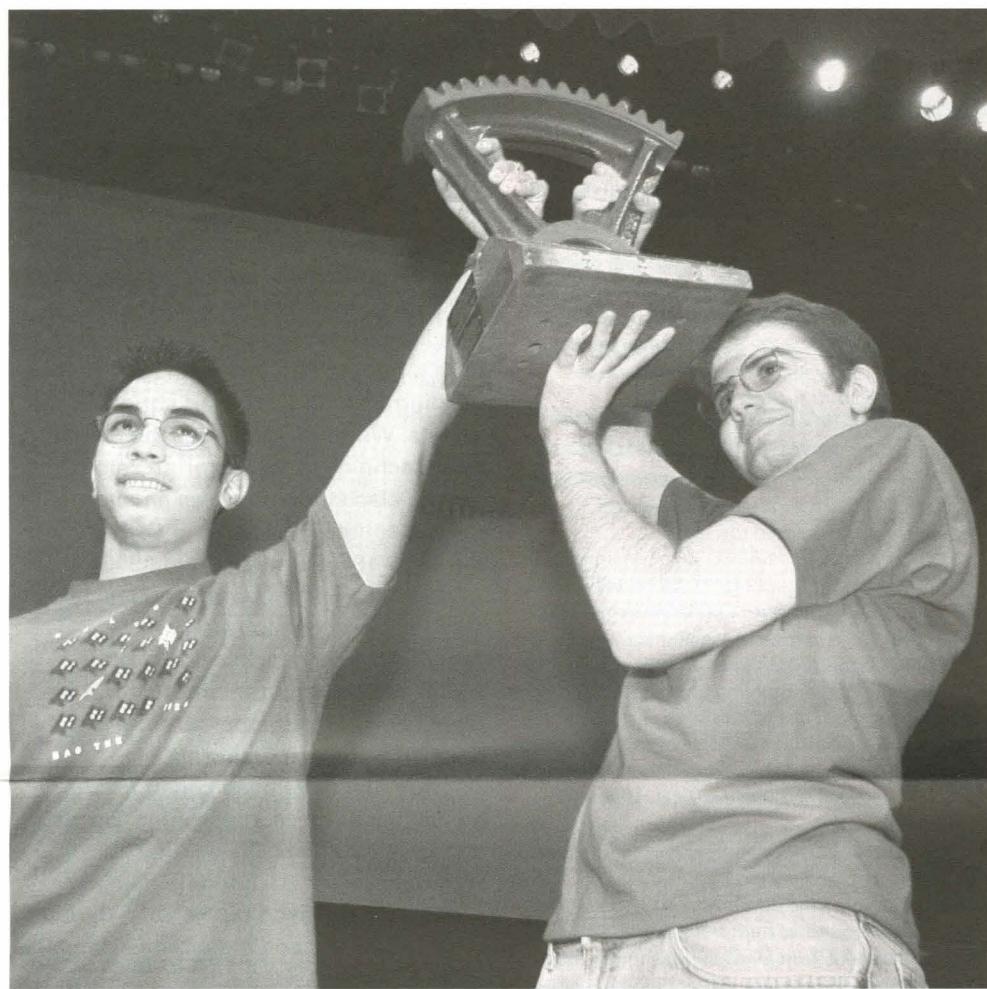


Caltech336

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

The campus community biweekly
January 9, 2003, vol. 3, no. 1

Baggers of the flag



Caltech juniors Brian Hefelfinger (left) and Euan McLeod celebrate their win in the 2002 ME 72 engineering design contest, "Bag the Flag." The team built two robotic devices that worked together to transport a flag across an arena and plant it in the opposing team's base.

Marrow, blood donors needed

Members of the Caltech community are invited to help address the critical need for potential bone-marrow donors by having their tissue typed and added to a nationwide registry. The City of Hope will hold a tissue-typing and blood drive on Friday, January 24, from 10 a.m. to 3:30 p.m. in the Winnett lounge.

According to the City of Hope, each year thousands of patients with leukemia, aplastic anemia, or other blood diseases are told they need a bone marrow or blood stem-cell transplant. For those who don't have siblings with identical marrow tissue, their only chance may be to find an unrelated matching donor, most likely from the same ethnic background.

Although about 100 people receive marrow or blood stem-cell transplants each month, there are several times that number who could also benefit from such a procedure. With odds of just one in 20,000 of a patient finding an unrelated matching donor, the City of Hope Blood Donor/Apheresis Center works together with the National Marrow Donor Program (NMDP) to help increase those chances. The two organizations facilitate unrelated marrow and blood stem-cell

see Blood drive, page 6

Where have all the neutrinos gone?

In the subatomic particle family, the neutrino is a bit like a wayward stepson. Neutrinos were long ago detected, and everything physicists know says there should be a certain number streaming from the sun—yet there are nowhere near enough.

An international team, including Caltech experimental particle physicist Robert McKeown, has revealed that the sun's lack of neutrinos is a real phenomenon, probably explainable by conventional quantum mechanics theory. Observations were based on experiments involving nuclear power plants in Japan.

The project is called KamLAND, after Japan's Kamioka mine, where the neutrino detector is located. Properly shielded from background and cosmic radiation, the detector is optimized for measuring neutrinos from the country's 17 nuclear plants.

Neutrinos are produced in nuclear fusion, when two protons fuse together to form deuterium, a positron (the positively charged antimatter equivalent of an electron), and a neutrino. The deuterium nucleus remains near where it formed, while the positron eventually annihilates both itself and an electron.

see KamLAND, page 6

Caltech, UCLA create HIV gene therapy

Researchers in the lab of Caltech president and professor of biology David Baltimore and at UCLA have developed a new gene therapy that is highly effective in preventing the HIV virus from infecting individual cells in the immune system.

While not curative, the technique could be used as a significant new treatment for people already infected, by reducing the HIV-infected cells in their bodies. Also, the new approach could be used to fight other diseases resulting from gene malfunctions, including cancer.

In the current issue of the *Proceedings of the National Academy of Sciences*, Baltimore and his collaborators report that the technique uses a disabled version of the AIDS virus as a sort of "Trojan horse" to get a disruptive agent inside human T-cells, thereby reducing the likelihood that a potent HIV virus will be able to successfully invade the cell. Early laboratory results show that more than 80 percent of the T-cells may be protected.

