Caltech336

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The campus community biweekly

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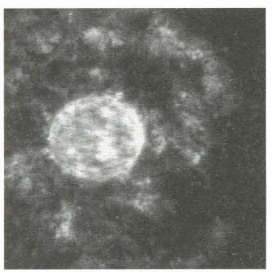

Astronomers detect gamma-ray bursts

Scientists "arriving quickly on the scene" of an October 4 gamma-ray burst have announced that their rapid accumulation of data has provided new insights into the exotic astrophysical phenomenon. For the first time, researchers have seen ongoing energizing of the burst afterglow for more than half an hour after the initial explosion.

The findings support the "collapsar" model in which the core of a star 15 times more massive than the sun collapses into a black hole whose spin, or magnetic fields, may be flinging material like a slingshot into the surrounding debris.

Several observatories operating in tandem enabled the observation, by far the most detailed to date. The blast was initially detected by NASA's High-Energy Transient Explorer (HETE) satellite, and fast-thinking researchers worldwide began using ground-based robotic telescopes. The results were reported in the March 20 issue of *Nature*.

"If a gamma-ray burst is the birth cry of a black hole, then the HETE satellite has just allowed us into the delivery room," says Caltech postdoctoral scholar in astronomy Derek Fox, the paper's lead author. He discovered the afterglow, or glowing embers of the burst, using the 48-inch Oschin Telescope at Caltech's Palomar Observatory.

see Gamma-ray, page 6

Invention could give optics more power

Four hundred years ago, a scientist could peer into one of the newfangled optical microscopes and see microorganisms, but nothing much smaller. Nowadays, a scientist can look in the latest lens-based optical microscope and also see, well, microorganisms, but nothing much smaller. The limiting factor has always been that it is a fundamental property of the wave nature of light for images of objects to be fuzzed out when those objects are much smaller than the wavelength of the light illuminating them. This has hampered the ability to make and use optical devices smaller than the wavelength. But a new technological breakthrough at Caltech could sidestep this longstanding barrier.

see Invention, page 6

Dodger Day set for June 21

Once again, the Institute is taking the entire community out to the ball game. The second annual Caltech-JPL Dodger Day will take place this year on Saturday, June 21, when the boys in blue face off against the 2002 world champion Anaheim Angels.

For just $8 per person, Caltech and JPL community members, their families, and friends can enjoy a full day of activities. A special pregame carnival tailored to kids will begin at 11 a.m., with wall climbing, slides, clowns, and face painting. When the game starts at 1:10 p.m., Institute spectators will enjoy having the entire right-field pavilion to themselves.

According to Dlorah Gonzales of Human Resources, "Hundreds of Caltech and JPL folks had a great time last year, and I heard a lot of comments about how people enjoyed the day." This year, about 3,300 tickets will be available, and the first 2,300 tickets sold will include a voucher for a free Dodger cap, courtesy of the Caltech Credit Union, which is cosponsoring the event.

Tickets will go on sale on April 14 at the Public Events ticket office, the Tech Express, the Caltech Bookstore, and Human Resources; at the JPL store and the Credit Union office at JPL; and at the main Caltech Credit Union office, 528 Foothill Boulevard, La Cañada Flintridge. For more information, call Human Resources customer service at (626) 395-3300.

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Caltech chess team triumphs

After a victory over MIT in their Internet match on March 2, Caltech's fledgling chess team, bearing the suitably techie name of "CALTECHnically Won," triumphed over other regional winners to gain the U.S. Amateur Team Chess Championship. The win gives Caltech "the most prestigious team chess championship title in the United States," according to freshman Patrick Hummel, the club's president. The matches were played on the U.S. Chess Federation's online server.

The triumphant team consisted of postdoc Wei Ji (Whee Ky) Ma, freshman Eugene Yanayt, junior Graham Free, and freshman Howard (Zhihao) Liu, all of them members of the Caltech Chess Club.

The club was founded at the beginning of the 2002–03 academic year by Hummel, Ma, Yanayt, and Free. Lectures by Hummel, who is a master player, have attracted a lot of interest, and the club has grown to a membership of 49. Early this year, teams from the club began to prove themselves with strong results in competition against

see Chess club, page 2

Science under the sun

Hundreds of middle-school girls from throughout Southern California attended the Sally Ride Science Festival at Caltech last Saturday. Here, girls construct models of molecules using beads and rods at one of the many exhibits sponsored by Caltech, JPL, and aerospace companies.

A Swiss film fest

Caltech has long been known for its scientific advances, but it's also a leader in hosting significant cultural events. Beginning April 11 and continuing through May 23, the Division of the Humanities and Social Sciences will offer a rare opportunity to see the work of Xavier Koller, one of Switzerland's most renowned filmmakers.

Although Switzerland may not enjoy as eminent a position in film history as other European countries, one of the most famous directors of the French New Wave, Jean-Luc Godard, was actually born and raised in Switzerland. In fact, not only have the Swiss earned more Nobel Prizes and registered more patents per capita than any other nation, their culture also offers a rich mosaic of Italian, French, and German influences in a beautifully rugged landscape.

Xavier Koller was born in the canton of Schwyz in 1944, and studied precision toolmaking before graduating from the Academy of Drama in Zurich. Working as an actor in television and the theater, Koller directed his first movie in 1969, the award-winning, experimental short film *Fanny Hill*. In 1991, he won the Oscar for Best Foreign Language Film for *Journey of Hope* (*Reise der Hoffnung*) and enjoys an ongoing relationship with Hollywood.

see Xavier Koller, page 6

Get balance at Health and WorkLife Fair

Caltech's upcoming Health and WorkLife Fair will feature many more activities and attractions than the average health fair. Members of the Caltech community will have a chance to get free cholesterol counts, body-fat measurements, and other indicators of health. Community members will also be able to get free massages and even a chance to scale a 60-foot climbing wall. All this will take place on Friday, April 11, from 11 a.m. to 2 p.m. in and around the Winnett Center. There will also be a blood drive in Winnett lounge from 10 a.m. to 3 p.m.

