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This image of the star HR 4796 and its sur-

rounding dust disk was taken on March 15

at the Keck II Observatory atop Mauna Kea, Hawaii, using MIRLIN, JPL's mid-infrared

camera. Images were taken at two different

infrared wavelengths (12 and 21 microme-

ters). The star, which is similar to our sun,

image. A much cooler disk of dust, a few

rounds the star. A slight decrease in the

brightness between the star and the outer

appears as the white dot in the center of this

times larger than our own solar system, sur-

parts of the disk implies that material in this

# Astronomers using Keck II find planet formation zone around nearby star

By JANE PLATT

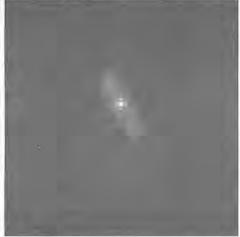
NASA astronomers using the new Keck II telescope in Hawaii have discovered what appears to be the clearest evidence yet of a budding solar system around a nearby star.

Scientists released an image of the probable site of planet formation around a star known as HR 4796, about 220 light-years from Earth in the constellation Centaurus. The image, taken with a sensitive infrared camera developed at JPL, shows a swirling disc of dust around the star. Within the disc is a telltale empty region that may have been swept clean when material was pulled into newly formed planetary bodies, the scientists said.

"This may be what our solar system looked like at the end of its main planetary formation phase," said Dr. Michael Werner of JPL, who codiscovered the region, along with Drs. David Koerner and Michael Ressler, also of JPL, and Dana Backman of Franklin and Marshall College, Lancaster, Pa. "Comets may be forming right now in the disc's outer portion from remaining debris."

The discovery was made on March 16 from the giant 10-meter (33-foot) Keck II telescope atop Mauna Kea, Hawaii. Keck II and its twin, Keck I, are the world's largest optical and infrared telescopes. Attached to the Keck II for this observation was the mid-infrared camera, developed by Ressler at JPL and designed to measure heat radiation.

The four scientists reported their discovery in a submission to Astrophysical Journal Letters. The disc was discovered independently



region has condensed to form planets. The bright outer disk may represent material left over from this planet-building phase and could still be actively forming comets. A color image of HR 4796 is posted on the World Wide Web at http://www.jpl.nasa.gov/ releases/98/hr4796.html .

and contemporaneously at the Cerro Tololo Observatory in Chile by another team of scientists, led by Ray Jayawardhana of the Harvard-Smithsonian Center for Astrophysics, Cambridge, Mass., and Dr. Charles Telesco of the University of Florida, Gainesville.

JPL's Koerner said the finding represents a "missing link" in the study of how planetary systems are born and evolve. "In a sense, we've already peeked into the stellar family album and seen baby pictures and middle-aged photos," Koerner said. "With HR 4796, we're seeing a picture of a young adult star starting its own family of planets. This is the link between discs around very young stars and discs around mature stars, many with planets already orbiting them."

This is the first infrared image where an entire inner planetary disc is clearly visible," Werner said. The planet-forming disc around the star Beta Pictoris was discovered in 1983 by the Infrared Astronomical Satellite (IRAS), and also later imaged with the Hubble Space Telescope, but glaring light from the star partially obscured its disc.

The apparent diameter of the dust disc around HR 4796 is about 200 astronomical units

See HR 4796, page 3

# Deep Space 1 launch delayed until October

By JOHN G. WATSON

The planned July 1998 launch of the JPLmanaged Deep Space 1 technology validation mission from Cape Canaveral, Fla., has been rescheduled for October.

The delay is due to a combination of late delivery of the spacecraft's power electronics system, and an ambitious flight software schedule, which together leave insufficient time to test the spacecraft thoroughly for a July launch.

The power electronics system regulates and distributes power produced by not only the solar concentrator array-a pair of experimental solar panels comprised of 720 cylindrical Fresnel lenses-but also by an on-board battery. Among many other functions, it helps the solar array to operate at peak efficiency and ensures that the battery is able to cover temporary surges in power needs so that the ion propulsion system (which needs electricity for its basic operations) receives a steady power supply.

"With a new launch date for this bold mission, we can be more confident that we will be ready to fully exercise our payload of important technologies," Chief Mission Engineer Dr. Marc Rayman of JPL explained. "The entire DSI team looks forward to this opportunity to make a significant contribution to science missions of the future through the capabilities we are testing on DS1."

Deep Space 1 is the first launch of the New Millennium Program, a series of missions designed to test new technologies so that they can be confidently used on science missions of the 21st century. Among the 12 technologies the mission is designed to validate are ion propulsion, autonomous optical navigation, a solar concentrator array and an integrated camera and imaging spectrometer.

The earlier July launch period for DS1 allowed it to fly a trajectory encompassing flybys of an asteroid, Mars and a comet. By the end of May, the mission design team is scheduled to finalize new target bodies in the solar system for DS1 to encounter based on an October launch date.

# Finding needles in Mars' haystack

# Global Surveyor seeks tiny targets to image from orbit of red planet

By FRANKLIN O'DONNELL

JPL lore is peppered with metaphors that describe the challenges of running spacecraft missions. The job of steering spacecraft or pointing science instruments across hundreds or thousands of kilometers has been compared to hitting a golf ball in California and sinking a hole-in-one in Maine-or standing in Chicago and tossing a coin into a plate in New York-or similar imaginary feats on Earth.

JPLers exhibited a new round of engineering derring-do in April when the Mars Global Surveyor project team stepped up to the challenge of imaging three extremely small targets from Martian orbit-the landing sites of the Viking I, Viking 2 and Mars Pathfinder spacecraft.

The project learn announced plans to image the three landing sites during a hiatus in "aerobraking," the gradual lowering of the spacecraft's orbit using atmospheric drag as Global Surveyor passes close to the planet on each looping orbit. Besides the three landing sites, Global Surveyor's camera was also going to target the so-called "Face on Mars" and other nearby features in the planet's Cydonia region.

"Imagine driving down a freeway at high speed, looking through a soda straw and trying to pick out a certain flower on the side of the road," said Wayne Lee, the Global Surveyor mission planner responsible for the imaging campaign. "We had to know not only exactly where to look, but also exactly when the target would pass in our very narrow field of view."

Indeed, during each of the imaging attempts Global Surveyor swept past the red planet at nearly 14,500 kilometers per hour (almost 9,000 mph). The flight team had to image features from a distance of 500 to 800 kilometers (about 300 to 500 miles) with a very narrow-angle camera. While the "Face" feature is about 1.5 kilometers (1 mile) across, each of the landers was only a couple of meters in size-smaller than a single pixel in even the best images the team could hope to obtain.

"No one really expected that the landers would be big enough to see," said Lee. "The main hope was that there might be some sun glint on them that would make them visible."

Three things had to go right if the effort was going to succeed: navigation had to be right, pointing of the camera must be correct, and the location of each of the targets had to be known accurately.

"The performance of the navigation team has been outstanding-they've put us right where we've told them we wanted to be," said Lee. "Pointing also worked very well. It was the knowledge of the location of the targets that gave us the most trouble. Although the spacecraft always pointed exactly where we told it, we didn't always know exactly where we needed

To prepare for any given attempt, the navigation team issued a "predict" that described the spacecraft's current orbit and its predicted location and speed at the time of the imaging attempt. On a given orbit, the team would collect Doppler radio data when the spacecraft passed closest to the planet, then solve for the spacecraft's orbital parameters. The closer the predict was issued to the time of the imaging attempt, the more accurate the prediction would be.

Although the team estimated odds of only about 30 percent for hitting the target on any

given imaging attempt, they were pleased with the results. But Martian weather-and uncertainties about the location of some of the targets-also added to the challenge.

The spacecraft had three imaging passes for each of the targets. The camera obtained a good



The Mars Pathfinder landing site is near the center of the above image, which was acquired April 22 by the Global Surveyor's Mars Orbiter Camera. Because of hazy atmospheric conditions and the fact that the camera had not yet been focused, the scale of the image was insufficient to resolve the lander. In addition, the relatively high sun angle of the image (the sun was 40° above the horizon) reduced the length of shadows (for example, only a few boulders are seen), also decreasing the ability to discriminate small features.

> image of the "Face" feature in Cydonia on its first try, locating the mesa nearly in the center of the image strip. During the second pass, the flight team targeted an adjacent group of features known popularly as "The City"; the image obtained was

See MGS, page 4

# Ulysses completes first full orbit around the sun

By DIANE AINSWORTH

After a seven-and-a-half-year flight covering 3.8 billion kilometers (2.4 billion miles), Ulysses-the only spacecraft ever to explore the sun's polar regions—has completed its first

Having passed under and over the sun's poles, Ulysses has returned to the region of space occupied by Jupiter, which is more than five times the distance of the Earth from the sun. Ulysses flew past Jupiter in February 1992 and used that giant planet's gravity to achieve the spacecraft's current orbit. The spacecraft is now on the opposite side of the sun from Jupiter and poised to return to the sun's poles during the peak of solar activity.

"Before the Ulysses mission, very little was known about the regions above and below the solar equator because our solar observations were restricted," said Dr. Edward Smith, project scientist of the joint NASA-European Space Agency mission. "We knew that the sun and solar system were enveloped in a huge, tenuous cloud of gas and dust, known as the heliosphere, but we did not know how this vast space around the solar system was structured."

During the first orbit, Ulysses data revealed that the gas in the heliosphere consists principally of energetic atoms from which one or more electrons have been removed to form ions. These ions become positively charged when they lose their electrons. In addition, three classes of charged particles have been identified on the basis of their energy and place of origin.