"To penetrate a cell, HIV needs two receptors that operate like doorknobs and allow the virus inside," says Baltimore. "HIV grabs the receptor and forces itself into the cell. If we can knock out one of these receptors, we hope to prevent HIV from infecting the cell."

The receptors in question are called the CCR5 and the CD4. The human immune system can't get along without the CD4, but about 1 percent of the Caucasian population is born without the CCR5. In fact, these people are known to have a natural immunity to AIDS.

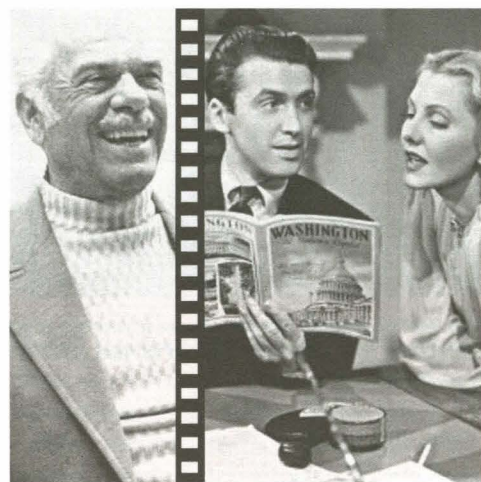
Therefore, the researchers' strategy was to disrupt the CCR5 receptor. They did this by introducing a special double-stranded RNA known as "small interfering RNA," or siRNA, into the T-cell. To do so, they engineered a disabled HIV virus to carry the siRNA into the T-cell. Thus, the T-cell was invaded, but the disabled virus has no ability to cause disease. Once inside the T-cell, the siRNA knocks out the CCR5 receptor.

Laboratory results show that human T-cells thus protected are quite resistant to infection by the HIV virus. When the T-cells were put in a petri dish and exposed to HIV, less than 20 percent were actually infected.

"Synthetic siRNAs are powerful tools," says Irvin S. Y. Chen, director of the UCLA AIDS Institute and one of the authors of the paper. "But scientists have been baffled at how to insert them into the immune system in stable form. You can't just sprinkle them on the cells."

Caltech postdoctoral researcher Xiao-Feng Qin and UCLA postdoctoral

see Gene therapy, page 6



Caltech alum Frank Capra (left) directed the 1939 classic *Mr. Smith Goes to Washington*, starring James Stewart and Jean Arthur.

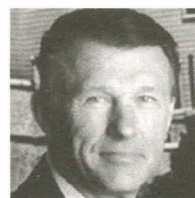
Film Fest to salute alum Capra

For decades, Caltech has churned out world-class scientists and researchers, who continue to pursue careers in everything from aeronautics to biology to physics.

But it may be surprising to some that Caltech has also prepared its alumni to excel in the arts and humanities. Witness 1918 graduate Frank Capra, a Sicilian immigrant who put himself through college and later became a preeminent Hollywood film director of his time. His extensive body of innovative work has left an indelible mark on the motion picture industry.

In recognition of his illustrious career, Caltech will show four of his classics during a film festival in his name. The Frank Capra Film Festival kicks off on Tuesday, January 14, with a screening of the 1936 comedy *Mr. Deeds Goes to Town*, for which Capra won an Oscar for best director. The story concerns Longfellow Deeds, a gullible tuba player and heir to a fortune, who falls under

see Capra, page 6



Kovacevich named new trustee

Richard Kovacevich, the chairman, president, and chief executive officer of Wells Fargo & Company, has been elected to Caltech's board of trustees.

The former CEO and chairman of Norwest Corporation, Kovacevich became president and CEO of Wells Fargo when the companies merged in 1998, and was named chairman in 2001. He had joined Norwest in 1986 as vice chairman, chief operating officer, and head of

see Kovacevich, page 6

NewsBriefs



Monkeying around: Blacker House freshmen enjoy the jungle gym they built along the Olive Walk as part of their 2002 Frosh Project, an annual team-building exercise.

Personals

Welcome to Caltech

November

Clarisse Alvarez, senior administrative secretary, Counseling Center; **Bradley Cain**, system administrator, Information Technology Services; **Lalaine Comia**, front office supervisor, Athenaeum; **Susan Dao**, research assistant I, biology; **Jennifer Formichelli**, administrative assistant II, theoretical astrophysics; **Catherine Stebbins**, Web author/presentation and exhibit developer, Office of the Provost; **Sanford Wendell**, unit chef manager, Dining Services.

December

Burton Calderon, cook, Dining Services; **Fernando Contreras**, assistant to the international student advisor, International Student Programs; **Sherry Feick**, senior administrative secretary, chemistry and chemical engineering; **Catherine Gaffney**, ticket office customer services representative, Caltech Public Events; **Cecilia Gamboa**, administrative support/grants administration, environmental science and engineering; **Rodrigo Teran**, dishwasher, Athenaeum; **Michael Throop**, utility mechanic, Physical Plant.

Deaths

Tom Lehman passed away at home New Year's Day from complications of lung cancer. He had served as technical director for Caltech Public Events for more than 30 years, working with many well-known performing artists. After he retired in 1998, he traveled frequently to China, volunteered at the Pacific Asia Museum in Pasadena, and hosted Caltech's Armchair Adventure travelogue series until its end in early 2001. A memorial service is scheduled for Thursday, January 16, at 2 p.m. at the Pacific Asia Museum, 46 North Los Robles Avenue. In lieu of flowers, donations may be sent to the museum for the Thomas K. Lehman Memorial Fund.

George Lundgren, who worked at Caltech for 33 years, died on November 24. A foreman in the aeronautics machine shop, he had retired in 1992.

Honors and awards

Pamela J. Bjorkman, professor of and executive officer for biology and a full investigator with the Howard Hughes Medical Institute, has been awarded the Max Planck Research Prize by the Max Planck Society in Germany. Presented each year to "individual foreign and German researchers who lead their respective fields with regard to outstanding, internationally recognized scientific achievements," the award includes a cash prize of

up to approximately \$125,000. The society cited her work in determining how the human immune system fights disease at the molecular level. In addition, Bjorkman has been elected to the American Philosophical Society. Founded by Benjamin Franklin in 1743, the society is the oldest learned society in the United States devoted to the advancement of scientific and scholarly inquiry. Bjorkman has been a professor at Caltech since 1988.