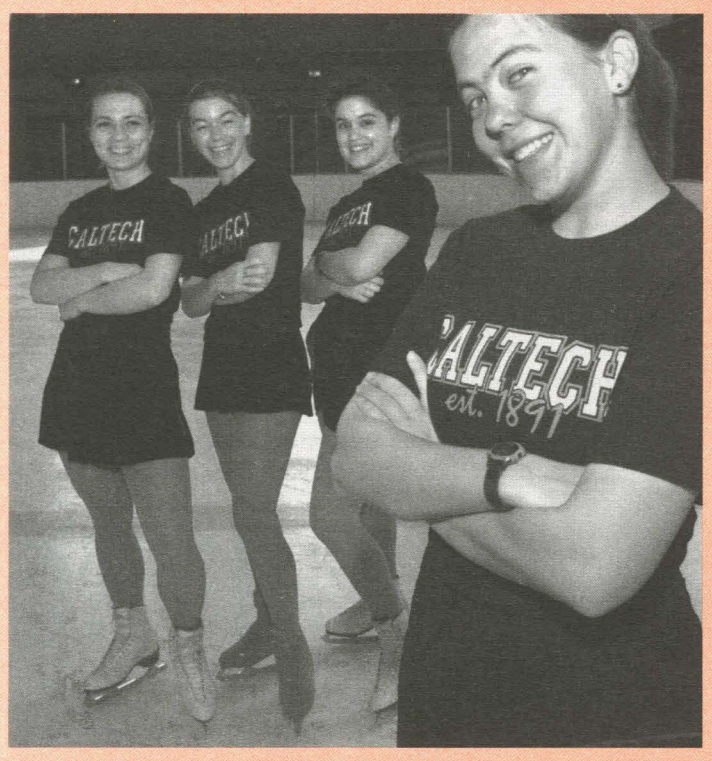
The event has been designed to address aspects of life that affect overall health and wellness, from exercise and nutrition to bicycle safety and stress.

"The idea is to give the students and staff the skills, tools, and information to incorporate a lot of what we're trying to encourage about health," says Jane Curtis, Caltech's health educator and event cochair.

Curtis, along with cochairs April White and Janice Black from the Staff and Faculty Consultation Center and Sue Friedman from the Residence Life Office,

see Health fair, page 6

NewsBriefs



Caltech figure skaters Kelly Martin, Olga Kowalewsky Schneider, Lara Pruitt, and Emily Schaller took sixth place at the National Intercollegiate Figure Skating Championships in Denver last weekend. The newly formed team had earlier taken first place at the Pacific Regional Collegiate Figure Skating Competition in San Jose.

Personals

Welcome to Caltech

February

Visiting associates **Tobias Delbrück**, in biology; **Francesco Fidecaro**, in physics, mathematics and astronomy; **Matthias Hieber**, in engineering and applied science; **Shih-Chii Liu**, in biology; **Angelika Niemz**, in chemistry and chemical engineering; **August Peter Van Gool**, in biology; **Leonid Zhukov**, in engineering and applied science.

March

Argelia Eve Helguero, research assistant II, biology; **Daniel Hernandez**, security officer, Campus Security and Parking Services; **Yves Lansac**, dynamics and multiscale software integrator, chemical engineering; **Steven Olson**, machinist, chemistry and chemical engineering; **Rene Perez**, security officer, Campus Security and Parking Services; **David van Gogh**, project engineer, control and dynamical systems; **Yang Xia**, computing analyst, high-energy physics.

W. Scott Kardel has joined Caltech as public-affairs coordinator for Palomar Observatory. His duties will include writing press releases, updating the museum, giving tours, handling documentary and commercial filming shoots, and improving the Palomar website, among other activities. A former high-school science teacher, he comes to Caltech from Wichita, Kansas, where he was assistant director of the Lake Afton Public Observatory and wrote articles on astronomy for the *Wichita Register*. He received his BS in physical science/secondary education from Northern Arizona University in 1984 and his MS in astronomy from the University of Arizona in 1992.

New positions

Danny Calegari, formerly assistant professor of mathematics, has been appointed associate professor of mathematics, effective February 1.

David MacMillan, formerly associate professor of chemistry, has been appointed professor of chemistry, effective March 15.

Retirements

Josefina Del Villar, who worked for the Housing Office, will retire on May 1. Hired in June 1979, she had been on disability since November 1988.

Alan Venable retired on April 1. A gardener with grounds services, he had been with Caltech for 13 years.

Honors and awards

Audit Services and Institute Compliance at Caltech has been honored with the Commitment to Quality Improvement Award by the Institute of Internal Auditors. The award recognizes commitment to professional excellence, quality of service, and professional outreach.

John Baldeschwieler, Johnson Professor and Professor of Chemistry, Emeritus, and a former chairman of the Division of Chemistry and Chemical Engineering, has been named corecipient of the Chemical Heritage Foundation's 2003 Othmer Gold Medal. His fellow medalist is George Hammond, who was a professor at Caltech from 1958 to 1972 and is also a former chairman of Chemistry and Chemical Engineering. The medal honors "outstanding individuals who, like Donald Othmer (1904–1995), have made multifaceted contributions to our chemical and scientific heritage through outstanding activity in such areas as innovation, entrepreneurship, research, education, public understanding, legislation, or philanthropy."

Scott Fraser, Rosen Professor of Biology, is receiving a Space Act Award from the Strategic Intellectual Assets Management Office, for his work on a two-photon microscope imaging spectrometer for multiple fluorescent probes. The award includes a check for $3,200.

Harry Gray, Beckman Professor of Chemistry and founding director of the Beckman Institute, has been selected to receive the National Academy of Science Award in Chemical Sciences. He is being recognized "for his demonstration of long-range electron tunneling in proteins, his inspirational teaching and mentoring of students, and his unselfish service as a statesman for chemistry."

A new resource for faculty, scholars, and students

Provost Steve Koonin has created a new position to support the increasingly required outreach activities associated with research grants. He has named **Jill Andrews** assistant to the provost for educational outreach, and she will be available for consultation to all faculty and their research groups.

