

News Briefs 2	Sister's passion for education . . 3
Special Events Calendar 2	Asteroids named for NEAT team . . 4
Asrar praises Lab's efforts 2	Passings, Letters 4
Service awards 2	Classifieds 4

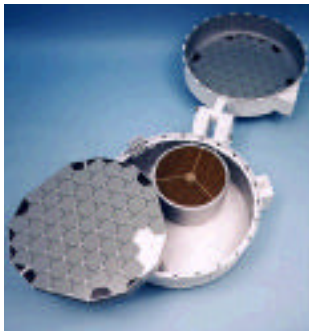
Genesis arrives at KSC

Spacecraft that will capture solar wind will launch July 30

By Martha Heil

Right: Workers off-load the Genesis spacecraft as it arrived at Kennedy Space Center's Shuttle Landing Facility at 3:30 a.m. Eastern time on May 31.

Below: The Genesis science canister. Inside the lid and on a rotating arm are arrays of hexagonal wafers into which solar wind particles will embed.



SOLAR SYSTEM



JPL'S GENESIS SPACECRAFT, to be launched aboard a Boeing Delta II vehicle on July 30, arrived May 31 at Florida's Kennedy Space Center from Denver aboard a U.S. Air Force C-17 aircraft.

Genesis will capture a piece of the Sun—a sample of the ions and elements in the solar wind—and bring the samples back to Earth so that scientists can study the exact composition of the Sun and probe the solar system's origin. By studying the solar wind, scientists will find clues to the formation of the solar system as we know it today. JPL manages the Genesis mission for NASA and the spacecraft was built by Lockheed Martin Astronautics, Denver.

In 2004, Genesis' samples will return to Earth in a spectacular helicopter capture. As the sample return capsule parachutes to the ground in Utah's Air Force Test and Training Range, specially trained helicopter pilots will catch it. The samples will then be analyzed to provide a "Rosetta Stone" of solar material for comparing the Sun's original ingredients to those of the planets and other solar system bodies. Information on the mission is available online at <http://genesismission.jpl.nasa.gov>.

The spacecraft will be processed for launch in Kennedy Space Center's Payload Hazardous Servicing Facility. Processing will begin with a functional test, an electrical systems test of the

spacecraft and deployment of the solar arrays. A test on June 7 will verify the spacecraft's communications systems and radio links to NASA's Deep Space Network space telecommunications system. Science instrument operations tests are scheduled June 11, and on June 12 the solar arrays will be cleaned and stowed for launch.

Genesis will be mated to a Star 37 upper stage booster on July 17 before being transported to Space Launch Complex 17 the following day. Once mated to the Delta II, a spacecraft functional test will be performed. The payload fairing is to be installed around Genesis on July 25. Stacking of the Boeing Delta 7326 launch vehicle at Pad 17-A is scheduled to begin on June 12. Launch is scheduled for July 30 at 9:36 a.m. Pacific time.

Genesis is part of NASA's Discovery Program of competitively selected, low-cost solar system exploration missions with highly focused science goals. Chester Sasaki of JPL is project manager, and Dr. Donald Burnett of Caltech is the principal investigator.

Deep Impact approved for development

By Martha Heil

JPL's Deep Impact mission, the first mission to ever attempt to impact a comet nucleus in order to answer basic questions about the nature of comets, has successfully completed its preliminary design phase and has been approved by NASA to begin full-scale development for a launch in January 2004.

"The Deep Impact mission follows the great tradition of other Discovery missions like Mars Pathfinder and the Near Earth Asteroid Rendezvous," said JPL's Brian Muirhead, the Deep Impact project manager. "The project team at JPL, Ball Aerospace and the University of Maryland are very excited and fully prepared to implement this technically challenging and scientifically unique mission."

The Deep Impact team of scientists, engineers and mission designers, from JPL, the University of Maryland, and Ball Aerospace and Technologies Corp., have been working for more than 18 months designing the mission, the dual spacecraft and three science instruments. The encounter with Comet Tempel 1 on July 4, 2005 will reveal clues to the origin of comets and the composition and structure of perhaps the most mysterious objects in our solar system.

Now the Deep Impact team is completing the final design details and will begin building the mission's two spacecraft: a flyby spacecraft and a 771-pound (350-kilogram) impactor spacecraft. They will be launched together in early 2004 and travel to Comet Tempel 1's orbit, where they will separate and operate independently. The flyby spacecraft will release the impactor into the comet's path, then watch from a safe distance as the impactor guides itself to collide with the comet, making a football field-sized crater in the comet's nucleus.

"This is a major milestone for us," said Michael A'Hearn of the University of Maryland, the principal investigator and mission director. "We have now shown NASA that we have a viable design for the spacecraft and the mission to carry out a truly rare, large-scale experiment on another body of the solar system."

As the gases and ice inside the comet are exposed and expelled outward by the impact, the flyby spacecraft will take pictures and measure the composition of the outflowing gas. The images and data will be transmitted to Earth as quickly as possible. Many observatories on Earth should be able to see the comet dramatically brighten just after the impact.

Scientists refer to comets as time capsules that hold clues about the formation and evolution of the solar system. Comets are composed of ice and dust, the primitive debris from the solar system's earliest and coldest formation period, 4.5 billion years ago. They would also like to learn much more about a comet's composition, structure and how its interior is different from its surface.

Discovered in 1867, Comet Tempel 1 orbits the sun every 5.5 years. It has made many passages through the inner solar system, making it a good target to study evolutionary change in the mantle, or outer crust, of a comet.

TECHNOLOGY

JPL software that thinks for itself and makes decisions without help from ground controllers will fly as the brains of triplet satellites in 2002.

The software builds on previous efforts to use artificial intelligence to control a spacecraft (such as JPL's Remote Agent experiment, which controlled the Deep Space 1 spacecraft during portions of several days in 1999). However, this new software uses more advanced technology to respond more quickly to events and will command a mission continuously for a period of approximately three months.

The Continuous Activity Scheduling, Planning Execution and Replanning (CASPER) software will guide a constellation of three identical miniature satellites, each weighing less than 15 kilograms (33 pounds). The three satellites will be launched from the space shuttle in a stack configuration and fly in formation as part of the Three Corner Sat mission, a joint project of Arizona State University, the University of Colorado, New Mexico State University, the Air Force Office of Scientific Research and NASA.

The mission goal is to demonstrate stereo imaging, formation flying, and innovative operations and commanding.

"The onboard software performs the decision-

making function for the spacecraft," said Dr. Steve Chien, principal scientist and lead researcher in automated planning and scheduling technologies at JPL. "Like a brain that uses inputs from the eyes and ears to make decisions, this software uses data from spacecraft sensors, such as cameras, to make decisions on how to carry out the mission.

"Low-quality science images or short-lived phenomenon could be discarded to free up space for newer science images," Chien said. "The onboard sensors and software might detect a volcanic eruption or solar flare might trigger science imaging."

The decision-making capability of the software is being considered for a wide range of NASA applications, including automated ground communications stations, planetary rovers and robot aircraft. Software with similar capabilities has been used by commercial companies for managing the distribution networks for groceries and other retail goods and for controlling the production of computers, automobiles, semiconductor chips, and consumer goods.

For more information, log on to <http://casper.jpl.nasa.gov>.

Artificial intelligence will command mission next year

By Carolina Martinez

News Briefs



A student from the Colorado School for the Deaf and Blind examines images from "Touch the Universe," a book that includes images from the Hubble Space Telescope.

Book helps the blind to touch the stars

Students who are visually impaired now have a unique opportunity to touch the stars and experience some of NASA's spectacular discoveries.

Majestic space images from the Hubble Space Telescope, including those taken by the JPL-developed and built Wide Field and Planetary Camera 2, are part of a new Braille book that combines tactile illustrations with striking images of planets, star clusters and nebulae.

The book, "Touch the Universe: A NASA Braille Book of Astronomy," is the brainchild of Bernhard Beck-Winchatz, an astronomer and faculty member at DePaul University, Chicago.

Teaming up with astronomer and author Noreen Grice of Boston, Beck-Winchatz developed the book with a \$10,000 Hubble Space Telescope grant for education programs. In 1999, Grice published "Touch The Stars," a book with touchable pictures based on drawings of constellations, comets, galaxies and other astronomical objects.

To allow both blind and sighted readers to enjoy the Hubble images in "Touch the Universe," Grice developed clear tactile overlays for each image. The overlays were sent to Benning Wentworth, a science teacher and astronomy enthusiast at the Colorado School for the Deaf and the Blind in Colorado Springs. His students evaluated each image for clarity and provided important suggestions for needed changes.

The book is for middle- and high-school students and adults alike, with and without sight. The book will sell for slightly above production cost so earnings can offset future updates and production of a second edition. The project received grants for education from NASA's Office of Space Science.

Photos of students from the Colorado School for the Deaf and Blind examining images from "Touch the Universe" are available at <http://analyz-er.depaul.edu/ttu>.

Lab contractor wins quality award

JPL contractor Raytheon ISSS has received the 2001 George M. Low Award, NASA's premier quality and productivity award for the aerospace industry. This annual award program recognizes NASA large and small businesses that demonstrate an exceptional level of quality and technical performance in NASA-related contracts

or subcontracts.

Raytheon ISSS, which was also nominated by NASA's Goddard Space Flight Center and the Ames Research Center, received the award in the large business-service category. In the past three years, the company has signed contract work orders with JPL worth \$40 million.

Another JPL-nominated contractor, Composite Optics Inc., received a finalist plaque in the small business-service category. In the past three years, the company has completed more than 70 contract work orders.

JPL contract technical managers provide nominations for the Low Award. Among the factors considered for the award are customer satisfaction and contract technical performance; schedule and cost performance; leadership and continuous improvement; and innovative management and/or technology breakthroughs.

The awards were presented last month at NASA's Continual Improvement and Reinvention Conference on Quality Management in Virginia.

Art competition winners selected

Winning entries for the 2001 Director's Art Competition are now on display on the ninth floor of Building 180.

The selected artwork has also been posted on the Director's home page at <http://ood>. Under "Information of General Interest," select "Director's Art Competition 2001."

Wine-tasting benefit set for June 23

The Child Educational Center's annual wine-tasting benefit will be held June 23 from 6:30 to 11 p.m. at Caltech's Avery House.

All proceeds from the evening will benefit the nonprofit CEC, which has been providing child care and educational outreach services to the JPL and Caltech communities—and to the general public—since 1979.

Wines, food, auction items, gaming and live music by the Chad Edwards Quartet will be featured. Tickets are available at the ERC and the CEC office, 140 Foothill Blvd., La Cañada (adjacent to La Cañada High School), at \$30; 10 tastes of premium wines will be served at a special Connoisseur table, for which tickets are \$60.

For more information, call the CEC at ext. 4-3418.



In an address to JPL staff last week, Dr. Ghassem Asrar, NASA's associate administrator for the Office of Earth Science, praised the Lab for its accomplishments in Earth science during his three-year tenure and pledged an exciting future of continuing research.

Asrar told a von Karman Auditorium audience of JPL's recent successes for the agency's Earth Science Enterprise. Included were:

The QuikScat satellite the Lab built with Goddard Space Flight Center; the Multi-Imaging Spectro-Radiometer (MISR) and Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) instruments onboard the Terra satellite; the Active Cavity Irradiance Monitor Satellite (ACRIMSAT); the Shuttle Radar Topography Mission (SRTM); and the New Millennium Program Earth Observer-1, partnered with Goddard.

JPL Earth science missions launching later this year, he noted, are Jason, a follow-on mission to TOPEX/Poseidon that will monitor global ocean circulation that launches in August; and The Gravity Recovery and Climate Experiment (GRACE), a joint U.S.- German mission to measure the components of Earth's static and dynamic gravity field, which launches in November.