"At the lowest energy, but dominant in number, are the particles that originate on the sun and continuously stream outward, forming the solar wind," Smith said. "More energetic but less numerous particles originate beyond the orbit of Earth. These accelerated particles occur in bursts and are found near 'weather fronts,' which develop several times a month. At the highest energies, and even lower in number, are the cosmic rays, which originate outside the solar system in the Milky Way galaxy."

See Ulysses, page 4

# **News Briefs**

**Dr. John McNamee**, manager of the 1998 Mars Surveyor mission, has been appointed project manager for Outer Planets/Solar Probe, which encompasses three planned missions—Europa Orbiter, Pluto-Kuiper Express and Solar Probe.

McNamee will continue as Mars '98 manager, with Outer Planets/Solar Probe as an additional role. After the launches of the Mars '98 Climate Orbiter on Dec. 10, 1998, and the Mars '98 Polar Lander on Jan. 3, 1999, McNamee will assume management of Outer Planets/Solar Probe on a full-time basis. Robert Staehle, former manager for the Ice and Fire Preprojects, has been named deputy project manager for Outer Planets/Solar Probe.

McNamee has served as the Mars '98 project manager since May 1995. Before that, he was manager of the Mars Exploration Preprojects and mission design manager for Mars Pathfinder. His nine-year career at JPL has also included positions as engineering office deputy manager and navigation team chief for the Magellan mission to Venus. His work on Magellan earned him NASA's Exceptional Service Award. □

JPL's Public Services Office seeks employees to participate in the annual Shadow Day May 22.

Marking its 11th anniversary, the program allows Eliot Middle School students to observe employees at their jobs and become aware of the diverse employment opportunities available at IPI

Those who participate will host a student from 9:30 a.m. to 1:30 p.m.

Employees from a variety of jobs are needed to make the program a success, said **Kay Ferrari** of Public Services. For details, contact her at ext. 4-9312. 

□

The next JPL/Red Cross blood drive will be held in von Karman Auditorium May 12 from 10 a.m. to 3:15 p.m. and May 13 from 7 a.m. to 12:15 p.m.

Sign-up sheets for the blood drive will be available at the ERC, Occupational Health Services (Building 263) and Occupational Health Services' home page at http://eis/medical prior to the blood drive.

Those who have not signed up ahead of time or wish to change their appointment may call **Ginger Morris** at the Pasadena Red Cross at (818)799-0841, ext. 630. □

New operating hours have been announced for two JPL stores, effective May 4.

Central Supply, in Building 171-107, will be open from 7:30 a.m. to 2 p.m. daily, while Photo Supply, located in Building 111-B17, will operate from 12:30 p.m. to 4 p.m. daily.

For off-hour emergencies only, contact Brett Boettcher at ext. 4-0833.

# Earth mission update



UNIVERSE PHOTO

The April 22 celebration of Earth Day proved a good opportunity for the news media to view the status of JPL's QuikScat/Seawinds mission, which is undergoing integration in the Spacecraft Assembly Facility. Project Manager Jim Graf, second from right, discussed the mission with reporters. QuikScat/Seawinds is set to launch Nov. 1. Reporters also had the opportunity to view one of the antennas for the Shuttle Radar Topography Mission (SRTM) in high bay 1.

# Award for Excellence fete honors the best of 1997

Ten teams and 16 individuals were formally recognized for their outstanding contributions to JPL in 1997 during the Lab's annual Award for Excellence ceremony April 22.

The Award for Excellence is the first tier in JPL's three-tiered Reward & Recognition Program. It is a cash award that is determined by committee based on employee nominations submitted in January 1998.

The selection committee chooses awardees in the categories of leader-

ship, technical, quality and business operations, and determines weightings for each of four criteria within each category. The criteria are value added, initiative, innovation and measurability.

Information about the Reward & Recognition Program is available online at http://eis.jpl.nasa.gov/sec614/reward/rr.htm.

JPL Deputy Director Larry Dumas presented the following awards during the ceremony:

See Excellence, page 3

# Cassini performs successful Venus flyby

The Saturn-bound Cassini spacecraft successfully performed a flyby of the planet Venus on April 26, coming about 284 kilometers (176 miles) from the Venusian surface. The flyby gave the Cassini spacecraft a boost in speed of about 7 kilometers per second (about 4 miles per second) to help the spacecraft reach Saturn in July 2004.

"The accuracy achieved by our navigators is roughly equivalent to shooting a basketball from Los Angeles to London and making a swish shot," said Cassini Program Manager Richard Spehalski.

NASA's Deep Space Network

telecommunications antennas in Goldstone, Calif. and near Madrid, Spain, tracked the spacecraft as it made its closest approach to Venus at 6:52 a.m., Pacific Daylight Time (Earth-received time). One-way light time to the spacecraft from Earth was about 7 1/2 minutes.

Leaving Venus, the spacecraft was moving at more than 141,000 kilometers per hour (87,000 mph). Science instruments on the spacecraft searched for lightning in Venus' atmosphere during the flyby, and the radar instrument onboard was activated to test a bounced signal off the planet's surface. In its long trajectory to Saturn,

Cassini will perform another flyby of Venus next June, one of Earth in August 1999, and one of Jupiter in 2000. All of the flybys impart more speed to the spacecraft to allow it to reach its final destination of the Saturnian system. After it enters orbit around Saturn in 2004, Cassini will study the ringed planet, its moons and ring system for at least four years. It will also deliver the Huygens probe to parachute to the surface of Saturn's largest moon, Titan.

# Special Events Calendar

# Ongoing

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

Codependents Anonymous—Meeting at noon every Wednesday. For more information, 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. For more information, call employee assistance counselor Cynthia Cooper at ext. 4-3680 or Randy Herrera at ext. 3-0664.

HIV Support Group—Meets quarterly. Call employee assistance counselor Cynthia Cooper at ext. 4-3680 for more information.

Parent Support Group—Meets the fourth Tuesday of the month at noon. For location, call Jayne Dutra at ext. 4-6400.

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. For more information, call (626) 397-3110.

#### Friday, May 1

JPL Dance Club-Meeting at noon

in Building 300-217.

Senior Care Connection Resource Fair—Senior- and elder-care agencies will be on hand at this 11:30 a.m. to 1:30 p.m. event, to be held at Caltech's Olive Walk. Transportation from JPL to Caltech and back will be provided from the main gate; the first bus leaves JPL at 10:21 a.m. and the last bus from Caltech departs at 1:24. For information about the fair, call (626) 395-8360.

#### Sunday, May 3

Classical Music—Caltech's pianistin-residence James Boyk will appear with guest artist clarinetist Margaret Thornhill in a free concert at 3:30 p.m. in Dabney Lounge. For information, call (626) 395-4652.

#### Monday, May 4

Caltech Seminar—Dr. Dorit Tanay, from the department of musicology and the Cohn Institute for the History of Science and Ideas at Tel Aviv University, will present "Born as Twins: Opera and the New Science of the 17th Century." At 7:30 p.m. in Caltech's Beckman Institute Auditorium.

#### Tuesday, May 5

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

JPL Genealogy Club—Meeting at noon in Building 301-169.

# Wednesday, May 6

Associated Refirees of JPL/Caltech— Meeting at 10 a.m. at the Caltech Credit Union, 528 Foothill Blvd., La Cañada.

Eudora Quick Start Session for Business Users—This overview is for cc:Mail PC users who have not yet begun to use Eudora Pro. At noon in the Building 167 conference room. For other Eudora classes, see the ICIS home page at http://icis.jpl. nasa.gov.

Eudora Quick Start Session for Technical Staff—This overview is for cc:Mail Macintosh users who have not yet begun to use Eudora Pro, and will offer more detail than the sessions for business users. At 2 p.m. in Building 180-101.

"The Experience of Faculty of Color in Higher Education"—
Professor Amy Iwasaki Mass of the department of sociology, anthropology and social work at Whittier College will speak at noon in Building 180-101. Sponsored by the Asian American Council and Advisory Council for Women.

## Thursday, May 7

Fidelity Workshops—Countdown to Retirement is tailored for employees who are two to 10 years for retirement. At 10 a.m. in Building 180-101. Turning Your Retirement Savings Into Income is for those within three years of retirement. At 2 p.m. in Building 180-101.

JPL Dance Club—Clogging class will be held at noon in Building 300-217.

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

### Friday, May 8

JPL Dance Club—Meeting at noon in Building 300-127.

#### Saturday, May 9

The Caltech Jazz and Concert Bands— The Caltech Jazz and Concert Bands will present the 19th annual Bandorama at 8 p.m. in Beckman Auditorium. Featured in this free program will be Dr. Les Deutsch, manager of the Telecommunications and Mission Operations Directorate's Technology Program Office.

# Monday, May 11

Associated Retirees of JPL/Caltech— Participating members will begin a 15day trip to Spain and Portugal. Cost: \$2,789 twin, \$3,289 double. Call Lila Moore at (818) 790-5893.

# Tuesday, May 12

Associated Retirees of JPL/Caltech— Members will attend the Palm Springs Follies, with lunch at Harry's Hofbrau. Cost: \$56.

Eudora Quick Start Session for

Business Users—This overview is for cc:Mail Macintosh users who have not yet begun to use Eudora Pro. At noon in the Building 167 conference room. For other Eudora classes, see the ICIS home page at http://icis.jpl. nasa.gov.

JPL Scuba Club—Meeting at noon in Building 168-427.

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

#### Wednesday, May 13

Caltech Jazz and Concert Bands— JPL Amateur Radio Club— The Caltech Jazz and Concert Bands Meeting at noon in Building 238-543.

JPL Toastmasters Club—Meeting at 5:30 p.m. in the Building 167 conference room.

#### Thursday, May 14

JPL Dance Club—Clogging class will be held at noon in Building 300-217.

