Universe

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Inside

Endeavour launch delayed

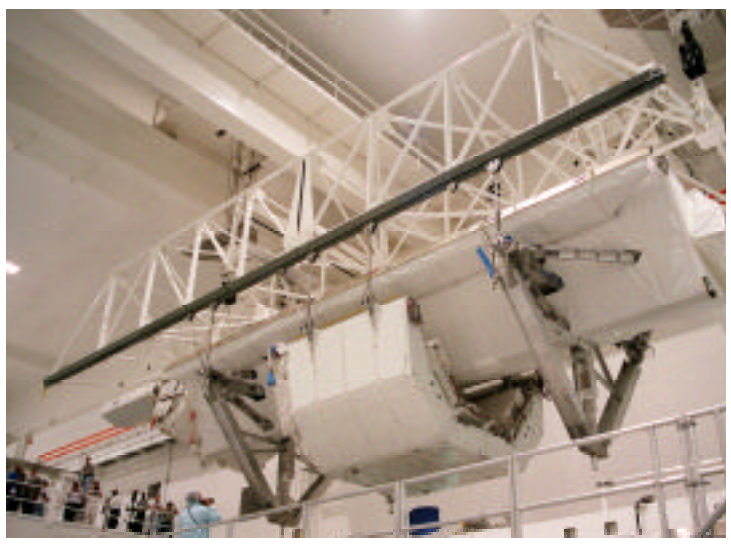
Shuttle carrying Lab's SRTM may go in about a week

The launch of JPL's Shuttle Radar Topography Mission from Kennedy Space Center onboard Space Shuttle Endeavour was postponed twice this week and will now launch no earlier than about Friday, Feb. 11.

NASA managers on Tuesday reset the launch so that engineers can replace a suspect master events controller. The electronics box is one of two that control the orbiter's pyrotechnic devices and process the signals that separate the solid rocket boosters and the external tank. On Monday, the launch was scrubbed due to bad weather at Kennedy Space Center.

Preliminary analysis and testing by shuttle engineers indicated a possible hardware problem within the master events controller. KSC staff tested a replacement unit on Tuesday.

On Feb. 11, the launch window opens at 9:28 a.m. Pacific time, and extends for 2 hours and 12 minutes.



Above right: Space Shuttle Endeavour sits on launch pad following the decision to delay launch Tuesday. Below: the SRTM payload is shown being lifted for its move to a payload bay canister at Kennedy Space Center. SRTM will gather data for the most accurate and complete topographic map of the Earth's surface ever assembled.

International help offered in Polar Lander search

Mission managers for Mars Polar Lander have reported that radio scientists at Stanford University have not detected a signal from the spacecraft in data they collected last week. Stanford will continue to analyze the data and it is still possible that more detailed analysis might reveal a signal.

In the meantime, additional radio telescopes around the world have offered their assistance in helping to confirm if the signal picked up by Stanford is from Polar Lander. The project has accepted offers of help from an array of fourteen 25-meter (82-foot) antennas at Westerbork in the Netherlands as well as the 76-meter (250-foot) antenna at Jodrell Bank, near Manchester, England, and an array located near Bologna, Italy.

"The international community has shown a real interest in being involved in our search. We appreciate their efforts and I think it shows that Mars is something that captivates everyone's imagination," said Mars Polar Lander Project Manager Richard Cook.

New commands were sent to the lander from NASA's Deep Space Network around the clock on Tuesday and Wednesday this week, Feb. 1 and 2, and were planned for Thursday afternoon, Feb. 3. These commands essentially told the spacecraft, if it is functioning, to reset its clock and send a signal to Earth. On Friday, Feb. 4, windows will open for the antennas in the Netherlands, England and Italy to begin listening. The antenna at Stanford may also listen during these windows.

The one-way light time from Earth to Mars is currently about 16 minutes. Mars is presently about 300 million kilometers (181 million miles) from Earth.

Study notes solar wind's 'memory'

By compiling all the solar wind data gathered in the space age, JPL scientists have concluded that even though the solar magnetic field is constantly changing, it always returns to its original shape and position.

"We now know that the Sun's magnetic field has a memory and returns to approximately the same configuration in each 11-year solar cycle," said JPL Distinguished Visiting Scientist Dr. Marcia Neugebauer. "Current theories imply that the field is generated by random, churning motions within the Sun and should have no long-term memory. Despite this expectation, the underlying magnetic structure remains fixed at the same solar longitude."

"It's interesting that the solar magnetic field varies in strength and direction, but not in longitude," said Dr. Edward Smith, senior research scientist at JPL.

The solar wind,composed of charged particles ejected from the Sun that flow continuously through interplanetary space, carries part of the Sun's magnetic field into space. "A better understanding of how the Sun generates its magnetic field will help us better understand the solar wind and space weather," Neugebauer said.

The findings, published in the Feb. 1 issue of the Journal of Geophysical Research, are based on all the solar wind data collected from the dawn of space exploration through 1998, both by Earth-orbiting satellites and interplanetary spacecraft. Co-authors of the article, in addition to Neugebauer and Smith, are Drs. Alexander Ruzmaikin, Joan Feynman and Arthur Vaughan, all of JPL.

Additional information is available online at *http://spacephysics.jpl.nasa.gov/pr/longitude.htm.*

SeaWinds weather data available online

Scientists, weather forecasters, and the public take possession of a valuable stream of meteorological and climate observations this week, as the first calibrated measurements from JPL's SeaWinds instrument on the Quikscat satellite become available.

Access to daily wind data and animations from the ocean-wind tracker is available online at *http://haifung.jpl.nasa.gov* and *http://airsea-www.jpl.nasa.gov/seaflux*. Scientific data sets and extensive links for educators and students can be accessed at JPL's Physical Oceanography Distributed Archive and Analysis Center at *http://podaac.jpl.nasa.gov/quikscat.*

"We're opening the tap on this global data to the world," said Dr. Michael Freilich, principal investigator on SeaWinds and a professor at Oregon State University. The measurements and data products show developing weather systems with unprecedented detail—information that can improve weather forecasting around the world.