Asrar said the Earth Science Enterprise has recently published a new strategic plan and research strategy for the next decade and beyond, which includes the following questions as its centerpiece:

- How is the global Earth system changing?
- What are the primary causes of change in the Earth system?
- How does the Earth system respond to natural and human-induced changes?
- What are the consequences of change in the Earth system for human civilization?
- How well can we predict future changes in the Earth system?

"We are well on our way in charting the course for Earth System Science for the next decade," he said. "And JPL's role in this great endeavor is a crucial one."

"JPL is also on the leading edge of geological and geophysical science," he added, "providing us with the world's first capability to do for the solid Earth what we are now doing for climate system research."

Complete text of Asrar's talk is available in PDF format at <http://www.jpl.nasa.gov/dailyplanet>.

Special Events Calendar

Ongoing Support Groups

Alcoholics Anonymous—Meetings are available. Call the Employee Assistance Program at ext. 4-3680 for time and location.

Codependents Anonymous—Meeting at noon every Wednesday. Call Occupational Health Services at ext. 4-3319.

End of Life Issues and Bereavement—Meets the second Monday of the month at noon. For location, call the Employee Assistance Program at ext. 4-3680.

Gay, Lesbian and Bisexual Support Group—Meets the first and third Fridays of the month at noon in Building 125-133. Call the Employee Assistance Program at ext. 4-3680 or Randy Herrera at ext. 3-0664.

Parent Support Group—Meets the third Thursday of the month at noon. For location, call the Employee Assistance Program at ext. 4-3680.

Senior Caregivers Support Group—Meets the first Tuesday of the month. For time and location, call the Employee Assistance Program at ext. 4-3680.

Friday, June 8—
Sunday, June 10

Six Characters in Search of an Author—Theater Arts at Caltech will present its final performances of the Pirandello play in Ramo Auditorium at 8 p.m. on Friday and Saturday, 2 p.m. on Sunday. Tickets are \$15. Call (626) 395-4652.

Saturday, June 9

Theater Auditions—JPL employees, retirees and family members are invited to audition at 1:30 p.m. in Caltech's Ramo Auditorium for the Theater Arts at Caltech production of *The Notebook of Trigorin* by Tennessee Williams. The play will be performed during fall term on three consecutive weekends beginning Nov. 3. Log on to www.its.caltech.edu/~tacit for related information.

Sunday, June 10

Skeptics Society Lecture—Dr. Michael Shermer will present "The Borderlands of Science: Where Sense Meets Nonsense" at 2 p.m. in Caltech's Baxter Lecture Hall. Donations: \$5 for members, \$8 for nonmembers.

Monday, June 11

American Heritage Week—The annual festivities, featuring a variety of music, dancing, guest speakers and international foods, get underway today and continue through Thursday, June 14.

Tuesday, June 12

JPL Stamp Club—Meeting at noon in Building 183-328.

Tues., June 12—Wed., June 13

Investment Advice—TIAA/CREF will hold one-on-one counseling sessions.

For an appointment, call (877) 209-3140, ext. 2614.

Wednesday, June 13

Fidelity Investment Review—Roland Jacobson, Fidelity vice president of investment consulting, will present economic and current market overviews, and discuss historical Fidelity mutual fund performance, from 2 to 4 p.m. in von Kármán Auditorium.

JPL Amateur Radio Club—Meeting at noon in Building 238-543.

JPL Toastmasters Club—Meeting at 5:30 p.m. in the Building 167 conference room. Guests welcome. Call Jim Raney at ext. 4-6301.

Thursday, June 14

TIAA/CREF Enrollment—This monthly meeting, held at noon in T1720-137, will assist employees who are newly eligible for Caltech/JPL retirement plan participation in selecting investment options and completing enrollment forms.

Tuesday, June 19

JPL Hiking+ Club—Meeting at noon in Building 303-209.

Wednesday, June 20

Investment Advice—Fidelity will hold one-on-one counseling sessions. For an appointment, call (800) 642-7131.

Thursday, June 21

Von Kármán Lecture Series—"From Galileo to Gossamer: 400 Years of Telescope Technology" will be presented by Art Chmielewski, manager of JPL's Large Telescope Concepts Office, and Mark Dragovan, JPL research scientist, at 7 p.m. in von Kármán Auditorium. Open to the public. A live Webcast of the lecture will also be presented; for details, log on to <http://www.jpl.nasa.gov/lecture/webcast/jun01w.html>

Friday, June 22

Von Kármán Lecture Series—"From Galileo to Gossamer: 400 Years of Telescope Technology" will be presented by Art Chmielewski, manager of JPL's Large Telescope Concepts Office, and Mark Dragovan, JPL research scientist, at 7 p.m. in The Forum at Pasadena City College, 1570 E. Colorado Blvd. Open to the public.

Monday, June 25

Caltech Ballroom Dance Club—The first in an eight-week series of Salsa lessons will be offered from 7:30 to 9 p.m. in Dabney Lounge. The professionally taught lessons cost \$8 each or \$56 for all eight. No partner is required. Refreshments and a half-hour practice period will follow each class. For more information, contact Megan Knight at knight@its.caltech.edu.

Earth science leader praises Lab's efforts



Dr. Ghassem Asrar

Service awards

The following JPL employees were recently honored for completing 20 or more years of service during the first quarter of fiscal year 2001.

45 years: Melvin Guenat.

40 years: Herbert Blackhall, Michael Carney, James Conel, Kathleen Myers.

35 years: Olen Adams, Ralph Bartera, Thomas Duxbury, John Hardy, William Kloezeman, M.L. MacMedan, Marie Petrie.

30 years: James Alexander, Margery Fea, Raymond Frauenholz, Donna Hofmann, Laura Hollis, William Irace, Gerhard Klose, Paul Koskela, Barry Levitt, Francis Mathur, Sharon Pasos, Elena Pestano, David Quinn, Moktar Salama.

25 years: Sandra Bedrossian, Richard Benson, Jeffrey Cornish, Michael Girard, Charles Greenhall, Ming-Taun Leu, Eleanor Manning,

Merle McKenzie, Ronald Schaifer, Joseph Toczylowski, Donald Yoemans.

20 years: James Border, Margaret Borzage, Robert Brooks, Lamont Burgess, Kumar Chandra, Stephen Dawson, David Diner, Richard Doyle, Mark Gatti, Susan Gilbert-Hagood, Johanna Gunn, Charles Keith, Shankar Keni, Gail Klein, William Kleinschmidt, Jack Mallory, Jacob Matijevic, Iain McDermid, Ronald Morillo, Patrick Murphy, David Nichols, Hope Norton, Alfred Pappano, Thomas Runge, Jennifer Schlickbernd, Linda Scott, Roy Scrivner, George Shultz, Steven Wells.

Editor's note: the May 25 issue of Universe inadvertently published a list of employees who were honored for completing 20 or more years of service during the second quarter. Only the first-quarter recipients listed above have thus far attended a luncheon reception honoring them for their years of service.



A SISTER'S PASSION for EDUCATION

By Angela McGahan

For those who ponder the convergence of science and religion, there is Sister Clarice Lolich, a Dominican nun in the Community of the Holy Spirit, a space-science education specialist, and a retired NASA consultant.

Since 1989 Lolich has been using her time one week a month at JPL, offering the special "Sister Clarice" tours of the Lab to school children. For 11 years she has led groups of local elementary school kids on a space odyssey through the Lab. Recently Lolich announced that she is retiring from her JPL duties to be closer to her San Mateo home, and to work on a new outreach and education program idea that she has conceived at NASA Ames.

On this day, Lolich is in JPL's 167 Café, talking to a room full of fourth-graders. She is telling them all about the space shuttle and its components. She has them repeat after her that the space shuttle "takes off like a rocket, travels like a spaceship, and lands like an airplane." The children are mesmerized by her energy and her simple explanations. Next she hands out graph paper, and has the children follow simple instructions on placing X's and O's in designated squares. At the end of the experiment every fourth-grader has a picture of the orbiter, complete with external tank and booster rockets. Next stop: the Space Flight Operations Facility, where they will find out about how the Deep Space Network operates, and why it is so important.

Born in San Francisco, Lolich entered the convent of the Dominican Sisters at Mission San Jose, has two master's degrees and a doctorate in humanistic psychology. She was called "the quintessential post-Vatican II nun" by a journalist referring to the changes in the Catholic church brought about in the late 1960s, after Pope John's modernization efforts. Soon after the pope's announcement, differences of perspective developed in her community. Lolich was one of 14 Sisters who formed a new sisterly order, the Community of the Holy Spirit, in 1970.

"The new sisterly order meant that we had to find jobs," she said. "I started in the science business many years ago as a science teacher in the elementary and secondary schools with my Dominican community, and building on that experience, I became director of education for the California Museum of Science and Industry, now named California Science Center." In short order, she was organizing educational tours to Florida to see the launches of Apollo and Skylab missions. Her passion for education—particularly science and the study of space—took her all over the country as part of NASA's effort to disseminate the results of its space exploration as widely as possible. NASA provided Lolich with a van, and she drove around the country visiting various school districts, as part of the Urban Community Enrichment Program. Lolich was bringing the excitement and wonder of space exploration to inner-city schools. All the while, Lolich says that she has tried to relate the spiritual into everything she teaches, because "one of the definitions of prayer is the lifting up of mind and spirit. That is the reason for my being here."

In her lifetime of teaching science, and seeking to bring the wonder and opportunity of learning to people in various walks of life, Lolich has traveled the world and earned many awards. She

has been named Aerospace Education's Teacher Educator of the Year by

the American Society for Aerospace Education; earned the Special Recognition Award from NASA's Urban Community Enrichment Program; was given the Aviation Educator of the Year Award by the California Association of Aeronautics Educators; and received NASA's Lifetime Achievement Award from the Aerospace Education Services Program. Last but not least, the Commonwealth of Kentucky commissioned her Honorable Kentucky Colonel. She has traveled to war-torn Bosnia and helped bring some sanity to children not able to go to school, living in refugee camps. She has been to Antarctica, and is looking forward to her trip in July to Tex Mallaqia, in Puebla, Mexico, where she will teach 60 children for two weeks about planets, math, and science. She says the most important part of her teaching is "the hands-on experiences."

The breadth of Lolich's experiences indicates that she loves to try new things. For her 75th birthday she went bungee jumping, and on her 80th birthday she jumped out of an airplane. Lolich is not deterred by her age; in fact her retirement is part-time. "I intend to continue my work with NASA Ames, bringing educational outreach programs to people who cannot visit a NASA center, such as retirement-home residents, residential facilities for the handicapped, jails and homes for juvenile offenders. I will also assist in training docents at NASA Ames," she said. She emphasizes that bilingual education students need a specific outreach effort directed specifically for them. "I want people to recognize that life is full of opportunities, and that there are many options in life." Lolich does not fully discount the possibility of returning to JPL, perhaps in a limited capacity.

Back at JPL's Space Flight Operations Facility, Lolich motions to a 10-year-old boy swiveling impatiently in a squeaky chair. "Come, stand here," she says, and places him next to the giant poster of the planets. "You are the Cassini spacecraft. You are sending information you have gathered about Jupiter to the Deep Space Network on Earth." The boy motions with his hands as if handing over imaginary packages into the darkened room. Sister Clarice then picks three girls, and positions them some feet away, standing back-to-back, with elbows interlocked. "You are Spain, you are Australia, and you are California," she says, touching each girl on top of her head. "Now spin slowly, and call out your name when you pass by the spacecraft." The girls wobble along, and call out "Spain ... Australia ... California ... Spain ..." "Good," she says. She motions to another boy. "Come stand here. You are JPL, and you are receiving the information from the three satellite dishes, and making it useful for everyone to learn what the Cassini spacecraft has learned about Jupiter." The children act out their parts, and suddenly a room full of fourth-graders understands the Deep Space Network and its importance.