For more information, contact Andrews at jandrews@caltech.edu, or call her at ext. 6254. The Educational Outreach website, which features information and news items about campus-wide outreach programs, can be found at www.outreach.caltech.edu.

Andrews formerly was manager of education and outreach in the Division of Engineering and Applied Science.

Jazz up your weekend

Bring a blanket and picnic basket to campus on Saturday, April 12, and enjoy a spring afternoon of Latin-tinged jazz at the third annual Caltech Jazz Festival, taking place from 3 to 6 p.m. in Dabney Gardens. Latin percussionist Robertito Melendez will be the special guest, joining the Caltech Jazz Bands under the direction of William Bing. This event is free. Refreshments will be available for a small fee.

For more information, contact Caltech Public Events at 1 (888) 2-CALTECH, (626) 395-4652, or events@caltech.edu, or visit www.events.caltech.edu. Individuals with a disability can call 395-4688 (voice) or 395-3700 (TDD).

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Symposium to help make words matter

Postponed after the February 1 shuttle tragedy, the Words Matter Science Writing Symposium will now take place on Monday, April 7, at 4 p.m. in Baxter Lecture Hall.

The free public symposium is especially intended for Caltech juniors who are writing science papers aimed at laypeople, and is a component of the Words Matter project, whose goal is to foster a culture of literacy at Caltech, cultivate students' interest in writing, and enhance their writing skills.

Panelists for the event will be science writer, essayist, and novelist Alan Lightman, a Caltech alum (PhD 1974); *Los Angeles Times* science reporter Usha McFarling; and Caltech vice provost and professor David Goodstein, who has written on science and society. Freelance author Russ Rymer, a former Caltech science writing instructor, will serve as moderator. The panelists will describe their work, discuss the challenges of communicating science and technology to nonspecialists, and answer audience questions.

Lightman will also serve the Words Matter program as Caltech's writer-in-residence from April 7 through 10. The author of the novels *Einstein's Dreams*, *Good Benito*, *The Diagnosis*, and the forthcoming *Reunion* (July 2003), he is an adjunct professor of humanities at MIT and a fellow of the American Academy of Arts and Sciences.

Words Matter is coordinated by Steven Youra, director of the Hixon Writing Center. As he explains, "The Science Writing Symposium will help our students understand how to communicate complex technical information to broad audiences. This symposium and other Words Matter events will raise students' awareness and appreciation of good writing by creating opportunities to engage with a range of accomplished authors from the realms of literature and the arts, as well as the sciences."

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Chess club, *from page 1*

other teams. The ambitious group won the U.S. Amateur Team West Chess Championship over the President's Day weekend, which put them up against the other regional champs in the finals.

The intervening win over MIT prompted praise from President David Baltimore, who wrote: "Patrick—I am writing . . . to congratulate you and the rest of the team on your historic victory over MIT. Chess is a quintessentially Caltech sport and it is terrific that in its first year, our team has done so well."

In the championship finals, Caltech ultimately faced the team from the University of Texas at Dallas, which was ranked second in the country among collegiate chess teams. (The U.S. Amateur Team competitions are not limited to collegiate teams.) Two early losses for Caltech meant that players Free and Ma would have to win their games if they were to save the match. Free won using an advantageous endgame, while Ma gradually outplayed his opponent to tie the match at 2-2, forcing a playoff. Another tie forced a second playoff.

The final playoff was the most dramatic match of all. With the score tied, it looked as if Ma might be forced to opt for a draw. With less than 30 seconds remaining for each player, Ma found a sequence of moves that gave Caltech's team the final victory it needed to take the match and the national championship.

The chess club meets for recreational and competitive play every Friday from 8 to 10:30 p.m. in the Page House kitchen. It is open to players of all levels of skill and from every sector of the Caltech community. Among the members are master players Hummel, Ma, and Sergiy Vasylkevych, a grad student at Caltech.

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Watch the smoking in Tournament Park

The city of Pasadena has begun implementing a California law that prohibits smoking or cigarette disposal within 25 feet of playgrounds or sandbox areas. Part of the state's Health and Safety Code Section 104495 as of January 1, the law aims to further reduce children's exposure to secondhand smoke.

"Exposure to cigarette smoke is especially dangerous for children because they have much higher rates of lung diseases like bronchitis and pneumonia. They are also at greater risk of developing asthma," says Tisha Dowe, health officer for the Pasadena Public Health Department. In addition, she says, "cigarette and cigar butts also can be hazardous to children. . . . They are at risk of swallowing, choking or burning themselves with discarded butts found in their play areas." Signs will be posted at all city parks, and offenders will be subject to a $250 fine. For more information, contact Pasadena's Tobacco Control Program office at (626) 744-6051.

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Institute policies updated for 2003

The newly revised Institute policies can be found on the Human Resources webpage at http://cit.hr.caltech.edu/policies/policies-main.html. They will be published in the *Caltech Catalog* in September. Caltech community members are encouraged to read these policies, which range in content from rules and regulations to helpful guidelines.

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April 7–13, 2003

M T W T F S S

Monday, April 7

Aeronautics Seminar
101 Guggenheim Lab, Lees-Kubota Lecture Hall, 1 p.m.—"Efficient VSTOL Airplane," Anthony duPont, DuPont Aerospace Company. Information: www.galcit.caltech.edu/seminars.shtml.

Inorganic-Electrochemistry Seminar
147 Noyes, Sturdivant Lecture Hall, 2 p.m.— "Bridging the Gap Between Homogeneous and Heterogeneous Catalysis via Surface Organometallic Chemistry: A Structural Point of View," Christophe Coperet, research associate, laboratory of surface organometallic chemistry, Centre National de la Recherche Scientifique, Lyon, France.

Ulric B. and Evelyn L. Bray Seminar
25 Baxter, 4 p.m.—Topic to be announced. Larry Epstein, professor of economics, University of Rochester. Refreshments.