Fore more information on the mission, go online to *http://winds.jpl.nasa.gov.*

Stardust completes velocity maneuver

JPL's Stardust spacecraft has successfully completed a three-part deep space maneuver designed to keep it on target for an Earth gravity assist in January 2001. That gravity assist will propel the spacecraft toward its 2004 rendezvous with Comet Wild-2.

The maneuver consisted of a trio of propulsion firings performed on Jan. 18, 20 and 22 to achieve velocity changes of 58, 52, and 48 meters per second, respectively (about 130, 116 and 107 mph).

Stardust's mission is to collect samples of comet dust from Wild-2 for return to Earth in 2006. While en route, the spacecraft will also attempt to gather samples of interstellar dust particles for study on Earth. Engineers plan to command Stardust to extend its dust collector on Feb. 22 in order to begin collecting interstellar dust from a stream that flows into our solar system.

News Briefs

Dr. Cheick Diarra

Diarra garners African honor

DR. CHEICK DIARRA, an interplanetary navigator and senior member of the technical staff in Division 700, has been named in an African magazine as one of the top 50 Africans of the 20th century.

A native of Mali, Diarra has worked at JPL since 1988 and formerly was manager of the Mars Exploration Directorate's Education and Public Outreach Office. He was given the honor by the French-language magazine *Juene Afrique*.

In 1998, Diarra was designated the 19th goodwill ambassador of the United Nations Educational, Scientific and Cultural Organization (UNESCO) for science, technology and enterprise. He was the first ambassador originally from Africa, the first from the sciences and the first American citizen to hold the post. His role included working toward establishing a university in Africa with a strong science curriculum and raising public awareness of the importance of science and mathematics to global peace and technological advancement.

Diarra's recent outreach efforts include the organization of a summit on science and new technologies last November in the Western African nation of Gabon, which was attended by scientists from around the world.

Video ideas for news media sought

The Media Relations Office seeks ideas from JPL staff for short video productions about the Lab's work that are submitted to news organizations.

The office produces "live shots"—one-on-one interviews for television news broadcasts—and "video files," edited productions that may include animation and interviews.

"Not all videos produced for the news media are about JPL's major flight projects," said video coordinator JACK DAWSON of Media Relations. "Concepts often involve other developmental work done on Lab, or personal stories on interesting employees."

Tips and ideas may be sent to him at *Jack.Dawson@jpl.nasa.gov* or to mail stop 186-120.

Blood drive set for February

The next JPL/Red Cross blood drive will be held in von Kármán Auditorium Feb. 15 from 10 a.m. to 4 p.m. and Feb. 16 from 7 a.m. to 1 p.m.

Signup sheets will be available prior to the blood drive at the Occupational Health Services Office in Building 310 and on their home page at *http://eis/medical/blood_form.html*.

If not signed up ahead of time, or to change an appointment, call the Pasadena Red Cross at (626) 799-0841, ext. 630 or e-mail to *sinovec@sgvarc.org*.

Packed house celebrates King's birthday

An overflow crowd packed von Kármán Auditorium Jan. 21 to celebrate the life and achievements of Reverend Dr. Martin Luther King Jr., in a presentation themed "MLK Dream: Vision to Reality."

Sponsored by the Human Resources Directorate, the Advisory Committee on Minority Affairs and the African American Resource Team, the event included rousing entertainment provided by several singers and dancers; a slide show on King's life and his contributions to the civil rights movement as well as how his vision is being realized through the accomplishments of past, present and future leaders; and an inspirational keynote speech by Judge Belinda Joy Hill of the United States District Court in Texas.

Terri Griffin/JPL Photo

Right: Judge Belinda Joy Hill, keynote speaker at JPL's Dr. Martin Luther King celebration Jan. 21.

Hill noted that through courage and determination, King always stood up for dignity and self-worth, that his dream was deeply rooted in the American dream.

"But King's dream is still a reality that is not fulfilled for all Americans," she said. "There is still injustice, inequality and hate in the world. It's easy to be discouraged, but it's our responsibility to keep the dream alive and make it a reality for all. His dream should always reside in the hearts and souls of all good people and minds."

Planning committee chair Hamilton Hill of Section 336 thanked the committee and JPL volunteers for their support in organizing the event.

"A lot of hard work went into the event, which turned out to be most impressive," he said. "The most important part of it was that we addressed the theme, and people were very inspired about what they need to do to make things better."

TAP Honor Awards bestowed

The 1999 Technology and Applications Programs (TAP) Honor Awards were presented Jan. 28. Part of JPL's Reward and Recognition Program and patterned after the NASA Honor Awards, they are designed to recognize exemplary performance on reimbursable tasks and projects, including any general support given to these areas.

The 1999 Technology and Applications Programs (TAP) Honor Awards winners follow.

Exceptional Achievement Award:
Awarded for a specific, exceptional accomplishment that contributed to TAP's mission; recognizes the acquisition of new work as well as improvements in operations, efficiency, service, financial savings, science or technology.

Tien-Hsin Chao (Section 344), Sarath Gunapala (346), Ryan Mackey (367), Lute Maleki (335), Larry Matthies (345), Joseph Provenzano (366), Marshall Smart (346), Thomas Sterling (385), Robert Thomas (336).

Exceptional Service Award:
Awarded for continuous, exceptional performance; recognizes service that clearly contributed to the acquisition of new work or to improvements in engineering, science and administration.

Shari Asplund (101), Nevin Bryant (388), Erich Corduan (369), Carol Fisher (234), William Frey (830), Mukund Gangal (833), Ranty Liang (380), Alan Marriott (870), Merle McKenzie (890), Calvin Miyazono (369), John Michael Morookian (367), Allen Nikora (345), David Rice (351), Betty Sivalon (800), Tommy Thompson (334), Thomas Tolerson (665).

Group Achievement Award:
Recognizes outstanding accomplishment made through the coordination of many individual efforts, and substantial contributions to the accomplishment of an objective.

