entrapment Defense,” Gideon Yaffe, assistant professor of philosophy, USC. Refreshments.

# November 10–16, 2003

M T W T F S S

## Monday, November 10

### Geological and Planetary Sciences Seminar

155 Arms, Robert Sharp Lecture Hall, 4 p.m.—“Reorganization of Biogeochemical Cycles During the Terminal Proterozoic,” John M. Hayes, senior scientist, Woods Hole Oceanographic Institution.

### High Energy Physics Seminar

469 Lauritsen, 4 p.m.—Topic to be announced. Ira Rothstein, assistant professor, department of physics, Carnegie Mellon University. Information: [www.theory.caltech.edu/people/helen/seminar1.html](http://www.theory.caltech.edu/people/helen/seminar1.html).

### Inorganic-Electrochemistry Seminar

147 Noyes, Sturdivant Lecture Hall, 4 p.m.—“Physical Studies of Ionic Liquids: Properties, Solvation Dynamics, and Electron Reactivity,” Dr. James Wishart, chemistry department, Brookhaven National Laboratory.

### Teaching Workshop

Beckman Institute auditorium, 5:30 to 7 p.m.—“Methods of Teaching for the Development of Skills in Critical Thinking and Inquiry,” Janet Hering, professor of environmental science and engineering, Caltech.

## Tuesday, November 11

### Caltech Library System Presents: Introduction to Beilstein/Gmelin Crossfire

Sherman Fairchild Library, multimedia conference room, noon to 1:30 p.m.—A review of database content and a quick comparison with SciFinder Scholar and the Combined Chemical Dictionary. Examples of structure searching and the displaying of results in Beilstein Commander will be shown. A handout with examples of search and display features will be provided, along with practice structure problems. Registration: <http://library.caltech.edu/learning/form.htm>.

### Institute for Quantum Information Seminar

74 Jorgensen, 3 p.m.—Topic to be announced. Daniel Gottesman, research scientist, Perimeter Institute, Canada.

### Ulric B. and Evelyn L. Bray Seminar

25 Baxter, 4 p.m.—“Regime Shifts in a Dynamic Term Structure Model of the U.S. Treasury Markets,” Qiang Dai, assistant professor of finance, NYU Stern School of Business. Refreshments.

### The Caltech Presidential Lecture Series on Achieving Diversity in Science, Math, and Engineering

Beckman Institute auditorium, 4 to 5:30 p.m.—“Let Nurture Take Its Course: Diversifying the Talent Pool for Science and Engineering,” Shirley Malcom, head of the Directorate for Education and Human Resources Programs, American Association for the Advancement of Science. Admission is free. Permits for free parking and directions to the auditorium are available at the South Holliston Avenue parking structure.

### Chemical Physics Seminar

147 Noyes, Sturdivant Lecture Hall, 4 p.m.—Topic to be announced. Professor Amit Sinha, department of chemistry and biochemistry, UC San Diego.

## Wednesday, November 12

### Mathematical Physics Seminar

351 Sloan, noon—“Schrödinger Operators with Strong Magnetic Field of Compact Support,” Rainer Hempel, Technische Universität Braunschweig. Information: [www.math.caltech.edu/events/mathphys.html](http://www.math.caltech.edu/events/mathphys.html).

### Astronomy Colloquium

155 Arms, Robert Sharp Lecture Hall, 4 p.m.—“The Origin of Water on Earth and Mars, With Implications for Making Other Earths,” Jonathan Lunine, professor of planetary sciences, University of Arizona. Information: [www.astro.caltech.edu/~gma/colloquia.html](http://www.astro.caltech.edu/~gma/colloquia.html).

### Environmental Science and Engineering Seminar

142 Keck, 4 p.m.—“Trace Metals in the Nitrogen Cycle: Potential for Metal Limitation of Dentrification,” Professor Bess Ward, geosciences department, Princeton University. Refreshments, Keck Labs lobby, 3:40 p.m.