Norman Davidson Lecture
Ramo Auditorium, 4 p.m.—"The Type IA DNA Topoisomerases: Omnipresence and Role in Genome Stability," James C. Wang, Mallinckrodt Professor of Biochemistry and Molecular Biology, Harvard University. Refreshments, 3:30 p.m.

Geological and Planetary Sciences Seminar
155 Arms, Robert Sharp Lecture Hall, 4 p.m.—Topic to be announced. Ralph Keeling, assistant professor of geochemistry, UC San Diego. Information: www.gps.caltech.edu.

Applied and Computational Mathematics Colloquium
101 Guggenheim Lab, Lees-Kubota Lecture Hall, 4:15 p.m.—"High-Order Methods in Computational Electromagnetism," Randy Paffenroth, staff scientist, applied and computational mathematics, Caltech. Refreshments, 3:45 p.m. Information: www.acm.caltech.edu/colloq.shtml.

Tuesday, April 8

Caltech Library System Presents: Patents and Patent Searching
Sherman Fairchild Library, multimedia conference room, 2 to 3:30 p.m.—A quick review of the patenting process, searching for patents and patent equivalents, legal status issues, and current awareness techniques. Registration: http://library.caltech.edu/learning/form.htm.

Mechanical Engineering Seminar
206 Thomas, 3 p.m.—"Dynamics of Carbon Nanotube-Based Scanning Probes," Professor Arvind Raman, assistant professor of mechanical engineering, Purdue University.

Chemical Physics Seminar
147 Noyes, Sturdivant Lecture Hall, 4 p.m.—"Statistical Thermodynamics of Biomolecules: Effects on Anomalous Single Molecule Dynamics In Vivo," Watt Webb, Eckert Professor of Engineering, Applied and Engineering Physics, Cornell University.

General Biology Seminar
119 Kerckhoff, 4 p.m.—"Aspects of Calcium Signaling in T Cells," Anjana Rao, department of pathology, Harvard Medical School.

William Bennett Munro Memorial Seminar
25 Baxter, 4 p.m.—"Bayesian Coherentism," Professor Stephan Hartmann, department of philosophy, University of Konstanz, Germany. Refreshments.

Thomas Wolff Memorial Lectures in Mathematics
151 Sloan, 4:15 p.m.—"Longtime Behavior of Semilinear Dispersive Equations," Terence Tao, professor of mathematics, UCLA. Today's talk will present a discussion of turbulence and scattering. Information: http://math.caltech.edu/seminars.html.

Wednesday, April 9

Mathematical Physics Seminar
351 Sloan, noon—"Mass Points of Measures on the Unit Circle and Verblunsky Coefficients," Leonid Golinskii, Institute for Low Temperature Physics, Kharkov, Ukraine. Information: www.math.caltech.edu/events/mathphys.html.

Astronomy Colloquium
155 Arms, Robert Sharp Lecture Hall, 4 p.m.—"The Spin Periods of Millisecond X-Ray Pulsars and the Possible Role of Gravitational Radiation," Deepto Chakrabarty, assistant professor of physics, MIT. Information: www.astro.caltech.edu/~gma/colloquia.html.

Neurobiology Seminar
24 Beckman Labs, 4 p.m.—"New Ventures in Multiphoton Microscopy in Neuroscience," Watt Webb, Eckert Professor of Engineering, Applied and Engineering Physics, Cornell University.

William Bennett Munro Memorial Seminar
25 Baxter, 4 p.m.—Topic to be announced. Professor James R. Hurford, department of theoretical and applied linguistics, University of Edinburgh, Scotland. Refreshments.

Thursday, April 10

Quick Review for Electronic Theses
Sherman Fairchild Library, multimedia conference room, 2 to 3 p.m.—Caltech requires that theses be submitted in both paper and electronic versions. This presentation will offer a brief overview of techniques useful in the production and publication of electronic theses. The session will include tips on formatting, intellectual-property considerations, turning paper to pixels, creating PDFs, how to submit a thesis, and availability (who can see it and when) issues. Information: 395-6713 or kathleen@library.caltech.edu.

Ulric B. and Evelyn L. Bray Seminar
25 Baxter, 4 p.m.—"Housing, Consumption, and Asset Pricing," Professor Monika Piazzesi, Anderson School, UCLA; with Professor Martin Schneider, department of economics, UCLA, and Selale Tuzel, doctoral student, Anderson School, UCLA. Refreshments.

Geoclub Seminar
151 Arms, Buwalda Room, 4 p.m.—"Sorption and Biomineralization of Metals at Mineral/Biofilm Interfaces: X-Ray Spectroscopy Investigations," Dr. Alexis Templeton, Scripps Research Institute.

Physics Research Conference
201 E. Bridge, 4 p.m.—"Spin-Polarized Gases," William Happer, professor of physics, Princeton University. Refreshments, 114 E. Bridge, 3:45 p.m. Information: www.pma.caltech.edu/~physcoll/PhysColl.html.

Robert W. Vaughan Lecture in Chemical Engineering
106 Spalding Lab, Hartley Memorial Seminar Room, 4 p.m.—"Ionic Liquids for Chemical Processing," Professor Joan F. Brennecke, department of chemical engineering, University of Notre Dame. Refreshments, 113 Spalding Labs, 3:30 p.m. Information: www.che.caltech.edu/calendar/seminars.html.

Thomas Wolff Memorial Lectures in Mathematics
151 Sloan, 4:15 p.m.—"Longtime Behavior of Semilinear Dispersive Equations," Terence Tao, professor of mathematics, UCLA. Today's talk will present a discussion of nonsqueezing, and stability of solitons. Information: http://math.caltech.edu/seminars.html.

Friday, April 11

Fluid Mechanics Seminar
101 Guggenheim Lab, Lees-Kubota Lecture Hall, 3 p.m.—Topic to be announced. Tait Pottebaum, graduate student in aeronautics, Caltech. Information: www.galcit.caltech.edu/Seminars/Fluids/CurrentFluids/index.html.

General Biology Seminar
119 Kerckhoff, 4 p.m.—Topic to be announced. Sin Urban, Medical Research Council Laboratory of Molecular Biology, University of Cambridge.