Von Kármán Lecture Series—Deputy Project Manager Robert Staehle will discuss Outer Planets/Solar Probe at 7 p.m. in von Kármán Auditorium. Open to the public.

## Friday, May 15

Von Kármán Lecture Series— Deputy Project Manager Robert Staehle will discuss Outer Planets/ Solar Probe at 7 p.m. in The Forum at Pasadena City College, 1570 E. Colorado Blvd. Open to the public.



# Daughters' day draws 350

About 350 children of JPL employees took the day off from school April 23 for the annual Take Our Daughters to Work Day as they got a glimpse of how mom and dad spend their time at the Laboratory,

Actually, it was much more than mothers and fathers who escorted the 9- to 17-year-olds to their workplaces and to a number of special activities on Lab. Grandparents, aunts and uncles, brothers and sisters, family friends and others also got involved

in hosting a record number of girls and boys for the event.

Participants enjoyed a number of demonstrations and discussions by JPLers. Dr. Sabrina Grannan of Section 346, who is managing a feasibility study for a Europa probe, discussed with the youngsters the search for life elsewhere in the universe and how JPL is going about it.

Grannan, who majored in physics, drew from her experiences as a child when, she said, she first got excited about science by visiting her father several times a year in his physics lab, where he taught at a local community college.

"Take Our Daughters to Work Day made me realize how beneficial it would be to have children experience the world of working scientists on a more frequent and impromptu basis," Grannan said. "It was wonderful talking to the kids and I really enjoyed it."

Jeanette Mills, chairwoman of JPL's Advisory Council for Women and a member of the Take Our Daughters to Work Day committee, said, "It was exciting to share the day

# Dad, daughter take turns at the camera



JPL photographer Bob Brown captured some of the fun of Take Our Daughters to Work Day last month in the photo at left, as Allison Clark, 9, daughter of Jerry Clark of Section 388, and two other girls get a kick from the feeling of a Mars rover rolling over them. Brown then handed the camera over to his 9-year-old daughter, Ariell, who shot the photo above. Brian Cooper, who drove Pathfinder's Sojourner rover on Mars, is shown describing the prototype rover to a large gathering of onlookers as Nicole Potter, daughter of Don Potter of Section 506, drives.

with the next generation and to see the children's eyes light up when they realize their potential and say, 'I can do that.'

"Even those who didn't bring their children appreciated being asked what they do and enjoyed talking about their job," she added.

A particular favorite among the activities offered was the Mars rover demo in the mall.

Third-grader Chris Johnson, 9, whose mother, Debbie, works in Section 109, allowed the rover to be driven over his body, then took a turn driving it.

"It was cool. It felt like thousands of bees were on me," he said. On driving the rover, he said, "It was easy to drive, really easy.

"I want to become an astronaut, maybe. Or maybe a pilot of a real rover on other planets," he added.

Thomas Kratz, whose 11-year-old son Andrew saw Tom Valdez of Section 346 demonstrate fuel cell power, also thought the day was worthwhile.

"These demonstrations are interesting because they show what is possible—getting down to something you can actually hold in your hands."

-Enrico Piazza and Mark Whalen

# Stone calls for new research challenges

JPL Director Dr. Edward Stone has announced a new initiative to stimulate ideas for future JPL research that will combine state-of-the-art scientific and technological advances.

The plan, called Grand Challenges in Robotic Space Exploration, will look beyond the horizon of current and planned NASA/JPL missions and will provide new research opportunities for the Laboratory.

JPL Chief Scientist Dr. Moustafa Chahine, who will administer the program, issued a call for research concepts May 1 to kick off the process of selecting initial ideas for consideration.

Chahine said he hopes that initial proposals reveal a number of challenging and interrelated research problems whose synergistic solution would lead to breakthrough advances in robotic systems for future missions. He noted that a Grand

Challenge should set long-range interdisciplinary research goals, be doable in a time frame of 5 to 15 years, and provide system-level functions to exciting new missions that have never been done before.

"A Grand Challenge must either fit within the JPL mission or expand on it," Chahine said. The kinds of activities envisioned for the program are not unprecedented, he noted, pointing to the fact that when the protoplanetary disk was discovered around Beta Pictoris in 1983, then-JPL Director Lew Allen issued the challenge of detecting planets around other stars. This challenge led to the formation of JPL's interferometry program and, in turn, Chahine said, the Origins Program.

Hoping to seize on similar opportunities for the 21st century, the Grand Challenge activity is intended to provide stable financial support to high-risk/high-payoff basic research to enable new missions. The Director's Research and Development Fund will support the activity with about \$1 million annually.

One or two meetings will be convened in May by Chahine and members of JPL's Generate Innovative Concepts committee for general discussion of ideas.

Abstracts of one to two pages should be submitted to Chahine by June 15 at mail stop 180-904, and should contain the following information: a short statement of a proposed grand challenge concept; a list

of the interrelated scientific and technical disciplines required to address the challenge, together with the major issues associated with each of these disciplines; a statement of metrics that would be used to evaluate progress; and a brief description of the kind of discoveries that would be enabled if the challenge is solved.

A workshop hosted by Caltech President Dr. David Baltimore in August will then be followed by preliminary selection of concepts by Stone.

For more information, call Chahine at ext. 4-6057.

# HR 4796

Continued from page 1

(one astronomical unit is the distance from Earth to the sun). The diameter of the cleared inner region is about 100 astronomical units, slightly larger than our own solar system.

HR 4796 was originally identified as an interesting object for further study by Dr. Michael Jura, an astronomy professor at UCLA. The star, HR 4796, is about 10 million years old and is difficult to see in the continental United States, but is visible to telescopes in Hawaii and the southern hemisphere.

The discovery of the HR 4796 disc was made in just one hour of observing time at Keck, but the JPL team plans to return to Hawaii in June for further studies. They hope to learn more about the structure, composition and size of this disc, and to determine how discs around stars in our galaxy produce planets. They plan to study several other stars as well, including Vega, which was featured prominently in the movie "Contact."

The Harvard/Florida research team that also found the HR 4796 disc included Drs. Lee Hartmann and Giovanni Fazio of Harvard-Smithsonian Center for Astrophysics, and Scott Fisher and Dr. Robert Pina of the University of Florida.

JPL's use of the Keck telescope is supported by the Origins program, a series of missions to study the formation of galaxies, stars, planets and life, and to search for Earth-like planets around other stars that might have the right conditions for life.

The W.M. Keck Observatory is

owned and operated by the California Association for Research in Astronomy, a joint venture between the University of California, Caltech and NASA.

The research of both teams was supported in large part by the Origins Program, with additional support to the Harvard/Florida team from the National Science Foundation, the National Optical Astronomy Observatories, and the Smithsonian Institution; and with additional NASA support for the Caltech/JPL-Franklin & Marshall team, including use of the Keck Observatory.

The Keck II image of HR 4796 is available online at http://www.jpl.nasa.gov/releases/98/hr4796.html. The image and information on the MIRLIN camera is available at http://cougar.jpl.nasa.gov/mirlin.html. \(\Pi\)

# Excellence

Continued from page 2

Individual awards:

Quality

Outstanding initiative, dedication and eustomer service in creating and maintaining Web sites including the Comet Hale-Bopp home page and others: Ron Baalke (Section 311).

Outstanding initiative and dedication in expanding the effectiveness of science outreach to both the educational community and the general public: Stephen Edberg (3238).

Outstanding initiative, dedication and customer service in providing excellent and timely mechanical fabrication services: Joachim Voeltz (357).

#### Technical

Significant achievement in the conceptual design and development of the Web interface for Telescience (WITS): Paul Backes (345).

Significant achievement as the key technical contributor and Cognizant Engineer for the Cassini Command and Data Subsystem: Jim Donaldson (341).

Significant achievement as the Project Scientist for the Mars Pathfinder Mission: Matthew Golombek (3236).

Significant achievement in the management of the WIRE Project and in the development of a working thermal model critical to WIRE: Thomas Luchik (794).

Significant achievement as the key technical contributor in the development, validation and implementation of the Mars Pathfinder entry, decent and landing system: Robert Manning (410).

Significant achievement as the key technical contributor and cognizant engineer for the Cassini Attitude and Articulation Control Subsystem: Robert Rasmussen (3410).

Significant achievement in the development of a new forced limited vibration testing technique: Terry Scharton (352).

Leadership

Substantial contribution as the Mars Pathfinder mission manager in providing excellent leadership in the design, development, integration, and validation of the mission operations: Richard Cook (410).

Substantial contribution in leading the effort of integrating the RTGs on the Cassini spacecraft, which included development and implementation of techniques, procedures and support equipment: Brett Lindenfeld (352).

Substantial contribution as lead engineer in the design, fabrication and installation of thermal blankets on the Cassini spacecraft; Pamela Hoffman (352).

Substantial contribution as the group supervisor of the Submillimeter Wave Advanced Technology Group in providing excellent leadership to the submillimeterwave technology development: Peter Siegel (386)

**Business Operations** 

Outstanding initiative, dedication and customer service in managing design and implementation to replace UPS batteries in the Space Flight Operations Facility: Krisknan (6641):

#### Team awards:

Quality

Radiation Testing Team: Outstanding initiative, dedication and innovations in developing and implementing several new approaches, procedures and processes that have resulted in substantial improvements to radiation testing services and products: Charles Barnes, Harvey Schwartz, James Coss, Larry Edmonds, Hossein Farmanesh, Allan Johnston, Choon Lee, Linda Mayo, Tetsuo Miyahira, Duc Nguyen, Michael O'Connor, Bernard Rax, Luis Selva, Gary Swift, Joan Westgate,

Michael Wiedeman, TOPEX/Poseidon "El Niño" Science Visualization and Awareness Team; Outstanding initiative and dedication in using TOPEX/Poseidon data to provide excellent images, animations and other information to the media and the world that increased the general awareness of the ocean's role in climate variability: Annette Decharon, Mary Hardin, Richard Pavlovsky, Akiko Hayashi, Lee-Lueng Fu, William Patzert, Victor Zlotnicki, James Lambert, Carol Lachata.