### Materials Research Lecture

106 Spalding Lab, Hartley Memorial Seminar Room, 4 p.m.—“Protein Crystal Growth,” James De Yoreo, Lawrence Livermore National Laboratory. Refreshments, 113 Spalding Lab, 3:45 p.m. Information: [www.matsci.caltech.edu/seminars.html](http://www.matsci.caltech.edu/seminars.html).

### Organic Chemistry Seminar

153 Noyes, Sturdivant Lecture Hall, 4 p.m.—“Development and Synthetic Applications of Electron Transfer Initiated Cyclization Reactions,” Professor Paul Floreancig, department of chemistry, University of Pittsburgh.

## Thursday, November 13 Friday, November 14

### Caltech Library System Presents: Business Resources

Sherman Fairchild Library, multimedia conference room, 2 to 3:30 p.m.—This class will focus on business research strategies and methods for finding information on companies and industries. Such information can be useful for job searches and interviews, and for research before starting a business. Information: <http://library.caltech.edu/learning/default.htm>.

### Biophysics Lecture

153 Noyes, Sturdivant Lecture Hall, 4 p.m.—“Beyond 3D Structure: Dynamics and Its Role in Protein Function,” Professor Peter E. Wright, chairman of the department of molecular biology, Scripps Research Institute.

### Chemical Engineering Seminar

106 Spalding Lab, Hartley Memorial Seminar Room, 4 p.m.—“Zeolite Thin Films: From Computer Chips to Space Station,” Professor Yushan Yan, department of chemical and environmental engineering, UC Riverside. Refreshments, 113 Spalding Lab, 3:30 p.m.

### Physics Research Conference

201 E. Bridge, 4 p.m.—“Physics at the B Factories: Progress and Prospects,” Patricia Burchat, professor of physics, Stanford University. Refreshments, 114 E. Bridge, 3:45 p.m. Information: [www.pma.caltech.edu/~physcoll/PhysColl.html](http://www.pma.caltech.edu/~physcoll/PhysColl.html).

### Social and Information Sciences Laboratory Seminar Series

25 Baxter, 4 p.m.—“Choice and Games with Ambiguity as Sets of Probabilities,” Maxwell B. Stinchcombe, E. C. McCarty Centennial Professor, department of economics, University of Texas, Austin. Refreshments.

### High Energy Theory Seminar

469 Lauritsen, 11 a.m.—Topic to be announced. Johannes Walcher, Kavli Institute for Theoretical Physics (KITP), UC Santa Barbara. Information: [www.theory.caltech.edu/people/seminar/schedule.html](http://www.theory.caltech.edu/people/seminar/schedule.html).

### High Energy Theory Seminar

469 Lauritsen, 1 p.m.—“Penrose Limit and DLCQ,” Assaf Shomer, Hebrew University. Information: [www.theory.caltech.edu/people/seminar/schedule.html](http://www.theory.caltech.edu/people/seminar/schedule.html).

### Inorganic-Organometallics Seminar

151 Crellin, 4 p.m.—“Mechanistic Aspects of Olefin Hydroarylation: Are Efficient 1-2 Insertion and C-H Activation Mutually Exclusive?,” Jonas Oxgaard, postdoctoral scholar in chemistry, Caltech.

### Kellogg Seminar

Lauritsen Library, 4 p.m.—“New Results From SAMPLE Experiments,” Takeyasu Ito, senior postdoctoral scholar in physics, Caltech.

# CampusEvents

## Monday, November 3

### 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.

### West Coast Swing Lessons

Winnett lounge, 7:30 p.m.—Join the Ballroom Dance Club as we learn West Coast swing. This is the fifth of a series of nine classes. No experience or partner is necessary. Fee: \$1 per class. Refreshments.

