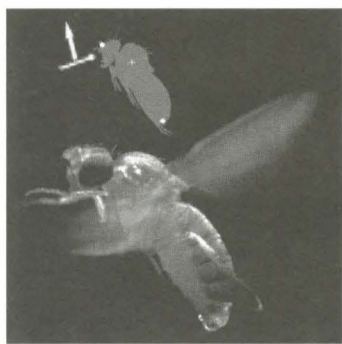


Caltech 336

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

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



Flight insights from flies

How does a fly fly and why should we care? To the first, says Michael Dickinson, professor of bioengineering at Caltech, the short answer is different from what we have thought. He and his colleagues used a dynamically scaled flapping robot (aka Robofly), a free-flight arena (Fly-O-Rama), and a 3-D, infrared visual flight simulator (Fly-O-Vision) to prove it.

And we should care, says Dickinson, because the simple motion of a fly flying links a series of fundamental and complex processes within the physical and biological sciences. Studying a fly may eventually lead to a model that will provide insight into the behavior and robustness of complex systems in general, and may help in the design of flying robots that mimic nature.

see Robofly, page 2

Seminar Day weekend packed with activity

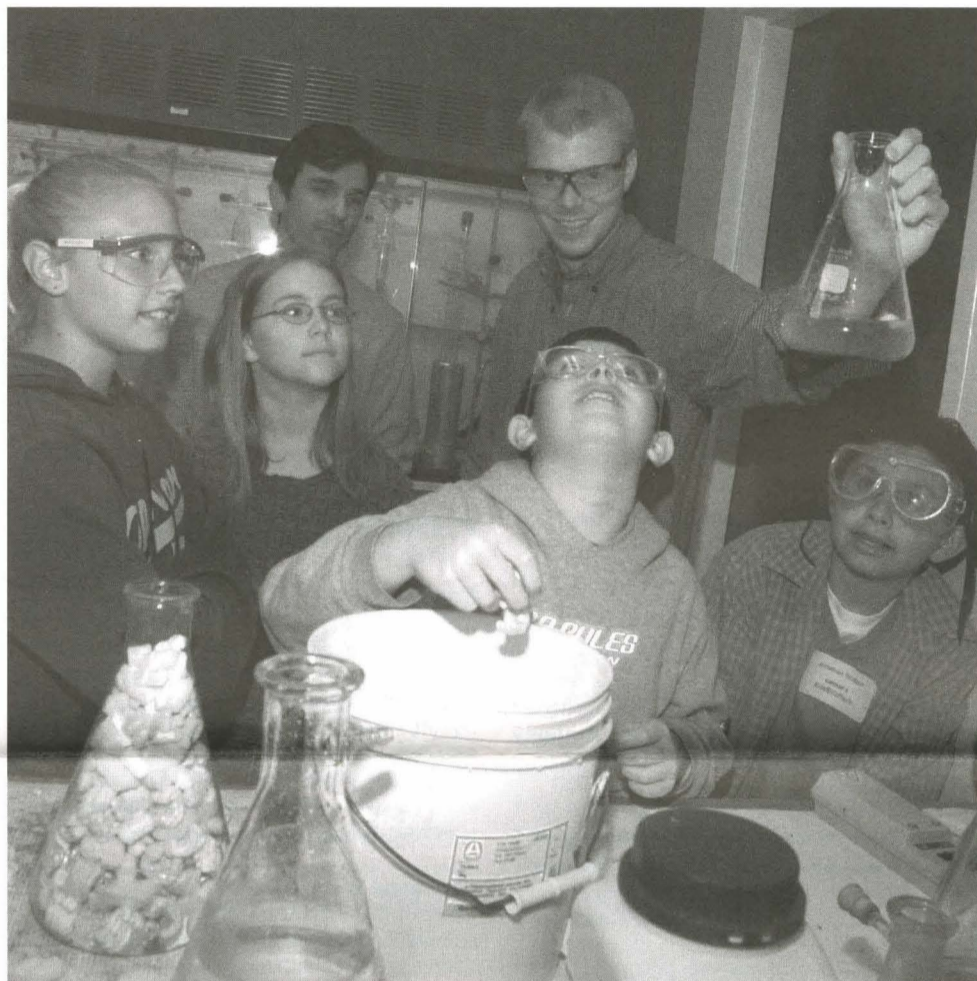
An eventful four days await Caltech graduates at the Alumni Reunion Weekend and 66th Annual Seminar Day. Taking place on Thursday, May 15, through Sunday, May 18, the class reunions and related activities include a myriad of academic lectures and presentations by faculty, researchers, and students, as well as social events.

Throughout the weekend, alums celebrating their first-year reunion and those from every fifth year (fifth through 65th year) can attend various tours and gatherings. A program listing all events and lecturers is available through the Caltech Alumni Association and at www.its.caltech.edu/~alumni/reunions.htm.

Seminar Day is scheduled for Saturday, May 17. Over the course of five sessions, Caltech faculty members and JPL researchers will expound on their latest research. Sprinkled among these seminars will be the Everhart Lecture Series, delivered by graduate students, and presentations by the winners of the undergraduate Perpall SURF Speaker Awards.

see Seminar Day, page 6

Soaking it all in



Kids visiting campus on Take Our Children to Work Day last Thursday toured the lab of Assistant Professor of Chemistry Jonas Peters (background, left). Grad student Seth Harkins (holding flask) had them stuff foam "peanuts" into flasks of water and of acetone, demonstrating the concept of solubility.

New structure to ease parking woes

Commuters rejoice! The Institute is gearing up for a new parking lot that will relieve significant congestion at Caltech's southwest corner. This improvement will provide spaces for hundreds of vehicles just a short walk from the buildings near California Boulevard. Perhaps the biggest advantage is that it will be all but invisible.

That's because the new parking structure will be placed under the existing north athletic field, which lies southeast of the Keith Spalding Building and is anchored by the Brown and Braun gyms.

"That corner has been the place with the tightest parking situation and the most congestion," says Gregg Henderson, chief of campus security and parking services, noting that the structure will hold up to 700 cars and will open in the summer of 2004.

It's common knowledge that finding parking at the corner of California Boulevard and Wilson Avenue is so tight because of the nearby offices and services. Throughout the day, people visit the post office and graphic arts facilities inside Keith Spalding, the two gyms nearby, the tennis courts, and the athletic field. After

see Parking, page 6

Rice University professor will discuss diversity

Richard Tapia, the Noah Hardiup Professor of Computational and Applied Mathematics at Rice University, will be the next speaker in the President's Lecture Series on Achieving Diversity in Science, Math, and Engineering. His free public lecture, "Post-Affirmative Action Challenges to Diversity in Higher Education," will take place Thursday, May 8, at 4 p.m. in Ramo Auditorium.