Barry Barish, Linde Professor of Physics and director of the Laser Interferometer Gravitational-Wave Observatory Laboratory, has been nominated by President George W. Bush to the National Science Board. Once his appointment has been approved by the U.S. Senate, he will help oversee the National Science Foundation and advise the president and the Congress on a broad range of policy issues related to science, engineering, and education. The National Science Board was created by an act of Congress in 1950, with the mission to "promote the progress of science; advance the national health, prosperity, and welfare; and secure the national defense." Barish joined Caltech's faculty in 1963 as a research fellow, and he has been Linde Professor since 1991 and director of the LIGO Lab since 1997.

André DeHon, assistant professor of computer science, has been awarded a research grant by the Okawa Foundation for Information and Telecommunications. The grant will further his work in developing "new computational models which enable computational architectures to exploit the large device capacities associated with modern and emerging technologies." DeHon received his PhD from MIT in 1996 and joined Caltech in 1999.

Thomas Everhart, professor of electrical engineering and applied physics, emeritus, and Caltech president emeritus, has been awarded the Okawa Prize by the Okawa Foundation for Information and Telecommunications "for distinguished accomplishments in the development of scanning electron microscopy and micro-fabrication technologies; and for outstanding contributions and leadership in the development of science and technology, engineering education and progress of the information industry." He served as president of Caltech from 1987 to 1997.

Harry Gray, Beckman Professor of Chemistry and founding director of the Beckman Institute, will receive several honors in 2003. The American Chemical Society has chosen him to receive the William H. Nichols Medal "for his outstanding contributions to bioinorganic chemistry." The University of Chicago, meanwhile, has named him the recipient of the G. W. Wheland Award, and the School of Pharmacy of the University of Maryland, Baltimore, has selected him for the Grollman Lectureship Award "in recognition of his outstanding contributions to chemistry and the life sciences." Finally, the Royal Society of Chemistry has chosen Gray to deliver the third Geoffrey Wilkinson Lecture for 2003-04. He has been a professor of chemistry at Caltech since 1966.

Babak Hassibi, assistant professor of electrical engineering, has been awarded a research grant by the Okawa Foundation for Information and Telecommunications. His work "will address the information-theoretic, coding-theoretic, and signal processing research challenges encountered in multi-antenna communications systems, as well as the impact of integrating their solutions into a multi-user wireless network." Hassibi received his PhD from Stanford in 1996 and joined Caltech in 2001.

Rudy Marcus, Noyes Professor of Chemistry, received an honorary doctor of science degree from the University of Waterloo at its fall convocation ceremony. Marcus joined the Caltech faculty as Noyes Professor of Chemistry in 1978, and he received the Nobel Prize in chemistry in 1992.

Caltech senior wins Marshall Scholarship

Vikram Mittal, a senior in engineering and applied science, has won a Marshall Scholarship, which will finance two years of graduate work at the University of Oxford. Every year over a thousand seniors compete for the Marshall, which allows recipients to study at any university in Great Britain. Only 40 seniors at most are selected each year to receive the award.

The scholarships were founded in 1953 to commemorate the Marshall Plan, the U.S. aid program extended to Europe in the wake of World War II, and are named after George C. Marshall, who originated the plan.

Currently serving as ASCIT vice president and as chair of the Board of Control, Mittal will graduate from Caltech this year. At Oxford he plans to earn his master's degree in mechanical engineering while pursuing his interest in helicopter design. His appetite for living abroad was whetted when he spent last winter term residing in the University of Cambridge's Pembroke College, courtesy of Caltech's Cambridge Scholars Program. While there he played for the college's rugby team.

Marshall recipients include such well-known Americans as U.S. Supreme Court Justice Stephen Breyer, *Time* editor Nancy Gibbs, and Ray Dolby of sound-system fame, and former Caltech president Tom Everhart was in the first class of Marshall Scholars. Other Caltech recipients include alum Sterl Phinney (class of 1980), professor of theoretical astrophysics, and Jonas Peters, assistant professor of chemistry; Edward Stolper, Leonhard Professor of Geology and chair of the Division of Geological and Planetary Sciences; and Stephen Quake, associate professor of applied physics and physics.

Patterson receives McKnight Award

The McKnight Endowment Fund for Neuroscience will award \$300,000 over three years to Caltech biology professor **Paul Patterson** for his research on mental illness.

He is one of seven researchers nationally who are receiving Neuroscience of Brain Disorders Awards to further their studies in diagnosing, preventing, and treating injuries or diseases affecting the brain and spinal cord.

Patterson's research is "A Mouse Viral Model for Study of the Pathogenesis and Prevention of Mental Illness," based on the knowledge that when a pregnant mother contracts influenza at a certain stage of pregnancy, the chances increase that her child may be schizophrenic or autistic. Using a mouse model, Patterson attempts to determine how maternal infection causes defects in fetal brain development and to prevent those abnormalities.

Other awards will go to U.S. scientists investigating epilepsy, mood disorders, Alzheimer's disease, schizophrenia, and spongiform encephalopathies (such as Creutzfeldt-Jakob disease, the human equivalent of mad cow disease). First given in 2001, the awards were created to help translate basic laboratory discoveries in neuroscience into clinical benefits for patients.

Funded by the McKnight Foundation of Minneapolis, the McKnight Endowment Fund for Neuroscience is an independent organization that was established in 1986 and is led by a board of prominent neuroscientists from around the country.

Marine biologist North dies

Wheeler North, whose seminal Caltech research showed that the ocean's kelp forests are as vital and productive as any land-based woodlands, died of lymphoma December 20 in Newport Beach, California. He was 80.

A professor of environmental science, emeritus, North spent much of his research career working out of Caltech's Kerckhoff Marine Laboratory in Corona del Mar. He pioneered the use of scuba diving as a basic marine science research tool, making his first dive in 1949 as a Caltech undergraduate. (After earning a BS in electrical engineering from Caltech in 1944, he returned to receive his BS in biology in 1950.) He purchased one of the first Aqua-Lungs sold in the United States; the Aqua-Lung, invented by Jacques Cousteau and Emile Gagnon, was a predecessor of modern scuba equipment.