### Advanced Ballet Class

Braun Gym, multipurpose room, 10 p.m.—Free class taught by experienced members of the Caltech Dance Troupe. Prior dance experience is required. Dance shoes and clothing are recommended.

## Tuesday, November 4

### 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: 793-4099 or camila\_bruns@hotmail.com.

### Caltech Shorinji Kempo Club

Brown Gymnasium, 7 p.m.—Learn effective self-defense and martial arts. Sessions are free. No experience required. Wear comfortable clothing.

### Caltech Tai Chi Club

Winnett lounge, 7 p.m.—Meets Tuesdays and Fridays weekly. Sessions are free. Information: www.its.caltech.edu/~taichi.

### Auditions for *Macbeth*

Ramo Auditorium, 7:30 to 10 p.m.—Auditions for TACIT's winter-term production of Shakespeare's *Macbeth* are open to all members of the Caltech community. Information: <http://tacit.caltech.edu/audition.html>.

### Volleyball

vs. University of Redlands, 7:30 p.m.

### Voices of Vision: Tom Maier

Beckman Institute auditorium, 8 p.m.—Tom Maier will talk about his book *The Kennedys: America's Emerald Kings*. Admission is free. Information: 395-4652, 1 (888) 2CALTECH, or [events@caltech.edu](mailto:events@caltech.edu). Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at [www.events.caltech.edu](http://www.events.caltech.edu).

## Wednesday, November 5

### Baby Furniture and Household Equipment Pool

See Monday, November 3, for details.

### 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. Information: 403-7163 or [ktclark@caltech.edu](mailto:ktclark@caltech.edu).

### Men's Soccer

at Cal Lutheran University, 3 p.m.

### Men's Water Polo

vs. Occidental College, 7 p.m.

### Auditions for *Macbeth*

See Tuesday, November 4, for details.

### Beginning Ballet Class

Braun Gym, multipurpose room, 10 p.m.—Free class taught by experienced members of the Caltech Dance Troupe. All experience levels are invited. No special clothing or shoes are required.

## Thursday, November 6

### Women's Club Welcoming Coffee

JPL, von Karman Auditorium, 11:30 a.m. to 1 p.m.—An opportunity to meet new friends, welcome newcomers, and learn more about the Caltech Women's Club. Information: Carol Andersen, (818) 790-8175 or [carol@vis.caltech.edu](mailto:carol@vis.caltech.edu).

### Caltech Shorinji Kempo Club

See Tuesday, November 4, for details.

### American Tango Lessons

Winnett lounge, 7:30 p.m.—Join the Ballroom Dance Club as we learn the American tango. This is the first of a series of four classes taught by a professional instructor. No experience or partner is necessary. Refreshments. Fee for students: \$20 for the series, \$6 per class. Others: \$28, \$8. Refreshments.

### Volleyball

at University of La Verne, 7:30 p.m.

### Voices of Vision: Howard Rosenberg

Beckman Auditorium, 8 p.m.—Howard Rosenberg, Pulitzer Prize-winning television critic for the *Los Angeles Times*, will discuss media ethics. Admission is free. Information: 395-4652, 1 (888) 2CALTECH, or [events@caltech.edu](mailto:events@caltech.edu). Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at [www.events.caltech.edu](http://www.events.caltech.edu).

### Hip-Hop Dance Class for Advanced Beginners

Braun Gym, multipurpose room, 9:30 p.m.—Hip-hop for advanced beginners, taught by a professional instructor. No special clothing or shoes are required. Open to all who have a valid gym membership. The trial class costs \$5. Fees for the full term: \$30 for Caltech students, \$40 for other Caltech community members. Sponsored by the Caltech Dance Troupe.

### International Quickstep Lessons

Winnett lounge, 9:30 p.m.—Join the Caltech Ballroom Dance Club as we learn international-style quickstep. This class is the first of a series of four classes taught by a professional instructor. No experience or partner is necessary. Fee not yet determined.