Technical

Cassini Mechanical ATLO Team: Significant achievement and dedication in assembling the Cassini spacecraft in support of the Cassini Mission: Gordon Cucullu III, Paul Hardy, Glenn Anderson, Pamela Hoffman, Brett Lindenfeld, Patrick Murphy, Mary Reaves, Pim Vosse, Michael Schmelzel, Mark Duran, Rennie Green, Daniel Maynard, Johnny Melendez, George Nakatsukasa, Alex Perez, David Rice, Norman Schwartz, John

Shuping, Christopher Tippit, Henry Conley, Richard Aragon, Larry Elias, Richard Paynter, Thomas Ramsey, Peter Sorci.

Mars Pathfinder Entry, Descent and Landing (EDL) Team: Significant achievement in the design, development, validation and successful accomplishment of the Mars Pathfinder entry, descent, and landing:

Sami Asmar, Guy Beutelschies, Carl Buck, Leslie Compton, Gregory Davis, Greg Gillis-Smith, David Gruel, Bryan Huneycutt, Pieter Kallemeyn Jr., William Layman, Roger Lee, Rebecca Manning, Robert Manning, Donald Meyer, Chia-Yen Peng, Christopher Porter, Richard Rainen, Tommaso Rivellini, Glenn Reeves, Dara Sabahi, Alejandro San Martin, Scott Shaffer, Kendra Short, Samuel Sirlin, James Stone, David Spencer, Carl Steiner, Brad Swenson, Sam Thurman, Jeffrey Umland, Robin Vaughan, Gordon Wood, Beth Wahl.

Mars Pathfinder Science Support Image Processing Team: Significant achievement and innovation in the design, development and implementation of rapid and automated production of Mars Pathfinder image products: Douglass Alexander, Jean Lorre, Justin Maki, Allan Runkle.

MGS Mission Redesign Team: Significant achievement in the timely development of a completely new mission design that was critical to the continuation of the MGS Project: William Blume, Daren Casey, Wayne Lee, Martin Johnston, Daniel Lyons, Ralph Roncoli, Theodore Sweetser III, Charles Whetsel, Bruce Waggoner. MSOP Automated Command and Sequence Process Development Team: Significant achievement and innovation in developing a fully automated process for generating MSOP spacecraft command files and ground support products and the application of this process to MGS aerobraking flight operations: Robert Brooks, Wayne Sidney, Judith Morris, Bruce Waggoner, Steven Wissler, Stephen Licata.

Tunable Diode Lasers Team: Significant achievement in the technology development and demonstration of tunable diode lasers for planetary in-situ studies: Lawrence Davis IV, Siamak Forouhar, Edward Fortier III, Sam Keo, Krishna Koliwad, James Lamb, Paul Maker, Mohammad Mazed, Randy May, Richard Muller, James Singletery Jr., Tasha Turner, Hugo Velasquez, James Wishard, Martin Young.

Active Pixel Imager Research & Development Team: Significant achievement, innovation and world-class contribution in the advancement of CMOS active pixel sensor technology: Thomas Cunningham, Brita Olson, Monico Ortiz, Bedabrata Pain, Chris Wrigley, Guang Yang.

**Business Operations** 

Purchase Card Process Implementation Team: Significant achievement in the design and implementation of a "purchase card" program.: Robert Barge, Ginger Loesch, John Schofield. □

# Ulysses

Continued from page 1

Ulysses scientists also found that the space between the sun's equator and poles can be divided into distinct regions, just as the Earth can be divided into tropical, temperate and arctic zones.

The speed of the solar wind is divided into two zones, one extending from the equator to about 30 degrees latitude. The typical wind flow in the equatorial region consists of particles traveling at variable rates,

kilometers to 400 kilometers per second (nearly 1 million mph). Above this zone, extending all the way to the highest latitude, is fast wind traveling at double the speed-about 750 kilometers per second (about 2 million mph)-and at a relatively steady flow. These winds come from coronal holes in the sun, which are close to the poles and fairly large when the sun is in a quiescent state. The speeds

"This division of the wind into three zones-north, equatorial and south-is also seen in the magnetic field measurements," Smith said. "In the fast, high-latitude wind, large amplitude waves are continuously present, traveling outward from the sun. These unusually large, strong waves are similar to waves moving along a taut rope. They move outward along a large scale solar magnetic field that is stretched outward into space by the solar wind."

Energetic particle bursts also divide space into two regions. The bursts occur from the equator to between 40 and 70 degrees latitude, after which they disappear. Unlike particle bursts, however, galactic cosmic rays occupy a single zone stretching from the equator to the poles, without a significant increase in number. Magnetic field observations made by Ulysses explain this relatively uniform distribution, Smith said. "Although the cosmic rays might have easier access to the poles by following the converging magnetic lines of force, the outward-traveling waves in the fast wind oppose their entry and compensate for this potential increase."

# MGS

#### Continued from page 1

slightly to the west of the target. The image obtained during the third pass was also slightly to the west of the targeted area. "In both of these cases, the amount we were off was within the standard error predicted," said Lee.

In the case of the Viking 1 landing site, on the first pass the targeted site fell slightly outside the image frame. On the second and third passes, the team hit the target dead on. Members of the science community, however, were debating last week whether the lander was really where they thought it was or if it might be off by about 0.2 degree. Some uncertainty exists regarding the coordinate system of Martian latitude and longitude, making a precise description of the location of features difficult.

Global Surveyor was successful in targeting the Viking 2 lander, but Martian weather intervened. Viking 2 was the northernmost of the targeted sites; with winter currently in the northern hemisphere, a "polar hood" of clouds descended over the region, obscuring the landing site on all three imaging attempts.

With Mars Pathfinder, the first attempt missed the lander by about 0.2 degree. As with the debate over the Viking 1 site, this springs from uncertainties in the coordinate system of Martian latitude and longitude. On the second pass, the pointing was accurate, but the camera took its exposure three or four seconds too late to hit the target. "The nav team provided a very good predict, but they did this on a Friday and the imaging attempt was at the end of the weekend," said Lee. "They therefore were projecting seven orbits into the future, which increased the uncertainty."

The third attempt to image the Pathfinder site proved successful, although a fair amount of haze appears in the frame. The lander itself is not visible, but nearby features such as Twin Peaks and the Big Crater are.

Last week's passes concluded the spring imaging campaign. Global Surveyor and Mars will shortly be passing behind the sun from Earth's point of view, degrading communications; after that, lighting conditions and other operational constraints are unfavorable for the targeted sites. sIn September, Global Surveyor will resume aerobraking to finalize its orbit for its prime science mission next spring.

# Lab helps kick off comet movie 'Deep Impact'

alternating between speeds of 350

in the high latitude zones north and

south are nearly equal, despite their

separation by slow wind around the

JPL was the site for a mid-April press briefing for the upcoming movie "Deep Impact," which chronicles the discovery that a comet is on a collision course with Earth.

Cast members from the film joined JPL engineers and scientists for media interviews during the event.

JPL and NASA provided technical advice for the Paramount/ DreamWorks production, which will be released May 8.

The film stars Robert Duvall, Téa Leoni, Morgan Freeman, Vanessa Redgrave and Elijah Wood.



PHOTO BY JOHN G. WATSON

Deep Impact star Téa Leoni shares a laugh with Deep Space 1 chief mission engineer Dr. Marc Rayman, center, and astronomer Dr. Donald Yeomans during April 19 press briefing held at JPL.

# LETTERS

Thanks to the ERC for a beautiful memorial to my mother, and to my Bldg. 233 co-workers for their thoughtfulness and kindness in the loss of my

Ray Freeman 000 Thanks to all my co-workers for the beautiful plant arrangement, the cards and sympathy on the pass-ing of my mother, Trudie de Silveira. Thanks also to the ERC for the wonderful plant; all this made

things easier.

Carl de Silveira

# FOR SALE

AQUARIUM for fish, 40 gal., rectangle, low wood-en stand, lighting and some access., \$85/obo.

626/303-5595, Paul. ART PRINT, Egyptian, by Gloria Eriksen, Pharaoh with Ankh and Queen, 37" x 37", \$200, 248-0178. AUTO HITCH, EZ Lift, H.D., attaches to frame type

AUTO HITCH, EZ LIII, H.D., attaches to frame type (welds), 2" receiver bar, 41"L x 2 1/2" tubing, \$95/obo. 626/303-5595.

BABY ITEMS: potty, \$5; backpack, Gerry, exc. cond., \$25, 355-9733, after 6 p.m. or leaver msg. BASEBALL CARIDS. 1 box unopened, Sports Illustrated, 24 packs, \$40; 1 box unopened Fleer Tradition, 35 packs \$40, 636/914-81983.

Tradition, 36 packs, \$40, 626/914-6083. BAT, softball, DeManni, double wall, cost \$300, sell \$250/obo. 626/932-7476. BED FRAME plus headset, mattress and box qn. size, Ethan Allen, all for \$600/obo; 2 matching

nightstands optional, 626/792-5771. BEDS, antique (win, head & fibrds, w/rails, mahogany (reddish), \$285/obo. 626/303-5595. BICYCLES: Specialized '91 Allez, 24 in, carbon fiber frame, Suntour 12 spd. shifters, very light and

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Universe

Mark Whalen

JPL Photo Lab

Editor

Photos

CA 91109.

to six lines.

following issue.