Inorganic-Organometallics Seminar
151 Crellin, 4 p.m.—"Dinitrogen Activation and Functionalization: Elucidating the Reactivity of Low-Valent Iron and Cobalt Tris(phosphine) Systems," Ted Betley, graduate student in chemistry, Caltech.

Swiss Film Series: A Koller Retrospective
Baxter Lecture Hall, 7:45 p.m.—Xavier Koller, *The Frozen Heart*, 1979; with English subtitles.

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April 14–20, 2003

M T W T F S S

Monday, April 14

Aeronautics Seminar
101 Guggenheim Lab, Lees-Kubota Lecture Hall, 1 p.m.—"Aeronautics First-Year Feedback," Joseph Shepherd, professor of aeronautics, Caltech, and Hans Hornung, Johnson Professor of Aeronautics and director of GALCIT, Caltech. Information: www.galcit.caltech.edu/seminars.shtml.

Astronomy Tea Talk
106 Robinson, 4 p.m.—"101 Superluminal Sources," Marshall Cohen, professor of astronomy, emeritus, Caltech. Information: www.astro.caltech.edu/~cc/tea_talks.

Ulric B. and Evelyn L. Bray Seminar
25 Baxter, 4 p.m.—"Executive Compensation and Short-Termist Behavior in Speculative Markets," Wei Xiong, assistant professor of economics, Princeton University. Refreshments.

Geological and Planetary Sciences Seminar
155 Arms, Robert Sharp Lecture Hall, 4 p.m.—Topic to be announced. Professor William E. Dietrich, UC Berkeley. Information: www.gps.caltech.edu.

Horowitz Lecture
119 Kerckhoff, 4 p.m.—"Weinberg's Heritage: Mutation and Paternal Age," James Crow, emeritus professor of genetics and medical genetics, University of Wisconsin–Madison.

Applied and Computational Mathematics Colloquium
101 Guggenheim Lab, Lees-Kubota Lecture Hall, 4:15 p.m.—"Pattern Formation and Atherosclerosis," Danny Petrasek, senior research fellow in applied and computational mathematics, Caltech. Refreshments, 3:45 p.m. Information: www.acm.caltech.edu/colloq.shtml.

Tuesday, April 15

Joint LIGO/CaJAGWR Science Seminar
351 West Bridge, LIGO Science Conference Room, 11 a.m.—Topic to be announced. Teviet Creighton, postdoctoral scholar, LIGO Laboratory, Caltech.

Caltech Library System Presents: Quick Overview of Information Resources
Sherman Fairchild Library, multimedia conference room, noon to 1 p.m.—Learn the most effective ways to use library services and resources. This session is designed especially for graduate students, postdocs, and research staff, but all are welcome. No reservations are required. Information: 395-6713 or http://library.caltech.edu/learning/default.htm.

Mechanical Engineering Seminar
206 Thomas, 3 p.m.—"Information Technology Approaches for Design and Manufacturing," Maria Yang, instructor in mechanical engineering, Caltech.

Ulric B. and Evelyn L. Bray Seminar
25 Baxter, 4 p.m.—"Endogenous Lobbying," Leonardo Felli, professor of economics, London School of Economics. Refreshments.

Chemical Physics Seminar
147 Noyes, Sturdivant Lecture Hall, 4 p.m.—Topic to be announced. Douglas Tobias, assistant professor of chemistry, UC Irvine.

General Biology Seminar
119 Kerckhoff, 4 p.m.—"Computational Analysis of Noncoding RNAs," Sean Eddy, associate professor, department of genetics, Washington University School of Medicine.

Wednesday, April 16

Astronomy Colloquium
155 Arms, Robert Sharp Lecture Hall, 4 p.m.—Topic to be announced. Nancy Levenson, department of physics and astronomy, University of Kentucky. Information: www.astro.caltech.edu/~gma/colloquia.html.

Organic Chemistry Seminar
147 Noyes, Sturdivant Lecture Hall, 4 p.m.—"Self-Assembling Dendrons as Biological Mimics," Professor Virgil Percec, department of chemistry, University of Pennsylvania.

Thursday, April 17

Quick Review for Electronic Theses
Sherman Fairchild Library, multimedia conference room, 2 p.m.—Caltech requires that theses be submitted in both paper and electronic versions. This presentation will offer a brief overview of techniques useful in the production and publication of electronic theses. The session will include tips on formatting, intellectual-property considerations, turning paper to pixels, creating PDFs, how to submit a thesis, and availability (who can see it and when) issues. Information: 395-6713 or kathleen@library.caltech.edu.

Biophysics Lecture Series
153 Noyes, Sturdivant Lecture Hall, 4 p.m.—"Beyond 3-D Structure: Dynamics and Its Role in Protein Function," Professor Peter E. Wright, chair, department of molecular biology, Scripps Research Institute. Refreshments, 3:45 p.m.

Geoclub Seminar
151 Arms, Buwalda Room, 4 p.m.—Topic to be announced. Nathan Onderdonk, department of geology, UC Santa Barbara.

William and Myrtle Harris Distinguished Lectureship in Science and Civilization
25 Baxter, 4 p.m.—"Physics, Philosophy, and the Foundations of Geometry: Einstein and the Logical Empiricists," Michael Friedman, Frederick P. Rehmus Family Professor of Humanities, Stanford University. Refreshments.

Social and Information Sciences Laboratory Seminar Series
25 Baxter, 4 p.m.—"Moore, Metcalfe, and Markets," David Leinweber, visiting associate in economics, Caltech. Refreshments.

Von Karman Lecture Series
JPL, von Karman Auditorium, 7 p.m. —"Mars Global Surveyor Across the Centuries," Dr. Terry Martin, research scientist, earth and planetary atmospheres, JPL. Admission is free. Information: www.jpl.nasa.gov/lecture.