COBRA Development Team (366), Defense Information Infrastructure Common Operating Environment Kernel Engineering Team (369), Dualband QWIP imaging camera group (346), GeoSAR Data Processing Team (334), GFO Receiver Repair Team (335), Rad Hard Active Pixel Sensor Team (385), Sea Dragon Technology Insertion Team (331/369), Space Technology Research Vehicle-1d QWIP Development Team (387), TAP Support Contract Source Selection Evaluation Team (621), TAP Task Order Administration Office Reimbursable Group (234), Terrain Perception Software Development Team (345), Vigilante project (344),

Special Events Calendar

Ongoing Support Groups

Alcoholics Anonymous—Meeting at 11:30 a.m. Mondays, Tuesdays, Thursdays (women only) and Fridays. Call Occupational Health Services at ext. 4-3319.

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

Gay, Lesbian and Bisexual Support Group—Meets the first and third Fridays of the month at noon in Building 111-117. Call employee assistance counselor Cynthia Cooper at ext. 4-3680 or Randy Herrera at ext. 3-0664.

Parent Support Group—Meets the third Thursday of the month at noon in Building 167-111. Call Greg Hickey at ext. 4-0776.

Senior Caregivers Support Group—Meets the second and fourth Wednesdays of the month at 6:30 p.m. at the Senior Care Network, 837 S. Fair Oaks Ave., Pasadena, conference room #1. Call (626) 397-3110.

Sunday, February 6

Chamber Music—The Chamber Music Society of Lincoln Center will perform at 3:30 p.m. in Caltech's Beckman Auditorium. Tickets are $25, $21, $17 and $13. Call (626) 395-4652.

Monday, February 7

Caltech Ballroom Dance Club—Beginning American Tango will be taught at 7:30 p.m. in Winnett Lounge. Cost: $30. Call (626) 791-3103.

Tuesday, February 8

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

Wednesday, February 9

AFS Quick Start Session for Windows 95—Jeff Sachs of Section 366 will provide an overview of the benefits of using the AFS distributed file system to manage your computer files, including setting up group space, accessing data, publishing Web pages, and more. At noon in the Building 167 conference room.

JPL Toastmasters Club—Meeting at 5:30 p.m. in the Building 167 conference room. Guests welcome. Call Mary Sue O'Brien at ext. 4-5090.

"Sampling the Universe"—JPL Director Dr. Edward Stone will speak at 8 p.m. in Caltech's Beckman auditorium. Admission is free. Call (626) 395-4652.

Thursday, February 10

Caltech Women's Club—Dr. Elizabeth Wayland Barber, a renowned expert on pre-historic textiles, will discuss her research of ancient textiles discovered in the graves of Caucasoid mummies found in Chinese Turkestan. In von Kármán Auditorium at 7:30 p.m. Reservations required; call Donna Burdick at (626) 798-0028. For more information, call Kathryn Bikle at (626) 797-2727.

ELIAS Grows Up—Jayne Dutra of Section 389 will discuss the Electronic Labwide Information Access System (ELIAS), JPL's intranet starting page, including the current task to redesign ELIAS as a portal delivery system and recent changes to help users more quickly find the JPL information they need. At noon in von Kármán Auditorium.

Investment Advice—Fidelity representative Ellen Flood will present a workshop titled "Women and Money." Topics will include asset allocation, mutual funds, and how to determine if you are saving enough for retirement. Information discussed will benefit all employees. To be held at noon in the Building 167 cafeteria.

Friday, February 11

Once Upon a Midnight—Actor John Astin is Edgar Allan Poe in this "8 p.m. production in Caltech's Beckman Auditorium. Tickets are $22, $18 and $14. Call (626) 395-4652.

Fri., Feb. 11—Sun., Feb. 13

The Merchant of Venice—Shakespeare's comedy will be presented in Caltech's Ramo Auditorium Friday and Saturday at 7:30 p.m., Sunday at 2 p.m. Admission is to be determined. Call (626) 395-4652.

Saturday, February 12

Folk Music—William Pint and Felicia Dale will perform a variety of music relating to those who live and work on the sea. At 8 p.m. in Caltech's Dabney Lounge. Tickets are $12 for adults, $4 for children under 12. Call (626) 395-4652.

Sunday, February 13

Chamber Music—Cellist James Wilson and pianist Joanne Kong will give a free concert at 3:30 p.m. in Caltech's Dabney Lounge. Call (626) 395-4652.

Tuesday, February 15

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

Thursday, February 17

"Engaging the Press, Engaging the Public: What JPL Stands to Gain"—Blaine Baggett, executive manager of JPL's Office of Communications and Education, will discuss the Lab's interaction with the news media and plans for a Labwide strategic communications plan. At 11 a.m. in Building 180-101.

JPL Astronomy Club—Meeting at noon in Building 306-109.

Von Kármán Lecture Series—Caltech President Dr. David Baltimore will present "AIDS Vaccine—Finding the Cure" at 7 p.m. in von Kármán Auditorium. Open to the public.

Friday, February 18

Anonymous 4—Four women blend their voices in a program of medieval music, poetry and narrative presented at 8 p.m. in Caltech's Beckman Auditorium. Tickets are $25, $21 and $17. Call (626) 395-4652.

"The Theory of Elementary Waves"—Physics theoretician Dr. Lewis Little will discuss a new, local and deterministic quantum theory, compatible with Bell's Theorem, including new insights into special and general relativity. From 9 to 11 in von Kármán Auditorium. For information, call Frank Schneider at ext. 4-4535.

Von Kármán Lecture Series—Caltech President Dr. David Baltimore will present "AIDS Vaccine—Finding the Cure" at 7 p.m. in The Forum at Pasadena City College, 1570 E. Colorado Blvd. Open to the public.