North's research proved kelp beds are part of a complex marine ecosystem providing food and shelter for hundreds of underwater species, and showed that human effluent deposited off the Southern California coast was adversely affecting kelp forests. The sewage, he found, was helping to feed and grow the sea urchin population, which, in turn, was feasting on kelp stalks and shrinking the forests. With his colleagues, he developed techniques for restoring kelp beds, and he also studied kelp as an alternative energy source. He taught at Caltech from the early 1960s until the mid-1990s.

Writing about his work and his passion for the ocean in *National Geographic* in 1972, North said, "I am a scuba forester and the 'trees' I tend are giant, vine-like streamers from the ocean floor off Southern California."

"He must have been coded for the genes that express endorphins. He was eternally optimistic," said Michael Hoffmann, dean of graduate studies.

North is survived by his wife, Barbara; a son, Wheeler; and a daughter, Hannah.

"Superconductivity: Resistance is Futile"

The winter term Watson Lectures will kick off with an exploration of superconductors, a recent technology with a wide range of possible applications.

On Wednesday, January 15, Caltech professor of physics Nai-Chang Yeh will discuss superconductors, materials that conduct electricity with no resistance below a critical temperature. Since the discovery of superconductors more than 15 years ago, a vast amount of new knowledge has been accumulated, resulting in applications ranging from magnetic sensors for cardiograms to microwave filters for cellular-phone base stations.

Despite the progress, however, superconductors' early promise has not been fully realized, largely due to the complexity of material properties that limits a fundamental understanding of physics at the microscopic level. Yeh's talk will review novel properties of high-temperature superconductors, the discovery of new materials, and potential uses in communications, energy technology, quantum computing, medical research, and space.

The free public lecture will take place at 8 p.m. in Beckman Auditorium. For more information, contact Public Events at 1 (888) 2-CALTECH, (626) 395-4652, or events@caltech.edu, or visit www.events.caltech.edu.

January 13–19, 2003

M T W T F S S

Monday, January 13

Quick Review for Electronic Theses

Sherman Fairchild Library, multimedia conference room, noon—Since July 1, Caltech has required 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.

Institute for Quantum Information Special Seminar

156 Jorgensen, 1:30 p.m.—“2-D Lattice Models Leading to ‘Designer Anyons,’” Michael Freedman, Microsoft Research.

Astronomy Tea Talk

106 Robinson, 4 p.m.—Topic to be announced. Nicole Homeier, department of astronomy, University of Wisconsin–Madison. Information: www.astro.caltech.edu/~cc/tea_talks.

Ulric B. and Evelyn L. Bray Seminar

25 Baxter, 4 p.m.—“Coalitional Bargaining with Externalities and Endogenous Exit,” Francis Bloch, professor of economics, University of Aix-Marseille. Refreshments.

Geological and Planetary Sciences Seminar

155 Arms, Robert Sharp Lecture Hall, 4 p.m.—“Microbial Communities and Their Geobiological Activities in Hot Spring and Coral Reef Environments,” Bruce W. Fouke, assistant professor, department of geology, University of Illinois, Urbana-Champaign. Information: www.gps.caltech.edu.

Applied and Computational Mathematics Colloquium

101 Guggenheim Lab, Lees-Kubota Lecture Hall, 4:15 p.m.—“Time Reversal of Waves in Random Media,” Leonid Ryzhik, department of mathematics, University of Chicago. Refreshments, 3:45 p.m.

Tuesday, January 14

Thesis Seminar

151 Crellin, 1:30 p.m.—“Force-Detected Nuclear Magnetic Resonance Independent of Field Gradients,” Garrett M. Leskowitz, graduate student in chemistry, Caltech.

Institute for Quantum Information Seminar

74 Jorgensen, 3 p.m.—“Gentle Tomography and Universal Quantum Data Compression,” Aram Harrow, department of physics, MIT.

Mechanical Engineering Seminar

206 Thomas, 3 p.m.—“Falling Leaves, Flapping Flight, and Making a Virtual Insect,” Professor Jane Wang, department of theoretical and applied mechanics, Cornell University.

Caltech/JPL Association for Gravitational-Wave Research Seminar Series

114 E. Bridge, 4 p.m.—“Tidal Excitation of White Dwarf Oscillations,” Roger Blandford, Tolman Professor of Theoretical Astrophysics, Caltech.

Galileo Meets Venus Seminar Series: Toward an Experimental Approach to Aesthetics

24 Beckman Labs, 4 p.m.—“Brain Basis of Musical Cognition, Performance, and Invention,” Lawrence M. Parsons, founding director, Cognitive Neuroscience Program, National Science Foundation. Refreshments.

General Biology Seminar

119 Kerckhoff, 4 p.m.—“Integration of Form and Function in Normal and Malignant Breast: The Importance of Context in Signaling for Differentiation and Apoptosis,” Mina Bissel, director, Division of Life Sciences, Lawrence Berkeley National Laboratory.

Wednesday, January 15

Quick Review for Electronic Theses

Sherman Fairchild Library, multimedia conference room, noon—Since July 1, Caltech has required 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.

Astronomy Colloquium

155 Arms, Robert Sharp Lecture Hall, 4 p.m.—Topic to be announced. John Carlstrom, department of physics, University of Chicago. Information: www.astro.caltech.edu/~gma/colloquia.html.

Environmental Science and Engineering Seminar

142 Keck, 4 p.m.—“Redox Reactions in Soils: How Structure and Speciation Influence Reactivity,” Alan Stone, professor of geography and environmental engineering, Johns Hopkins University. Refreshments, Keck Labs lobby, 3:40 p.m.

General Biology Seminar

24 Beckman Labs, 4 p.m.—“Functional Analyses and Anti-HIV Therapeutic Applications of RNAi,” John Rossi, department of molecular biology, City of Hope.

Organic Chemistry Seminar

147 Noyes, Sturdivant Lecture Hall, 4 p.m.—“Chemical Tools for Proteomics Research,” Professor Thomas J. Kodadek, University of Texas Southwestern Medical Center.

Earnest C. Watson Lecture

Beckman Auditorium, 8 p.m.—“Superconductivity: Resistance is Futile,” Nai-Chang Yeh, professor of physics, Caltech. Admission is free. Information: 395-4652, 1 (888) 2CALTECH, or events@caltech.edu. Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at www.events.caltech.edu.