ADVERTISERS

pedals, \$400 firm; Schwinti Voyager touring bike, 20 in, frame, 27 in, alum, wheels, women's saddle, 18 spd., bottle cage, rear rack, blue, w/choice of drop or upright handlebars, exc. cond., \$175 firm; Fuji 12 spd., 23 in, frame; gd. cond., alum. wheels. Suntour shilters, \$100 firm. 626/794-0886, Ted. BIRD, janday conure; very friendly, sweet, gd. conversationalist; Incl. Ig. cage; must self, \$200.

stiff, choice of triathlon or standard drop bars, Look

BLANKETS for water heaters; 3 avail., never used; \$10 sa./obo. 626/568-8298. BREAD MACHINE, Dak "auto bakery", exc. cond.,

\$50, 790-0692. BRICKS, used, approx. 750, vg cond., \$.30 each.

626/794-6860, eves. BUMPER, chrome, used, '91 Chevy S-10 Blazer, \$75/obe, \$26/303-5595. CELLULAR TELEPHONE, DiamondTel DT-20X,

battery w/overnight charger, car adapter charge cable, gd. cond. 626/844-4383. CELLULAR TELEPHONE, Motorola Tac Lite XL.

new battery, recharger, and car power cord; current model; \$300 new, sell \$100. 626/795-6538. GELLULAR TELEPHONES, AT&T #3630, 1 yr, old.

leather case, 3 batteries & home charger, \$950/obo; Tele T.A.C #250, 1 yr. old, leather case, home & car chargers, \$75/obo; Technophone #405. leather case, home & car chargers, \$75/obo. 626/303-5595.

CHAIR, blue velvet occasional, vg cond., \$75; LAMP SHADES, off-white pleated, exc. cond., \$20; LIGHT FIXTURES, recessed eyeball, \$15 ea. 626/798-2531.

CHAIR, reclining w/5 caster wheels; great cond.; \$25/obo. 826/568-8298.
CLUB CHAIR, burgundy and burnt orange leather;

\$200, 626/795-6538.

COFFEE & END TABLE (set), Crate & Barrel, lightcolored, solid oak, exc. cond., only 2 yrs. old; \$185/obo. 957-4677, Sherri.
COMFORTERS, 1 king, blue/yellow w/duster, shams; 1 gn., cream/rose w/duster; \$75 ea.

COMPUTER DESK/WORK CENTER, walnut color, L-shape, corner attachment connects desk to printer stand; shelves, upper and lower cubby holes, 1 small upper compartment; desk - 43" x 26h x 24d and shelving - 43" x 23"h x 11 1/2d; printer stand

has 2 storage shelves; \$75. 826/303-5595. COMPUTER, Dell, Pentium Pro, 180 MHz, 32 MB RAM, 2.1 GB HD, 4 MB Matrox Millenium graphics, 17 Trinitron, 33.6 lax/modem, 12x CD-ROM, AWE-32 sound card, keyboard/mouse, WinNT 4.0, Office 97, 1 1/2 yrs. remaining on warranty: \$1,500/obo.

957-4677, Doug. DESK, 25w x 16d x 26h (small) w/caster wheels; gd. cond.; \$25/obo. 626/568-8298. DESKS, child's, 1 left drawer, 2 right + 1 file, 30"w x

21°d x 30°h, painted white, \$50/obo; mahogany (reddish), middle, left and right drawers, 42°w x 21°d x 30°h, \$175, 626/303-5595,

DINETTE, "70s style; white and gold; 42" round table w/18" leaf, 4 comfy vinyl swivel chairs; exc. cond.; \$100, 353-9404.

DINING TABLE SET, walnut color, 6 chairs (2 w/arms), all chairs padded in beige fabric, table 39"w x 58"l; HUTCH, 78"h x 48"w x 17d, upper cabinet glass display, lower buffet portion is enclosed cabinets and drawers; \$595 set/obo. 626/303-5595. DRESSER, 4 small drawers, 6 larger, 42"w x 15"d x '34"h, white, \$50/obo. 626/303-5595. END TABLES (2), heirloom solid cherry wood,

Queen Anne legs, exc. cond.; \$175 ea./obo. 846-EXERCISE BIKE, Weslo Horizon Ergometer, \$50.

626/359-2065 EXERCISE MACHINE, Aerobicrider, like new. \$100, 790-0692.

FAN, 15", 3-speed w/extensible stand; \$25/obo. 626/568-8298. FURNITURE: sofa & love seat set \$150: dresser with mirror & 5-drawer chest set, solid wood, \$50, all ln gd. cond., 790-9355, alter 6 p.m.

GPS, Magellan 2000, \$50. 909/599-3936. GUITAR AMPLIFIER, Park G10, new in the box. \$100.248-0178. GUITAR CASE for Gibson hollow body electric, hard shell, 70s vintage, \$100, 248-0178.

HORSES, 10-yr.-old Arabian mara, sound, registered, very sweal, \$5,500; 3-yr.-old Arabian lilly, green broke, very smart and willing to learn, will be great hunter/jumper, \$3,000; must sell both.

MICROWAVE OVEN, Litton 1 cu. lt. w/continuous

MOVING SALE, couch & love seat, washer/dryer, stove, walnut wall unit, microwave and stand, chil-dren's loft bed unit, sm. round oak drop leaf table & chairs, toys, and much more; all must go; 262 E. Poppyfields Ave., Altadena, Sat. May 2, 8-4, NECKLACE, .25 ct. diamond pendant; appraised \$600, sell \$300; CHRISTMAS BELLS, Lladro, \$20

ea. 626/798-2531.

OVEN, electric slove, avocado green, 4 burners, 2

ovens, \$50, 626/795-3172. PIANO, 6' 1' Knabe Baby Grand, cherry finish; recently reconditioned by tech.; appraised \$5-6K; moving, sell \$4,500/obo. 626/351-8601.

RIMS & tires, for '91 S10 Chevy Blazer stock, 15", \$250/obo. 626/303-5595, Paul, ROCKER, bentwood, antique child's, \$50; RUG

SHAMPOOER, Little Green Machine, new, \$50; LPs, opera & classical, exc. cond., \$2/disk; COM-MODE CHAIR, circa 1875, \$400; CHAIR, gray velvei Queen Anne, \$250; SIDE CHAIRS, pair carred, w/needlepoint, \$500, 826/449-8035. SECURITY ALARMS, Quorum brand, all new. 10

personal alarms, 10 sports style personal, 1 per-sonal property, 1 auto, 2 auto external, 1 auto Immobilizer, 1 home + 1 external, 2 starter kits, 1 demo case; retail value \$1,634, wholesale \$1,092. lirst \$695/obo takes it all. 626/303-5595. SLIDE/PLAY CENTER, Little Tikes, small, \$25/obo.

SNOWBOARDS: used "40 Below" 145 cm w/bindings, \$100; new Morrow 150 cm w/o bindings,

\$175, 626/793-4485. TABLE + 6 chairs, exc. cond. - like new, \$120. 626/564-8483, Christophe.

TELEPHONE ANSWERING MACHINE, General Electric, black, microcass., voice time/day stamp, hardly used. 626/844-4383.

TRICYCLE, adult 2-seater, side by side, tandem, 3 spd.; w/trailer, 4' x 8', collapsible; both in exc. cond.; \$495 total. 805/251-7616, Ben, after 6 p.m. TV. RCA 26" color, floor model, swivel base, walnut

linish, \$50. 626/795-3172. TV, Zenith 25" color, gd. cond., \$25. 626/286-2752.

TV, Zenith 27" console, w/remote, \$50/obo; WASH-ERS (2), \$100 ea./obo; DRYER, \$100/obo; STOVE, \$75/obo; SURFBOARD, short, \$200/obo; REFRIG-ERATOR, \$150/obo; all in exc. cond. 626/442-

UTILITY TRAILER, 4 1/2' x 10' with side boards, sin-

gle axle, \$595/obo. 626/303-5595, Paul. VIDEO GAME SYSTEMS, Super Nintendo, with 2 controllers and 1 power stick controller, \$50; various games, \$10 ea.; Sega Genesis with 2 con-trollers, \$35, various games, \$10 ea. 626/795-3172 VIDEO GAMES, GameBoy, full size, clear color, new w/night light and battery pack, \$40; Pocket GameBoy, silver color, new, \$40; various games, \$5 ea 626/795-3172.

WATERBED, queen, 12 drawers, new 30-year waveless mattress; new heater, mirror headboard w/shelves, perfect pecan wood, \$1,000, 248-6615.

#### AUTOS/BOATS/ MOTORCYCLES / RVs

'77 CADILLAC Brougham, luxury edition, beautiful classic car, beige leather & teak wood custom int., deep brown ext. w/leather trim, garaged & driven locally, 50K orig. ml., exc. cond.; \$4,950/obo. 626/794-5196.

'89 CHEVROLET Silverado pickup truck, 3/4 tori, 350 eng., long bed, extended cab, loaded incl. tow okg., 106K mi., \$7,900/obo, 626/303-5595, Paul. '81 CHEVROLET El Camino, '85 update, pw. new tires, camper shell, straight body; \$800/obo. 310/637-0917

70 CHEVROLET El Camino, clean, big tires 101/2 to 1 compression, 350 engine, \$5,000/obo, 626/914-

'91 FORD Festiva 2-dr. hatchback, blue, 5 spd., a/c, AM/FM/cass. stereo, vg cond., exc. gas mi., \$2,800/obo, 626/914-6267.