## Friday, November 7

### Caltech Opera Club

Center for Student Services, noon—A guest speaker will present an informal talk on the upcoming production of *Lucia di Lammermoor* at the Los Angeles Opera. We will meet in the Chris Brennen Conference Room (Center for Student Services, third floor). Bring lunch and friends. Information: [www.its.caltech.edu/~opera](http://www.its.caltech.edu/~opera).

### Diwali Celebrations

Beckman Institute lobby, 6 p.m.—OASIS invites you to celebrate the Indian festival of lights. The program will include quintessential Diwali festivities, as well as Indian music, and will be followed by the screening of an Indian movie. Refreshments native to the Indian subcontinent will be served. This is a free event and open to all members of the Caltech/JPL community. Information: [oasis@caltech.edu](mailto:oasis@caltech.edu) or 395-8775.

### Caltech Tai Chi Club

See Tuesday, November 4, for details.

### Men's Water Polo

vs. Cal Lutheran University, 7 p.m.

### Caltech Chess Club

Page House Dining Hall, 8 p.m.—Be you master or novice, you will enjoy the chess club's weekly meetings. Information: [www.its.caltech.edu/~citchess](http://www.its.caltech.edu/~citchess).

### Sweeney Todd

Ramo Auditorium, 8 p.m.—Theater Arts at Caltech presents Christopher Bond's *Sweeney Todd: The Demon Barber of Fleet Street*. (This play is not Sondheim's musical.) Tickets and information: 395-4652, 1 (888) 2CALTECH, or [events@caltech.edu](mailto:events@caltech.edu). Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit TACIT at [www.tacit.caltech.edu](http://www.tacit.caltech.edu).

## Saturday, November 8

### Swimming and Diving

vs. Chapman University, at Mills College, 11 a.m.

### Beginning Belly-Dancing

Braun Gym, multipurpose room, 12:45 p.m.—Learn basic belly-dance technique with Leela, a popular belly-dance performer and instructor. No special clothing or shoes are required. Open to all with a valid gym membership. The trial class costs \$5. Fees for the full term: \$30 for Caltech students, \$60 for other Caltech community members. Class size is limited. Reservations: 395-6763 or [Kathy.Kelly@caltech.edu](mailto:Kathy.Kelly@caltech.edu).

### Auditions for *Macbeth*

Ramo Auditorium, 1:30 to 4 p.m.—See Tuesday, November 4, for details.

### Sweeney Todd

See Friday, November 7, for details.

## Sunday, November 9

### Women's Intermediate Self-Defense

Caltech Women's Center, 1 to 5 p.m.—This class is for those women who have participated in the introductory workshop and would like the opportunity to practice with a padded assailant. Registration: [wcenter@studaff.caltech.edu](mailto:wcenter@studaff.caltech.edu).

### Sweeney Todd Matinee

Ramo Auditorium, 2 p.m.— See Friday, November 7, for details.

### Caltech Shorinji Kempo Club

Braun Gym, multipurpose room, 3:30 p.m.— See Tuesday, November 4, for details.

## Monday, November 10

### Baby Furniture and Household Equipment Pool

See Monday, November 3, for details.

### West Coast Swing Lessons

See Monday, November 3, for details.

### Advanced Ballet Class

See Monday, November 3, for details.

## Tuesday, November 11

### Preschool Playgroup

See Tuesday, November 4, for details.

### Caltech Shorinji Kempo Club

See Tuesday, November 4, for details.

### Caltech Tai Chi Club

See Tuesday, November 4, for details.

### 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](mailto:lkamp@lively.jpl.nasa.gov). Visit our website at [www.its.caltech.edu/~aigp22](http://www.its.caltech.edu/~aigp22).

## Wednesday, November 12

### Baby Furniture and Household Equipment Pool

See Monday, November 3, for details.

### Wednesdays in the Park

See Wednesday, November 5, for details.