Friday, April 18

Fluid Mechanics Seminar
101 Guggenheim Lab, Lees-Kubota Lecture Hall, 3 p.m.—"The Magneto-Hydrodynamic Richtmyer-Meshkov Instability," Ravi Samtaney, computational scientist, Princeton Plasma Physics Laboratory, Princeton University. Information: www.galcit.caltech.edu/Seminars/Fluids/CurrentFluids/index.html.

Inorganic-Organometallics Seminar
151 Crellin, 4 p.m.—"Organometallic Chemistry of Pt and Cu Amido Complexes," Seth Harkins, graduate student in chemistry, Caltech.

Kellogg Seminar
Lauritsen Library, 4 p.m.—"Baryons in 1/N_c: The Classic and Nouveau," Richard Lebed, assistant professor, department of physics and astronomy, Arizona State.

William Bennett Munro Memorial Seminar
25 Baxter, 4 p.m.—Topic to be announced. Graciela De Pierris, associate professor of philosophy, Stanford University. Refreshments.

Von Karman Lecture Series
Pasadena City College, 1570 E. Colorado, the Vosloh Forum (south of Colorado on Bonnie), 7 p.m.—"Mars Global Surveyor Across the Centuries," Dr. Terry Martin, research scientist, earth and planetary atmospheres, JPL. Admission is free. Information: www.jpl.nasa.gov/lecture.

CampusEvents

Monday, April 7

Child Educational Center Summer Camp Sign-Up
Enrollment is open for the CEC's Summer Camp Program for children completing kindergarten through 6th grade. Caltech and JPL families have priority enrollment. The program is held from June 23 through August 27 at three locations: on Michigan Avenue near Caltech, in La Cañada Flintridge at the Oak Grove site near JPL, and at Paradise Canyon Elementary School. The Oak Grove site also offers a program for children entering kindergarten in the fall. Information: (818) 354-3418 or www.ceconline.org.

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.

Women's Tennis
Alumni/faculty match, 2 p.m.

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

Ceroc Dance Lessons
Winnett lounge, 7:30 p.m.—Ceroc is a hip, international dance club sensation. This is a series of 10 weekly classes, sponsored by the Ballroom Dance Club. No experience is required. Fee: $1; free for freshmen, first-year graduate students, and those taking the class for PE credit. The series began March 31.

Tuesday, April 8

Photoshop Class
NewMedia Classroom, 363 S. Hill Avenue, 10 a.m. to noon—Learn the important functions of Photoshop, such as selection, layers, image enhancement, and correct file formats. The emphasis is on research images, but the information is useful to anyone working with images. This two-day class will continue on Thursday. Fee: $100. Registration: wenyee@caltech.edu. Information: http://muri.caltech.edu/nmc/index.htm.

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

Men's Golf
vs. Whittier College, at Friendly Hills Country Club, 1 p.m.

Women's Tennis
at Biola College, 3 p.m.

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

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.

Wednesday, April 9

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

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

Laboratory Safety 101
118 Keith Spalding Building, 3 p.m.—This course is designed to prepare incoming researchers to work in a laboratory at the Institute. Issues include laboratory organization, emergencies, injuries, general laboratory safety, and more. Space is limited. Please call 395-6727 or e-mail safety.training@caltech.edu to reserve a place.

American Smooth-Style Dance Lessons
Winnett lounge, 7:30 p.m.—An assortment of popular American smooth-style dances, including the fox-trot, tango, and waltz, taught by a professional instructor. This is a series of nine weekly classes, sponsored by the Ballroom Dance Club. No previous experience is necessary. Fee: $6 per class for Caltech students, $8 per class for others, with a discount for full payment in advance.

Dance Team Fox-Trot Classes
Winnett lounge, 9:30 p.m.—Join the Caltech Ballroom Dance Team for this series of classes, which includes five weeks of fox-trot and four weeks of quickstep, to be taught by a professional instructor. No experience is required. Fee not yet determined.

Thursday, April 10

Photoshop Class
NewMedia Classroom, 363 S. Hill Avenue, 10 a.m. to noon—A continuation of Tuesday's class. Information: http://muri.caltech.edu/nmc/index.htm.

Reel Women Film Series: *Tough Guise*
Center for Student Services, noon—While the social construction of femininity has been widely examined, the dominant role of masculinity has until recently remained largely invisible. This film examines the relationship between images of popular culture and the social construction of masculine identities in the United States at the dawn of the 21st century. Pizza and drinks will be provided. The films are shown in the second floor common area, just outside the Women's Center. Information 395-3221.

Friday, April 11

Health and WorkLife Fair
Winnett Quad, 11 a.m. to 2 p.m.—The Health and WorkLife Fair is designed to promote wellness by providing information and resources on a variety of health-related topics. Local and regional vendors showcase their products and services by donating free samples and providing product information and healthy snacks.

Baseball
vs. Pomona-Pitzer Colleges, 3 p.m.

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

Saturday, April 12

Men's Tennis
at University of Redlands, 9:30 a.m.

Women's Tennis
vs. University of Redlands, 9:30 a.m.

Baseball
at Pomona-Pitzer Colleges, doubleheader, 11 a.m.

Track & Field
California-Nevada Championships, at UC San Diego, 11 a.m.

Self-Defense for Men
Caltech Women's Center, 1 to 6 p.m.—An introduction to the physical skills involved in self-defense. Participants will learn a variety of hands-on techniques, and will have an opportunity to rehearse verbal role-play scenarios and to deliver full-force blows to a padded assailant.

Third Annual Caltech Jazz Festival
Dabney Gardens, 3 to 6 p.m.—Enjoy an afternoon of Latin jazz. The Caltech Jazz Bands will be joined by the great Latin percussionist Robertito Melendez for this event. Bring a blanket and a picnic basket, or purchase refreshments for a small fee. Admission is free.

Aoife Clancy
Dabney Lounge, 8 p.m—Aoife (pronounced "Eefa") is the daughter of the late Bobby Clancy, longtime member of the legendary Irish group Clancy Brothers and Tommy Makem. She spent nearly five years with Cherish the Ladies. Now a solo act, Aoife sings and accompanies herself on guitar. Tickets and information: 395-4652, 1 (888) 2CALTECH, or events@caltech.edu. Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit the Folk Music Society at www.folkmusic.caltech.edu.