Internationally known for his research in the computational and mathematical sciences, Tapia is also a leading voice in the effort to increase educational opportunities for minorities and women in math, science, and engineering. The director of Rice's Center for Excellence and Equity in Education, he has helped the university gain national recognition for its educational outreach and has influenced hundreds of teachers through the center's Mathematical and Computational Sciences Awareness and GirlTECH programs.

Rice's computational and applied mathematics department has also become a national leader in producing female and underrepresented minority PhD graduates. Of the 37 PhD students Tapia has directed or codirected, 16 have

been women and 13 underrepresented minority students.

A Los Angeles native, Tapia earned his BA, MA, and PhD from UCLA, where he also served on the faculty, and taught at the University of Wisconsin before joining Rice in 1970. He served as department chair for five years and is also an adjunct faculty member at Baylor College of Medicine and the University of Houston. The author or coauthor of two books and more than 80 papers, he has addressed numerous national and international mathematical conferences and serves on several national advisory boards. He was the first Mexican American to be named to the National Academy of Engineering and has also received the Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring, the Lifetime Mentor Award from the American Association for the Advancement of Science, the Distinguished Scientist Award from the Society for the Advancement of Chicanos and Native Americans in Science, and the Reginald H. Jones Distinguished Service Award from the National Action Council for Minority Engineers.

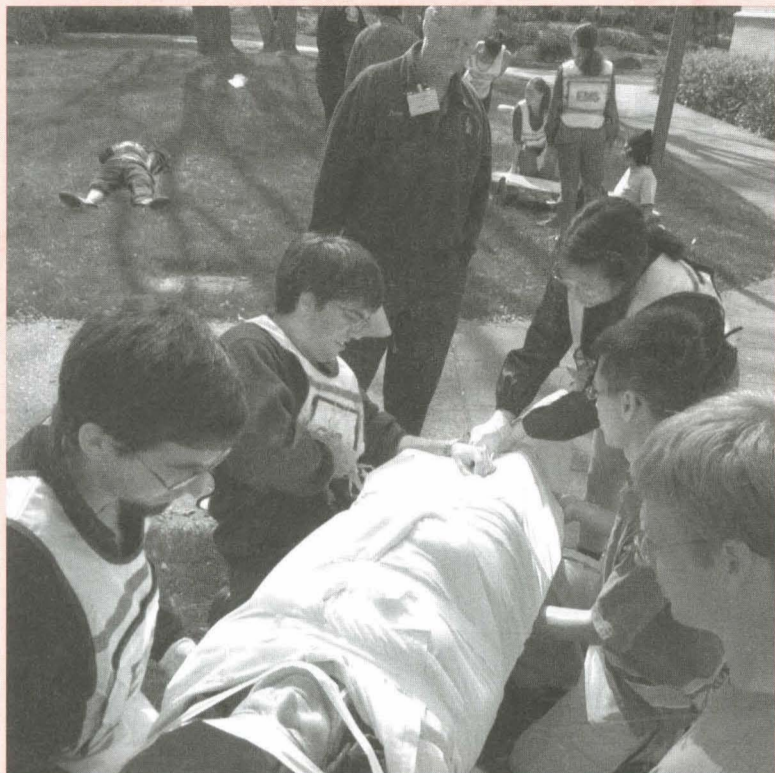
A call for viewpoints on diversity

Now that two years have passed since Caltech's first official statement on diversity was issued, the time has come for a review and to include broader input from the campus community, according to Sharyn Slavin Miller, assistant vice president for student affairs.

Noting that the Institute had not had a formal statement prior to March 2001, Slavin Miller says, "It was wonderful to have a statement that was endorsed by the administration, the Board of Trustees, and the faculty board, and it was a great beginning. But we've done a lot of work since then," she adds, referring to the efforts of ACODAMA (the Administrative Committee on Diversity and Minority Affairs), which provides oversight of campus initiatives and policies to increase diversity; the Diversity Progress Group, which focuses on strategic planning and the assessment of diversity programs; the Office of Minority Student Education; and Miriam Feldblum, special assistant to the president. "So it felt like the time was right to relook at the statement and also to make it a larger discussion on campus."

see Diversity, page 6

NewsBriefs



Local emergency personnel and students were among those taking part in Caltech's recent emergency drill simulating an earthquake situation. JPL emergency coordinator Eric Fuller watches as (from left) Lloyd House health advocates James Denny-Frank, Vicente Fernandez, and Greta Jo, and volunteers Grant Chang-Chien and John Howard treat an injured "victim," alum Trisha Sando.

Personals

Welcome to Caltech

March

Postdoctoral scholars **Sungsook Ahn**, in chemistry, **Marino Balaguer**, in aeronautics, **Anthony Bonetti**, in physics, and **Holly Carlisle**, in biology; **Marin Clark**, Texaco Prize Postdoctoral Scholar; postdoctoral scholars **Anne Dailly**, in materials science, and **Cheol-Sang Hwang**, in biology; **Fatemeh Jalayer**, George W. Housner Postdoctoral Scholar in Civil Engineering; postdoctoral scholars in biology **Igor Kagan** and **Jan Karbowski**; postdoctoral scholars in chemistry **Judy Kim** and **Baoyan Li**; postdoctoral scholars **Stefan Maier**, in applied physics, and **Christiane Meyers**, in chemistry; **Byung Mhin**, visitor in chemistry; **Conor Mow-Lowry**, student researcher in physics; postdoctoral scholars **Titus Neumann**, in bioengineering, and **Jason Rhodes**, in physics; **Izabela Sandu**, visitor in materials science; **Doron Shilo**, postdoctoral scholar in aeronautics; **Takahiro Tagami**, visitor in geochemistry; **Irene Arias Vicente**, postdoctoral scholar in aeronautics.

April

Youichi Aso, visitor in physics (Laser Interferometer Gravitational-Wave Observatory); **Sylvain Barbot**, visitor in geology; **YaBei Gu**, postdoctoral scholar in aeronautics; **Tracy Chanin**, senior administrative secretary, humanities and social sciences; postdoctoral scholars in chemistry **Anatoly Chlenov** and **Paula Diaconescu**; postdoctoral scholars in biology **Andrew Ewald** and **Yasuko Funabiki**; **Ellis Geoffrey**, postdoctoral scholar in chemistry; **Rajagopal Jayaraman**, network/software engineer, computer science; postdoctoral scholars **Jin Koda**, in physics, and **Adrian Lew**, in aeronautics; **Greg Mclvor**, student researcher in physics; **Teresa Ortiz**, dispatch officer, Campus Security and Parking Services; postdoctoral scholars **Sergey Polyakov**, in physics, and **Melissa Saenz**, in biology; **Thomas Schroder**, visitor in planetary science; **Naoki Seto**, postdoctoral scholar in astrophysics; **Valluvadasan Sivakumaran**, Caltech postdoctoral scholar in JPL's atmospheric chemistry research element; **Kalpesh Solanki**, associate applications developer, Seismological Laboratory; **Akiteru Takamori**, visitor in physics; **Michael Thomas**, computing analyst, high-energy physics.