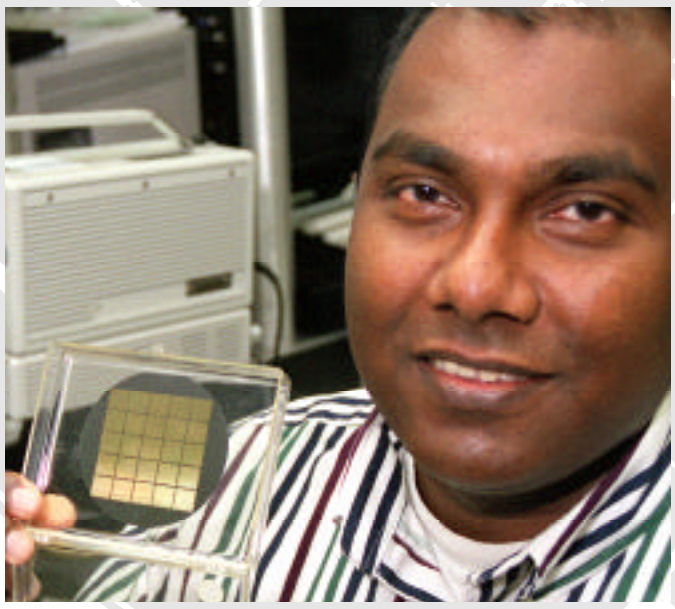
Fri., Feb. 18—Sun., Feb. 20

The Merchant of Venice—Shakespeare's comedy will be presented in Caltech's Ramo Auditorium Friday and Saturday at 7:30 p.m., Sunday at 2 p.m. Admission is to be determined. Call (626) 395-4652.

LAB TECHNOLOGY IMPROVES CANCER RESEARCH

Infrared device speeds breast cancer detection; many other applications shown

By Nancy Lovato and Mark Whalen



Bob Brown/JPL Photo

The war against breast cancer has a new weapon, thanks to an advanced sensor developed at JPL.

The device, called the BioScan System, was developed by OmniCorder Technologies, Inc., Stony Brook, N.Y. OmniCorder received clearance to market the system from the Food and Drug Administration last month.

Studies have determined that cancer cells exude nitric oxide. This causes changes in blood flow in tissue surrounding cancer that can be detected by the sensor. The BioScan System is sensitive to temperature changes of less than .015 degree Celsius (.027 degree Fahrenheit) and has a speed of more than 200 frames per second. It causes no discomfort to the patient (completely non-invasive) and uses no ionizing radiation. The device has also been cleared to be marketed for other applications.

The sensor, called the Quantum Well Infrared Photodetector (QWIP), was invented by Dr. Sarath Gunapala, a principal engineer of JPL's Device Research and Applications Section. The digital sensor detects the infrared energy emitted from the body, thus "seeing" the minute differences associated with blood flow changes.

The BioScan System also uses Dynamic Area Telethermometry, invented by Dr. Michael Anbar, founding scientist of OmniCorder. The two technologies work together to image the target area and to provide the physician with immediate diagnostic information.

Gunapala discusses other past, current and future uses of the QWIP technology with Universe.

Q *What was the QWIP technology first developed to do? How does it work to detect tumors?*

A The detector measures infrared light at long wavelengths, detecting temperature changes of one one-hundredth of a degree Celsius. This level of sensitivity is required for many Earth and planetary observations, and we have found that the technology has become useful in many other applications, including the medical field.

Breast tumors grow very fast, and since QWIP can measure in longer wavelengths—in the 8- to 9-micron region—it can receive a high amount of signals. This also represents a very good signal-to-noise ratio, allowing the sensor array to make measurements very quickly.

Since it's warmer around a breast tumor, the key is the device's ability to detect the amount of heat emitted. It's possible that the technology will allow doctors to detect breast tumors up to two years faster than would a normal mammogram.

Q *Has the QWIP technology been adapted for other medical uses?*

A Yes. Researchers at the State University of New York in Buffalo and Walter Reed Army Institute of Research in Washington, D.C. used QWIP to study skin temperature. The device is also being used in experimental stages by the USC Children's Hospital to help surgeons detect brain tumors.

The camera was also used by Texas researchers in a heart surgery experiment, where QWIP detected arterial plaque in a rabbit's heart.

Q *QWIP's ability to detect heat like no other device would seem to make it indispensable for a number of other applications. How else has it been used thus far?*

A The technology was integrated into a handheld camera that was used by firefighters during fires in Malibu in 1996 to detect "hot spots," areas that were obscured by smoke and not visible to the naked eye. Firefighters have also studied its use in rescues—the detector can "see" the warmth of a human body that may be obscured by smoke.

The camera was also used to observe and map geothermal features of the Kilauea Volcano in Hawaii, showing a hot lava tube running underground that was not visible to the naked eye.

The Department of Defense's Ballistic Missile Defense Organization has utilized the technology to discriminate and identify a relatively cold launch vehicle body (250 degrees C or 480 F) from its hot exhaust plume (950 C or 1,740 F). The organization has plans to use QWIP in intercontinental ballistic missile observations.

Q *Will QWIP technology be used on space missions?*

A Yes. The first will be on the Space Technology Research Vehicle-1D, which is a JPL mission, to detect the severity of radiation damage to QWIPs in the Van Allen Belt. The focal arrays are extremely radiation-tolerant because they are made with a high-band gap semiconductor.

Q *Has the technology been utilized in astronomy studies?*

A Yes. A QWIP focal plane array was used by JPL astronomers in observations with the five-meter Hale telescope at Mt. Palomar and compared with observations made by the Wide Field Planetary Camera on the Hubbell Space Telescope; a number of infrared features were observed with the QWIP sensor that were dim or undetectable in visible light.

Q *What's next for QWIP? In what areas do see the technology developing in the future?*

A The goal of QWIP technology is to provide very low-cost, large format (or size) imaging focal plane arrays for various applications. Therefore, QWIPs will find many more applications in NASA, the Department of Defense, commercial enterprises and medicine.

All members of the Infrared Focal Plane Array Technology Group in Section 346 contributed to the success of the technology. And we just received about $2.2 million in funding over four years from the Department of Defense's Defense Advanced Research Project Agency (DARPA) to develop QWIP-based miniature imaging spectrometers for chemical-agent detection on unmanned aerial vehicles.