At the end of the tour the children shout a resounding "Thank you!" to Lolich—undoubtedly a refrain of the thousands who have visited the Lab in years past and have enjoyed the wonders of science and space exploration because of her passion and dedication.



Tom Wynne / JPL Photo Lab

Sister Clarice Lolich celebrated her 80th birthday by skydiving (above). At JPL, she shows a visiting student how the Deep Space Network works.

Lolich says that she has tried to relate the spiritual into everything she teaches, because "one of the definitions of prayer is the lifting up of mind and spirit. That is the reason for my being here."

Asteroids named for NEAT researchers

NEAT team members, from left: Erik Hovland, Dr. Larry Scherr, George Frascchetti, Jeff Schroeder, Tom Bickler, Dr. Matt Klimesh and Dr. Steven Pravdo, project manager.

Seven members of JPL's Near Earth Asteroid Tracking (NEAT) team have been honored for their work by having asteroids named after them.

NEAT Project Manager Dr. Steven Pravdo led a ceremony honoring:

- Jeff Schroeder, who has contributed to the mechanical design and fabrication of all the NEAT cameras, starting with the 1995 NEAT/Ground-based Electro-Optical Deep Space Surveillance (GEODSS) camera on Haleakala, Maui, Hawaii, and concluding with the 2001 NEAT/Oschin camera.



- Thomas Bickler, who is responsible for the NEAT camera electronics, having worked extensively with CCD camera electronics systems.
- Steve LaBrecque, who was responsible for the successful installation and operations of the NEAT/Maui Space Surveillance Site camera in 2000.
- Lawrence Scherr, an optical engineer and lens designer, who designed the optics for the NEAT/Oschin instrument.
- Erik Hovland, a JPL computer programmer who developed the NEAT operations software when it changed telescopes to the Maui Space Surveillance Site 1.2m on Maui, and has helped deploy the first phase of the Keck Interferometer.
- George Frascchetti, a technical advisor and contributor to the NEAT instruments.
- Matthew Klimesh, who developed the efficient data compressor for archiving the voluminous NEAT data.

NEAT is a cooperative effort between NASA/JPL and the U.S. Air Force. It is designed to complete a comprehensive search of the sky for near-Earth asteroids and comets. The NEAT system is mounted on the Maui Space Surveillance Site 1.2-meter (4-foot) telescope.

Passings

ARVOL METZINGER, 68, a retired electrician on Section 645, died of cancer May 2 at his home in Washington state.

Metzinger joined the Lab in 1950 and retired in 1989. He is survived by his wife, Ruth, nine children, four grandchildren and one great grandchild. Services were private.

HENRY ROBINSON, 84, a retired receiving and shipping clerk, died of Alzheimer's disease May 7 at his home in Glendora.

Robinson worked at JPL from 1967-83. He is survived by his wife, Alyce, son Theodore, daughter Beverly Woodcox, two grandchildren and two great grandchildren.

Services were held May 11 at Forest Lawn Memorial Park in Glendale.

JAMES McCaul, 66, a retired machinist, died May 26 after a brief illness.

McCaul worked at the Lab for 43 years, retiring in 1997. He is survived by his wife, Renate, and daughters Helen and Carol.

Letters

On behalf of my family and myself, I would like to thank the ERC for the lovely plant on the passing of my mother. I wish to thank Section 331 for their support and sympathy cards and flowers for the memorial service.

Mardy Wilkins

We would like to thank the MER Project for their prayers, cards, expression of sympathies, meals, and flowers upon the death of Cece's father. Thanks also to the ERC for the beautiful plant. Your thoughtfulness was a great comfort during our time of grief.

Cece Guiar and Jeff Mellstrom

My wife and I would like to thank ERC for the lovely sympathy flower sent to our home following the passing of my 96-year-old father.

Kermit Pederson

Classifieds

For Sale

BIKE, mountain, 21 spd., Shimano equipped, 24" frame, nearly new, used little, cost \$135 new, sacrifice \$85/obo; CHAIR, black leather, high back office style, \$20; FOUNTAIN, fiberglass, mountain-look, approx. 30" H x 34" W, w/pump, \$55. 661/297-0219.

CAMERA, 35mm SLR, Pentax Super ME, 28mm, 50mm and 200mm lenses, flashes, auto winder and filters, exc. cond., \$250. 626/793-7879.

CD JEWEL CASES, 50, \$10; DIET TAPES, Jenny Craig, set of 14, \$50; COMPUTER PWR. CONT. CTR., 5 pwr. switches + 1 master sw., 5 surge-protected outlets + 2 modem/fax/phone jacks, new, \$20; ORGAN, Yamaha 415, electronic console w/13 pedals, 3 keybds, 144 rhythm patterns, pd. \$7,500, sacrfc. for \$3,000. 790-3899.

CHINA CABINET, 1950s Drexel mahogany, e-mail lelson@altavista.com for photo, \$800, cash and carry. 353-9367.

DINING SET, table & chairs, less than a year old, great cond., Asian beechwood, mission-style, solid, dark stained wood; includes long table, 4 chairs, and one bench, \$950; REFRIGERATOR, good cond., white, top/bottom 2-door style, \$300. 626/432-6852.

DOG, 8-month-old girl Boxer to good home, cute, very smart, ears & tail cropped, up to date on all shots, vg w/children, best offer. 353-9859.

DRAFTING TABLE, professional tilt-top, 38 x 72, with Vemco drafting machine, \$200. 626/395-3533.

GARAGE SALE: 50 years' accumulation; machinery, instruments, lenses, vacuum system parts, you name it; Friday, Saturday, Sunday, June 8, 9,10, 8 am.-4 p.m., 317 San Juan Way, La Canada.

GPS, Garmin GPS III, moving and display, exc. cond., \$200. 626/793-7879.

LUGGAGE, pilot case on wheels, lots of compartments, great for student or professional, \$35; RING/EARRING SET, woman's 10K diamond and Ceylon blue-color lab-created sapphire, diamond and created ring, retail val. \$100/\$125, sell for \$75/ea. 362-3358, Valerie.

MISC: home furnishings: stereo syst. and black lacquer TV cabinet; cardioglide; pictures; curtains; rugs; bedding; pillows; clothes; interior door, nice, like new; baby car seats. 626/398-1988.

MOVING SALE: bedspread & 3 pillow shams, custom-made for qn. bed with rust/apricot blue flowers on linen-background fabric, \$95; vertical blinds, 104" W x 84" tall, never used (in box), white vinyl \$49; rocking chair, lightweight cherry-finish wood, \$39; small doghouse, free. 790-4719, Ann.

PRINTER, color inkjet, Compaq IJ1200, brand new, box unopened, 2400 x 1200 res., \$100, \$40 less than retail. 353-4400, Brian.

SCUBA GEAR, tank, BCD, used once, regulator, the works, woman's wet suit, all exc. cond., prices negotiable. 957-3296.

SKATES, inline, Rollerblade Lightning TRS, woman's size 8, exc. cond., hardly used, \$75/obo. 952-8803, Carol.

SOFA, slip-covered, exc. cond., oatmeal color background with pale pink roses, 2 cushions, 4 pillows, \$125. 626/794-8720, Andy or Lisa.

SOFA/CHAIR SET, Frieze, exc. cond., contemporary print on black background, \$175; SEWING MACHINE, Brothers Professional, exc. cond., to make and repair boat sails, heavy sewing, \$295. 661/259-3858.

STORAGE BUILDINGS, two, 8' x 16', wood frame, sliding, portable, on skids, \$995/ea. 562/699-8687.

SWIMMING POOL LADDER, stainless steel, \$15. 626/794-2431.

TABLE, candlestick, Ethan Allen, 14", \$25; FOOT STOOLS, stack, Ethan Allen, \$25. 626/797-5387.

TABLE/CHAIRS, 42", round, smoke glass, on metal base with 4 blue cloth chairs, good condition, Monrovia area, \$60. 626/357-6155.

TYPEWRITER, IBM Selectric III, exc. cond., w/cover, access. incl., \$50 firm. 626/284-9664.

WET SUIT, men's large size, jacket and Farmer John pants, Body Glove, \$20/ea; SWIM FINS, heavy duty, \$15. 626/794-2431.

'86 CADILLAC Seville, exc. body, silver-gray, exc. cond., 59K mi., \$3,800. 248-4637.

'86 CHEVROLET S-10 Blazer 4 x 4, 129,000 mi., 1 owner, a/c, power windows, locks and steering, trailing hook up, roof rack, tilt steering, cruise control, runs good, everything working, good tires, \$2,800. 661/513-9079.

DASH COVER, black, for Honda Civic, '95, car cover, compact sedan \$25/ea; 2 WHEELS, '95 Honda Civic, 175 70R13, \$40. 362-3358, Valerie.

'99 FORD Explorer XLS, 4 x 4, 4 dr., vg cond., auto trans., 5 spd. w/OD, pwr. steering/doors/windows, dark blue, 33K mi., trailer hitch, 2" front/rear load leveler, 5 Goodrich all-terrain LT tires, steel wheels, a/c, am/fm/CD, roof rack, tilt wheel, cruise cont., anti-theft keyless entry, tint windows, running boards, front/side air bags, ABS, in warranty, \$23,000. 626/355-9707.

'96 FORD Explorer XLT, auto, front/rear a/c, leather, all electric, pwr. windows/doors/locks/seats, cruise cont., 6 cyl., 48K mi., alloy whls, loaded, exc. cond., \$14,500. 310/451-5919.

'94 FORD Explorer Sport, 5 spd., 4 W/D, 96K mi., black, gray leather, all power, 10-disk CD, alarm, alloy wheels, 5 new tires, \$7,000/obo. 323/655-5864.

'89 FORD Ranger XLT King Cab, w/camper shell, carpet kit, V6, 2.9L eng., a/c, pwr. steering/windows/doors, tow pkg., am/fm/cass, c.c., tilt wheel, exc. cond., 80K mi., \$4,300/obo. 626/791-7645.

'67 FORD Mustang, 390, 4 spd., S code, new paint, new interior, original LA model, 80% restored, runs great, \$9,000/obo. 626/339-9353, Greg.

'00 HONDA Civic Si, completely stock, ready to modify, blk. rear wing, LoJack, weather tech, cargo mat, 7,400 mi., mint, \$20,400. 661/255-5645.

'92 HONDA Accord EX, 2 dr., 5 spd., owned since 1993, 92 M, alarm, rose wood, air bag, moon roof, ABS, runs good, very clean in and out, \$6,250. 957-3033.

'88 HONDA Accord, blue, 4 door sedan, 5-sp.

manual trans., 1 non-smoking owner, service records, very clean, 65,500 mi., am/fm cass., a/c, power steering, tilt wheel, new front brakes, \$3,400. 790-4719, 6-9 p.m., Ann.

'86 HONDA Accord LXI, 1 owner, new interior, upgraded audio, \$2,850/obo. 957-5382.

LUGGAGE CARRIERS, Sears, rooftop; fiberglass, \$50; soft, new, \$20. 626/797-6982.

'95 NISSAN 240 SX SE, 5 spd., CD, pwr. windows/locks, \$9,000. 661/267-0000, Chuck.

'88 SAAB 900, turbo, convertible, in perfect running condition, recent engine overhaul, good body shape and paint, \$7,000/obo. 795-2421, weekends, Srivastava.

'95 SATURN SL Sedan, 5 spd., white exterior, gray interior, a/c, 75,000 miles, exc. running cond., good physical condition, mileage 27 city, 37 freeway, am/fm/tape, no accidents, \$3,900/obo. 957-5742.