New positions

Anne McMenamain, of Caltech's Development Office, has been named acting director of Gifts and Estate Planning (GEP). With more than 20 years experience in the areas of trusts and finance, she will lead the GEP program while a national search is conducted to find a new director.

Honors and awards

Anneila Sargent, professor of astronomy and director of both the Owens Valley Radio Observatory and the Interferometry Science Center, has been named to the United Kingdom's Particle Physics and Astronomy Research Council (PPARC). Sargent, who has been president of the American Astronomical Society and chair of NASA's Space Science Advisory Committee, is expected to provide an international perspective to PPARC. Her appointment is for four years.

Richmond Wolf, associate director of Caltech's Office of Technology Transfer, has been appointed to the Advisory Committee for the L.A. County Business Technology Center (BTC). The only U.S. high-tech business incubator owned and operated by a county agency, and considered California's largest incubator, the BTC is located two miles from JPL, on Lincoln Avenue in Altadena. It houses 26 early-stage and start-up technology firms with focuses ranging from software development to DNA chip architecture.

Caltech team named to hall of fame

Caltech's entire 1944 football team has been elected to the International Scholar-Athlete Hall of Fame, which is administered by the Institute for International Sport and located at the University of Rhode Island.

Established to "honor those individuals who exemplify the scholar-athlete ideal" and "foster and spread the scholar-athlete ideal globally," the hall of fame chooses inductees "based on their distinguished athletic, academic, and humanitarian achievements." Over 1,200 academicians, journalists, representatives of national Olympic organizations, and former athletes take part in the selection process.

Among other things, the induction committee said of the 1944 Caltech squad that it "embodies the excellence and integrity we seek in inductees. The committee was also very impressed with the way these men went on to lead their lives."

There will be an induction ceremony the weekend of June 21-22 in Rhode Island.

May is the month for music

Listen up, music lovers! This month is packed with opportunities to hear students perform melodious tunes. All events are free and open to the public.

Caltech's student chamber ensembles will hold their spring performances in Dabney Lounge beginning Friday, May 9, at 8 p.m. Highlights of the opening concert will be Ravel's *String Quartet*, a Saint-Saëns quartet for woodwinds and piano, and a Czerny trio for flute, cello, and piano. A Mother's Day concert will follow on Sunday, May 11, at 3:30 p.m., in which student musicians will pay tribute to their mothers with pieces by Haydn, Beethoven, Brahms, Clara Schumann, and Jacques Ibert.

Concluding the series will be concerts on Saturday, May 17, at 8 p.m. and Sunday, May 18, at 3:30 p.m. Chamber music director Delores Bing says, "Be prepared for anything from music for two pianos by Brahms, to music for three recorders by Corelli, to great music for most any other combination of strings, winds, and piano."

This year's Bandorama concert, presented by the Caltech-Occidental Concert Band and Caltech's Jazz Bands and Chamber Singers on Saturday, May 10, will feature works and solos by JPL staff member and Caltech alum (BS 1976, PhD 1980) Leslie Deutsch.

Deutsch, the chief engineer for JPL's Interplanetary Network Directorate, is an accomplished musician and composer. In addition to playing numerous keyboard, brass, woodwind, and percussion instruments, he has been Caltech's organist since his sophomore year, performing annually at commencement. The program will include Deutsch's *Fantasy and March for Three Trumpets* and *Theme and Perturbations*, performed by the Concert Band, as well as his *Prelude and Fugue in G Minor*, his *Suite 343*, and a choral piece, performed by the Monday Jazz Band, the Thursday Jazz Band, and the Chamber Singers, respectively.

Other numbers will be Count Basie's *Kid From Red Bank*, Mendelssohn's *Overture for Band*; von Suppé's *Jolly Robbers*, conducted by Professor Paul Asimow; and the *Star Wars Medley*, conducted by senior Chad Kishimoto. The program will begin at 8 p.m. in Beckman Auditorium.

Rounding up the spring music is the annual Caltech Glee Clubs and Caltech-Occidental Orchestra concert on Friday, May 16, at 8 p.m. in Ramo Auditorium. Opening the program, the orchestra and combined choruses, conducted by Allen Robert Gross, will present Ernest Bloch's *Avodath Hakodesh (Sacred Service)*, featuring Los Angeles Opera principal Ralph Wells as the Cantor. Gross describes Bloch's setting of the Jewish Shabbat morning service as "one of the most important and beautiful settings of that liturgy composed in the twentieth century." The orchestra will also perform Smetana's *The Moldau*, and the women's chorus, directed by Desiree Lavertu, will present Fauré's *Cantique de Jean Racine*. Concluding the concert, the men's chorus will premier director Donald Caldwell's *Dream on a Text by Whitman*, based on Whitman's poem "Song of the Universal."

This concert will also be held on Sunday, May 18, at 8 p.m. at the Pasadena Jewish Temple, 1434 North Altadena Drive; call (626) 798-1161 for more information. For information on the other performances, contact Caltech Public Events at 1 (888) 2CALTECH, (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).



Les Deutsch with Pope John Paul II at a 1997 symposium in Italy dedicated to Galileo. Deutsch gave a technical paper on communications and presented an organ concert of music from the astronomer's day, in the cathedral Galileo attended.

Robofly, from page 1

In a paper, "The Aerodynamics of Free-Flight Maneuvers in *Drosophila*," Steven Fry of the University of Zurich, Caltech research assistant Rosalyn Sayaman, and Dickinson show how fruit flies use their wings to generate enough torque to overcome inertia, not—as conventional wisdom has held—to overcome friction. The paper appeared in the April 18 issue of *Science*.

Flies are capable of making 90-degree turns, called saccades, in less than one 50-thousandth of a second. To make the turn, a fly must generate enough torque, or twisting force, to offset two forces working against it—the inertia of its own body and the viscous friction of air.

Until now, it's always been assumed that viscosity, or resistance to flow, is the enemy of small flying critters, while inertia is the bane of larger animals like birds. But the theory had never been tested.

To study the aerodynamics of active flight maneuvers, the researchers employed three infrared, high-speed video cameras (the 3-D Fly-O-Vision) to capture fruit flies, *Drosophila melanogaster*, performing saccades in free flight. The animals were released in a large enclosed arena (the Fly-O-Rama) and lured toward a cylinder laced with a drop of vinegar. As the flies approached the cylinder, it loomed within their field of view, triggering rapid turns that helped the flies avoid a collision.

The flies performed saccades within the intersecting fields of view of the three cameras, which allowed the researchers to film the turn, measure the wing and body positions, and calculate the velocity of the fly's path.