Thursday, January 16

Chemical Engineering Seminar

106 Spalding Lab, Hartley Memorial Seminar Room, 2 p.m.—Topic to be announced. Vinny Manoharan, chemical engineering department, UC Santa Barbara. Refreshments, 113 Spalding Lab, 3:30 p.m. Information: www.che.caltech.edu/calendar/seminars.html.

The Perpall Final Round

100 Broad Center, 2 to 5 p.m.—The eight winners of the Perpall Speaking Competition semifinals will give a presentation of their SURF projects from this past summer. The competition was named for Doris S. Perpall and designed as an incentive for SURF students to develop oral presentation skills. First, second, and third-place prize winners will be chosen. A reception will follow.

Physics Research Conference

201 E. Bridge, 4 p.m.—“Brain Circuit Dynamics and the Encoding of Odor Signals,” Gilles Laurent, Hanson Professor of Biology and Computation and Neural Systems, Caltech. Refreshments, 114 E. Bridge, 3:45 p.m. Information: www.pma.caltech.edu/~physcoll/PhysColl.html.

Social and Information Sciences Laboratory Seminar Series

25 Baxter, 4 p.m.—“FAST Kernel,” Steven Low, associate professor of computer science and electrical engineering, Caltech. Refreshments.

Friday, January 17

Condensed Matter Physics Seminar

107 Downs Lab, noon—Topic to be announced. Peter Taborek, professor of experimental condensed matter physics, UC Irvine. Information: www.its.caltech.edu/~jpelab/CMP_Seminar_Dates.html. Note special date.

Quick Review for Electronic Theses

Sherman Fairchild Library, multimedia conference room, noon—Since July 1, Caltech has required 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.

Theoretical Astrophysics and Relativity Seminar

114 E. Bridge, 2 p.m.—“The Milli- and Microlensing of Macrolensed Quasars,” Paul Schechter, Burden Professor of Astrophysics, MIT.

Fluid Mechanics Seminar

101 Guggenheim Lab, Lees-Kubota Lecture Hall, 3 p.m.—“New Structures in Free Surface Flows,” John Bush, associate professor, department of mathematics, MIT. Information: www.galcit.caltech.edu/Seminars/Fluids/CurrentFluids/index.html.

Inorganic-Organometallics Seminar

151 Crellin, 4 p.m.—“Non-Carbonyl-Stabilized Metallocarbenoids in Synthesis: The Development of a Tandem Rhodium-Catalyzed Bamford-Stevens/Claisen Rearrangement,” Jeremy May, graduate student in chemistry, Caltech.

January 20–26, 2003

M T W T F S S

Monday, January 20

Martin Luther King Day holiday

Tuesday, January 21

Mechanical Engineering Seminar
206 Thomas, 3 p.m.—“Microfluidics: Living at the Edge of the Continuum,” Professor Kenny Breuer, engineering department, Brown University.

Chemical Physics Seminar
147 Noyes, Sturdivant Lecture Hall, 4 p.m.—“The Effect of Electronic Asymmetry in Clusters and Reactions,” Millard Alexander, Distinguished University Professor, department of chemistry and biochemistry, University of Maryland, College Park.

General Biology Seminar
119 Kerckhoff, 4 p.m.—“Visualizing T-Lymphocyte Activation In Vivo,” Marc Jenkins, department of microbiology, Center for Immunology, University of Minnesota Medical School.

History, Society, and Culture Seminar Series
237 Baxter, 4 p.m.—“Experts, Forgers, and Collectors: Knowledge, Expertise and the Art Market,” John Brewer, professor of history and literature, Caltech. Refreshments.

Social and Information Sciences Laboratory Seminar Series
25 Baxter, 4 p.m.—Topic to be announced. Charles R. Plott, Harkness Professor of Economics and Political Science, Caltech. Refreshments.

Wednesday, January 22

Environmental Science and Engineering Seminar
142 Keck, 4 p.m.—“Properties of Midlatitude and Tropical Ice Clouds,” Andrew Heymsfield, senior scientist, NCAR. Refreshments, Keck Labs lobby, 3:40 p.m.

Information Sciences Seminar Series
74 Jorgensen, 4 p.m.—Topic to be announced. Nicholas Bambos, associate professor, department of electrical engineering and department of management science and engineering, Stanford. Information: <http://netlab.caltech.edu/seminar/winter03.htm>.

Organic Chemistry Seminar
147 Noyes, Sturdivant Lecture Hall, 4 to 5:30 p.m.—“Reactions of Silacyclopropanes as New Methods for Stereoselective Synthesis,” Professor Keith Woerpel, department of chemistry, UC Irvine.

Wiersma Lecture
24 Beckman Labs, 4 p.m.—“The Yin and Yang of the KATP Channel: Diabetes and Congenital Hyperinsulinism,” Frances Ashcroft, department of physiology, Oxford University.

Thursday, January 23

Thesis Seminar
106 Spalding Lab, Hartley Memorial Seminar Room, 1 p.m.—“Engineering Dioxygenases by Laboratory Evolution: A Comparison of Evolutionary Search Strategies,” John Joern, graduate student in chemical engineering, Caltech.

Caltech Library System Presents: Quick Overview of Information Resources
Sherman Fairchild Library, multimedia conference room, 2 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>.

Ulric B. and Evelyn L. Bray Seminar
25 Baxter, 4 p.m.—“Chance, Collective Action, and Institutional Innovation,” Samuel Bowles, director of the economics program at the Santa Fe Institute and professor of economics at the University of Massachusetts at Amherst. Refreshments.

Chemical Engineering Seminar
106 Spalding Lab, Hartley Memorial Seminar Room, 4 p.m.—“Gene Expression Control Strategies Through mRNA Turnover,” Dr. Christina Smolke, department of chemical engineering, UC Berkeley. Refreshments, 113 Spalding Labs, 3:30 p.m. Information: www.che.caltech.edu/calendar/seminars.html.

Physics Research Conference
201 E. Bridge, 4 p.m.—“Exploring the Dark Universe,” Timothy McKay, associate professor of physics, University of Michigan. Refreshments, 114 E. Bridge, 3:45 p.m. Information: www.pma.caltech.edu/~physcoll/PhysColl.html.