'88 SEA RAY boat, 23' cuddy cabin, 185 orig. hrs., 5.7 liter motor, mercruiser outdrive, new upholstery, ship to shore radio, live bait tank, \$11,000/obo. 626/339-9353, Greg.

'91 SUBARU Loyale, 4-dr. wagon, 149K mi., 5 spd., 2 w/d, must sell, very well maintained, a/c, power locks/steering/windows, CD player, alloy whl., tilt wheel, Yakima roof rack, new tires & clutch, recently repaired transmission, a/c & timing belt, runs great, call for digital pictures, Kelly Blue Book \$3,755, sell for \$2,900/obo. 507-5632 or 626/379-0969.

'98 TOYOTA Camry CE, white, manual trans., 58,000 mi., exc. cond., am/fm/cass., a/c, must sell, \$9,000/obo. 323/722-4412.

'96 TOYOTA Tacoma pickup, extra cab, 6 cyl, 5 sp., a/c, am/fm/CD, bedliner, 173K mi. (fwy), orig. owner w/maint. recs., vg cond., \$7,250/obo. 909/865-8782.

'95 TOYOTA Tacoma SR5, V6, 3.0 liter, extra cab, 5-sp. manual trans., 4 w/d, most extras including shell with carpet kit, alarm, 91,000 miles, \$11,500. 790-5229, Steve or soburks@pacbell.net.

'92 TOYOTA Camry SE, V6, 5 spd., 3.0 litre, 115K mi., one owner, fair condition, sunroof, power windows, locks, cruise control, alloys, smog cert. thru 5/03, reg thru 5 '02, \$4,500/obo. 626/794-8720, Andy.

'89 TOYOTA Corolla LE, 4 dr., 89K mi., auto, air, pwr. strng., cruise cont., tilt strng. whl, adjustable lumbar support for driver, exc. cond., fairly recent new tires, gd gas economy, alw. garaged, orig. owner, \$3,050. 957-8609.

'87 TOYOTA Camry, 4 cyl., a/c, 130K mi., well looked after, Blue Book \$3,700/obo. 626/796-2662.

'87 TOYOTA Tercel, liftback, very good cond. inside and out, 1 owner, 138K mi., \$1,200. 626/397-7044 or 310/463-9712.

'81 TOYOTA Corolla, 2 dr., 5 spd., liftback, looks great, runs great, 225K mi., \$995. 626/256-1138.

'78 TRIUMPH Spitfire, white, appropriate to its age, there are a few things that need fixing, but it does run, great for a collector or someone who appreciates its classic body shape. 248-7848, Roy.

Wanted

BOY SCOUT PATCHES and memorabilia, for private collection by Scout Master. 909/948-9595.

HOUSING, furn., for visiting faculty, singles, couples, families, for 10 weeks, June-Aug. Call Petra in Educational Affairs at 4-0726.

HOUSING, visiting German scientist with family, looking for furnished rental house, close to JPL, Pasadena, Monrovia, Arcadia, 7/16-8/19/01. 248-8591.

PARKING SPACES, 1 or 2, for vehicle storage of a mini RV, medium SUV size and a compact car, \$250/yr for 1, \$400/yr for 2. 1-1.5 yrs max time. 310/824-5688.

RECORDS and pre-recorded reel-to-reel tapes, '50s & '60s, by priv. collector. 626/447-3270.

ROOMMATE, n/s female preferred, 2 bd., 2 ba., apt. near Caltech in Pasadena, washer and dryer included, newly remodeled, \$650. 303/829-2920.

ROOMMATE, female preferred, to share 2-bd., 2-ba. apt. in Pasadena near 210 fwy.; separate phone line, secured bldg., pool, whirlpool, BBQ, laundry facil. in complex; \$600 + half util. (gas, electric, cable ~\$60), month-to-month lease. 626/795-8197, Denise.

SPACE INFORMATION/memorabilia from U.S. & other countries, past & present. 790-8523, Marc Rayman.

TENNIS PLAYER, for doubles, to sub occasionally on Thursdays at 5:00 in Altadena. 626/791-2464.

THEATRICAL PLAYERS, all levels of experience, for collaborative effort on digital video project. 545-8671, Dan.

VOLLEYBALL PLAYERS, coed, all levels of play, Tues. nights 8-10 p.m. at Eagle Rock High School, \$3/nt. 956-1744, Barbara.

Free

AIR CONDITIONER, Kenmore, 8000 BTU, 115V 9A, window mount, tall/narrow 15 w x 21 h,

worked fine, stuck relay after 5-yr. storage, s/b easy fix. 323/663-0769.

CATS, for adoption, several wonderful middle-aged kitties need new homes because owner recently passed away. 626/791-3763, Judy.

For Rent

ALTADENA guest house, 1 bd., Florecita area, walk to JPL, fenced yard, extra storage space, 1st month + security deposit to move in, avail. 7/1, \$475 + 1/3 utilities. 626/794-6076.

ALTADENA, beautifully refurbished 2 bd., 1 ba., 2-car garage, .5 miles from JPL, \$1,050. 323/664-5208.

ALTADENA, lg. furn. room w/cable TV, priv. ba., priv. off-st. parking, share 3 bd. 2.5 ba., quiet hilltop house, pool, lg. garden, patios, view, kitchen w. d/w, washer, central a/c, 11-min. drive to JPL, avail. by 7/1 only to smoking-tolerant, JPL empl./contr., temp. OK, \$485., incl. all util. 626/794-1050, after 7 p.m., Harry.

LA CRESCENTA House, 3 bd., 1 ba, f/p, dining room, patio, detached garage, fully fenced yard, quiet street, good neighborhood, \$1,750. 249-9522.

PASADENA, 1 bd., .75 ba., in charming 1907 Pasadena bungalow, share house w/JPL engineer, laundry, cent. a/c, quiet neighborhd, off-street parking, all privileges, 10 min. to JPL, prefer summer student, \$600 incl. util. 626/296-8315.

PASADENA townhouse: 2 bd., 2.5 ba., 1 mile from Caltech; stove, dishwasher, fridge, f/p, patio, a/c, 2-car garage, laundry hookups; non-smoker preferred; \$1,350 + \$1,500/sec. dep., avail. 6/15. 626/462-1497.

SOUTH PASADENA, furnished studio, 1718 Huntington Dr, betw. Marengo and Milan Ave., carport, laundry, no pets, non-smoker, available 6/21, utilities paid, \$750. 626/792-9053, Marilyn or Ray.

Real Estate

MONROSE, 5 min. JPL, 3-level townhouse, 8 yrs. old, 1,900 sq. ft., 3 + 2.5, incl. lg. master suite, Jacz. tub, very lg. gourm. kitch. w/granite counters + breakfast nook, 2 sky lites, alarm syst., lg. 2-car attached gar., exc. view + exc. neighborhd, new roof, \$319,000. 249-0453.

TUJUNGA, move-in cond. 2 story, 3 bd., 2 full ba., large country kitch., f/p, central air, built in 1980, RV access, cute yard w/covered patio, 2-car attached garage, built-in speakers, \$228,888. 848-9977, ext. 323, agent.

Vacation Rentals

BIG BEAR, cabin, walk to village, quiet area, 2 bd., sleeps 8, completely furnished, f/p, TV/VCR, \$75 night. 249-8515.

BIG BEAR LAKEFRONT, luxury townhome, 2 decks, tennis, pool/spa, beautiful master bd. suite, sleeps 6. 949/786-6548.

CAMBRIA, ocean front house, sleeps up to 4, excellent view. 248-8853.

HAWAII, Maui condo, NW coast on beach w/ ocean view, 25 ft. fr. surf, 1 bd. w/loft, compl. furn., phone, color TV, VCR, mcrow., d/w, pool, priv. lanai, slps. 4, 4/15-12/14 \$105/nt./2, 12/15-4/14 \$120/nt./2, \$10/nt. add'l person. 949/348-8047.

LAKE TAHOE, Ridge Tahoe Resort, timeshare, 2 bd., sleeps 6, 6/29-7/6/01, \$2,000. 626/282-8284.

MAMMOTH, studio condo, queen-size bed, full kitch., great complex, sauna and Jacuzzi, right across the street from a beautiful public golf course, price is sure to please. 626/791-5376.

MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, sleeps 6-8, fully equip'd kitchen incl. microwave, d/w, cable TV, VCR, phone, balcony w/mtn. view, Jacz., sauna, streams, fishponds, close to Mammoth Creek, JPL discount. 626/798-9222 or 626/794-0455.

OCEANSIDE condo, fully furn. 2 bd., 2 ba., f/p, full kitchen, quiet, relaxing, in beautiful setting, located at beachside, w/BBQ, pool, spa, game room, and great ocean view, easy walk to pier and restaurants, sleeps 6, available weekly or monthly. 909/981-7492 or e-mail dfhaug@yaho.com, Jim or Darlene.

OCEANSIDE, on the sand, charming 1 bd. condo; panoramic view, walk to pier or harbor; pool, spa, game rm., sleeps 4. 949/786-6548.

PACIFIC GROVE hse, 3 bd., 2 ba., f/p, cable tv/vcr, stereo/CD, well-eqpd. kit w/microw, beaut. furn. close to golf, beaches, 17 mile dr, aquarium, Cannery Row, JPL discnt. 626/441-3265.

ROSARITO BEACH condo, 2 bd., 2 ba., ocean view, pool, tennis, short walk to beach on priv. rd., 18-hole golf course 6 mi. away, priv. secure parking. 626/794-3906.

SAN DIEGO, Coronado Beach Resort, 1 bd., sleeps 4, July 22-29, '01, \$1,500. 626/282-8284.

SAN FRANCISCO, Nob Hill honeymoon suite, sleeps 2 max, full kitchen, maid service, concierge, reserve early, \$125/nite, \$750/wk. 626/254-1550.

Editor

Mark Whalen

Design & Layout

Adriane Jach, Audrey Riethle/
Design Services

Chief Photographer

Bob Brown/Photo Lab

Advertising

Susan Braunheim-Kalogerakas

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Notice to Advertisers

Advertising is available for JPL and Caltech employees, contractors and retirees and their families. No more than two ads of up to 60 words each will be published for each advertiser. Items may be combined within one submission. Ads must be submitted on ad cards, available at the ERC and the Universe office, Bldg. 186-118, or via e-mail to universe@jpl.nasa.gov. Ads are due at 2 p.m. on the Monday after publication for the following issue.

All housing and vehicle advertisements require that the qualifying person(s) placing the ad be listed as an owner on the ownership documents.

News Briefs 2	Hardware facility dedicated . . . 4
Special Events Calendar 2	Passings, Retirees 4
Reward & Recognition 2	Letters, Classifieds 4
New Directions 3	

JPLers thanked for helping inner-city kids

By Mark Whalen

Above: Ray Garcia of Section 353 works with students at Albion Elementary School in Los Angeles as part of the LA's BEST program.



a June 13 ceremony was held on Lab to thank those who participated late last year in an educational outreach program to inner-city elementary schools throughout the Los Angeles Unified School District.

In December, 38 JPLers visited 36 LA's BEST (Better Educated Students for Tomorrow) school sites, discussing with students in grades 3 through 5 such subjects as the search for life, how the planets formed, radar and hurricanes, and spacecraft design. They also give general career advice during these one-hour workshops scheduled throughout the city.

JPL promotes such community and educational outreach activities through VOICES (Validating Outreach Innovations for Community and Education Services).

"This is a unique contribution to students that a place like JPL can make," said Richard Shope, JPL education and public outreach coordinator. He noted that the program was successful in "communicating to

children hungry for real-world knowledge . . . in some of the hardest to reach rural and urban communities in America."

Shope said the participating scientists, engineers and technologists helped to "create an outreach testbed; not only for our own missions, but for space exploration itself."