The 3-D video of these saccades showed that, despite the fly's size and slow speed, it typically performed a banked turn, first accelerating then slowing as it changed heading, then accelerating again at the end of the turn. This suggests that the timing and velocity of the fly's turn are dominated by body inertia and not friction.

To see if the measured patterns of wing motion were sufficient to explain the saccades, the researchers played the sequences through a robotic model (Robofly) to measure the aerodynamic forces over time. They found that the timing and torque calculations based on the videotaped fly's morphology and motion matched the calculations derived from the robot's wing motion. These results further support the notion that even in small insects the torques created by the wings act primarily to overcome inertia and not friction.

Although the experiments were performed on fruit flies, the importance of inertia over friction increases with an animal's size; thus, these forces impact nearly all insects. The results provide a basis for future research on the neural and mechanical basis of insect flight and, for roboticists, may offer insights into the design of biologically inspired flying devices.

May 5–11, 2003

M T W T F S S

Monday, May 5

Aeronautics Seminar

101 Guggenheim Lab, Lees-Kubota Lecture Hall, 1 p.m.—“Inertial Fusion Energy: Where It Came from and Where It Is Going,” Dr. Jill Dahlburg, General Atomics. Information: www.galcit.caltech.edu/seminars.shtml.

Astronomy Tea Talk

106 Robinson, 4 p.m.—Topic to be announced. Graham Smith, postdoctoral scholar in astronomy, Caltech. Information: www.astro.caltech.edu/~cc/tea_talks.

Bioengineering Seminar Series

142 Keck, 4 p.m.—Topic to be announced. Grant Jensen, assistant professor of biology, Caltech. Refreshments, Keck Labs lobby, 5 p.m.

Geological and Planetary Sciences Seminar

155 Arms, Robert Sharp Lecture Hall, 4 p.m.—“The Isotopic Ecology of Past and Present Marine Mammals on the Pacific Rim,” Paul L. Koch, associate professor of earth sciences, UC Santa Cruz. Information: www.gps.caltech.edu.

Information Sciences Seminar Series

070 Moore, 4 p.m.—Topic to be announced. Adam Bosworth, vice president of engineering, BEA Systems. Information: <http://netlab.caltech.edu/seminar>.

William Bennett Munro Memorial Seminar

25 Baxter, 4 p.m.—“A Glimpse of the ‘Secret Connection’: Harmonizing Mechanisms with Counterfactuals,” Professor Stathis Psillos, department of philosophy and history of science, University of Athens. Refreshments.

John D. Roberts Lecture

22 Gates Annex, 4 p.m.—“Olefin Polymerizations Catalyzed by Late Transition Metal Complexes,” Professor Maurice S. Brookhart, Kenan Professor of Chemistry, University of North Carolina, Chapel Hill. Refreshments.

Tuesday, May 6

Joint LIGO/Caltech-JPL Association for Gravitational-Wave Research Seminar Series

351 West Bridge, LIGO Science Conference Room, 11 a.m.—Topic to be announced. Albert Lazzarini, member of the professional staff, LIGO Laboratory, Caltech.

Institute for Quantum Information Seminar

74 Jorgensen, 3 p.m.—Topic to be announced. Ashish Thapliyal, UC Berkeley.

Ulric B. and Evelyn L. Bray Seminar

25 Baxter, 4 p.m.—“Democratically Elected Aristocracies,” Uzi Segal, professor of economics, Boston College. Refreshments. (Coauthored with David Heyd, professor of philosophy, Hebrew University of Jerusalem.)

Carnegie Observatories Colloquium Series

William T. Golden Auditorium, 813 Santa Barbara Street, 4 p.m.—“Lyman Alpha Forest Clustering,” Scott Burles, assistant professor of physics, MIT. Refreshments, 3:30 p.m.

Wednesday, May 7

Astronomy Colloquium

155 Arms, Robert Sharp Lecture Hall, 4 p.m.—“Supernovae, Protoneutron Star Winds, and the Origin of the Heavy Elements,” Dr. Todd Thompson, department of astronomy, UC Berkeley. Information: www.astro.caltech.edu/~gma/colloquia.html.

2003 Arnold O. Beckman Lecture

22 Gates Annex, 4 p.m.—“Diversity-Oriented Synthesis and Chemical Genetics,” Professor Stuart L. Schreiber, department of chemistry, Harvard University. Refreshments.

Information Sciences Seminar Series

070 Moore, 4 p.m.—Topic to be announced. Vinod Sharma, professor, electrical communication engineering, Indian Institute of Science, Bangalore. Information: <http://netlab.caltech.edu/seminar>.

Applied and Computational Mathematics Colloquium

101 Guggenheim Lab, Lees-Kubota Lecture Hall, 4:15 p.m.—“Inverse, Shifted Inverse, and Rayleigh Quotient Iteration as Newton’s Method,” Richard Tapia, associate director of graduate studies, department of computational and applied mathematics, Rice University. Refreshments, 3:45 p.m. Information: www.acm.caltech.edu/colloq.shtml.

Earnest C. Watson Lecture Series

Beckman Auditorium, 8 p.m.—“All the Faults in the World: The Cutting Edge of Tectonics,” Brian Wernicke, Chandler Family Professor of Geology, Caltech. Admission is free.

Thursday, May 8

Thesis Seminar

151 Crellin, 2 p.m.—“Detection of DNA by Sequence-Specific Fluorescent Polyamides,” Victor Rucker, graduate student in chemistry, Caltech.

Biophysics Lecture Series

153 Noyes, Sturdivant Lecture Hall, 4 p.m.—“The Effect of Force on Thermodynamics and Kinetics of Reactions: Unfolding Single RNA Molecules,” Professor Ignacio Tinoco, chemistry department, UC Berkeley. Refreshments, 3:45 p.m.

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

Ramo Auditorium, 4 p.m.—“Post-Affirmative Action Challenges to Diversity in Higher Education,” Richard A. Tapia, Noah Harding Professor of Computational and Applied Mathematics, associate director of graduate studies, and director of the Center for Excellence and Equity in Education, Rice University. The lecture series was established to bring to campus speakers who have had highly successful experiences in promoting women and underrepresented minorities in science and technology.

Geoclub Seminar

151 Arms, Buwalda Room, 4 p.m.—Topic to be announced. Paul Wennberg, professor of atmospheric chemistry and environmental engineering science, Caltech.

Physics Research Conference

201 E. Bridge, 4 p.m.—“Voyager’s Race to Interstellar Space,” Edward Stone, Morrisroe Professor of Physics, 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.—“Congestion and Cost Allocation,” Yan Chen, associate professor, School of Information, University of Michigan, Ann Arbor. Refreshments.