In the future, QWIP cameras will be able to monitor electrical transformers by reading temperatures from the ground. The technology has also shown promise in the construction industry. For example, the infrared camera can be used to monitor the warmth of the many brake pads on cranes. A cooler brake pad would indicate more wear, which would need to be replaced.

In the years ahead, when focal plane arrays can be produced in a "faster, better, cheaper" manner, the technology may be used for many advanced Earth-monitoring applications, such as pollution monitors.

"It is a great pleasure to see something I invented being used for public benefit, especially in medicine and even more so in the early detection of cancer."

— *Dr. Sarath Gunapala*

Gunapala, top, shows a wafer holding QWIP sensors used for the newly licensed cancer-screening device and other applications. Above, a QWIP camera image taken at midnight shows where cars were parked earlier in the day as cooler, dark areas.

View this and previous issues of Universe online

http://universe.jpl.nasa.gov

Universe

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Notice to Advertisers

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

WILLIAM PORTER, 72, former manager of JPL's Contract Management Office, died of pulmonary fibrosis Dec. 1.

Porter joined JPL in 1966 and retired in 1989. He is survived by his wife, Susan, daughter Kathleen Simonds and son William Porter Jr.

Services were private.

WILLIAM REILLY, 64, a retired engineer in Section 353, died of a heart attack Dec. 13 at his home in Altadena.

Reilly worked at the Lab from 1958–97. He is survived by his wife, Kathie, and daughter Dianne.

Memorial services were held at Mountain View Cemetery in Altadena.

JOHN BLIZZARD SR., 63, a retired plant protection guard in Section 665, died of cancer Dec. 15.

Blizzard worked at JPL from 1981–98. He is survived by his wife, Sally, nine children, 39 grandchildren and 16 great grandchildren.

Memorial services were held at Mountain View Cemetery in Altadena.

JOHN MCCAIG, 76, a retired postal supervisor in Section 643, died of Parkinson's disease Dec. 17.

McCaig joined the Lab in 1961 and retired in 1989. He is survived by his wife, Constance, four sons and one daughter.

Services were private.

JANET SIMON, 75, a retired senior clerk in Section 642, died of pneumonia Dec. 20.

Simon worked at JPL from 1974–92. She is survived by daughters Lee Reynolds, Pamela Simon and Patricia Simon.

Services were private.

SAMUEL WARD, 79, a retired engineer in the former Section 420, died Dec. 23.

Ward worked at JPL from 1966–87. He is survived by four children, eight grandchildren and three great grandchildren.

Services were held Jan. 5 at Rose Hills Memorial Park in Whittier.

LEONARD JAFFE, 80, a retired senior engineer in Section 313, died of pneumonia Dec. 25.

Jaffe joined JPL in 1954 and retired in 1998. He is survived by his wife, Esther, two daughters, two sons, seven grandchildren and two great grandchildren.

Services were private.

Letters

We would like to thank our friends at JPL for their support during the illness and death of our father, Brian Mahoney. It's been a great comfort having you all to share this experience with us. And our thanks to the ERC for the beautiful plant.

Colin and Debby Mahoney

I want to thank my friends and colleagues at JPL for your support and expressions of sympathy upon the recent passing of my father. This support has been, and continues to be, very important to me during this extraordinarily difficult period. Thanks also to the ERC for the plant.

John West

I would like to express my gratitude to my friends and co-workers for their concern, support, and sympathy at the recent passing of my mother, especially to those who sent cards and donations to the Alzheimer's Association. In addition, thank you to the ERC for the lovely plant. I am grateful to be a part of such a caring community of people.

Sandi Jamison

I would like to express my thanks and appreciation to my friends and co-workers who have been so kind and supportive during the time leading up to the recent death of my father. Thanks also to JPL for having a "family sick leave" policy—it makes a difference when trying to care for your loved ones. Thanks to the ERC for the plant—I'll try not to kill it.

Scott Allen

I would like to extend my deepest appreciation for the support and thoughtfulness from my JPL co-workers and management during the trying period following the death of my husband, John E. McCaig. Your support for my family and myself has meant a lot. Thank you for expressing your sympathies.

Constance McCaig

My family and I would like to express our thanks to my friends and specially to the ERC for the beautiful plant upon the passing of my brother.

Cosme Chavez

My family and I would like to express our sincere thanks and appreciation to my wonderful JPL friends and coworkers for their prayers, expressions of sympathy and generous donation upon the untimely death of my father, Willie. We also would like to thank the thoughtful people at the ERC for the beautiful plant.

Carl J. Simon

Classifieds

For Sale

AUDIO SNAKE, Pro Sound, 100 ft., 27 pairs (24 mic. inputs, 3 sends), $475. 626/797-1673, Anthon.

BABY ITEMS, KidCo stairway gate, adjust. 28" to 46", $30; Safeway Gate, $20; Dutailier glider/rocker w/ottoman, $100; Diaper Genie, $10; Fisher-Price Push 'n Pedal trike, $20; Cosco booster seat, $10; Graco portable playpen, $20. 790-8442.

BARBECUE, gas, Charbroil brand, dual igniters, side shelves, tank not incl., $40. 626/398-0921.

BED, brass, double, headbd. & wrap pieces w/ Italian marble, exc. cond., $275. 626/445-4690.

BEDROOM SET, dresser w/mirror, 2 nightstands, headbd., full size, bookcase, TV stand, VG cond., bleached wood venire finish, $250/obo. 249-8840.

CELL PHONE, Nokia, analog, model 252, full-featured, incl. charger, cigarette lighter adapter, leather case, 1 yr. old, exc. cond., see description at http://www.nokiausa.com/beauty/1,1002,17,FF.html, $30. 353-6369, eves.

COMPUTER, Mac PowerBook G3, bronze key edition, 400MHz, 64MB RAM, 8MB video RAM, Mac OS9, 14.1" screen, LS120 Superdisk drive, CD-ROM drive, Virtual PC, SoftWindows '98, two button USB scroll mouse, 1 mo. old, $3,000. 626/351-6741, Karsten Browning, kbrowning@swales.com.