JPL Director Dr. Charles Elachi presented each participant with certificates of recognition, and thanked them for their efforts. "Nothing you can give is more valuable than your time," he said, noting that NASA is JPL's major customer, "but our direct customer is the general public."

Elachi also thanked JPL supervisors for supporting their employees' volunteer efforts.

Tom Nolan of the Mission Systems Engineering Section, who visited Gratts Elementary School in Los Angeles, said he most enjoyed the challenge and level of interest brought to the kids, to where "they want to discuss it at the lunch table and on the playground. Their passion for learning will never change."

LA's BEST director Carla Sanger said the program continues to add school sites to its roster. She thanked Shope for his leadership of JPL's efforts, in "moving from impulse to intention to implementation." Recalling last month's Los Angeles city elections, Sanger said, "all candidates agreed on the value of LA's BEST and in its expansion, and we want JPL to be there with us."

The visits were arranged as a result of a partnership between LA's BEST and JPL's Education and Public Outreach Office. LA's BEST celebrates science in its after-school enrichment program, reaching more than 13,000 students in 78 inner-city elementary schools throughout the LAUSD in partnership with the Office of the Mayor of Los Angeles.

As part of the ceremony, Elachi received a special award for his support of the For Inspiration and Recognition of Science and Technology (FIRST) robotics competition in which JPL participated. Dr. Ayanna Howard and Shonte Wright presented the director with the competition's National Rookie All-Star trophy, which was earned by King Drew Medical Magnate School, one of 20 schools that received financial support from JPL during the competition. The school decided to pass the trophy on to Elachi and to JPL, because, Howard said, "they couldn't have done it without JPL's support."

New Optical Interferometry Development Laboratory breaks ground

From left: Mike Shao, Interferometry Center of Excellence; Tam Antoine, Construction of Facilities Program manager; Mike Devirian, Origins Program manager; Carl Simon, JPL construction project manager; Dr. Charles Elachi, JPL director; Bruce Fischer, Facilities Division manager; Ted Fujisawa, president of OC America, general contractor.

A groundbreaking ceremony was held June 5 for the new Optical Interferometry Development Laboratory (OIDL), Building 318, to be located just south of Building 170 along Surveyor Road.

JPL Director Dr. Charles Elachi noted the potential for new business in stellar interferometry at the Lab, emphasizing that this building would "bring unique capabilities providing a sub-nanometer-class development and test facility in a clean-room environment."

The OIDL building is needed because current development-laboratory space is inadequate and existing personnel overflow current facilities that are scattered across the Laboratory. The location of the new building, in the vicinity of buildings 171, 301 and 306, was needed to cluster it in proximity with existing vibration-isolated and clean environments used for interferometry development. Presently, Building 306 is capable of nearly comparable vibration isolation, but its space is fully occupied by preliminary interferometry technology development, as well as hardware dedicated to other flight missions.

Origins Program Manager Michael Devirian said the financing of the new building was unique in that it is the first at JPL to be financed directly by program funds. Currently the Space Interferometry Mission (SIM), managed by Tom Frascchetti, and Starlight, managed by Leslie Livesay, are sharing the costs. Dr. Michael Shao, manager of the Interferometry Center of Excellence, expressed his desire for OIDL to be a premier facility for interferometry technology development. Shao also acknowledged the efforts of his deputy manager, Bill Goss, in the planning, design and procurement of the building.



The new facility is designed to meet extremely demanding criteria for control of temperature, humidity, vibration and noise sufficient for development of picometer-class control technology. The building is a 1,346-square-meter (14,500-square-foot) structure containing a 458-square-meter (4,930-square-foot) high bay with an 11-meter (36-foot) ceiling, a 185-square-meter (1,990-square-foot) ground support equipment room, and three development laboratories, each at 219 square meters (2,360 square feet).

Construction of the building will eliminate 22 trailers along with Building 11, built in 1947, and Building 121, built in 1952, all of which are antiquated and maintenance-intensive laboratory and office space.

Construction of the OIDL was scheduled to begin June 18. The facility is expected to be completed in July 2002.

News Briefs

JPL Photo Lab



JPL Director Dr. Charles Elachi (second from left) with QWIP camera team members (from left) Dr. Sumith Bandara, Dr. Sarath Gunapala and John Liu.

QWIP camera gets hall of fame nod

An advanced sensor developed at JPL has been inducted into the U.S. Space Foundation Hall of Fame in recognition of its potential uses in medicine, firefighting and industry, as well as astronomy.

The Quantum Well Infrared Photodetector (QWIP) technology has been licensed for various commercial applications, including non-invasive detection of breast and skin cancers. Physicians use it during brain surgery to visualize a tumor's perimeter. The camera's ability to see through dust and smoke has proven useful to firefighters and helicopter camera crews by allowing them to see fire hot spots from the air through heavy smoke. The technology also has many other potential uses,

including search and rescue, and volcano observation. "It is a great pleasure to see something we developed being used for

public benefit," said DR. SARATH GUNAPALA, co-inventor and principal engineer of the sensor developed at JPL, "especially in medical applications, such as the early detection of cancer."

QuikScat captures Catalina Eddy

The elusive swirl of breezes called the Catalina Eddy, responsible for helping cool the Los Angeles basin, is captured in a new animation of sea-surface winds measured by JPL's SeaWinds instrument on the QuikScat satellite. During the hot, dry summer months these gentle winds are welcomed because they direct the offshore marine layer toward the Los Angeles basin. Because the flow is more on-shore than normal, this cooling oceanic influence of the eddy has been described as nature's purifier or air-conditioner for Los Angeles.

The animation is online at <http://www.jpl.nasa.gov/videos/earth/california>.

While the Catalina Eddy, an atmospheric vortex or eddy with a counterclockwise rotation pattern, can occur at any time of the year, it is most often seen during May and June. It can develop when the winds from the northwest along the Southern California coast are stronger than normal and interact with the local coastal and land topography.

A brighter Mars this summer

Hold on to your hats and keep a pair of binoculars handy: After a 26-month sprint around the track of the solar

system, we are about to lap Mars again.

Today, the red planet is in "opposition," an event that puts Earth between Mars and the Sun. On June 21, Mars was at its closest distance from Earth since 1988, a mere 67.3 million kilometers (about 42 million miles). All summer long, Mars will be brighter than usual, particularly for sky-watchers in the southern United States and those in the Southern Hemisphere.

On average, Mars is 50 percent farther from the Sun than Earth is. Because of its tighter orbit, Earth passes Mars every couple of years. The reduced distance between the two planets and better solar illumination angle give Earthlings the best Mars-viewing opportunity. Through October, Mars will be easy to spot looking south, especially around midnight. The more south the observer is, the higher the red planet will appear in the sky.

Radio clubs to have a field day

The JPL and Caltech Amateur Radio Clubs will join forces in the annual Field Day activity on the weekend of June 23 from atop Mount Gleason. This activity demonstrates radio amateurs' readiness to provide needed help to the public during times of emergencies, when normal communications services are either out of commission or overtaxed.

This year, the clubs plan to field eight stations for the first time. New to this year's operation will be usage of new radio amateur digital communications modes. Also in operation will be an automatic positioning mode used last year to determine how specific floats in the Rose Parade were progressing down Colorado Boulevard on New Year's Day.

Visitors are welcome to the event, said JPL Radio Club member BOB POLANSKY. Mount Gleason is located 30 miles north of JPL by auto and can be reached via Angeles Crest Highway.

Operations start at 11 a.m. on June 23 and run for 24 hours. For more information, call Polansky at ext. 4-4940 or JAY HOLLADAY at ext. 4-7758.

Attention office professionals

JPL's Office Professionals Mentoring Group is now accepting applications for its September 2001 program.

The group, which meets twice monthly during the lunch period, works to identify secretarial needs, gather appropriate resources, gain required permissions and provide solutions.

Formed in September 1999, the group recently developed a Web site (<http://hr/officepros>) that provides access to office procedures, and was invited to form a pilot group for the new JPL portal being developed by ICIS.

For more information, call JOY HODGES at ext. 4-7041.

Special Events Calendar

Ongoing Support Groups

Alcoholics Anonymous—Meetings are available. Call the Employee Assistance Program at ext. 4-3680 for time and location.

Codependents Anonymous—Meeting at noon every Wednesday. Call Occupational Health Services at ext. 4-3319.

End of Life Issues and Bereavement—Meets the second Monday of the month at noon. For location, call the Employee Assistance Program at ext. 4-3680.

Gay, Lesbian and Bisexual Support Group—Meets the first and third Fridays of the month at noon in Building 125-133. Call the Employee Assistance Program at ext. 4-3680 or Randy Herrera at ext. 3-0664.

Parent Support Group—No meetings are scheduled for July; next meeting is Aug. 16. For location, call the Employee Assistance Program at ext. 4-3680.

Senior Caregivers Support Group—No meetings are scheduled for July or August; next meeting is Sept. 6. For time and location, call the Employee Assistance Program at ext. 4-3680.

Friday, June 22

Von Kármán Lecture Series—"From Galileo to Gossamer: 400 Years of Telescope Technology" will be presented by Art Chmielewski, manager of JPL's Large Telescope Concepts Office, and Mark Dragovan, JPL research scientist, at 7 p.m. in The Forum at Pasadena City College, 1570 E. Colorado Blvd. Open to the public.

Saturday, June 23

CEC Wine-Tasting Benefit—The Child Educational Center's annual fundraiser will be held from 6:30 to 11 p.m. at Caltech's Avery House. Wines, food, auction items, gaming and live music by the Chad Edwards Quartet will be featured. Tickets are available at the ERC and the CEC office, 140 Foothill Blvd., La Cañada (adjacent to La Cañada High School), at \$30; 10 tastes of premium wines will be served at a special Connoisseur table, for which tickets are \$60. All proceeds will benefit the nonprofit child care center. Call the CEC at ext. 4-3418.

Monday, June 25

Caltech Ballroom Dance Club—The first in an eight-week series of Salsa lessons will be offered from 7:30 to 9 p.m. in Dabney Lounge. The professionally taught lessons cost \$8 each or \$56 for all eight. No partner is required. Refreshments and a half-hour practice period will follow each class. For more information, contact Megan Knight at knight@its.caltech.edu.

Tuesday, June 26

Investment Advice—Fidelity will hold one-on-one counseling sessions. For an appointment, call (800) 642-7131.

Wednesday, June 27

JPL Toastmasters Club—Meeting at 5:30 p.m. in the Building 167 conference room. Guests welcome. Call Jim Raney at ext. 4-6301.

"The Indispensable Elements Required to Successfully Build Your Career and Perform Your Job"—As people work to move ahead in their careers they often forget some of the "fundamentals" in performing their jobs. Associate Lab Director Kirk will give some examples from his personal experience during his noon in von Kármán Auditorium. Sponsored by The Director's Advisory Council for Women.

Thursday, June 28

JPL Golf Club—Meeting at noon in Building 306-302.

Tuesday, July 3

Ethics Training—Available to all personnel from 9 to 10 a.m. in Building 180-101. A list of training sessions is available at online at <http://hr/et>; search on "Ethics." The one-hour session is offered monthly or can be arranged for group presentations; call Martha Avina, ext. 4-3154.

JPL Gamers Club—Meeting at noon in Building 301-227.

JPL Genealogy Club—Meeting at noon in Building 301-271.

Thursday, July 5

JPL Gun Club—Meeting at noon in Building 183-328.

Space Flight Awareness honorees tour D.C.

Photo courtesy Nancy Kapell



Space Flight Awareness Program honorees, from left: Phillip Barela (Section 506), Stuart Imai (261), Sharon Langenbeck (352), Kathryn Weld (314), Roger Lee (174).

Five JPL employees have received Mid-Level Management Awards, part of NASA's Space Flight Awareness Program.