'88 FORD Taurus, V6 3,0L, 120K ml., metal. gray, ong. owner, exc. cond; \$3,500/obo. 626/798-4946 93 HONDA Nighthawke motorcycle, black, 4,500 mi.; perfect cond., never been dropped; with extras, and if you need it and it fits, will include helmet;

\$2,200, 803-8686, pgr. '91 HONDA CRX Si, white on black; incl.: MOMO steering wheel and stick shift, new tires, leather hood cover, alarm, pwr. door lock, \$2,500 stereo system; pre-wired for Motorofa cell phone kilt; mint cond.; 80K mi.; \$7,000. 803-8686, pgr. '86 HONDA Accord, 4 dr. sedan, 115K mi., auto.

trans., a/c, AM/FM/cass., cruise, orig, owner, recent trans./a-c compress/wat. pump/CV boots, exc. cond., \$3,900/obo. 909/592-2279. '85 HONDA Prelude Si, red, auto., great running

and body cond., well-maintained in and out, pwr. windows/sunroof/steering, AM/FM cass. stereo, cruise control, a/c, alarm, 127K mi., \$2,800/obo. '90 MERCEDES BENZ 300E sedan, vg cond., low

80K ml., red ext. w/beige int., a/c, cruise control, nwr windows/locks/mirrors/seat suproof stereo cass., gold pkg., \$17,600, 363-1328, Paul.

84 MERCEDES BENZ 380SL Roadster, 2 tops, sil

ver-blue exterior, 560-style wheels, Lo-Jack installed + alarm, \$16,950. 805/553-9443.

'91 MERCURY Capri convertible, white, 90K mr., AM/FM cass., runs great, good gas mi. 909/626-

'82 MERCURY LN7, vg cond., white, 67K orig. mi.,

1 owner, maint, records, good family 2nd car or starter for teen; \$1,199/obo, 626/797-2475 or leave msg. 626/726-4393, Gloria.

95 NEWPORT 326 sailboat (32.5' by 10' 9"), 2 enclosed staterooms, head w/shower, teak int., VHF radio, VCR, refrig., stove/oven, inflatable dinghy, wheel steering, instruments, Yamaha diesel engine, \$52,000. 248-8936. '86 TOYOTA 4x4 truck, WD, extra cab, shell, a/c,

18K mi., gray/gray, \$3,200/obo. 562/903-9458. '82 VW Westphalia camper, slps. 4; new engine, tires and shocks; \$4,500/obo. 626/355-6664.

# WANTED

COMPUTER, DOS-compatible PC with 1.4 MB floppy drive and working serial port; prefer laptop. 626/355-8706.

HOUSING, furn.; sought for JPL Summer Fellows; various requirements for 10 weeks, June-August.

Ext. 4-1444, Lisa, wkdays. PLANT, red red clivia. 909/392-0379. ROOM to rent or apt, to share in Pasadena or surrounding area; APT non-smoker. E-mail Robert Thomas (rthomas@cmcvax.mckenna.edu). SOFTWARE, old version of Soft-PC (DOS-only is

OK). 626/355-8706. SPACE INFORMATION & memorabilia from U.S. & other countries from past & present. 790-8523,

# FREE

FILL DIRT, clean (mostly gravel-like); several cu. yds.; take as little or as much as you like; located 3 blks. ESE of NY & Hill, Altadena. 798-5152. KITTENS, cute, 3 wks. old. 626/445-8422. TUB, white cast iron, gd. cond.; you haul. 626/792-

#### FOR RENT

ALTADENA, N. Lake area, 2 bd. condo, 1 3/4 ba., i/p and upgraded kitchen, custom closets, custom patio; community pool, parking, and storage; built in 1981; very close to JPL; must see; \$975, 626/98-

ARCADIA, cozy, lum. room in home; kitchen privileges, Indry., pool; non-smoker; \$350, 626/448-

ARCADIA/MONROVIA border, 2 bd., 1 ba. rear house; new carpets, paint, windows, etc.; stove, washer/dryer, poss, refrig.; lg. fenced yd. w/covered patio; nice area; water/trash pd., \$750. 909/596-

AZUSA, 2 bd., 2 ba, house, hdwd, firs., detached garage, fenced front and bkyd., laundry rm., \$870. 626/812-0872. Debbie. ENCINO, 3-bd., 2 1/2-ba., 2-story lurn. condo; small

pet OK; \$1,695, 990-6038.

ENCINO, roommate to share 3-bd., 2-ba. condo; patio, small yd.; Indry., pool, rec. rm.; furn. or unturn.; small pet OK; \$750 incl. utils. 783-6377. GLENDORA, split nuge house w/JPL professional quiet neighborhood, fenced yd, in cul-de-sac, 2 extra rooms (den and office) for increased space; \$475 + ½ utils, 626/335-4409, Jeff.

N. ALHAMBRA, Ig. 1 bd. duplex in gd. residential area; 700 sq. ft., clean, hdwd. floor, 1-car garage; stove, window a/c, refrig., washer; water, trash and gardener provided; \$600. 683-9935, eves.

PASADENA, 1 bd. cottage w/private lenced yd., near Walnut & Hill; small, cute, h/w floors, new paint, new ba.; st. parking only; \$650 incl. utils., stove, ref. 626/797-9765, Scott.

ROOM in Ig. house, shared ba., furn.; non-smoker, clean: \$450 + 1/3 util. 626/797-5570. SAN GABRIEL, housemale to share 3 bd., 2 ba.

house; 23 min./JPL; \$500, 626/281-2179, Mike, SILVERLAKE townhouse, 20 min./JPL; 2 bd., 3 ba., lg. liv. rm., loft, 3 balconies, att. 2-car gar., storage rm., washer/dryer hookup; close proximity to all fwys.; great view; avail, for move-in June 1, 213/666-7415.
SOUTH PASADENA, bungalow studio apt., lurn., coord area in 1718 Huttington Dr. near Margage.

good area on 1718 Huntington Dr. near Marengo; electric heat/air cond., parking and laundry facil.; non-smoker; \$565 incl. utils. 626/792-9053, TEMPLE CITY apt., 2 hd., 1 ba., stove, garage

quiet neighborhood, good school, close to shopping ctr.; 20 min./JPL; \$700, 626/451-6890.

TUJUNGA, upper duplex, nice view; new crpt., tresh paint; stove, refrig., 2 bd., 1 ba., 2 patios; no dogs (no yd.); 20 min/JPL; \$650, 362-5608. WEST COVINA, 1 bd., 1 ba., a/c, built-in stove, unfurn.; near Citrus & S. Garvey in a 10-unit complex w/pool, laundry rm. and carport; newly redecorated; \$525. 626/798-2072.

#### REAL ESTATE

BIG BEAR, new cabin 2 blks. from lake, 2 bd., 2 ba., mud/laundry rm., \$129,000. 909/585-9026. GLENDALE, lot with view, 4,222 sq ft., \$32,000,

PASADENA, 3-level townhouse, Altadena Dr. and Orange Grove, across Victory Park; 3 bd., 2.25 ba., lireplace, balcony, pool, spa and sauna, 1,300 sq. ft; sharp and close to JPL; no agents: \$166,000. 626/398-5303.

SUNLAND townhouse, Alpine Meadows complex, 2 bd., 1.5 ba., 2-story, 2-car garage, pool, spa, tennis ct., rec. room, well-maintained; \$110,000. 248-

#### VACATION RENTALS

BIG BEAR LAKE cabin, near ski area, lake, shops, village, forest, lake; 2 bd., slps. up to 6, fireplace, TV, VCR, phone, microwave, BBQ and more; JPL disc. price from \$65/night. 909/599-5225. BIG BEAR LAKEFRONT luxury townhome, indoor

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

pool/spa, near skiing, stone 1/p, slps. 6. 714/786-

CAMBRIA, ocean front house, exc. view, slps. up to 4, \$125/night for 2, \$175/night for 4, 248-8853, LAGUNA BEACH luxury apt., slps. 4; steps to beach, walk to town; avail. 5/15-5/22/98; \$85/nite,

\$510/wk, 626/797-3156. MAMMOTH condo in Chamonix at lifts 7, 8, 16, 17; walk to warming hut; 2 bd., 2 full ba., slps. 6, fully & wood, color TV. VCR, FM stereo; o/d Jacuzzis, sauna, game, rec. & Indry, rms.; pool & BBQ area in summer; conv. to shops, lifts, hiking; spec. midweek rates; summer rates as of May. 249-8524. MAMMOTH condo, 2 bd. + loft, 3 ba., stps. 8, spa

full kitchen, TV/VCR, JPL spring disc, rates; walk to Canyon Lodge, 249-8088, MAMMOTH condo, slps. 5, shuttle stop nr. condo;

downtown; \$50 Sun.-Thurs., \$65 Fri. & Sat. 353-MAMMOTH condo, studio + loft, 2 ba., fireplace

w/wood supplied, Jacuzzi, sauna, game rm., color cbl. TV/VCR, full kitchen w/microwave, terrace, view, amen., spring rates, great snow. 714/870-MAUI condo, on beach w/ocean view, 25 ft. from surf, 1 bd. w/loft, compl. furn., Incl. phone, color TV,

VCR, microwave, dishwasher, pool & priv. lanal, slps. 4, 4/15-12/14 rate \$95/nite/2, 12/15-4/14 rate \$110/nite/2, \$10/nite/add'l person, less 10% JPL & Caltech disc. 714/348-8047. OCEANSIDE, on the sand, charming 1 bd.+ condo.

panoramic view, walk to pler/marina, pool, spa, oame rm. 714/786-6548.