Tango Buenos Aires
Beckman Auditorium, 8 p.m.—The dance ensemble Tango Buenos Aires is one of the world's most authentic and uncompromising performers of the Argentine tango. Tickets and information: 395-4652, 1 (888) 2CALTECH, or events@caltech.edu. Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at www.events.caltech.edu.

Monday, April 14

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.

Ceroc Dance Lessons
Winnett lounge, 7:30 p.m.—Ceroc is a hip, international dance club sensation. This is a series of 10 weekly classes, sponsored by the Ballroom Dance Club. No experience is required. Fee: $1; free for freshmen, first-year graduate students, and those taking the class for PE credit. The series began March 31.

Tuesday, April 15

Premiere Video Editing Class
NewMedia Classroom, 363 S. Hill Avenue, 10 a.m. to noon—Learn about digitizing video for use on your computer, including basic editing techniques, adding titles, and using effects and transitions. Output your final project to tape or to file. This two-day class will continue on Thursday. Fee: $100. Registration: wenyee@caltech.edu. Information: http://muri.caltech.edu/nmc/index.htm.

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

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

Wednesday, April 16

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

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

American Smooth-Style Dance Lessons
Winnett lounge, 7:30 p.m.—An assortment of popular American smooth-style dances, including the fox-trot, tango, and waltz, taught by a professional instructor. This is a series of nine weekly classes, sponsored by the Ballroom Dance Club. No previous experience is necessary. Fee: $6 per class for Caltech students, $8 per class for others, with a discount for full payment in advance. The series began April 9.

Dance Team Fox-Trot Classes
Winnett lounge, 9:30 p.m.—Join the Caltech Ballroom Dance Team for this series of classes, which includes five weeks of fox-trot and four weeks of quickstep, to be taught by a professional instructor. No experience is required. The series began April 9.

Thursday, April 17

Premiere Video Editing Class
NewMedia Classroom, 363 S. Hill Avenue, 10 a.m. to noon—A continuation of Tuesday's class. Information: http://morel.caltech.edu/classes/workshops.html.

Self-Defense for Moms
Caltech Women's Center, noon to 1 p.m.—This class is designed to teach personal safety and self-defense tactics useful to mothers out with their children. The second part of the training will be held at noon on April 24. Lunch is provided for both sessions. Information and registration: 395-3221 or wcenter@studaff.caltech.edu.

Men's Golf
vs. University of Redlands, at Brookside Golf Course, 1 p.m.

Friday, April 18

Men's Tennis
SCIAC Championships, at Pomona, 9 a.m.

Women's Tennis
SCIAC Championships, 9 a.m.

Earth Day Fair
Winnett quad, 11 a.m. to 2 p.m.—The annual Earth Day Fair celebrates the environment and conservation. There will be food, T-shirts, and live music. Sponsored by the Caltech Environmental Task Force. Information: www.cco.caltech.edu/~cetfers/cetf.html.

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

Saturday, April 19

Math Olympiad
Between Braun and Noyes Laboratories, 9 a.m. to 4 p.m.—The Math Olympiad is offered to all Korean-American students from 4th to 11th grades who are currently enrolled in Los Angeles County school districts. Cosponsored by the Korean-American Scientists and Engineers Association (KSEA). Information: sonjong@cheme.caltech.edu or 395-2323.

Men's Tennis
SCIAC Championships, at Pomona, 9 a.m.

Women's Tennis
SCIAC Championships, 9 a.m.

Track and Field
Pomona-Pitzer Invitational, at Pomona-Pitzer Colleges, 11 a.m.

Sunday, April 20

Skeptics Society Lecture
Baxter Lecture Hall, 2 p.m.—"The Quest for Consciousness: A Neurobiological Approach," Christof Koch, Troendle Professor of Cognitive and Behavioral Biology and professor of computation and neural systems, Caltech. 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.

Gamma-ray, *from page 1*

Gamma-ray bursts shine hundreds of times brighter than a supernova and, though common, are random and fleeting. The gamma-ray portion of a burst typically lasts from a few milliseconds to a couple of minutes. The afterglow, caused by shock waves from the explosion sweeping up matter and ramming it into the region around the burst, can linger for much longer, releasing energy in the form of X-rays, visible light, and radio waves. By studying such afterglows, astronomers hope to learn more about the origins and nature of these cosmic explosions.

This gamma-ray burst, called GRB021004, appeared on October 4 at 8:06 a.m., EDT. Seconds after HETE detected the burst, Palomar and observatories around the world received an e-mail with accurate coordinates. Fox pinpointed the afterglow soon afterward from images captured by the Oschin Telescope within minutes of the burst, and notified the astronomical community through NASA's rapid e-mail system for following up such bursts. Then the race was on, as scientists around the globe employed more than 50 telescopes to zoom in on the afterglow before sunrise. At about the same time, the afterglow was detected by a telescope operated by the Japanese research institute RIKEN.

Analysis of the observations produced a surprise: fluctuations in brightness, which scientists interpreted as evidence for a continued injection of energy into the afterglow, well after the gamma-ray burst occurred.

"This ongoing energy shows that the explosion is not a simple, one-time event, but that the central source lives for a longer time," said Shri Kulkarni, Caltech's MacArthur Professor of Astronomy and Planetary Science and a study coauthor. "This is bringing us closer to a full understanding of these remarkable cosmic flashes."

Fox and his team relied on data from RIKEN's telescope and from the Oschin Telescope and its Near Earth Asteroid Tracking (NEAT) camera. The Caltech-NEAT collaboration has helped to identify fully 25 percent of afterglows discovered worldwide since autumn 2001.

The first satellite to provide and distribute accurate burst locations within seconds, HETE was built under the NASA Explorer Program, a collaboration between U.S. universities, Los Alamos National Laboratory, and scientists in Brazil, France, India, Italy, and Japan.

More details, including images and animation, can be found at http://www.gsfc.nasa.gov/topstory/2003/0319hete.html. Details on the study can be found at www.nature.com.