Honorees Phillip Barela (Section 506), Stuart Imai (261), Sharon Langenbeck (352), Roger Lee (174) and Kathryn Weld (314) recently traveled to Washington, D.C. to attend ceremonies held in conjunction with the 20th anniversary of the first space shuttle launch. They attended receptions at the Air and Space Museum with senior NASA and industry management, shuttle astronauts and international representatives supporting both the International Space Station and shuttle programs.

In addition, honorees attended a special tour of the Paul E. Barber facility, which refurbishes artifacts for the Smithsonian museums.

At JPL, the Space Flight Awareness Program is part of the Reward & Recognition Program. For information, log on to <http://eis.jpl.nasa.gov/sec614/reward>.

NOVA awards

The following employees received JPL's Notable Organizational Value Added (NOVA) awards in May:

Division 210: Josephine Ahumada, Noel Alejandrino, Michelle Hernandez, MeiYan Lin-Kao, Richard Niccoli, Kathie Reilly, Jose Rodriguera, Balta Rosales, Celine Sargan, Alice Smilgis, Rodney Stanley, Jennifer Unsen.

Division 230: Katrina Evans, Amanda Gibbs, Mary Ellen Robertson, Cynthia Rowland, Manick Sivarajah.

Division 250: Luis Arenas, Erica Beam, Brian Beeler, Cal Chambers, Kristy Dell'Aquila, L. Bruce Gibby, Annette Green, Charlene Hazelton, Robert W. Johnson, J. Steven Joines, Sharmon Keasler, H. Ming Kwong, Sharon Kyle, Cathy Lemaster, Brigid Lewis, Genevieve Lopez, Myriam Lopez, Melinda van der Geugten.

Section 312: Peter Antreasian, Vijayarag Alwar, Darren Baird, Brian Barden, Ramachand Bhat, Eugene Bonfiglio, John Bordin, George Carlisle, Eric Carranza, Steven Chesley, Stuart Demcak, Pasquale Esposito, Eric Graat, Mark Guman, Clifford Helfrich, Jennie Johannesen, James Miller, William Owen Jr., Mark Ryne, Tseng-Chan Wang, Bobby Williams, Roby Wilson.

Section 313: Steven Broberg, Louise Hamlin, Wayne Lee, Joel Krajewski.

Section 314: Duane Bindschadler, Roy Gladden, Kevin Grazier, Katherine Moyd, Taifun O'Reilly.

Section 323: Scott Bolton, Sandra Dewegeli.

Division 330: David Rochblatt, Charles Ruggier.

Section 366: Sandy Gutheinz, Gerald Humphrey, Paul Ottenfeld.

Section 367: Demetri Capetanopoulos, Russell Knight, Kacie Shelton.

Section 368: Robin O'Brien.

Section 385: Shannon Jackson.

Section 900: Duane Bindschadler, Scott Bolton.

Section 920: Rose Nadjarian, Byron Yetter.

Section 940: Richard Markley, Lorraine Suwa.

Section 970: Charles Steizler.

The following employees received NOVAs in June:

Division 190: Laura Chin-Loy, Sandra Dennis, Sheri Leigh, Viviana Navarro, Ivette Nicholls, Gail Rasmussen.

Section 335: Debra Coler, Vicky de La Trinidad, James Kohel, Sara Katrdzhyan, Carol Lorre, Kathleen Nielsen, Yvonne Vigue-Rodi.

Section 351: Pattie Broom, Christopher Carson, Daniel Cortez, Nancy Chiang, Melissa English, Terry Fisher, Guy Labrador, Michael McKee, Cindy Nguyen, Michelle Lyn Tuazon, Philip Withington, Bruce Woodward.

Section 352: William Allen, Mark Balzer, David Braun, Hugh Briggs, Carl Buck, Stephanie Buck, James Colvin, Gerardo Flores, Virginia Ford, Angel Garnica, Peter Illsley, Christopher Landry, Paul McGrath, Annette Nasif, David Otth, Chia-Yen Peng, Christopher Porter, Tommaso Rivellini, Karen Russo, Terri Scribner, Donald Sevilla, Adam Steltzer, James Stone, Frank Tillman, Wan Tsoi, Richard Webster.

Section 354: Chuck Jennings: Michael Schmelzel, Christopher White.

Section 367: Barbara Engelhardt, Benjamin Smith.

Section 368: Alexander Novati.

Section 369: Christine Aguilera, Tamara Andres, Joe Diep, Angela Esser, Rosemary Estrada, Jill Figueroa, Dana Flora-Adams, Carol Glazer, Gaylord Hammerwold, Marian Kuri, Katherine Levister, Amalaye Oyake, Judith Ryken, Tatiana Stalker, Sheila Tews.

Section 387: John Bousman, David I. Brown, Thomas Chrien, Michael Eastwood, James Gerhard, Jason Koelliker, Sarah Lundeen, Ian McCubbin, Betina Pavri, Beverly St Ange.

Division 500: Kirk Gerbracht, W. Darrol Houser Jr., Geoffrey James, Isik Kanik, Patricia Westerlund.

Division 800: Alfred Pappano, Jennifer Schlickbernd.

NEW DIRECTIONS

JPL studies for Earth science and missions to Mars and Pluto have recently received the go-ahead by NASA for further development

THE SOLAR SYSTEM

JPL IS INCLUDED IN TWO PROPOSALS selected by NASA for detailed mission feasibility studies as candidates for a Pluto-Kuiper Belt mission.

"For this mission to be possible, new funding would have to be provided in NASA's FY 2002 budget," said Gregg Vane, manager of JPL's Discovery Pre-Projects

Office. "There would be a \$500 million cost cap for the mission, which would include the launch vehicle and power source," Vane said.

The president's FY 2002 budget request does not contain development funding for a Pluto mission, and Congress requested that NASA "not do anything precipitous that would preclude the ability to develop such a mission until it is considered in the context of the FY 2002 budget." If

a Pluto-Kuiper Belt mission is developed, launch would be in the 2004-06 time frame and the spacecraft would arrive at Pluto before 2020.

The selected investigations are:

- Pluto and Outer Solar System Explorer (POSSE).

Principal Investigator is Dr. Larry Esposito of the University of Colorado, Boulder.

- New Horizons: Shedding Light on Frontier Worlds. Principal Investigator is Dr. S. Alan Stern of Southwest Research Institute in Boulder.

On POSSE, JPL co-investigators are Dr. Candy Hansen, leading the mission planning team and a member of the atmospheric and geology teams; Dr. Bill Owen, leading the optical navigation team and a member of the geology and geophysics teams; Dr. Nicole Rappaport, leading the radio science team and a member of the atmospheric team; and Dr. Tom Spilker, a member of the atmospheric team.

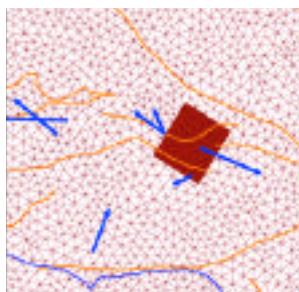
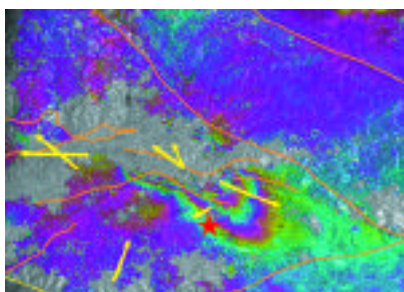
Each proposal team will receive \$450,000 to conduct a three-month concept study, which will culminate in a written proposal that documents technical implementation approach and cost feasibilities. Later this year, if funding is available, NASA will determine if either proposal is selectable.

Each proposal includes a remote sensing package that includes imaging instruments, a radio science investigation, and other experiments to characterize the global geology and morphology of Pluto and its moon Charon, map their surface composition, and characterize Pluto's neutral atmosphere and its escape rate.

If POSSE is selected for development, JPL's role would also include project management and overall implementation; mission design and operations; system engineering; safety and mission assurance; and launch approval management. If New Horizons is selected, JPL would provide Deep Space Network support.

Global positioning system measurements are indicated with arrows that show seismic activity during the 1994 Northridge quake.

Colored areas show interferometric Synthetic Aperture Radar data. Scientists will use the mesh overlay shown at right to help them assimilate seismic and geologic data into earthquake modeling studies.



THE MARS

THE 10 MOST PROMISING MISSION CONCEPTS of the 43 proposed to NASA for possible launch to Mars in 2007 were selected earlier this month to receive funding for six months of continued studies. Of those 10, two would be led by principal investigators from JPL.

Included in the 10 concepts selected for study are missions to return samples of Martian atmospheric dust and gas, networks of small landers, orbiting constellations of small craft and a rover that would attempt to establish absolute surface ages of rocks and soils.

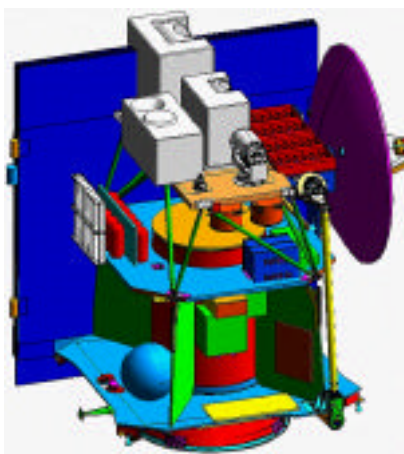
The missions that would be led by JPL principal investigators are:

- Mars Environmental Observer, led by Dr. Michael Janssen. This science orbiter would intensively explore the role of water, dust, ice and other materials within the Martian atmosphere to understand parts of the hydrologic cycle.

- CryoScout, led by Dr. Frank Carsey. This mission, designed to use heated water jets to descend through Martian polar ice caps, could potentially probe to depths of tens to hundreds of meters, or yards, while measuring composition and searching for organic compounds.

NASA plans to evaluate the 10 innovative concepts using rapid six-month studies as a means for jump-starting the identification of new Mars Scout missions that will compete for a possible launch in 2007. The proposals were submitted to NASA's Mars Exploration Program in response to a call for proposals in March 2001. Those selected will receive up to \$150,000 each for the study.

Fifteen of the 43 proposals to NASA involved JPL partnership, noted Gregg Vane, manager of JPL's Discovery Pre-Projects Office. These proposals called for the Lab to be responsible for project management and overall implementation; mission design and operations; system engineer-



Schematic diagram of the proposed Mars Environmental Observer.

ing; safety and mission assurance; and a requirement for significant JPL science participation. All 10 principal investigators selected have asked JPL to be their project-manager partner if their eventual mission proposal were selected for implementation via the upcoming NASA Announcement of Opportunity that will be released next year, Vane said.

Dr. Ed Weiler, NASA's associate administrator for space science, selected the 10 winners on the basis of overall scientific merit and potential for implementation under a total mission cost cap of \$300 million.

Next year, NASA plans to initiate a competition for small Scout missions to Mars to broadly involve the scientific and aerospace communities in the Mars Exploration Program. The 10 concepts selected in June will not be given any advantage in that competition.

THE EARTH

JPL RESEARCHERS HAVE BEEN SUCCESSFUL in two peer-reviewed solicitations for new work. One call for proposals focused upon grand challenges in science, and the other focused on data studies applicable to the Earth Observing System Aqua Platform.

In a call for proposals for "Grand Challenge Investigations-Increasing Interoperability and Performance of Applications in the Earth, Space, Life and Microgravity Sciences," NASA made nine awards nationally. JPL either leads or participates in four of the activities.

- JPL's Dr. Andrea Donnellan leads a team including researchers from JPL, Brown University, Indiana University, UC Irvine, USC and the University of Colorado. The team will be studying the physics of earthquakes using state-of-the-art modeling and data analysis tools.