### Caltech Management Association

Beckman Auditorium, 3 p.m.—Business consultants and authors Beverly Kaye and Sharon Jordan-Evans offer a guide to workplace satisfaction with their talk "Both Sides Now: The Dual Role of Managers and Employees in Workplace Satisfaction." Admission is free. Information: 395-8734 or [gail@caltech.edu](mailto:gail@caltech.edu). Open to members of the Caltech/JPL community only.

### 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. Reservations: 395-6727 or [safety.training@caltech.edu](mailto:safety.training@caltech.edu).

### Beginning Ballet Class

See Wednesday, November 5, for details.

## Thursday, November 13

### REEL Women Series

Caltech Women's Center, noon—*Thank God I Am a Lesbian* (1992, 59 minutes) is an entertaining documentary about the diversity of lesbian identities. Lunch will be provided.

### Caltech Shorinji Kempo Club

See Tuesday, November 4, for details.

### American Tango Lessons

See Thursday, November 6, for details.

### Hip-Hop Dance Class for Advanced Beginners

See Thursday, November 6, for details.

### International Quickstep Lessons

See Thursday, November 6, for details.

## Friday, November 14

### Fire-Extinguisher Training

Wilson Avenue North Parking Structure, roof, 11 a.m.—This class will teach basic fire safety and include hands-on training on how to use a fire extinguisher. Class size is limited; please call 395-6727 or e-mail [safety.training@caltech.edu](mailto:safety.training@caltech.edu) to reserve a place.

### Caltech Tai Chi Club

See Tuesday, November 4, for details.

### Caltech Chess Club

See Friday, November 7, for details.

### Caltech Concert Band

Beckman Auditorium, 8 p.m.—The program will feature waltzes by Strauss, Cajun folk songs by local composer Frank Ticheli, and some great old Leroy Anderson selections such as "A Trumpeter's Lullaby" and "The Typewriter." A reception will follow the concert. Information: 395-4652, 1 (888) 2CALTECH, or [events@caltech.edu](mailto:events@caltech.edu). Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at [www.events.caltech.edu](http://www.events.caltech.edu).

### Sweeney Todd

See Friday, November 7, for details.

## Saturday, November 15

### Men's Soccer

vs. alumni, 11 a.m.

### Swimming and Diving

at Whittier College, 11 a.m.

### Beginning Belly-Dancing

See Saturday, November 8, for details.

### Sweeney Todd

See Friday, November 7, for details.

### Caltech Folk Music Society Presents Cathy Fink and Marcy Marxer

Winnett lounge, 8 p.m.—Program to be announced. Tickets and information: 395-4652, 1 (888) 2CALTECH, or [events@caltech.edu](mailto:events@caltech.edu). Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit the Folk Music Society at <http://folkmusic.caltech.edu>.

### Shangri-La Chinese Acrobats

Beckman Auditorium, 8 p.m.—Watch formidable feats of daring and balance, explosive Kung Fu, dazzling acrobatic displays, and a touch of Chinese comedy in this performance honoring Tom Lehman, the late founding technical operations manager of Caltech Public Events. Tickets and information: 395-4652, 1 (888) 2CALTECH, or [events@caltech.edu](mailto:events@caltech.edu). Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at [www.events.caltech.edu](http://www.events.caltech.edu).

## Sunday, November 16

### Skeptics Society Lecture

Baxter Lecture Hall, 1 p.m.—"The Future: Science Fact and Science Fiction," Dr. David Brin, scientist and author. Donation is \$8 for nonmembers, \$5 for members and non-Caltech students. A book signing will follow the lecture. Free to the Caltech/JPL community. Information: 794-3119 or [skepticmag@aol.com](mailto:skepticmag@aol.com). Visit the Skeptics Society at [www.skeptic.com](http://www.skeptic.com).

### Sweeney Todd Matinee

Ramo Auditorium, 2 p.m.—See Friday, November 7, for details.