Von Karman Lecture Series

JPL, von Karman Auditorium, 7 p.m.—“Challenges in Mobility and Robotics for In Situ Science,” Brian Wilcox, manager, Solar System Exploration Mobility Technology Program, JPL. Admission is free. Information: www.jpl.nasa.gov/lecture.

Friday, May 9

Thesis Seminar

74 Jorgensen, 9 a.m.—“Discrete Exterior Calculus,” Anil Hirani, graduate student in computer science, Caltech.

Fluid Mechanics Seminar

101 Guggenheim Lab, Lees-Kubota Lecture Hall, 3 p.m.—Topic to be announced. Jeffrey Jacobs, associate professor, department of aerospace and mechanical engineering, University of Arizona. Information: www.galcit.caltech.edu/Seminars/Fluids/CurrentFluids/index.html.

Inorganic-Organometallics Seminar

151 Crellin, 4 p.m.—“Investigating Terminal Ruthenium Carbidos and Fast-Initiating Metathesis Catalysts,” Andrew Hejl, graduate student in chemistry, Caltech.

Kellogg Seminar

Lauritsen Library, 4 p.m.—“Many-Body Pion and Nucleon Interactions on the Lattice,” Dean Lee, assistant professor, department of physics, North Carolina State University.

Von Karman Lecture Series

Pasadena City College, 1570 E. Colorado, the Vosloh Forum (south of Colorado on Bonnie), 7 p.m.—“Challenges in Mobility and Robotics for In Situ Science,” Brian Wilcox, manager, Solar System Exploration Mobility Technology Program, JPL. Admission is free. Information: www.jpl.nasa.gov/lecture.

Swiss Film Series: A Koller Retrospective

Baxter Lecture Hall, 7:45 p.m.—Xavier Koller’s *The Frozen Heart*, 1979; with English subtitles.

Saturday, May 10

Caltech/MIT Enterprise Forum Spotlight Series Program

Beckman Institute auditorium, 7:45 a.m. to 12:30 p.m.—Corporate Formation and Tax Workshop. Additional details and registration information to be announced.

May 12–18, 2003

M T W T F S S

Monday, May 12

Aeronautics Seminar

101 Guggenheim Lab, Lees-Kubota Lecture Hall, 1 p.m.—“Making Data Make Sense: Accessing and Visualizing Very Large Data Sets,” Dr. Dan Katz, JPL. Information: www.galcit.caltech.edu/seminars.shtml.

Astronomy Tea Talk

106 Robinson, 4 p.m.—“Galaxy Clustering and the Galaxy Power Spectrum in the SDSS,” Michael Blanton, research scientist, physics department, New York University. Information: www.astro.caltech.edu/~cc/tea_talks.

Ulric B. and Evelyn L. Bray Seminar

25 Baxter, 4 p.m.—Topic to be announced, Professor Bhaskar Dutta, economics department, University of Warwick. Refreshments.

Geological and Planetary Sciences Seminar

155 Arms, Robert Sharp Lecture Hall, 4 p.m.—“Intersonic Shear Ruptures and the Story of the Square Root of Two Times the S-Wave Speed,” Ares J. Rosakis, professor of aeronautics and mechanical engineering, Caltech. Information: www.gps.caltech.edu.

Inorganic-Electrochemistry Seminar

147 Noyes, Sturdivant Lecture Hall, 4 p.m.—“Designing Photoactive Two-Electron Reagents,” William Connick, assistant professor, department of chemistry, University of Cincinnati.

Applied and Computational Mathematics Colloquium

101 Guggenheim Lab, Lees-Kubota Lecture Hall, 4:15 p.m.—“Convergence of Approximations to Linearized and Adjoint Equations in the Presence of Shocks,” Mike Giles, professor of computational fluid dynamics, Computing Laboratory, Oxford University. Refreshments, 3:45 p.m. Information: www.acm.caltech.edu/colloq.shtml.

Tuesday, May 13

LIGO Science Seminar

351 West Bridge, LIGO Science Conference Room, 11 a.m.—Topic to be announced. LIGO Science Seminar, Laura Cardonati, MIT/LIGO.

Caltech Library System Presents: Physical Property Data Searching

Sherman Fairchild Library, multimedia conference room, noon—Learn about searching for physical property data in both print and online resources. Approximately one hour of formal instruction, immediately followed by optional hands-on practice. Registration: <http://library.caltech.edu/learning/form.htm>.

Mechanical Engineering Seminar

206 Thomas, 3 p.m.—“Mechanics and Friction at the Nanometer Scale: New Insights via Scanning Probe Microscopy,” Professor Rob Carpick, department of engineering physics, University of Wisconsin–Madison.

Ulric B. and Evelyn L. Bray Seminar

25 Baxter, 4 p.m.—“A Foundation of Location Theory: Existence of Equilibrium, the Welfare Theorems and Core” (joint work with Karl Dunz, American University in Paris), Marcus Berliant, visiting associate in economics, Caltech. Refreshments.

Carnegie Observatories Colloquium Series

William T. Golden Auditorium, 813 Santa Barbara Street, 4 p.m.—“Galactic Winds,” Professor Crystal Martin, department of physics, UC Santa Barbara. Refreshments, 3:30 p.m.

Chemical Physics Seminar

147 Noyes, Sturdivant Lecture Hall, 4 p.m.—Topic to be announced. Dr. Sotiris S. Xantheas, chief scientist, Pacific Northwest National Laboratory.

Wednesday, May 14

Thesis Seminar

151 Crellin, 2 p.m.—“Ancillary Ligand Effects in Niobocene Olefin Hydride Complexes and Hydrocarbon Oxidation by Palladium (II) Complexes,” Lily J. Ackerman, graduate student in chemistry, Caltech.

Astronomy Colloquium

155 Arms, Robert Sharp Lecture Hall, 4 p.m.—Topic to be announced. Professor Jill Bechtold, department of astronomy, University of Arizona. Information: www.astro.caltech.edu/~gma/colloquia.html.

Environmental Science and Engineering Seminar

142 Keck, 4 p.m.—“The Stratosphere: Does It Influence Surface Climate?” R. Alan Plumb, professor of meteorology, department of earth, atmospheric, and planetary sciences, MIT. Refreshments, Keck Labs lobby, 3:40 p.m.

Information Sciences Seminar Series

070 Moore, 4 p.m.—Topic to be announced. Professor Fernando Paganini, electrical engineering department, UCLA. Information: <http://netlab.caltech.edu/seminar>.

Thursday, May 15

Center for Neuromorphic Systems Engineering's Ninth Annual Industry Day

Beckman Institute auditorium, 8 a.m. to 6 p.m.—The day's theme is “Awareness and Learning in Machines.” The plenary lecture will be presented by Mark Tilden of Hasbro Toys. Additional topics include human-machine interfaces, sensing and behavior, neuroprosthetics, and control systems. A panel discussion on applications using neuromorphic engineering will include panelists from leading industrial organizations. Registration and information: 395-2246, doris@erc.caltech.edu, or www.cnse.caltech.edu/Industry/Conferences/2003/AIC/index.html.