- Caltech professor Thomas Prince (who is also JPL's chief scientist) will lead a team developing high-performance computing to support development of the National Virtual Observatory. The observatory will support astronomical observations and investigations through digital representation of the sky and associated electronic information archives. It will be distributed, and use the next generation of high-speed networks as its infrastructure.

- JPL's Dimitris Menemenlis is co-investigator on a UCLA-led project on high-performance computing that will be used to increase the interoperability of an Earth system model of atmosphere-ocean dynamics.

- JPL's Dr. Paulett Liewer is supporting a University of Michigan research effort to develop an adaptive simulation framework for space-weather modeling.

In response to a call for "Validation Studies for Data Products from the Earth Observing System Aqua (PM) Platform and EOS-Related Spectroscopic Studies," NASA made 27 awards; five of these include JPL leadership or involvement. The selected JPL proposals and principal investigators are:

- "Infrared Laboratory Spectroscopy for Atmospheric Infrared Sounder, Thermal Emission Spectrometer and High Resolution Dynamics Limb Sounder," Dr. Linda Brown.

- "Laboratory Measurement of Air Broadened Linewidths in Support of EOS Microwave Limb Sounder," Dr. Ed Cohen.

- "Validation of Advanced Microwave Scanning Radiometer-E Rainfall Using an Airborne Precipitation Radar," Dr. Eastwood Im.

- "Spectroscopy Evaluation Using Mark IV Balloon Spectra," Dr. Geoffrey Toon.

In addition, a JPL team including Dr. Mike Gunson and Bill Irion will be supporting an award for "Validating AIRS Ozone Observations."



Artist's rendering of the proposed Mars CryoScout.

For extended coverage of these stories, including a list of additional selected mission concepts, principal investigators and participating teams, log on to <http://dailyplanet>

Flight hardware program dedicates facility

Project Support Office Manager Ron Ploszaj cuts a ribbon to dedicate the Flight Hardware Logistics Program Bonded Stores. Left to right: Ken Van Amringe (FHLP project element manager), Kevin Clark (FHLP program manager), Ploszaj, and Clifford Smith (FHLP Bonded Stores Lead).

The Flight Hardware Logistics Program (FHLP) has dedicated FHLP Bonded Stores for residual flight hardware capture, registration, storage and disbursement in Building 251.

"This facility responds to the needs of the many JPL projects to more efficiently transfer residual flight hardware from past to future projects," said FHLP Program Manager Kevin Clark, who added that the program plans to open a larger bonded store later this year to address all JPL residual flight hardware.

The new facility consists of two 300-square-foot rooms, which house residual inventory from prior projects and ongoing common-buy procurements. One of the rooms has both Class 100,000 clean room and electrostatic-discharge certifications.

To help JPL achieve its goal to provide critical hardware to projects faster and more effi-

ciently, the FHLP brokers common flight procurements, develops supplier agreements and provides information to projects and proposers about flight hardware availability. FHLP's online catalog at <http://fhlpl> provides Lab-wide access to a registered inventory that includes 300 different line items comprising more than 2,000 pieces. Inventory includes most spacecraft subsystems, science instruments, parts and ground support equipment.

The program's most notable successes to date, Clark said, include the delivery of 31 RAD6000 flight computers to nine JPL projects, achieving significant delivery-time savings and cost savings of more than \$3 million, and the establishment of a flight parts service center, which enables anticipatory procurement and replenishment of flight electronic parts to drastically reduce their delivery time.



Bob Brown / JPL Photo Lab

DailyPlanet

Online for the JPL community

Classified ads will be available the day before Universe is published, at

<http://www.jpl.nasa.gov/dailyplanet>

JPL's new online news source

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Advertising is available for JPL and Caltech employees, contractors and retirees and their families. No more than two ads of up to 60 words each will be published for each advertiser. Items may be combined within one submission. Ads must be submitted on ad cards, available at the ERC and the Universe office, Bldg. 186-118, or via e-mail to universe@jpl.nasa.gov. Ads are due at 2 p.m. on the Monday after publication for the following issue.

All housing and vehicle advertisements require that the qualifying person(s) placing the ad be listed as an owner on the ownership documents.

Passings

ARTHUR FERRIN, 73, a retired security guard, died May 28 at his home in Escondido.

Ferrin joined JPL in 1972 and retired in 1992. He is survived by sons Gary and Mark, daughters Tammie Hutcheson and Cathy Cadin, eight grandchildren, brother Dale, and sisters Omaha Kee and Shelsea Allison.

Services were held June 4 at Mountain View Cemetery in Pasadena.

Retirees

The following employees retired in June:

John Garba, 42 years, Section 352; Boris Seidel, 39 years, Section 333; Carol Hix, 35 years, Section 185; Davona Cazier, 34 years, Section 662; Paul Penzo, 31 years, Section 312; Paul Koskela, 30 years, Section 314; Thomas Sweeney, 22 years, Section 333; Margaret Dietrich, 16 years, Section 387; Patricia Parrett, 12 years, Section 261; Stephen Fox, 11 years, Section 351; Mary Brancheau, 10 years, Section 335.

Letters

I would like to thank everyone who attended my retirement party. All of you made it a fantastic success, and it will always remain a special moment in my life. A very special thank you to Tracy (351) Tere (387), Jesse and Bob (380) for everything they did to make this all possible, and to everyone in Division 38 who made me part of their family, and allowed me to be of service over the years.

Steve and Doris Fox

Classifieds

For Sale

AQUARIUM, 60 gal., salt water, w/oak stand & lid, exc. cond., incl. \$500 chiller syst. & \$400 compact light syst., in working order. \$2,500 new, first \$750 takes it all. 626/335-7398.
BBQ, natural gas w/side burner, Sears Kenmore, 484 sq. in. cooking area, used only once, exc. cond., extra large warming rack, 3 storage shelves, also includes heavy duty full-length vinyl cover, and brand new gas connect kit, \$350 value, all for \$199. 926-0075.
BIKE, Nishiki Rally, 58 cm, road bike, gd for commuting, incl. lights, pump, rear rack & cargo bag, can be seen on Lab, \$100. 236-2888.
BUNK BED, Oak Loft, w/ladder, loft desk and bookcase/chest, good cond., \$250; DAYBED, with white porcelain finials & casting, trundle included, \$150. 626/915-1278, eves.
CABINET, antique curio, exc. cond., refinished, must see, \$1,800/obo. 248-4613.
CELL PHONE, Panasonic Duramax, exc. cond., 2 months old; includes battery, earbud, plug-in charger, manuals, leather cover and cigarette lighter charger; one of most durable on the market, only usable on AT&T Wireless system, \$150. 626/233-2957.
COFFEE, Kona, top of the line, 100% pure, sun dried, hand-picked from top-qual. trees, rich, dark roast, limited supply, discounted 45% at intro. price of \$21/lb. 626/584-9632.
COMPUTERS, notebooks, Toshiba Satellite 4080 XCDP with Pentium III 366 MHz CPU, 192 MB RAM, 6 GB HD, 14" active matrix screen, internal modem, 24 x CD-ROM, floppy, good cond., \$700/obo; Fujitsu 655TX with Pentium 155 MMX CPU, 80 MB RAM, 1 GB HD, 12.1" active matrix screen, 33.6 modem, floppy, ultrathin about 1", under 4 lbs, 3 units avail., \$250/ea. 626/308-2163.
COMPUTER CART, w/casters, solid wood and

veneers, no particle board, warranty, sliding trays for keybd. and printer, 37.5 L x 18.5 D x 30 H, stained lite oak, lots of storage, exc. cond., \$100. 626/793-3561.

DOG, Chow Sheltie mix needs home, 35 lbs, good, loving, very friendly, neutered, shots, 5 yrs. old, donation sought. 562/693-2986.

ESTATE SALE, Sat., June 23, 8 a.m.-3p.m., furn., clothes, china/glassware, new books, great misc. items. 5061 Angeles Crest Hwy, La Canada.

EXERCISE MACHINE, Nordic Track Pro Ski, exc. cond., a \$550 value for \$200. 249-5611.

EXERCISE MACHINE, Solo Flex, with accessories, wooden bench, vg cond., \$125. 310/454-7133, eves.

FURNITURE: dresser, black, 5' long, 8 drawers, from Ikea, \$20; nightstand, black, 2 drawers, from Ikea, \$5; bed frame, metal, heavy-duty, used for only 6 months, adjusts to fit Q, K, or CaK mattress, \$20. 249-4683, Daniel.

FURNITURE, misc.: low prices; chairs, dinette glass tbl. w/4 chairs, twin matr. & long spring box, desk, stereo cabinet, sofa bed (qn.), bedroom set, full size bed headboard, 2 nightstands, large dresser w/mirror and 5-drawer dresser, nightstand, TV stand, 2 bikes. 597-0274.

INVERSION TABLE, Hang Ups, F5000III, hang upside down for back relief, like new, used 10 times, paid \$300, \$175/obo. 626/577-2882.

METAL DETECTOR, Bounty Hunter Land Star, brand new, used twice, perfect cond., a great way to teach kids about geology and science, orig. \$450, sell for \$250, cash only. 248-6062.

MOVING SALE: refrigerator, Amana 21 cu. ft., gd. working condition, \$100; washing mach., Maytag, vg cond., \$100; dryer, gas, Maytag, vg cond., \$100; TV, 25 inch, Magnavox, with remote, exc. cond., \$140; TV, 19", Magnavox, with remote, exc. cond., \$90. 597-0274.

MOVING SALE: washer and dryer, coffee tables, 20" stereo TV, f/p screen and tools, musical keyboard, bread machine, manual lawnmower, electric weed trimmer, starter astronomical telescope w/mount and tripod. 236-2888.

PACHINKO MACHINE, Japanese, from the '70s, Nishijin, \$50/obo. 626/577-6773, Kathy.

PIANO, Logan & Co., 1920s era, upright, gd for beginners, pd \$1,383, make offer. 591-8888.

PIANO, baby grand, Schafer & Sons, 2 yrs. old, exc. cond., walnut color, \$3,500/obo. 248-4613.

POCKET PC, Cassiopeia EM-500, Windows CE, Excel, Word, Internet, Pocket Streets, adv. scientific/finance calculators, MP3 player, digital voice recorder, color, handwriting recognition, holster case, manual, box, warranty, brand new, \$349. 909/592-2279.

ROTISSERIE & BBQ, Showtime electric, healthy fat-free cooking, built-in timer, holds up to a 15-lb. turkey, makes delicious meals, incl. op-tional access., med. & lg. cooking baskets for fish, burgers, etc., food ties, hi-temp gloves, 6 self-turning kabob rods, heating tray for steaming, etc., cost over \$250 new, \$99. 352-0075.

SAW, 10" table Skilsaw, new, \$100; ROUTER, new, Black and Decker, 11 amp, \$130; FUTON, \$50; LOVESEAT, \$70. 626/797-6737.

SPEAKERS, center channel, 150W, Cerwin Vega, efficient, exc. cond., \$69; TV, Sony 19" color, gd cond., remote, cable, great picture, \$79; CAR STEREO, Toyota, am/fm/cass, 1998, exc. cond., \$49; CRIB, matr., white, gd cond., \$69; BABY SWING, gd cond., \$25. 909/592-2279.

STROLLER, Peg Perego tandem, navy/white, very good cond., \$195. 797-9615.

TABLE, dinette, square glass top 5' x 5' w/metal feet and 4 matching chairs, \$700/obo; BAR STOOLS, four matching, metal frame, all in superb cond., \$300/obo. 626/398-3480.

TABLES: maple wood coffee & 2 end table set, \$75; coffee, wood, \$25; kitchen, wood, with 2 folding sides, \$45; BED FRAME, twin, maple, \$75; TYPEWRITER, old IBM, \$35; BAR STOOLS, 4, wood, \$55. 909/941-2897.