Von Karman Lecture Series
JPL, von Karman Auditorium, 7 p.m.—“Using Space Technology to Understand Earthquakes,” Dr. Andrea Donnellan, deputy manager, Earth and Space Sciences Division, JPL. Admission is free. Information: www.jpl.nasa.gov/lecture.

Friday, January 24

Condensed Matter Physics Seminar
107 Downs Lab, noon—Topic to be announced. Steve Simon, Bell Labs. Information: www.its.caltech.edu/~jpelab/CMP_Seminar_Dates.html.

Fluid Mechanics Seminar
101 Guggenheim Lab, Lees-Kubota Lecture Hall, 3 p.m.—“Scale-Dependent Droplet Clustering in Turbulent Clouds,” Raymond Shaw, assistant professor, department of physics, Michigan Technological University. Information: www.galcit.caltech.edu/Seminars/Fluids/CurrentFluids/index.html.

Inorganic-Organometallics Seminar
151 Crellin, 4 p.m.—Topic to be announced. Parisa Mehrkhodavandi, postdoctoral scholar in chemistry, Caltech.

Von Karman Lecture Series
Pasadena City College, 1570 E. Colorado, the Vosloh Forum (south of Colorado on Bonnie), 7 p.m.—“Using Space Technology to Understand Earthquakes,” Dr. Andrea Donnellan, deputy manager, Earth and Space Sciences Division, JPL. Admission is free. Information: www.jpl.nasa.gov/lecture.

CampusEvents

Monday, January 13

Ballroom Dance Club

Winnett Lounge, 7:30 p.m.—Salsa dancing, taught by a professional instructor. This is the second of a five-week class for beginners. No experience or partner is required. Fee: Students, \$20 for the remaining classes or \$6 a class; non-students, \$28 for the series or \$8 per class. Refreshments.

Ballroom Dance Club

Winnett Lounge, 9:30 p.m.—Cha-cha dance class, professionally taught. This is the second class of a five-week series, open to beginners and to dancers with more experience. No partner is required. Refreshments. Fee not yet determined.

Tuesday, January 14

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/.

Amnesty International Letter Writing

Athenaeum Rathskeller, 7:30 p.m.—An informal meeting at which we write letters on human-rights abuses around the world. All are welcome. Refreshments. Information: (818) 354-4461 or lkamp@lively.jpl.nasa.gov.

Frank Capra Film Festival: *Mr. Deeds Goes to Town*

Beckman Auditorium, 7:30 p.m.—This work by Caltech alumnus Frank Capra (BS 1918) tells the story of Longfellow Deeds, a simple-hearted Vermont tuba player, who inherits a fortune and has to contend with opportunistic city slickers. After the screening, Capra's son will offer insights into his father's life and work. Admission is free. Information: 395-4652, 1 (888) 2CALTECH, or events@caltech.edu. Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at www.events.caltech.edu.

Women's Basketball

vs. Cal Lutheran University, 7:30 p.m.

Wednesday, January 15

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.

Swimming and Diving

vs. Pomona-Pitzer Colleges, 5 p.m.

Ballroom Dance Club

Winnett Lounge, 7:30 p.m.—West Coast swing, taught by an amateur instructor. This is the second class of a 10-week series. No experience or partner is required. Fee: \$1 per class. Refreshments.

Men's Basketball

at Claremont-Mudd-Scripps, 7:30 p.m.

Reel Women Series: *Marie Curie: The Woman Behind the Mind*

Center for Student Services, second-floor common area, north wing, 8 p.m.—This inspiring portrait of Marie Curie, the first woman to receive the Nobel Prize in a science, portrays her growing up, her efforts to obtain an education, and her life in science and as a wife and mother. Snacks provided.

Friday, January 17

Fire-Extinguisher Training

Wilson parking garage, roof, 11 a.m.—This class, which will meet on the north roof, 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 Andrea.Acosta@caltech.edu to reserve a place.

Women's Club Welcoming Coffee

Athenaeum Rathskeller, 4:30 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.

Caltech Tai Chi Club

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

Women's Basketball

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

Folk Music Society Presents David Massengill

Dabney Lounge, 8 p.m.—Massengill, who accompanies himself on the mountain dulcimer and guitar, tells humorous and poignant stories through his songs, many about his childhood in the South. 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.its.caltech.edu/~folkmusi.

Michelin Distinguished Visitor Lecture

Beckman Auditorium, 8 p.m.—Michael Crichton, author of *The Andromeda Strain* and *Jurassic Park* and creator of the television series *ER*, will speak. Admission is free. Information: 395-4652, 1 (888) 2CALTECH, or events@caltech.edu. Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at www.events.caltech.edu.

Saturday, January 18

Swimming and Diving

at Whittier College, 11 a.m.

Men's Basketball

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

Sunday, January 19

Skeptics Society Lecture

Baxter Lecture Hall, 2 p.m.—"Who Is Science Writing For?", Margaret Wertheim, research associate, American Museum of Natural History, New York, and author and lecturer. Donation is \$8 for nonmembers, \$5 for members and non-Caltech students. Free to the Caltech/JPL community. Tickets and information: 794-3119 or skepticismag@aol.com. Visit the Skeptics Society at www.skeptic.com.

Amnesty International Book Discussion Group

Vroman's Bookstore, 695 E. Colorado Boulevard, 2nd floor, 6:30 p.m.—Special Martin Luther King day discussion of *The Atlantic Sound*, by Caryl Phillips. All are welcome. Registered members of the group can buy the book at a discount from Vroman's.

Men's Basketball

vs. Bard College, 7:30 p.m.

Monday, January 20

Martin Luther King Day Holiday

Ballroom Dance Club

Winnett Lounge, 7:30 p.m.—Salsa dancing, taught by a professional instructor. If you missed the first two weeks, feel free to attend if you're comfortable with the basics. No partner is required. Fee: \$6 a class for students; \$8 for nonstudents. Refreshments.

Ballroom Dance Club

Winnett Lounge, 9:30 p.m.—Cha-cha dance class, professionally taught, open to beginners and to dancers with more experience. No partner is required. Refreshments. Fee not yet determined.

Tuesday, January 21

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.