Caltech Library System Presents: Copyright for Researchers in Academia

Sherman Fairchild Library, multimedia conference room, 2 p.m.—Rights and responsibilities under copyright law will be discussed by Kimberly Douglas, acting director of the Caltech Library System, and attorney Peggy Luh, Caltech's Office of the General Counsel. Information and registration: <http://library.caltech.edu/learning/form.htm>. Open to Caltech community members only.

Chemical Engineering Seminar

106 Spalding Lab, Hartley Memorial Seminar Room, 4 p.m.—“Biomaterials and Biocompatibility: Past, Present, and Future,” Professor Buddy D. Ratner, bioengineering and chemical engineering, University of Washington. Refreshments, 113 Spalding Lab, 3:30 p.m. Information: www.che.caltech.edu/calendar/seminars.html.

Geoclub Seminar Series

151 Arms, Buwalda Room, 4 p.m.—“Fire Effects on Surface Energy Balance in Alaska: Feedbacks to Regional Climate,” Heping Liu, postdoctoral scholar in geochemistry, Caltech.

Physics Research Conference

201 E. Bridge, 4 p.m.—“Optical Wave Phenomena in Photonic Crystals: From Theory to Practice,” Amnon Yariv, Summerfield Professor of Applied Physics, Caltech. Refreshments, 114 E. Bridge, 3:45 p.m. Information: www.pma.caltech.edu/~physcoll/PhysColl.html.

Science, Ethics, and Public Policy Seminar

125 Baxter, 4 p.m.—“The Fearless Vampire Conservator: Philip Kitcher, Genetic Determinism and the Informational Gene,” Professor Paul Griffiths, history and philosophy of science, University of Pittsburgh. Refreshments.

Friday, May 16

Fluid Mechanics Seminar

101 Guggenheim Lab, Lees-Kubota Lecture Hall, 3 p.m.—“Tidal Conversion,” Stefan Smith, department of mechanical and aerospace engineering, UC San Diego. Information: www.galcit.caltech.edu/Seminars/Fluids/CurrentFluids/index.html.

Inorganic-Organometallics Seminar

151 Crellin, 4 p.m.—“The Synthesis and Oxidation Chemistry of Platinum(II) Alkyl and Olefin Complexes,” David Weinberg, graduate student in chemistry, Caltech.

JPL opens its doors once again

The Jet Propulsion Laboratory has resumed its popular annual open house, and this year invites the public to visit on Saturday and Sunday, May 17 and 18, from 9 a.m. to 5 p.m. The event will celebrate the Lab's accomplishments with exhibits and demonstrations about its ongoing research, and scientists and engineers will be on hand to answer questions on the what, where, why, and how of space exploration: new technologies, solar system exploration, spacecraft communication, and much more. Special hands-on activities for kids will be available, along with food and beverages, space souvenirs, and NASA and JPL merchandise. Parking and admission are free. For more information, call (818) 354-0112 or visit www.jpl.nasa.gov/pso/oh.html.

CampusEvents

Monday, May 5

Child Educational Center Summer Camp Sign-Up

Enrollment is open through June 20 for the CEC's Summer Camp Program for children completing kindergarten through 6th grade. Caltech and JPL families have priority enrollment. Information: (818) 354-3418 or www.ceconline.org.

NEURO: An Art and Science Collaboration
NEURO is a display of works by six contemporary artists who drew on the technology resources of Caltech and the knowledge of the Center for Neuromorphic Systems Engineering (CNSE) scientists. The works will be on display through Sunday, June 29, in the Athenaeum lobby and at the Art Center College of Design's Williamson Gallery. CNSE and the Williamson Gallery are cosponsors. Admission is free. Information: www.artandscience.us.

Ceroc Dance Lessons

Winnett Lounge, 7:30 p.m.—Ceroc is a hip, international dance club sensation. The 10-week series began March 31. No experience is required. Fee: \$1; free for freshmen, first-year graduate students, and those taking the class for PE credit.

Tuesday, May 6

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. Registration: 395-3420 or wenyee@caltech.edu. Fee: \$100. 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.

Intermediate Jazz Dance Class

Braun Gym, multipurpose room, 9:30 p.m.—Intermediate jazz dance, taught by a professional instructor. Open to everyone with a valid gym membership. No special clothing or shoes are required. The trial class costs \$5; fee for the full term is \$30 for Caltech students, \$40 for non-students. Sponsored by the GSC, ASCIT, and the Alumni Fund.

Wednesday, May 7

Introduction to Flash

NewMedia Classroom, 363 S. Hill Avenue, 10 a.m.—Flash is used to enhance presentations and websites. Attendees of this introductory workshop will come away with an understanding of time-based motion graphics, will see how objects work on a timeline, and get an introduction to scripts. Reservations: 395-3420 or wenyee@caltech.edu. Information: <http://muri.caltech.edu/nmc/html/02handson.htm>. **This class will be repeated at noon.**

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.

Caltech Management Association

JPL, von Karman Auditorium, 4:45 to 6 p.m.—"Echoes of the Ancient Skies: The Astronomy of Lost Civilizations," Dr. E. C. Krupp, astronomer and director, Griffith Observatory. Admission is free and open to all JPL/campus personnel and retirees.

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. The series began April 9.

Dance Team Fox-Trot Classes

Winnett Lounge, 9:30 p.m.—Five weeks of fox-trot, taught by a professional instructor. No experience is required. The series began April 9.

Hip-Hop Dance Class for Advanced Beginners

Braun Gym, multipurpose room, 9:30 p.m.—This hip-hop class offers beginners a more challenging experience. Open to everyone with a valid gym membership. No special clothing or shoes are required. The trial class costs \$5; fee for the full term is \$30 for Caltech students and \$40 for nonstudents. Sponsored by the GSC, ASCIT, and the Alumni Fund.

Thursday, May 8

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>.

Friday, May 9

Caltech Tai Chi Club

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

Caltech Student Chamber Ensembles

Dabney Lounge, 8 p.m.—The program will include trios by Beethoven and Czerny, a quartet for winds and piano by Saint-Saëns, piano duets, and Ravel's String Quartet. A reception will follow the concert. Admission is free.

Saturday, May 10

CNSE/CSEM High School Open House

106 Spalding Lab, Hartley Memorial Seminar Room, 8 a.m. to 5 p.m.—This day-long open house is for high school sophomores and juniors, their science teachers, and parents. They will learn about the college admissions process, hear presentations by Caltech faculty, meet Caltech students, tour the Center for Neuromorphic Systems Engineering (CNSE) and Center for the Science and Engineering of Materials (CSEM) labs, and participate in hands-on activities. Parental permission forms must be completed by May 1. Information: www.cnse.caltech.edu/Education/open-house.