ROSARITO BEACH condo. 2 bd., 2 ba., pool, lennis ct., ocean view, near beach, 18-hole golf course w/in 5 mi., priv. prkg. 626/794-3906. SOUTH LAKE TAHOE KEYS waterfront home, 4 bd./3 ba., slps. 12+; f/p on 2 levels, decks overlook-

ing private dock and ski lifts; gourmet kitch.; bicycles, 20' sail & paddle boats, 3 color TVs, VCR, stereo w/tape & disk; assn. indoor & ouldoor pools, hot tub & beach; 8 lighted tennis cts.; 10 min, to ski-ing, casinos, golf; 1 hr. to Western Sierra wine country; \$995/wk. for high season (June 15-Sept. 15; Nov. 22-Mar. 1); \$495/wk. low season, + \$90 eaning fee; 3-day min. 626/578-1503, Jim

# May 1, 1998

# 'Day on Europa' highlights a possible water world in space

Two-day event to go on Internet; includes May 21 Caltech panel

By JANE PLATT

What do an Olympic skier, a science fiction writer and a submarine volcano researcher have in common? They'll all take part in events related to a "Day on Europa," a series of free public and educational activities focusing on the prospect of liquid oceans under the icy surface of Jupiter's moon Europa, and its similarities to Earth's arctic regions and sea floor volcanoes.

"A Day on Europa" will take place Wednesday, May 20 and Thursday, May 21, since daylight on Europa lasts about two Earth days. Scheduled activities in numerous American cities will be transformed into global village events via the Internet. Highlights will include new imagery of Europa taken by the Galileo spacecraft and a free panel discussion titled "Europa: Another Water World?" on May 21 at Caltech's Beckman Auditorium.

The presentation, to be broadcast live on the Internet, will feature science fiction writer Arthur C. Clarke, author of "2001: A Space Odyssey" and "2010: Odyssey Two," via live telephone hookup from Sri Lanka. Other panelists include Dr. Ron Greeley of Arizona State University, a Galileo project imaging team member; Dr. John Delaney, a submarine volcano researcher with the University of Washington; and Joan Horvath of JPL, the Europa/Lake Vostok Initiative manager. Lake Vostok, a frozen lake underneath the ice in Antarctica, may have features similar to Europa. Dr. Richard Terrile of JPL will moderate the panel and JPL Director Dr. Edward Stone will give the welcome address.

The event is free, but tickets must be obtained from the Caltech Ticket Office, with information available by calling (626) 395-4652 or at the following website: http://www.caltech.edu/~tickets/to.htm. The panel discussion may be viewed live on the Internet at the following site, which also contains information on other "A Day on Europa" activities: http://www.jpl.nasa.gov/galileo/europaday. Questions for the panelists may be submitted in advance by e-mail to europaday@www.jpl. nasa.gov.

For those attending the May 21 panel discussion, a special "history walk" will take visitors through the past, present and future of our knowledge of Jupiter and Europa, Special booths with period costumes and displays will depict the Roman Empire, the era of astronomer Galileo Galilei, the Space Age featuring Voyagers 1 and 2, the Galileo spacecraft, and future Europa missions. Vendors will offer related memorabilia and Nikki Stone, a 1998 Winter Olympics gold medal-winning skier, will speculate on what it would be like to ski on Europa. The panel discussion is scheduled from 7 to 8:30 p.m. PDT, with vendors and entertainment from 6 to 9:30 p.m. Door prizes will be given away during the

See Europa, page 3

Jet Propulsion Laboratory

# Universe

Pasadena, California

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# Pathfinder contractors receive NASA's highest award

Three aerospace companies were awarded NASA's highest honor May 1 for the excellence and quality of work they performed on the Mars Pathfinder and other projects for JPL.

NASA Administrator Daniel Goldin presented the 1998 George M. Low Award to the companies at the 13th annual NASA Continual Improvement and Reinvention Conference on Quality Management in Alexandria, Va. The award is NASA's highest quality and excellence award for contractors and subcontractors and the oldest award for organizational quality.

"These companies exemplify excellence and outstanding achievements that prove beneficial to NASA and the nation's industry," said Goldin.

Advanced Technology Company (ATCO) of Pasadena received the award for service in the small-business category. ATCO is considered a world-class metal joining company, tackling jobs that most organizations consider impossible. The woman-owned company has produced 20 imaging detectors that are operating error-free in space, and has worked on a variety of JPL projects over the past 26 years, including the development of the Wide Field Planetary Camera 1 and 2 for NASA's Hubble Space Telescope.

ILC Dover Inc., Frederica, Del., which specializes in developing high-technology engineered soft goods, received the award for product in the large-business category for work on the development and delivery of the Mars Pathfinder airbag landing system. The company also has a long record of outstanding performance in the development of astronaut spacesuits for extravehicular activity in space.

BST Systems Inc., Plainfield, Conn., received the award for product in the small-business category for development of the battery used on Pathfinder's Sojourner rover. The battery lasted more than three times the planned Mars surface-mission duration, 98 Martian days versus the required 30 days.

Acquisition operations and planning principal Mel Roberts of the Engineering and Science Directorate noted the contributions of JPL contract technical managers who worked closely with the three companies in the development and delivery of their contributions to Pathfinder. Priscilla Ottley and Don Dunn of Section 387 worked with Advanced Technology Company; Tom Rivellini of Section 352 partnered with ILC Dover; and Stephen Dawson of Section 341 worked with BST Systems.

Roberts said JPL's nominating committee solicited candidate nominations from all organizations on Lab. The respective contract technical managers worked with him to prepare and submit nominating papers to JPL senior management. From the suggestions, the committee screened four contractors to go forward as JPL



PHOTO BY BILL INGALLS / NASA HEADQUARTERS

NASA Administrator Daniel Goldin, right, congratulates contractors who received the agency's George M. Low Award May 1. From left are Homer Reihm of ILC Dover Inc., Max Solis of BST Systems Inc. and David Velazquez of Advanced Technology Company. The three were honored for their contributions to JPL's Pathfinder mission.

# JPL program office describes its success at continual improvement conference

In addition to celebrating George M. Low Award winners, NASA's Continual Improvement and Reinvention Conference on Quality Management is a forum to share best practices and lessons learned from quality management initiatives.

The NASA Quality Management Associates board selected JPL's Flight Hardware Logistics Program and four other NASA teams to showcase their successes during the May 1 conference.

The Flight Hardware Logistics Program Office, Section 504, is managed by Dr. Larry Wright. The program, he said, was created to help JPL's Develop New Products reengineering activity achieve its stretch goals of cutting the time to implement typical JPL projects in half and reduce their cost by one-third.

At the conference, Wright described an outstanding example of the program's success in its consolidated computer buy that comprises nine flight projects requiring a total of 29 computers. Through this action, he said, the program negotiated significantly better price and delivery schedules than the projects could have obtained individually.

This led to efficiencies both in manufacturing and in management that resulted in an overall savings of about \$3.2 million for the projects involved.

Wright said the program has also significantly helped some projects by leading them to the use of heritage hardware available from prior projects. QuikScat, for example, was able to eliminate a very substantial schedule risk by use of bus interface units that were available off-the-shelf as heritage items.

For more information about the the Flight Hardware Logistics Program, call Wright at ext. 4-5603.

Two other companies, AlliedSignal Technical Services Corporation, Lanham, Md., and DynCorp, Johnson Support Division, Houston, were given the award for service in the large-business category for their work with

other NASA centers.

For more information, see NASA's George M. Low Award home page at http://www.hq. nasa.gov/office/codeq/gmlhome.htm or call Roberts at ext. 4-1001. □

# Lab's open house to feature past, present and future of space

# East-lot shuttle buses to help bring employees on Lab for May 30-31 event

JPL will open its doors to the public during its annual open house on Saturday, May 30 and Sunday, May 31, from 9 a.m. to 5 p.m. both days.

This popular, free event celebrates JPL's "Past, Present and Future" with exhibits and demonstrations about the Laboratory's ongoing research and space exploration missions.

More than 30,000 visitors attended last year's open house, and between 40,000 and 50,000 are expected this year.

JPL personnel are encouraged to avoid heavy traffic in the west parking lot during the open house by parking in the east lot, where shuttle buses will bring visitors on Lab every five minutes.

Security and Plant Protection Capt. Michael Norwood said the east lot will only be made available to the general public after the west lot is full Shuttle buses will also transport visitors to the main gate from all off-Lab parking lots, which have been given names based on past and current JPL missions so that visitors can more easily recall where they parked. New signage is being posted in all lots and will remain there after the open house.

Norwood said employees who are working during the open house must enter the Lab through the south gate only, and may park in any available space except under the Building 167 cafeteria, or in any handicapped or illegal space. There will be no access to the Lab from the east gate area for employees and their personal vehicles, he said. Also, those who are working but are bringing open house visitors must drop them off at the main gate.

Because office areas are off limits to the public during the open house, Norwood encouraged employees to lock their offices as well as any valuables inside.

Many of the Lab's scientists and engineers will be on hand for the two-day celebration to answer questions about how spacecraft are sent to other planets, how scientists utilize space technologies to explore Earth and how researchers have begun searching for planets beyond the solar system. Visitors will see exhibits, displays, demonstrations and presentations covering such topics as planetary imaging, space robotics, and spacecraft communications and tracking.

Visitors will be able to see two Earth-observing instruments currently in development in the Spacecraft Assembly Facility, looking in on the progress of the Quick Scatterometer (QuikScat), set for launch in November, which will study winds over the oceans, and the Shuttle Radar Topography Mapper (SRTM) that will ride on the space shuttle and collect 3-D images of the

See Open house, page 4

# Volunteers working open house will get their just rewards

The Public Services Office seeks JPL exempt employees willing to volunteer their support staffing the annual open house May 30 and 31.

Everyone working the open house will receive a Mattel rover toy and a JPL T-shirt. In addition, a thank-you reception will be held, and there will be a drawing for ERC gifts and 20 pairs of tickets to Disneyland. For each two hours worked, volunteers will receive one ticket for the drawing.