### Caltech Shorinji Kempo Club

Braun Gym, multipurpose room, 3:30 p.m.—See Tuesday, November 4, for details.

### Amnesty International Book Discussion Group

Vroman's Bookstore, 695 E. Colorado Boulevard, second floor, 6:30 p.m.—This month's book is *The River's Tale: A Year on the Mekong*, by Edward Gargan, a richly described and melancholic tale of the author's journey through Tibet, China, Laos, Cambodia, and Vietnam. All are welcome. Sponsored by Caltech/Pasadena AI Group 22. Visit Group 22 at [www.its.caltech.edu/~aigp22](http://www.its.caltech.edu/~aigp22).

## News extras



A sellout crowd estimated at more than 2,500 enjoyed dinner al fresco, children's activities, and the movie *Finding Nemo* at the annual Caltech-JPL United Way Family Night last Friday.



Caltech Dining Services was one of three U.S. university food programs visited by a delegation from Japan. The group learned about new trends in order to shore up food service at Japanese universities, which anticipate severe competition for students due to governmental restructuring.

### Get "In the Money" with CEFCU

Be among those who refer a relative, colleague, or fellow student to membership in the Caltech Employees Federal Credit Union, and you could win a \$1,000 grand prize or one of 20 \$100 first prizes. Also, sign up for CEFCU's new e-Move program to easily transfer funds online between institutions. Visit [www.cefcu.org](http://www.cefcu.org) or 515 South Wilson Avenue, e-mail [students@cefcu.org](mailto:students@cefcu.org), or call ext. 6300.

### Strut your stuff at show

The Caltech Dance Troupe is accepting proposals for its first-ever all-campus show. To be held March 12 and 13, the program will showcase the wide variety of dance talent in the Caltech community. Choreographers should submit proposals, forms for which are available at <http://troupe.caltech.edu>, by November 17. Auditions will be held in early winter term. For more information, contact Robin Deis at [deis@caltech.edu](mailto:deis@caltech.edu) or ext. 1094.

### Zewail, from page 1

In 2001 Zewail established undergraduate prizes for excellence in the sciences and humanities at the American University in Cairo (AUC). Named by AUC in his honor, the award recognizes graduating students who demonstrate "extraordinary commitment to the pursuit of scientific inquiry and the affirmation of humanistic values."

Zewail's Nobel Prize honored breakthrough research. Using ultrafast lasers in a novel way, his team was able to observe atoms in motion and to record the transition state of a chemical reaction, revealing, as he put it, "the chemical act—the breaking and making of chemical bonds." Until this breakthrough, transition states had never been observed in real time because they happen on the timescale of a femtosecond—a millionth of a billionth of a second. At the interface of physics and chemistry, Zewail founded the new fields of femtochemistry and femtobiology.

An independent organization whose mission is to foster the sciences, particularly mathematics and the natural sciences, the Royal Swedish Academy of Sciences awards a number of honors yearly, including the Nobel Prize.

### Mead, from page 1

be emulated by analog circuits in order to create novel devices. Past projects have included a cochlear chip modeled after human hearing, and devices modeled after vision and learning.

According to the White House, Mead was honored for his achievements in integrated-circuit design and electronic-design automation, in helping the United States lead the world in microelectronics technology through his years of teaching, and in founding more than 20 companies.

Established by Congress in 1980, the National Medal of Technology is bestowed on individuals and organizations that "embody the spirit of American innovation and have advanced the nation's global competitiveness."

Mead received the National Academy of Engineering's Founders Award on October 12, for his "pioneering work in the fields of solid-state electronics and the management of complexity in the design of very large scale integrated (VLSI) circuits," leading to "development of a design methodology for VLSI," and in computational neural systems. Created in 1965 to honor exceptional contributions to the field of engineering and to society, the award includes a cash prize and gold medallion.

A Caltech alum (BS 1956, PhD 1960), Mead has been a faculty member for 45 years. He holds more than 50 U.S. patents, has written or contributed to upwards of 100 publications, and has received numerous awards and honorary degrees.