TELEVISION, Emerson 19" color, \$50. 626/797-3310, evenings & weekends.

VIDEO GAME SYSTEM, Sega Dreamcast, w/2 controllers and memory card, plus 6 games, like new, \$150. 626/345-0969.

WASHER, GE, \$150; DRYER \$150, good cond., similar but do not match exactly, white, both for \$250. 790-6185.

WASHER/DRYER, extra large capacity, gas dryer, good cond., \$175. 248-7097.

WEDDING GOWN, Moonlight Designer, shown in Bride's Magazine, beautiful off-the-shoulder gown, Basque waist, illusion fitted point, stain/organza & Alencon lace, Cathedral train, pearl & sequin beading, <http://www.moonlightbridal.com/asps/gowndetail.asp?gno=JW3004> for picture, purchased late 2000, worn once, clean, size 14, fits 5'8" or shorter, \$199/obo; ACCESSORIES, matching head crown piece, 3-tier veil and petticoat, \$90. 241-3779.

WEDDING GOWN, Mori Lee Designer, scalloped neckline, short capped sleeve, satin bodice overlaid w/lace & re-embroidered appliques, trimmed w/sequins, pearls, deep V-back meets satin bow at waist, no train, <http://www.morileeinc.com/>

catalog for picture, C2001S5pix1.html, purchased late 2000, worn once, clean, size 12, fits 5' 8", \$199/obo; ACCESSORIES, matching head crown piece, three-tier veil, petticoat, \$90. 241-3779.

WINDOWS, alum. slider style, for home or mobile home, five 3' H x 5' W, \$35/each; one 3' H x 8' W, \$55; one 18 1/2" H x 22 1/2" W \$16; STORM WINDOWS, alum. style, five 47 1/4" H x 47 1/4" W \$65; STROLLER, twin, \$35; 2 twin bed safety rails \$9; BABY HOLDER, rocking disc type \$9; SNOW SKI RACK, w/lock, lg. car, \$75. 909/941-2897.

YARD SALE, neighborhood, Saturday, June 23, 7:30 a.m. to 3 p.m., 5036 N. Nearglen Ave., Covina. 626/915-1278.

Vehicles/Accessories

'89 BMW 750IL, white, sunroof, car phone, seat warmers, 6 CD changer, 11 extras, automatic, low mileage, \$8,000/obo. 248-4613.

CHEVY Suburban rims & tires, stock mag., four, \$275. 909/941-2897.

'99 FORD Explorer XLS, V6, 4 dr., fully equip'd, auto & manual 4W drive, 5 spd., pwr. steering/doors/mirrors/windows, blue, 33K mi., 2" trailer hitch, cartop carrier, Goodrich All Terrain, CrSteel wheels, a/c, am/fm stereo, CD, roof rack, tilt wheel, c/c, anti-theft keyless entry, tint windows, running boards, front & side a/b, ABS, warranty, \$24,000. 626/355-9707.

'86 FORD Taurus GL station wagon, fully equip'd, gd. cond., 2-tone silver, 113K mi., maintenance records, shop manuals, code scanner (all codes clear), Kelly BB retail \$2,700, sell for \$1,950. 626/355-2237.

'94 FORD Explorer Sport, 5 spd., 4 w/d, 96 k mi., black, grey leather, all power, 10 disk CD, alarm, alloy wheels, 5 new tires, \$7,000/obo. 323/655-5864.

'67 FORD Mustang, 390, 4 spd., S code, new paint & interior, orig. LA model, 80% restored, runs great, \$9,000/obo. 626/339-9353, Greg.

'93 HONDA Accord LX Hatchback, 2 dr., basic transportation. 626/403-0446.

'89 PORSCHE 944, black, 127K mi., automatic good cond. \$5,500/obo. 360-7863, eves.

'88 SEA RAY boat, 23' cuddy cabin, 185 orig. hrs., 5.7 liter motor, mercruiser outdrive, new upholstery, ship to shore radio, live bait tank, \$11,000/obo. 626/339-9353, Greg.

'91 SUBARU Loyalte, 4D wagon, 149K mi., 5 spd., 2 w/d, must sell, very well maint., a/c, pwr. locks/steering/windows, CD, alloy whls., tilt whl., Yakima roof rack, new tires & clutch, recently repaired transmission, a/c & timing belt, runs great, call for digital pictures, Kelley Blue Book \$3,755, sell \$2,900/obo. 507-5632 or 626/379-0969.

'97 TOYOTA Corolla, exc. cond., 57K mi., \$8,200. 957-6821.

Wanted

HOUSE OR APT. to rent for visitor from France working at JPL, 4 bd. furn. or unfurn., for a complete 1- to 3-yr. period starting Sept. '01 in Los Feliz/Glendale/Burbank/Pasadena area; possibility to visit in advance in mid-July. Ext. 4-2665, Yoaz Bar-Sever.

HOUSING, furnished, visiting scientist from Italy w/family (2 children), from 8/1 to 8/31. 957-5546.

HOUSING, visiting scientist from Germany w/family looking for furnished rental house, close to JPL, Pasadena, Arcadia, Monrovia, from 7/16-8/19/01. 248-8591.

KITTENS (2), for elderly woman. 323/931-6577.

LINENS, antique, white on white, hand-embroidered, preferably monogrammed (any monogram), must be in exc. cond. 980-1638.

SPACE INFORMATION/memorabilia from U.S. & other countries, past & present. 790-8523, Marc Rayman.

Free

CAT, female tabby needs new home, de-clawed, spayed, good TV buddy, intolerant of other cats. 626/447-5433, Bob.

KITTEN, rescued, 8 weeks old, found in Monrovia, gray/white, very friendly, litter trained, healthy, no fleas. 626/287-9433.

KITTENS, several wonderful middle-aged need new homes, owner recently passed away. Judy 626/791-3763, Judy.

Lost & Found

Lost: set of car keys on Lab, identifying tag, metal Beverly Hills medallion. Found: pair of half glasses, gold rimmed prescription, in Building 301 ladies room, 2nd floor. Ext. 4-0116, Linda.

For Rent

ALTADENA condo for lease, minutes from JPL, 2 bd., 1.75 ba., nice closets w/organizers, f/p,

cent. a/c, community pool, storage room, 2-car garage/carport, tile counter top & marble floor in kitchen, lg. patio with landscape, planters and oriental garden with waterfall and spa, end unit, with windows on three sides, cable on, for rent by owner, \$1,200. 626/398-1988, Beverly. ALTADENA guest house, 1 bd., Florecita area, walk to JPL, fenced yard, extra storage space, 1 month + security to move in, \$475 + 1/3 utils, avail. 7/1. 626/794-6076.

LA CANADA guesthouse for summer, pool, non-smoker, \$650. 248-4774.

LA VERNE/CLAREMONT-area townhome, 2 master bd., 2.5 ba., 2-car att. gar. w/washer & dryer hookups, private backyard, approx. 1,400 sq. ft., avail. 8/1, \$970. 909/596-5774.

MONTROROSE studio apt., detached, 10 min. from JPL, \$485. 626/445-0884.

PASADENA, charming 2 story, English, 3 bd., 2 ba., formal DR, cozy f/p, laundry room, large backyard, pool, patio, built in BBQ, wood deck, nice landscape, avail. from 8/1, incl. pool and gardener, \$1,350. 626/574-7027, eves.

PASADENA, 3 bd., 2.5 ba., townhouse-style apt., built-in range & oven, disposal, 2 f/p, cpts., drapes/blinds, a/c, covered parking, laundry, near Pas. City College, \$995. 790-7062.

SOUTH PASADENA, fully furn. studio apt, 1718 Huntington Dr. betw. Marengo & Milan Sts., car space, laundry, utilities paid, no pets, non-smoker, \$750. 626/792-9053, Ray or Marilyn.

Real Estate

ALTADENA condo, min. from JPL, 2 bd., 1.75 ba., nice closets w/organizers, f/p, cent. a/c, community pool, storage rm, 2-car garage/carport, tile countertop & marble floor in kitchen, lg. patio with landscape, planters & oriental garden w/waterfall & spa, end unit w/windows on 3 sides, \$154,000. 626/398-1988, Beverly.

MONTROROSE, 5 min./JPL, 3-level townhouse, 8 yrs. old, 1,900 sq. ft., 3 + 2.5, incl. lg. master suite, Jacz. tub, very lg. gourm. kitch. w/granite counters + breakfast nook, 2 skylites, alarm syst., lg. 2-car attached gar., exc. view + exc. neighbor'hd, new roof, \$319,000. 249-0453.

TUJUNGA, move-in condition, 2 story, 3 bd., 2 full ba., large country kitchen, f/p, central air, built in 1980, RV access, cute yard with covered patio, 2-car attached garage, built in speakers, \$228,888. 848-9977 ext. 323, agent.

Vacation Rentals

BIG BEAR LAKEFRONT lux. townhome, 2 decks, tennis, pool/spa, beaut. bd. suite, slps 6. 949/786-6548.

HAWAII, Kona, ocean front on Keauhou Bay, house and guest house comfortably sleep 6, 3 bd., 2 ba., rustic, relaxing and beautiful, swimming, snorkeling, fishing, spectacular view, near restaurants, golf and other attractions. 626/584-9632.

HAWAII, Lahaina, Maui, condo on beach, 2 bd., 2 ba., slps 6, private lanai, 2 pools & spa, tennis, golf, restaurant and bar on site, avail 2/2-2/9/02, \$1,500. 626/797-6737.

HAWAII, Maui condo, NW coast on beach w/ocean view, 25 ft. fr. surf, 1 bd. w/loft, compl. furn., phone, color TV, VCR, mcrow., d/w, pool, priv. lanai, slps 4, 4/15-12/14 \$105/nt./2, 12/15-4/14 \$120/nt./2, \$10/nt. add'l person. 949/348-8047.

LAKE ARROWHEAD house, small 4 bd., 2 1/2 ba., slps. 10, quiet, secluded, relaxing, woodsy area of Cedar Glen, http://www.highcountryrents.com/cedar_run.html for pictures/rates, JPLers book directly with owner for extra days & discount, \$410/weekend. 626/403-0446, owner.

LAKE TAHOE, N. Shore condo, 2 bd., 2.5 ba., slps. 6, pool, priv. beach, all amenities, convenient location, avail. Aug., weeks only, special JPL discount. 626/355-3886, Rosemary or Ed.

MAMMOTH, Courchevel, fully equipped unit, 2 bd., 2 ba., sleeps 6, summer rates for summer activities, fishing, mountain biking, hiking. 661/255-7958.

MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, sleeps 6-8, fully equipped kitchen incl. microwave, d/w, cable TV, VCR, phone, balcony w/view to mtns., Jacuzzi, sauna, streams, fishponds, close to Mammoth Creek. 626/798-9222 or 626/794-0455.

OCEANSIDE condo, on the sand, charming 1 bd., panoramic view, walk to pier & harbor, pool/spa, game rm., sleeps 4. 949/786-6548.

PACIFIC GROVE hse, 3 bd., 2 ba., f/p, cable tv/vcr, stereo/CD, well-eqpd. kit w/microw, beaut. furn. close to golf, bches, 17 Mile Dr., Aquarium, Cannery Row. JPL disnt. 626/441-3265.

ROSARITO BEACH condo, 2 bd., 2 ba., ocean view, pool, tennis, short walk to beach on priv. rd., 18-hole golf course 6 mi. away, priv. secure parking. 626/794-3906.

SAN FRANCISCO, Nob Hill honeymoon suite, sleeps 2 max, full kitchen, maid service, concierge, reserve early, \$125/nite, \$750/wk. 626/254-1550.