Adult, Child, and Infant First-Aid and CPR Training

Brown Gym classroom, 5:30 to 10 p.m.—Adult, child, and infant first-aid and CPR training will be offered by Caltech's Safety Office in conjunction with the American Red Cross. Fee: \$25 for materials. This is a two-day class; to receive certification, you must attend tonight and on January 23. Registration: 395-6727 or safety.training@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/.

Women's Basketball

at Claremont-Mudd-Scripps, 7:30 p.m.

Wednesday, January 22

CPR Recertification Training

Brown Gym classroom, 7:30 a.m. to noon—CPR recertification training will be offered by Caltech's Safety Office in conjunction with the American Red Cross. There is a small fee for materials. Information and registration: 395-6727 or safety.training@caltech.edu. This class will be repeated from 1 to 5 p.m.

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.

CPR Recertification Training

Brown Gym classroom, 1 to 5 p.m.—CPR recertification training will be offered by Caltech's Safety Office in conjunction with the American Red Cross. There is a small fee for materials. Information and registration: 395-6727 or safety.training@caltech.edu.

Ballroom Dance Club

Winnett Lounge, 7:30 p.m.—West Coast swing, taught by an amateur instructor. No experience or partner is required. Fee: \$1 per class. Refreshments.

Men's Basketball

at Cal Lutheran University, 7:30 p.m.

Thursday, January 23

Caltech Architectural Tours

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

Amnesty International Monthly Meeting

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

Friday, January 24

Standard First Aid and CPR Training

Brown Gym classroom, 7:30 a.m. to 5 p.m.—Standard first-aid and CPR training will be offered by Caltech's Safety Office in conjunction with the American Red Cross. Fee: \$20 for materials, due in advance. Registration: 395-6727 or safety.training@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/.

Women's Basketball

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

Caltech Student Chamber Ensemble Concert

Dabney Lounge, 8 p.m.—Caltech students will present the first concert in their winter series of music for small ensembles. Admission is free. A reception will follow the concert.

Saturday, January 25

Baseball

vs. Dodgertown West, doubleheader, 11 a.m.

Swimming and Diving

at Occidental College, 11 a.m.

Men's Basketball

at Whittier College, 7:30 p.m.

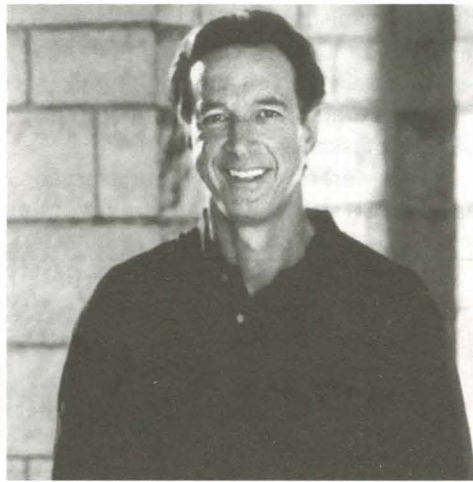
Caltech Jazz Bands Concert

Beckman Auditorium, 8 p.m.—The Caltech Jazz Bands, directed by William Bing, will present an evening of jazz featuring the music of Count Basie, and swing dancers from the Pasadena Ballroom Dance Association. Admission is free.

Sunday, January 26

Super Bowl Alternative Concert IX

Dabney Lounge, 3:30 p.m.—Caltech students will present a concert for those who prefer chamber music to football. A reception will follow the concert. Admission is free. Information: 395-4652, 1 (888) 2CALTECH, or events@caltech.edu. Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at www.events.caltech.edu.



Elena Seibert

Author and filmmaker Michael Crichton will deliver the Michelin Distinguished Visitor Lecture on Friday, January 17, at 8 p.m. in Beckman Auditorium.

Capra, from page 1

the sway of crooked big-city opportunists yet triumphs over them. One of Capra's sons will offer insights into his father's life and work during the panel discussion that follows the screening.

The second film in the festival, *Mr. Smith Goes to Washington*, was released in 1939 and is generally considered to be Capra's masterpiece. Its plot concerns a politically idealistic man who goes to the nation's capital and trounces government corruption and the shysters who benefit from it. The movie will be shown on Tuesday, January 28.

The rising tide of fascism on the global stage led to the making of *Meet John Doe*, which will be screened on February 11. Released in 1941, the film's plot revolves around the printing of a prank letter to the editor and the snowball effect it initiates. In the letter, the nonexistent "John Doe" despairs that the only response to the world's social ills is to end his own life. After the public's outraged and concerned response, unscrupulous newspaper editors hire a man to assume John Doe's identity in order to spur the newspaper's circulation.

State of the Union, which rounds out the festival on February 25, is the story of a wealthy industrialist with aspirations to the presidency of the United States. As Grant Matthews's Republican campaign proceeds, complications arise in his personal life, as do doubts about the integrity of his fellow politicians. The movie was released in 1948.

In many of his works, Capra exhibited an unmistakable affection for the underdog, most notably in *Mr. Deeds Goes to Town* and *Mr. Smith Goes to Washington*. This theme, in which an innocent or naïve man prevails despite the odds, became something of a Capra signature.

Capra may have been drawn to these stories because of his own life experiences in the role of the little guy. As described in his 1971 autobiography, *The Name Above the Title*, his impossibly rigorous schedule at Caltech consisted of an early morning 15-mile motorbike ride to a job at Pasadena's power plant, followed by on-campus dishwashing and waiting jobs, several hours of class, then an hour with the glee club. He writes that each day he devoted just two hours and thirty minutes to his studies and five hours to sleep.

"What did this schedule do to my studies? Nothing," he recounts. "I won the Freshman Scholarship prize: \$250 and a trip around the country, and sincere congratulations of my proud teachers: Dr. Bates (Chemistry), Dr. Van Buskirk (Mathematics), Dr. Beckman (German), Professor Sorensen (Electrical Engineering), Professor Clapp (Geology), and proudest of all, Professor Judy (English)."

If that weren't enough, Capra served as an ASCIT officer, was a member of the

chemistry club, served as the editor of the *California Tech*, and managed to graduate in three years.