### Malcom, from page 1

careers. A former National Science Board member, she was a presidential advisor on science and technology from 1994 to 2001.

Among her many honors, Malcom is a fellow of the AAAS and the American Academy of Arts and Sciences, holds 13 honorary degrees, and is an honorary trustee of the American Museum of Natural History. In 2003 she received the National Academy of Sciences' highest award, the Public Welfare Medal, in recognition of her achievements in increasing diversity. Malcom received a bachelor's degree with distinction in zoology from the University of Washington, a master's degree in zoology from UCLA, and a doctorate in ecology from Pennsylvania State University.

No tickets or reservations are needed for the lecture. Campus parking is available with a permit from the security station in the parking structure at 370 South Holliston Avenue.

Sponsored by the Office of the President, Minority Student Education, the Women's Center, and Officers of the Faculty, the Presidential Lecture Series brings to campus speakers who have successfully promoted women and underrepresented minorities in science and technology.

### Caltech Today, from page 1

online guide to Pasadena), posts local weather data provided by the weather station at the Polytechnic School, and advertises campus specials available from the Caltech Bookstore, Caltech Wired, and Graphic Resources. A link connects the user to an expanded and reorganized Caltech Streaming Theater.

Of special note is the content management system, a Web interface that allows campus groups to enter their own news postings; they can enter and schedule stories to appear months in advance if they wish. Campus groups who wish to post notices may become contributors by e-mailing [today@caltech.edu](mailto:today@caltech.edu).

*Caltech Today* retains some of the features of the older *Tech Today* and *@Caltech* sites such as the classified ads, the Caltech master calendar, and *My Space*, which allows Caltech community members to post advertisements and events.

Look up *Caltech Today* on the Web at <http://today.caltech.edu>. We welcome your comments and any questions you may have. Please call Gail Anderson at extension 8734 or e-mail us at [today@caltech.edu](mailto:today@caltech.edu).

## Of payback and meat pies

Theater Arts at Caltech will start its new season by bringing an infamous tale of revenge, horror, and remorse to Ramo Auditorium.

The group is presenting Christopher Bond's *Sweeney Todd: The Demon Barber of Fleet Street*. Not the Sondheim musical but the drama on which it is based, the play unfurls the tragic story of an innocent man torn from his family, who later exacts a dreadful vengeance on the perpetrators, aided by a mutually beneficial relationship with the proprietress of the downstairs meat-pie shop.

Directed by Robert Parker, husband of cast member and former Caltech staff member Karen Kähler, *Sweeney Todd* also features students Parag Bhayani, Ewen Chao, Matthew Krogstad, Katharine Magary, Nicholas Rupprecht, and Suzana Sburian; grad students Case Bradford, Vijay Gupta, and Dylan Nieman; staff member Trevor Roper; Caltech community member Lavanya Vasudevan; JPL staffers Steve Collins and Lynne Cooper; Robert Burnham of PCC; and Harper Gernet-Girard and Sophia Sikora of Flintridge Preparatory School.

The play opens Friday, October 31, at 8 p.m., with a special Halloween show and prize drawing, and continues on Fridays and Saturdays at 8 p.m. and on Sundays at 2 p.m., through November 16.

Tickets can be purchased through Caltech Public Events or at the door, and group discounts are available. Call 1 (888) 2CALTECH or (626) 395-4652, e-mail [events@caltech.edu](mailto:events@caltech.edu), or visit [www.events.caltech.edu](http://www.events.caltech.edu). Individuals with a disability can call 395-4688 (voice) or 395-3700 (TDD).



Lust-driven Judge Turpin (Dylan Nieman) lifts Johanna (Lavanya Vasudevan), portraying Johanna's mother, Lucy, in a flashback, as sinister Beadle (Trevor Roper) watches.

# Caltech 336

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

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