May Day Celebration

The Beckman Institute's west lawn (in front of Broad and the Beckman Institute), 8 a.m. to 6 p.m.—The Caltech Medieval and Renaissance Society invites one and all to its annual May Day celebration. Three types of fighting tournaments will run all day, and a traditional Maypole dance will take place in the afternoon. Bring a chair, a drinking vessel, and sunscreen. Wear comfortable shoes, and clothing suitable for a Renaissance Faire.

Intermediate Ballet Class

Braun Gym, multipurpose room, 1 p.m.—Free class taught by experienced members of the Caltech Dance Troupe. No special clothing or shoes are required.

Bandorama: Caltech Concert and Jazz Bands

Beckman Auditorium, 8 p.m.—This year's annual Bandorama concert, presented by the Caltech Occidental Concert Band, the two Caltech Jazz Bands, and the Caltech Chamber Singers, will feature the musical talents of Dr. Leslie Deutsch. Admission is free. For complete program information, go to <http://events.caltech.edu/events/event-303.html>.

Folk Music Society Presents: Sparky and Rhonda Rucker

Dabney Lounge, 8 p.m.—The Ruckers' repertoire includes railroad songs, Appalachian music, old-time blues, slave songs, gospel, work songs, ballads, and original compositions. 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.

Sunday, May 11

Mother's Day Chamber Music Concert

Dabney Lounge, 3:30 p.m.—The program will include trios by Haydn, Beethoven, Brahms, Clara Schumann, and Ibert, as well as a quartet by Mozart. A reception will follow the concert. Admission is free.

Monday, May 12

Ceroc Dance Lessons

Winnett Lounge, 7:30 p.m.—Ceroc is a hip, international dance club sensation. The 10-week series began March 31. No experience is required. Fee: \$1; free for freshmen, first-year graduate students, and those taking the class for PE credit.

Tuesday, May 13

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.

Self-Defense: Travel-Safety Workshop

Caltech Women's Center, noon—This class is designed to help travelers recognize safe and unsafe traveling habits and behaviors, while also providing some self-defense tactics. Registration: emery@studaff.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.—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.

Intermediate Jazz Dance Class

Braun Gym, multipurpose room, 9:30 p.m.—Intermediate jazz dance, taught by a professional instructor. Open to everyone with a valid gym membership. No special clothing or shoes are required. The trial class costs \$5; fee for the full term is \$30 for Caltech students, \$40 for non-students. Sponsored by the GSC, ASCIT, and the Alumni Fund.

Wednesday, May 14

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.

Reel Women Film Series: *Minerva's Machine*

Center for Student Services, noon—The film celebrates the history of women in computing and profiles successful women in the field today. 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.

Watch Your Back! Safety Training

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

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. The series began April 9.

Dance Team Quickstep Classes

Winnett Lounge, 9:30 p.m.—Four weeks of quickstep, taught by a professional instructor. No experience is required. Fee not determined at this time. Sponsored by the Ballroom Dance Club.

Hip-Hop Dance Class for Advanced Beginners

Braun Gym, multipurpose room, 9:30 p.m.—This hip-hop class offers beginners a more challenging experience. Open to everyone with a valid gym membership. No special clothing or shoes are required. The trial class costs \$5; fee for the full term is \$30 for Caltech students and \$40 for nonstudents. Sponsored by the GSC, ASCIT, and the Alumni Fund.

Thursday, May 15

Preparing for Emergencies: What Every Citizen Needs to Know

Beckman Auditorium, 6 p.m.—Learn from the experts about disaster preparedness. There will be displays and resources, panel presentations, and a Q & A session. The keynote speaker will be Dr. Fadi Essmaeel, Risk, Emergency and Disaster Information Services (REDIS). Kent Shocknek, of KCBS Channel 2 News, will be the program moderator. Sponsored by the Pasadena Police Foundation and supported by Caltech and the *Pasadena Star-News*.

Friday, May 16

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 safety.training@caltech.edu to reserve a place.

Caltech Tai Chi Club

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

Caltech Glee Clubs Spring Concert

Ramo Auditorium, 8 p.m.—The annual spring concert features the Caltech Glee Clubs and the Caltech Occidental Orchestra. The program will include works by Ernest Bloch, Smetana, Fauré, and Donald Caldwell. The concert will be repeated on Sunday, May 18, at 8 p.m. at the Pasadena Jewish Temple, 1434 North Altadena Drive. For information on Sunday's concert, call 798-1161.

Saturday, May 17

JPL Open House

4800 Oak Grove Drive, Pasadena, 8 a.m. to 5 p.m.—This popular, free event provides an opportunity for the public to visit the Laboratory and learn about its latest projects.

Intermediate Ballet Class

Braun Gym, multipurpose room, 1 p.m.—Free class taught by experienced members of the Caltech Dance Troupe. No special clothing or shoes are required.

Caltech Student Chamber Ensembles

Dabney Lounge, 8 p.m.—Students will present three major works on this program: compositions for two pianos by Brahms and Corigliano, and Schubert's Quintet in C Major for two violins, viola, and two celli. A reception will follow the concert. Admission is free.

Sunday, May 18

JPL Open House

4800 Oak Grove Drive, Pasadena, 8 a.m. to 5 p.m.—This popular, free event provides an opportunity for the public to visit the Laboratory and learn about its latest projects.

Caltech Student Chamber Ensembles

Dabney Lounge, 3:30 p.m.—In their final concert of the spring series, Caltech chamber music students will present a variety of music for recorders, woodwinds, strings, and piano by Badings, Boccherini, Dvorák, Brahms, Schumann, and Khachaturian. A reception will follow the concert. Admission is free.

Amnesty International Book Discussion Group

Vroman's Bookstore, 695 E. Colorado Boulevard, 2nd floor, 6:30 p.m.—This month we discuss *The Aquariums of Pyongyang: Ten Years in the North Korean Gulag*, by Kang Chol Hwan. All are welcome. Registered members of the group can buy the book at a discount from Vroman's. Sponsored by Caltech/Pasadena AI Group 22. Visit Group 22 at www.its.caltech.edu/~aigp22.

Seminar Day, from page 1

The day will include the presentation of the Distinguished Alumni Awards, beginning at 11 a.m. in Beckman Auditorium. Initiated for Caltech's 75th anniversary in 1966, the award recognizes extraordinary achievement in business, community, and professional life and is the highest honor that the Institute bestows on its graduates.