COMPUTER, Notebook, 100 MHz Pentium processor, 16 MB RAM, 720 MB HD, 11.3" screen (800 x 600), CD, 28.8 PCMCIA modem, Win '95, Office '97, $400/obo. 353-9367.

COMPUTER, StarMax 4000/160MHz Mac clone minitower w/keyboard & mouse, $150; Apple 320 laser printer w/nearly new cartridge, $100; SCSI zip drive w/cable $50; perf. cond. 323/257-7217.

COMPUTER, Mac Performa 6300CD, 66MHz, OS 7.5, 8 MB, 250 MB HD, CD-ROM, diskette, modem, 14-in. color mon., all orig. software, $150/obo. 626/305-9134.

DESK, perfect for home office, never used, in box, $175/obo. 626/403-9002.

DESK, oak, roll top, set up for computer, $500/obo. 661/251-3854.

DINING ROOM SET, table w/2 leaves, 6 chairs, china cabinet and hutch, colonial maple finish, $175/obo. 550-7555, Rob.

FIREPLACE SCREEN, tri-fold, black, $15. 626/398-0921.

FUTON, full sz. bi-fold, wooden frame, thick mattress, exc. cond., $200/obo. 550-1405.

HOCKEY TICKETS (2), Kings, Staples Center lower bowl, behind net, parking incl., $92. 626/331-9998.

JACKET, black leather, men's large w/zip out lining, exc. cond., $125. 626/445-4690.

LAMP, Tiffany style, w/clear beveled glass, dining rm. hanging type, $75. 957-4770.

LATHE, metal, Craftsman/Atlas, 6" radius swing, long bed, exc. cond., $1,200; might consider trade for Delta/Rockwell 14" commercial metal cutting band saw + $. 626/797-1673.

MATTRESS, full sz., new, $75/obo. 762-7298.

MISC, MacPowerBook 145B, $100; Mac LaserWriter 300, $200; Thule roof rack system, 2 bars, $20; 4 Y-mounts, $60; 4 locks, $10; sofa, 85", leather, black, $300; loveseat, 63", leather, black, $200; bureau, 5-drawer, rock maple, c. 1930, 50"H x 33"W x 19"D, $125. 626/793-3561.

MISC, mtn. bike, specialized 'stump-jumper', barely used, paid $1,200, sacrifce for $600; beautiful oak glider/rocker, wide back, matching footstool, like new, $300; antique white Swedish portable size baby crib, $70. 626/791-3329.

MISC, Sony Mavica digital camera, w/10X zoom, $389; Onkyo Pro Logic surround sound receiver w/5 CD carousel player/speakers, $269; Belkin 4 to 1 peripheral share device, new, w/gold IEEE cable, $49, orig. $99; new aquarium filter system/pump, $9; satellite signal booster, $8. 366-6134.

MOVING SALE, black sofa and loveseat, good cond., $250; matching dining rm. table & 4 chairs w/smoked glass top, good condition, $150; entertainment ctr., black w/mirrored front, VG cond., $250; end tables, 2, brass w/black, $25 ea.; Covina area. 626/858-9730.

MOVING SALE, variety of furniture, old & new, southwestern & Cal. styles, sofas, tables, leather recliner, dresser, etc., misc. appliances, Simac refrigerated self-contained ice cream maker, racing bike, misc. electronics. 626/446-4771, Bruce.

ORGAN, electronic, Gulbransen Pacemaker II, bench, 3 1/2 octave solo & accompaniment manuals, 1 octave pedal keybd., multiple pedal, accompaniment, effects & solo stops, 12 auto rhythm patterns, more, $800. 626/355-0372.

PHOTO ENLARGER, dbl. bellows, can be converted to view camera, 5.6 Ektar lens, $75. 626/446-5835.

POOL TABLE made by Cal Spa Billiards, 4.5' x 9' w/oak finish & green felt, sticks, balls, chalk incl., $1,000. 626/398-3649.

PRINTER, HP DeskJet 500C color, inkjet, works great, needs new ink cartridge, $20 firm. 550-7555, Rob.

PRINTS, 2, desert, one framed, 35 x 35, earth tones, med. $20/lg. $40. 362-3358.

RANGE, Whirlpool gas, almond, 30" self-clean oven, like new, must see, $350. 626/337-6130.

SCRIPTS, Star Trek DS9 & TNG w/color covers, various years & episodes. 626/355-4909.

SHOWER HEAD, Teledyne WaterPik, hand held, 5 settings, $10. 362-7187.

SOFA & LOVE SEAT, synthetic/wool blend, off white, seat cushions & pillows have zippers, exc. cond., $450. 626/798-2925.

SPEAKERS, Bose Acoustimas-5, $300; Bose VCS-10 center speaker, $100; Bose 4.2 stereo everywhere speaker, $100/pr. 661/255-5645.

STEREO, Magnavox, remote control, CD player, double cassette deck, digital tuning, $50/obo. 626/305-9134.

STORAGE SHED, approx. 8 x 8', will remove. 626/797-1673.

TELEVISION, big screen, Mitsubishi 50" projection, VS-5072, beaut. oak cabinet, great picture, incl. free Technics 100Wx5 AV control stereo receiver SA-AX910, cost $3,000, sacrifice for $800. 249-6786.

TILE, ceramic, assorted, new. 626/446-5835.

TREADMILL, Sears Lifestyler 8.0, motorized/incliner, $300. 352-2036.

VIDEO GAMES, Nintendo 64 system w/2 controllers, exc. cond., $110. 909/592-4667.

Vehicles / Accessories

'95 ACURA Legend LS coupe, 2D, black, auto, 104,000 miles, mint cond. leather, sunroof, heated seats, alloy wheels, CD changer, remote keyless entry, $17,000/obo. 626/584-3204 day, 909/592-0780 eve/weekend.