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Xavier Koller, *from page 1*

Haydar Sener (played by Necmettin Çobanoglu) in Xavier Koller's *Journey of Hope* (1990).

The organizer of the film series, Andreas Aebi, a Caltech lecturer in German, describes Koller as "a great storyteller" and "a careful observer of people, with a commitment to the individual's right to be what they need to be."

In conjunction with the Consulate General of Switzerland, in Los Angeles, and Pro Helvetia, the Arts Council of Switzerland, Caltech will present four of Koller's works. Each movie will be screened in Baxter Lecture Hall at 7:45 p.m. Admission is free. The dialogue will be in German or Swiss-German with English subtitles. Koller will be in attendance on opening night.

Featured on April 11 will be the first film of the series, *The Frozen Heart* (*Das gefrorene Herz*) (1979), a provincial comedy about two rival villages that refuse to bury a man who dies on the border between them. Based on a story by Swiss author Meinrad Inglin, the film is admired for its evocative wintry setting.

Screening on April 25, *Tanner, the Rebellion* (*Der schwarze Tanner*) (1985) depicts a battle of wills between the Swiss government and a dairy farmer (stoically played by Otto Machtlinger) when the authorities dictate the use of his farmland for the public good. Screenwriter Walter Deuber (currently a visiting professor at Cal State Long Beach) will be in attendance.

Journey of Hope, on May 9, is based on the true story of a Kurdish family who, traveling from Turkey to Switzerland, face a never-ending series of setbacks and difficulties. A critical and commercial hit, the film may be the most famous Swiss film to date.

The last film of the series, *Gripsholm* (2000), details the experience of the German-Jewish satirical writer Kurt Tucholsky (Ulrich Noethen) in 1932, just before the Nazi oppression. Noted for its cinematography and nuanced performances, the movie portrays the clash of ideals and interpersonal relationships.

Envisioned as part of an ongoing series of international films, the Xavier Koller retrospective promises to be an important stepping-stone in Caltech's ongoing cultural life.

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Invention, *from page 1*

Caltech applied physicist Harry Atwater and his associates have announced their success in creating "the world's smallest waveguide, called a plasmon waveguide, for the transport of energy in nanoscale systems." In essence, they have created a sort of "light pipe" constructed of a chain-array of several dozen microscopic metal slivers that allows light to hop along the chain and circumvent the diffraction limit. With such technology lies the possibility that optical components can be constructed for a huge number of technological applications in which the diffraction limit is troublesome.

"What this represents is a fundamentally new approach for optical devices in which diffraction is not a limit," says Atwater, Hughes Professor and professor of applied physics and materials science at Caltech.

Because the era of nanoscale devices is rapidly approaching, Atwater says, the future bodes well for extremely tiny optical devices that, in theory, would be able to connect to molecules.

At present, the Atwater team's plasmon waveguide looks something like a standard glass microscope slide. Fabricated on the glass plate by means of electron-beam lithography is a series of nanoparticles, each about 30 nanometers (30 billionths of a meter) in width, about 30 nanometers in height, and about 90 nanometers in length. These etched "rods" are arranged in a parallel series like railroad ties, with such a tiny space between them that light energy can move along with little radiated loss.

Therefore, if light with a wavelength of 590 nanometers, for example, passes through the nanoparticles, the light is confined to the smaller dimensions of the nanoparticles themselves. The light energy then "hops" between the individual elements in a process known as dipole-dipole coupling, at a rate of propagation considerably slower than the speed of light in a vacuum.

These structures are also sensitive to the presence of biomolecules. Thus a single molecule of nerve gas could conceivably be detected by an optical device designed for biowarfare sensing.

A description of the device appears in the April 2003 issue of the journal *Nature Materials*. The other Caltech authors of the paper were Stefan Maier, a postdoctoral scholar in applied physics who was responsible for the working device, and Pieter G. Kik, a postdoctoral scholar in engineering and applied science. Other authors were Sheffer Meltzer, Elad Harel, Bruce E. Koel, and Ari A. G. Requicha, all from the University of Southern California.

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Health fair, *from page 1*

planned the event through a committee consisting of students, faculty, and department heads. The representatives examined their specific groups' needs and determined that the Caltech community would benefit from a fair that looked at the wider health picture.

"This year we're trying to do more prevention education and more health promotion to create a space where other dimensions of health could be addressed," Curtis said. She added that the event's theme, "Get Balance!", promotes the benefits that follow when a balance is struck between the various facets of life, including work, relationships, nutrition, studies, and exercise.

The event combines the annual Health Fair and the WorkLife Fair and is expected to attract at least 1,500 members of the Caltech community.

"The two fairs were using the same vendors, and given the overlap, it made sense to have one fair and expand it," Curtis says. In all, more than 55 vendors will conduct demonstrations, distribute literature, and, best of all, provide goodie bags of free samples. Live reggae/salsa music will be provided by the band Upstream, and members of the Caltech DJ club will spin records from 11 a.m. to noon.

A partial list of vendors includes HMO Kaiser Permanente, which will give free 10-minute massages on three chairs; a representative from the Food and Drug Administration, who will provide tips on safe food handling; chiropractors from L.A.'s Cleveland Chiropractic College, who will perform spinal screenings and have handouts on what to look for when purchasing a good pillow; and Derma Scan technicians, who will use UV light to detect skin damage from exposure to the sun.

In addition to donating to the blood drive that day, attendees can have their blood pressure checked by Caltech's Health Advocates. Other participating Caltech offices include the Counseling and Health Centers, the Women's Center, and the Caltech Y Outdoor Committee.

Community vendors include the Outland Mountain Shop, Pasadena Cyclery, the Buddhist Tzu Chi Free Clinic, Run With Us, Caltech's Environmental Task Force, the Child Educational Center, Huntington Senior Care Network, the Pasadena AIDS Service Center, and the SPCA. This last agency will provide cat health facts to the caretakers of the undergraduate House mascots, who could also do with a little balance in their busy lives.

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Caltech 336
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