This year's Distinguished Alumni Awards recipients are Fernando Corbató (BS '50, physics), professor emeritus in the department of electrical engineering and computer science at MIT; James Edward Gunn (PhD '66, astronomy and physics), Higgins Professor of Astronomy at Princeton University Observatory; Michael Hunkapiller (PhD '74, chemistry), senior vice president of Applera Corporation and president of Applied Biosystems Group; Alan Lightman (MS '73, PhD '74, physics), MIT professor and novelist; and Michael Malin (PhD '76, planetary science and geology), president and chief scientist of Malin Space Science Systems, Inc.

The awards presentation will be followed by an address by Ed Stone, Morrisroe Professor of Physics and a former JPL director, who will discuss "Voyager's Search for the Edge of Interstellar Space."

The Alumni Reunion Weekend will be enhanced by special events, including the daylong 9th Annual Industry Day at the Center for Neuromorphic Systems Engineering on Thursday, May 15, in Beckman Institute auditorium. The theme is Machine Awareness and Learning; speakers will make presentations on such subjects as human-machine interfaces and neuroprosthetics, among others.

All alumni are invited to a spring concert on Friday, May 16, at 8 p.m. Caltech's Glee Clubs will be joined by the Caltech Occidental Symphony Orchestra in Ramo Auditorium.

A brunch for alumni, hosted by the Caltech Y, will take place on Sunday, May 18, from 11 a.m. to 1 p.m. in the Center for Student Services, 414 South Holliston Avenue.

During their visit to their alma mater, alumni will be able to enjoy a 10 percent discount on all Caltech insignia merchandise at the bookstore, which will be open on Seminar Day from 11 a.m. to 6 p.m.

Reservations for the Alumni Reunion Weekend must be received by Monday, May 5; walk-in registration will be available, for Seminar Day only, on Saturday, May 17. For further details, contact the Alumni Association at (626) 395-8364, 395-8366, or reunions@alumni.caltech.edu.

Caltech experts featured on PBS series

A new PBS television series has begun airing that will include a number of Caltech scholars as panelists, engaging in conversation on various topics in scientific research, philosophy, and creativity.

Closer to Truth: Science, Meaning and the Future is coproduced by Caltech's Bruce Murray, professor of planetary science and geology, emeritus, and a former director of JPL. Among the many guests, including scientists, novelists, philosophers, and other experts, will be Erin Schuman, executive officer for neurobiology and associate professor of biology, in the episode "How Does the Autistic Brain Work?"; Roger Blandford, Tolman Professor of Theoretical Astrophysics, and David Goodstein, vice provost and professor of physics and applied physics, in "How Weird is the Cosmos?"; Alice Huang, senior councilor for external relations and faculty associate in biology, in "Microbes—Friend or Foe?"; and David Baltimore, president and professor of biology, and Murray

Gell-Mann, Millikan Professor of Theoretical Physics, Emeritus, in "How Does Order Arise in the Universe?"

Other segments will include "How Does Basic Science Defend America?", with Steven Koonin, provost and professor of theoretical physics, and adviser to the federal government on civilian biodefense; "Is Consciousness Definable?", featuring Christof Koch, executive officer for computation and neural systems and Troendle Professor of Cognitive and Behavioral Biology; and "Is the Universe Full of Life?", with Bruce Murray and Shri Kulkarni, MacArthur Professor of Astronomy and Planetary Science.

In the Los Angeles area, the series airs Mondays at 10 p.m. on KLCS, channel 58, and in Huntington Beach on KOCE, channel 50, Wednesdays at 10 p.m. and Sundays at 5:30 p.m. More stations will be included in the coming months. For additional information, visit www.pbs.org/kcet/closetotruth.

Parking, from page 1

the occasional earthquake, the area near the Seismology Lab teems with television vans. Compounding that situation, the city has permanently designated the west side of Wilson Avenue for Polytechnic High School use, making that side of the street off-limits to Caltech personnel.

"The new parking structure will alleviate a lot of the parking crush we have on the south end of campus," says Al Horvath, vice president for business and finance. He estimates the cost for the two-story structure at about \$17 million. "The money comes from a bond issue the Institute did this past December," he says.

"The athletic field will be replaced," he says, adding that the grassy meadow's notorious drainage problems will be corrected. Once completed, the only sign that the lot is there will be the ramp leading down to it from California Boulevard.

Athletics and Physical Plant have been working together to mitigate any inconveniences that may arise during construction, set to begin in late summer.

The north athletic field is used for games and practice by Caltech's intercollegiate baseball and soccer teams and by extracurricular teams and classes, says Mark Harriman, associate athletic director.

"One of the things that has to take place is renovating the track and the field inside of it," he says of the field located south of Braun Gym. "Part of that renovation plan will allow for an intercollegiate soccer field to be placed inside the track for practice and games." The athletics department is investigating the possibility of using area

baseball diamonds for the team to practice on and for nonconference baseball games.

The parking lot is being built in preparation for the future astrophysics laboratory, to be situated on the site of the parking lot between the Keith Spalding Building and the tennis courts. The lab, Horvath pointed out, is one of the capital campaign's priorities.

During the parking structure's construction, the Institute will also begin a new phase of the cogeneration plant's ongoing renovation with the installation of an underground thermal-energy storage facility. This facility will also be located under the new athletic field.

Diversity, from page 1

April White, director of consulting services at the Staff and Faculty Consultation Center and facilitator of the Diversity Progress Group, agrees that input from all sectors of the Caltech community will be vital. "In expanding the scope of the statement, we want to have a process that includes perspectives from the entire community," she says.

That process includes a series of campuswide focus groups, which will meet during the month of May. Students, faculty, postdocs, and staff who are interested in discussing diversity issues may join either a general focus group or a specialized one: undergraduate men; graduate men; undergraduate and graduate women; multicultural students (African American, Latino, Native American, Pacific Islander, and international); Asian American; international; or lesbian, gay, bisexual, and transgender community members.

Facilitating the discussion groups will be Diversity Statement Subcommittee members Rachel Deco, Tony Nannini, and Cristina Thomas, undergraduate students; Bill Deverell, associate professor of history; Parandeh Kia, associate dean of graduate studies and director of International Student Programs; Erica O'Neal, associate dean and director of Minority Student Education; Candace Rypisi, Women's Center director; Joann Stock, professor of geology and geophysics; and Darryl Yong, von Kármán Instructor in Applied and Computational Mathematics.

To join a focus group, contact Malina Chang at ext. 6352 or machang@caltech.edu by Tuesday, May 6, and indicate your interest in a specialized or a general group. The current Diversity Statement for Caltech and other information can be viewed online at <http://diversity.caltech.edu>.

Celebrating culture and the earth

Undergraduate Serina Diniaga performed a traditional Hawaiian dance at the annual International Week culture show last Friday.



At Caltech's recent Earth Day event, Lucie Spencer, associate director of the Alumni Fund, volunteered for Fauna Outreach, a local animal welfare agency begun by two Caltech graduates.

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

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

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Published by the Office of Public Relations

California Institute of Technology
Pasadena, California 91125

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