'65 CADILLAC Coupe de Ville, 50,272 orig. mi., runs perfectly, exc. throughout, full pwr. accessories & A/C, newly painted gold ext., ivory top, ivory leather & cloth interior like new, new tires, p/s, radiator, etc., all else orig., $10,000. 626/446-4771, Bruce.

'97 CHEVROLET Astro 8-psgr. van, Autumn-Wood, LS, rear air, CD player, alarm, Lojak, class 3 hitch, towing pkg., clean, well-maint., 52K mi., ext. warr., $16,500. 891-6836, Steve.

'89 CHEVROLET 2500 Silverado pickup, 5.7L EFI V8, HD suspension, AC, AM/FM/cass., cc, pwr. win./locks, Snugtop bed cover, tow hitch, 78k mi., $6,000/obo. 626/794-3358.

'81 FIAT Spider 2000 convertible, classic, zippy engine, no leaks, in better shape than most 19 year olds, $2,800/obo. 323/225-1732.

'98 FORD Explorer XLT, loaded, am/fm/cass., CD, front/rear a/c, tint, V6, low mi. 18K, cherry cond., 4 x 2, $19,900. 909/606-2887.

'89 FORD Pony Escort, 2 dr., blue, manual, 126,000 mi., good cond., all orig., no accidents, $900/obo. 805/523-7246.

'65 FORD Thunderbird, classic beauty, new paint, warr., pwr. windows, am/fm cass., runs perfect, exc. interior, needs a driver who appreciates it, $4,400.00. 626/296-7323, Jessica.

'98 HONDA Civic EX, auto, sunroof, p/w, p/l, air, 19K mi., stereo fm/am, salvage title, exc. cond., $10,000/obo. 909/599-3230.

'97 JEEP Wrangler SE, 4 cyl., 4x4, red, P/S, P/B, twin air bags, stereo, cass., sound bar, Lo-Jack & ignition cut-off, 31" wheels, 25K mi., still under transferable warranty, exc. cond., $15,500/obo. 248-8103, Mike.

'90 LEXUSES 250, dark metallic blue, 52,000 orig. mi., complete service records, leather seats, PWR. win./door locks/seats/moon roof, titanium window tint, custom pin stripping, exc. cond., $9,300/obo. 626/443-9774, eve's.

'92 LINCOLN Continental, silver paint & silver leather interior, many newly-replaced components by Lincoln dealer, incl. engine & trans., 85K mi., new Mich. MXV4 energy tires, entire car looks & drives almost new, $9,500. 626/446-4771, Bruce.

'89 NISSAN Maxim, 213,200 mi., exc. cond., $3,000/obo. 805/523-7246.

'93 SAAB 900S, one owner, leather, sunroof, alloy wheels, exc. cond., $5,500/obo. 661/251-3854.

'89 PLYMOUTH Voyager, $1,600. 352-2036.

'00 TOYOTA Corolla LX, 4-dr., hunter green, auto, cruise, A/C, AM/FM/cass., pwr. windows/locks, tilt hl., perf. cond., 6K mi., must sell (cancer), take over lease, $254.98/mo., purch. $17,500, any reas. offer considered. 249-4561.

'95 TOYOTA Supra SE, auto, p/s, p/w, CD, p/d/l, stereo fm/am, 59k mi., salvage title, exc. cond., $14,500/obo. 909/599-3230.

'83 TOYOTA Supra, white w/blue int., 6 cyl., cruise, sunroof, CD, pwr. win/drs., alarm, looks good, runs good, $1,500/obo. 353-1907.

'91 VOLKSWAGEN Jetta, white, 4 dr., auto, Wolfsburg ed., a/c, upgraded Pioneer speakers, Sony pull-out cass./am/fm, 149K mi., exc. cond., super clean, $3,700/obo. 714/903-8888.

YAMIKA roof rack, 58" crossbars, locking Q-clips, fits gutterless cars, used on a '90 & '97 Toyota 4Runner, good cond., very sturdy, $60. 353-6369, eves.

Wanted

COMPUTER, an older Mac, at least 6100/60, for sale or donation to a needy young person. capttrs@aol.com or 790-6185, Tim Scheck.

CHAIR, double Papasan. 805/522-6197, Pat.

'68-'72 Chevy Nova, V8, 2-dr. 626/445-7425.

DRUM SET, junior, for beginner. 909/598-0065.

SEWING MACHINE, used, must work, $80 or less. 626/345-0681.

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

TUTOR, physics teacher, for college student. 626/574-0520, Kamini, after 6 p.m.

Free

AQUARIUM, 55 gallon, leaks but repairable or fine as terrarium. 790-8523.

DOG, rescued, beaut. black lab/chow mix, 2-3 yr. old male, trained, healthy, shots, needs loving family, great companion. 661/257-5817.

For Rent

ALTADENA house to share, 2 bd., furnished, female roommate preferred, must tolerate cats, smoker; includes all util., avail. late March, $375. 626/398-7672, Diane.

ALTADENA, 1-bd. guest house, fenced yd, Florecita area above east lot, laundry, clean & quiet, pets OK w/dep. $425 + part util. 626/794-6076.

EAST PASADENA house, 2 bd., 1 ba., 1 car garage, 1 carport, lg. front. yd. w/fruit trees, incl. gardener/water/trash, non-smoker, carpet, blinds, stove, f/p, $1,050 + $1,050 sec. dep. 1-yr. lease. 949/643-9439.

EAST PASADENA house, 2 bd., 1 ba., 1-car gar., lg. fenced yd. w/fruit trees, incl. gardener/water, carpet, drapes, fireplace, stove, ref. avail., covered patio, walk to Madre facility & shopping, avail. Feb. 14, $925. 626/794-3250.

LA CRESCENTA, 1 bd. duplex, front unit w/yd/., water & gardener paid, common rms. furn., AC/heat, washer/dryer, own phone line, 6 mi./JPL, no smoking/pets, male preferred, $400 + 1/2 util. 248-8103, Mike.

SOUTH PASADENA, fully furn. studio apt., nice area, 1718 Huntington Dr., btwn. Marengo & Milan Sts., car space, laundry facilities, utili. pd, non-smoker, no pets, $565. 626/792-9053, Marilyn.