Capra didn't learn about directing and the magic of film at Caltech; fortune provided him with that opportunity elsewhere. His time at Caltech coincided with World War I, and there were clear signs of it on campus. Temporary barracks and storage facilities were built, training in digging trenches was conducted on the site where the Athenaeum sits today, and students were in uniform. Shortly before the November 11, 1918, armistice, Capra enlisted in the Coast Artillery. After the war, jobs were difficult to come by, so for three years he became an "itinerant opportunist," as he put it. It was at a small movie studio in San Francisco that he learned to operate a camera, write gags, direct black-and-white silent films, and even serve as handler to a cranky, swaybacked horse (and actor) named Eight-ball.

Capra eventually moved to Hollywood, working at the Hal Roach Studios as a writer and, later, as a director. After moving to relatively small Columbia Studios, Capra began directing highly regarded movies such as the romantic comedy *Lady for a Day* (1933) and *It Happened One Night* (1934), which won all five top Oscars. That was only the beginning of an illustrious directing and producing career that included such films as *Arsenic and Old Lace* and *It's a Wonderful Life*, which has become a Christmastime classic.

Capra's association with his alma mater didn't end in 1918. He joined the Associates, and, in 1972, he donated his extensive estate in Fallbrook, located about 100 miles south of Pasadena in northern San Diego County, to the Institute for use as a faculty retreat.

All movies will be screened at 7:30 p.m. in Beckman Auditorium, and are free and open to the public. A panel discussion of scholars, writers, and industry professionals will follow each screening.

Kovacevich, from page 1

the banking group. Prior to that, he was group executive and member of the policy committee of Citicorp, and also was a division manager at General Mills, where his business career began.

Kovacevich earned bachelor's and master's degrees in industrial engineering and a master's of business administration, all from Stanford University. A past president of the Financial Services Roundtable, he serves as vice chairman of the American Bankers Council and is a board member of Cargill, Incorporated, and of Target Corporation. The San Francisco resident is also a board member of that city's Committee on JOBS; a member of the board of governors of its symphony; and a trustee of the Museum of Modern Art.

Gene therapy, from page 1

researcher Dong Sung An are the paper's other authors.

The technique should become a significant new means of treating people already infected with HIV, Baltimore and Chen say. "Our findings raise the hope that we can use this approach or combine it with drugs to treat HIV in people—particularly in persons who have not experienced good results with other forms of treatment," says Baltimore.

The technique can also potentially be used for other diseases when a specific gene needs to be knocked out, such as the malfunctioning genes associated with cancer, according to Chen. "We can easily make siRNAs and use the carrier to deliver them into different cell types to turn off a gene malfunction," he says. In addition, Baltimore says, the technique could be used to prevent certain microorganisms from invading the body.

The research is supported by the National Institute of Allergy and Infectious Diseases and the Damon Runyon-Walter Winchell Fellowship.

KamLAND, from page 1

The neutrino, being unlikely to interact with matter, streams away into space.

Therefore, physicists would expect neutrinos to flow from the sun in much the same way photons flow from a light bulb. The bulb throws out photons (bundles of light energy) radially and evenly, as if illuminating the surface of a surrounding sphere. Because a sphere's surface area increases by the square of the distance, an observer 20 feet away sees only one-fourth the photons as an observer at 10 feet.

Thus, observers on Earth expect to see a given number of neutrinos from the sun—assuming they know how many nuclear reactions are going on in the sun—just as they expect to know a light bulb's luminosity at a given distance if they know the bulb's wattage. But this hasn't been the case, and experiments have found far fewer neutrinos than predicted.

A theoretical explanation for this lack is that the neutrino "flavor" oscillates between the detectable "electron" neutrino type and the heavier "muon" neutrino and possibly the "tau" neutrino, neither of which is detected by the experiments. Utilizing quantum mechanics, physicists estimate that the number of detected electron neutrinos is constantly changing from 100 percent down to a small percentage and back again.

Therefore, the theory says, the reason we see only about half as many neutrinos from the sun as we should is because, outside the sun, about half the electron neutrinos are at that moment one of the undetected flavors.

Blood drive, from page 1

transplants by recruiting and educating donors from across the country.

Potential marrow donors of all ethnicities are needed, and must be 18 to 60 years old and in general good health. Joining the pool of potential donors requires a simple blood test to identify the donor's tissue type, which is then entered and maintained in the NMDP registry. Being registered does not obligate anyone to donate marrow; if a potential donor's tissue is matched to that of a patient, she or he will be contacted for additional tests and to make a final decision about whether to donate.

The drive will also help the City of Hope's ongoing need for blood and blood components such as platelets and white cells. To make an appointment to be tested for marrow donation and/or to donate blood, please contact Magnolia Ycasas at ext. 8095 or Magnolia.Ycasas@caltech.edu. For more information on marrow donation, visit www.cityofhope.org/bmtweb/trans_fset.htm.

The KamLAND experiment's triumph is that, for the first time, physicists can observe neutrino oscillations without making assumptions about the properties of the neutrinos' source. Because the nuclear plants have a precisely known amount of material generating the particles, it's much easier to determine with certainty whether the oscillations are real or not.

Actually, the plants' fission process differs from the sun's in that the nuclear byproduct includes antineutrinos—neutrinos' antimatter equivalent. But antimatter and matter are thought to be mirror images, so a study of nuclear antineutrinos should be exactly the same as a study of neutrinos.

"This is really a clear demonstration of neutrino disappearance," says McKeown. "Granted, the laboratory is pretty big—it's Japan—but at least the experiment doesn't require the observer to puzzle over the composition of astrophysical sources. This experiment allows us to study the neutrino in a controlled experiment."

McKeown's Caltech team includes senior researchers Petr Vogel and Glenn Horton-Smith. Other collaborators include Japan's Tohoku University; the University of Alabama; UC Berkeley and the Lawrence Berkeley National Laboratory; Drexel University; the University of Hawaii; the University of New Mexico; Louisiana State University; Stanford University; the University of Tennessee; Triangle Universities Nuclear Laboratory; and the Institute of High Energy Physics in Beijing. The project is supported in part by the U.S. Department of Energy.

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Editor: Daryn Kobata
(626) 395-6240; daryn@caltech.edu
Assistant Editor: Javier Marquez
(626) 395-6624; jmarquez@caltech.edu
Calendar Administrator: Debbie Bradbury
(626) 395-3630; debbieb@caltech.edu
Graphic Artist: Doug Cummings
Photographer: Bob Paz
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California Institute of Technology
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