SYLMAR, new spacious home w/buy option, 2,500 sq. ft. in San Gabriel Mtns., 4 bd., den, bonus rm., LR/dining area, valley views, future gated community w/pool, 2-car gar., $2,500. 626/584-6526.

TUJUNGA townhouse in quiet gated community, 3 bd., 2.5 ba. 3 level, 1,600 sq. ft., lg. liv. & din. rm., lg. bdrms, attached 2-car garage, pool/spa/BBQ, $1,200. 626/296-7003 days, 353-0529 eves.

Real Estate

BIG BEAR, new cabin 2 blocks from lake, 2 bd., 2 ba., mud/laundry rm., $129,000. 909/ 585-9026.

BIG BEAR townhome, 2 bd., 2 ba., attach. gar., walking distance to Bear Mtn. slopes & golf course, assoc. clubhouse w/pool table, spa, tennis court, exercise rm, $153,900. 790-8442.

LAS VEGAS, timeshr. condo, 1 block from Strip close to Flamingo Hilton, 2 bd+2 ba., fully equipped kitchen, TVs, VCR, laundry room, community pool, $13,000/obo. 909/592-4667.

PASADENA house in the Meadows, 3 bd., updated kitch., LR w/FP, DR, skylights, 2-car gar., quiet cul de sac , 5 min to JPL, reduced $10,000 to $193,700. 626/449-8224.

SAN DIMAS, immac. house built '88, quiet, secluded Via Verde, appx. 2,600 sq.', 4 bd., 3 ba., lg. master bd. w/priv. ba., 2 tiled f/p's, sec. syst., 3-car gar., marble flrs., c/a/h, huge landscaped backyd. w/auto sprinklers, lg. Span. ftn, BBQ area, palm/fruit trees, covered patio, red brick pathways/walls, orig. owner, $469,500. 626/584-3204 day, 909/592-0780 eve/weekend.

TEHACHAPI, new house, weekend getaway and/or retirement home, 3 bd., 2 ba., LR, DR, custom built, cent. heat/a/c on 2 1/2 acres, Dutch barn, 2-car garage/work area, lots of oaks, OWC. 626/794-5858.

Vacation Rentals

BIG BEAR, 7 mi./slopes; full kitch., f/p, 2 bd., 1 ba., sleeps 6; reasonable rates; 2-nt. min. no smokers/ pets; exc. hiking, biking, fishing nearby. 909/585-9026, Pat & Mary Ann Carroll.

BIG BEAR cabin, quiet wooded area near village, 2 bd., sleeps 8, F/P, TV, VCP, completely furn., $75/nt. 249-8515.

BIG BEAR LAKE cabin, nr. ski area, lake, shops, village, forest, 2 bd., sleeps up to 6, f/p, TV, VCR, phone, microwave, BBQ & more, JPL disc. from $65/nt. 909/210-9182.

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

HAWAII, Kona, on 166 feet of ocean front on Keauhou Bay, priv. house & guest house, comfortably sleep 6, 3 bd., 2 ba., rustic, relaxing & beautiful, swim, snorkel, fish, spectac. views, near restaur., golf courses, other attractions. 626/584-9632.

HAWAII, Maui condo, NW coast, on beach w/ocean vw., 25 ft. fr. surf, 1 bd. w/loft, compl. furn., phone, color TV, VCR, microwv., dishwasher, pool, priv. lanai, slps. 4, 4/15-12/14 rate $95/nite/2, 12/15-4/14 rate $110/nite/2, $10/nite add'l. person. 949/348-8047.

HAWAII, W. Maui beach oceanfront luxury condo, fully furnished liv. rm., 2 bd. rms., kitch.d, $140/day for 2. 805/646-0810.

LAS VEGAS, 1 block from Strip, close to Flamingo Hilton, 2 bd., 2 ba. condo. w/fully equip. kit., TVs, VCR, laundry rm., comm. pool, Jul-Sep & Nov-Dec, $125/night, all other $110/night. 909/592-4667.

MAMMOTH, Chamonix condo, at lifts 7, 8, 16, 17; walk to Warming Hut, 2 bd., 2 full ba., sleeps 6, fully equip. elec. kitch. w/mcrowv. & extras, f/p & wood, color TV, VCR, cable, FM stereo, o/d Jacuzzis, sauna, game, rec. & laundry rms; convenient to shops, lifts; special mid-week rates. 249-8524.

MAMMOTH condo, studio + loft, 2 ba., fireplace w/wood, Jacuzzi, sauna, game rm., color TV w/cable & VCR, full kitch. w/microwave, terrace, view, amen. 714/870-1872.

PACIFIC GROVE house, 3 bd., 2 ba., fp, cable tv/vcr, stereo/CD, well-eqpd. kitch. w/microwv, beaut. furn., close to golf, bches., 17 Mile Dr, Aquarium, Cannery Row, JPL discount. 626/441-3265.

PALM SPRINGS, exquisite 2 bd., 2 ba. villa for rent (or sale) for vacations or long term, newly remodeled, skylight, patio, 2-car garage, located across the Living Desert, great private, secure resort w/ tennis cts., multiple pools & spas, clubhouse, great locality, close to Palm Desert Marriott, downtown, tourist attractions & major golf courses. 909/620-1364.

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.

SOUTH LAKE TAHOE KEYS waterfront, 4 bd., 3 ba., 1 bd. & liv. rm. upstairs, hcp. access fair, slps. 12+, fireplaces, decks overlook priv. dock & ski lifts, gourmet kitch., bicycles, sail & paddle boats, 4 color TVs, VCR, stereo w/tape & disk, assn. indoor & outdoor pools, hot tub & beach, lighted tennis, 10 min./skiing, casinos, golf; 1 hr./wine country, 3-day min., $1,195/wk. for high season [1 June to 15 Sept; 22 Nov to 1 April], $595/week low seas., + $90 cleaning fee. 949/515-5812.