Contact Public Services at ext. 4-0112 for more details or to sign up,  $\square$ 

# News Briefs

JPL's Benefits Office has scheduled a number of workshops through the rest of the year on investments offered through TIAA/CREF and Fidelity, as well as an individual appointment schedule for employees who have questions about their investments.

The next workshops in the series will be on May 28 in Building 180-101. How to Read Your Quarterly TIAA Statement will be offered at 10 a.m. and New Roth IRAs, Traditional IRAs, Educational IRAs and Mutual Funds will be held at 2 p.m.

Individual appointments are next scheduled for May 21, when employees may meet with a Fidelity representative.

Future workshops will be listed in Universe's Special Events Calendar. For more information, call Pat Houlemard at ext. 4-2549. □

The winners of JPL's Notable Value-Added (NOVA) awards for April have been announced:

Section 311: Jerry Brown. Thomas Clymer, Patricia Hallack, Miles Miller, Ronald Salazar, Thomas Spilker, Keith Warfield, Kenneth Williams, Richard Markley.

Section 314: Sherwin Goo, Stephen Gunter, Tonja Harris, Jay Holladay, Robert Sible Jr., Shirley Whittington, Kevin Yau.

Section 335: Michael Kelsay, Angelyn Moore, David Stowers.

# JPL to aid oil spill detection technologies

By JOHN G. WATSON

New technology to detect oil spills in the Alaska Pipeline will be developed under an agreement recently signed by JPL and Alyeska Pipeline Service Company, the Anchorage-based operator of the Trans Alaska Pipeline System.

Alyeska Pipeline currently uses a variety of leak detection technologies to identify possible spills at or below those levels required by regulations. The agreement calls for the investigation of technologies that can provide remote-sensing detection of oil releases below the present leak detection threshold. New technologies may also help the company find leaks more quickly.

The agreement was facilitated through JPL's Technology Affiliates Program, which allows companies to fund studies or technology work at the Lab. A small first effort will identify already existing space program technologies, if any, that hold the potential to meet Alyeska's leak detection requirements. A larger second phase involving technology development at JPL could follow.

Section 346: Timothy Krabach. Section 352: Susan Deligiannis, Juan Fernandez, Encelmo Garcia, Pamela Hoffman, Denise Hollert, Cheng-Hsien Hsieh, Andrew Kissil, Gregory Klotz, Lawrence Lee, Lindemann, Charmaine Mayes, Ellyn Mccoy, David Miller. Patrick Murphy, Paul Rapacz, Mary Reaves, Laurence Reinhart, David Rosing, Wesley Schmitigal, Choon-Foo Shih, Lori Shiraishi, Pim Vosse.

Section 380: Adam Kelly, Tadas Sesplaukis.

Section 391: Elvin Beyer, Joe Springer.

Section 393: Erich Corduan. Section 600: Daryal Gant.

Section 621: Maria Kemerer, Sharon Devore, Thomas Currier, Margaret Easter, Stephen Mitchell, Karen Thresher, Diane Garinger, Ramon Lemus, F Coleton Weirich.

Section 622: Rigoberto Medina, Linda Clifton.

Section 624: Andrew Guyton. Section 800: R. Rhoads Stephen-

Section 810: Rose Albano, Rocio Jimenez.

Section 867: Charles Weisbin. Section 870: Nancy Short.

Section 872: Alan Marriott. Section 873: Donald Kurtz. Section 877: William Frey.

Section 890: Annie Bradford. Section 895: Alice Wessen.

the private and public sectors to present available technologies to detect leaks as small as 10 gallons. According to Alyeska's conceptual engineering lead Claude Robinson, "None of the systems submitted to Alyeska met the specifications desired for the futuristic pipeline monitoring system the company envisioned. We realized we needed to understand the breadth of technologies that exist and also to review how we might put one or more of them together to make an operational system."

These efforts came to the attention of Joan Horvath, a business alliance manager with JPL's Technology Affiliates Program, who has been working with the Alaska Technology Transfer Center in Anchorage to provide Alaska businesses with access to JPL's solar system exploration technologies.

"We realized that JPL might be able to help Alyeska understand its options and move forward on a new system," Horvath said. "In particular, we thought that a lot of our instruments for closeup studies of Mars and Europa, a moon of Jupiter, might have some applicability for Alyeska's issues."

With the assistance of the Alaska Technology Transfer Center, the two parties came together, and the new agreement is the result. "It's exciting to be able to apply technology and knowledge that would not normally be easily accessible to us in Alaska,' said center director Charles Christy.

Alyeska Pipeline Service Company operates the 1,290-kilometer-long (800mile) trans-Alaska pipeline. More than 20percent of the United States' domes-

#### The agreement is the latest twist in an Alveska initiative launched last sumtic oil production flows through the mer when the company solicited both See Oil, page 3

Space inflatables highlighted in

May 20-21 workshop on Lab

Rovers, solar arrays, solar sails, radars, antennas and sunshields will be among the many inflatable space technologies demonstrated at the second National Space Inflatables Workshop, taking place on Lab May 20 and 21.

Meeting from 8:30 a.m. to 5 p.m., the workshop is designed to update engineers and scientists on the field's current developments as well as the emerging needs of future space mis-

On May 20, devoted to "The Users—Their Programs and Missions," speakers will cover inflatables being developed for NASA's Space and Earth Science Programs and Human Exploration Programs, the Department of Defense, commercial satellite companies, and European and Japanese space agencies.

On May 21, focusing on "Inflatable Technology Development," speakers will discuss such areas as deployment, rigidization, membranes, analytical tools, systems and advanced concepts. Opportunities to flight-test inflatables on such missions as the New Millennium Program's Deep Space 4/ Champollion, scheduled to land on a comet nucleus in 2005, will also be

For further workshop information, contact Art Chmielewski, JPL's space inflatable technology manager, at ext.

# New Millennium support acknowledged



Christine Anderson of the Air Force Research Laboratory in Albuquerque, N.M., receives a certificate of appreciation for the facility's contributions to JPL's Deep Space 1 mission and its work on the New Millennium Program's integrated product development teams. The organization's participation was also cited as an excellent example of interagency cooperation to meet common national objectives. Anderson is flanked by JPL Deputy Director Larry Dumas, left, Space and Earth Sciences Director Dr. Charles Elachi and Technology and Applications Programs Director Mike Sander.

# Special Events Calendar

# Ongoing

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

Codependents Anonymous-Meeting at noon every Wednesday. For more information, 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.

HIV Support Group-Meets quarterly. Call employee assistance counselor Cynthia Cooper at ext. 4-3680 for more information.

Parent Support Group-Meets the fourth Tuesday of the month at noon. For location, call Jayne Dutra at ext. 4-6400.

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.

# Friday, May 15

"Menopause: What It Is and How to Cope"-Dr. Laura Sirott, obstetrics and gynecology, and Sandy Hotchkiss, licensed clinical social worker, will deliver a talk designed for both men and women to gain an understanding of menopause, including its biological, psychological and emotional aspects. At noon in the Building 167 conference room. Sponsored by the Director's Advisory Council for Women (ACW) in recognition of National Women's Wellness Month.

Von Kármán Lecture Series-Deputy Project Manager Robert Staehle will discuss Outer Planets/ Solar Probe at 7 p.m. in The Forum at Pasadena City College, 1570 E. Colorado Blvd. Open to the public.

# Tuesday, May 19

Eudora Quick Start Session for Technical Staff-This overview is for cc:Mail Macintosh users who have not yet begun to use Eudora, and will offer more detail than the sessions for business users. At 2 p.m. in Building 180-101. For other Eudora classes, see the ICIS home page at http://icis.jpl.nasa.gov .

Music of Mozart's and Beethoven's Time-Suzanne Shapiro, an authority on 17th- and 18th-century keyboard music, will perform on the fortepiano during a free concert at 7 p.m. in Caltech's Dabney Lounge,

# Wednesday, May 20

JPL Drama Club-Meeting at noon in Building 301-127.

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

Future Directions for Web Technology at JPL: Portable Applications and Java-This talk follows February's introduction to the topic and will focus mainly on software portability. At noon in von Kármán Auditorium. Information from the talk will be available on the Internet in the "Noontime Talks" section under "IT Education & Training" on the ICIS home page at http://icis.

"Learning From A Tragedy: Explosions and Flight 800"-Caltech aeronautics professor Dr. Joseph Shepherd will give this free lecture at 8 p.m. in Caltech's Beckman Auditorium. For information, call (626) 395-4652.

#### Thursday, May 21

"Increasing Human Effectiveness: Managing the Rapids of Change"-This Director's Advisory Council for Women-sponsored talk will focus on the potential of self and others by examining individual self-worth. Presented by Dennis Goin of Edge Learning Institute, which assists organizations in achieving greater levels of productivity, quality and customer satisfaction. At noon in von Kármán Auditorium.

JPL Astronomy Club-Meeting at noon in Building 198-102.

# Friday, May 22

JPL Dance Club-Meeting at noon in Building 300-217.

#### Fri., May 22–Mon., May 25

"Someone Who'll Watch Over Me"-This Theater Arts at Caltech production explores the minds of three innocent Middle East hostages attempting to come to terms with their situation. Held in the Underground Theatre, located in the basement of the campus' Student Activities Center, Friday and Saturday at 8 p.m., Sunday and Monday at 2 p.m. Tickets are \$8. For information, call (626) 395-4652.

# Saturday, May 24

Chamber Music—The Juilliard String Quartet with Charles Neidich on clarinet will perform at 3:30 p.m. in Caltech's Beckman Auditorium. Tickets are \$25, \$21, \$17 and \$13. Call (626) 395-4652.

# Wednesday, May 27

JPL Atari Club-Meeting at noon in Building 238-544.

JPL Drama Club-Meeting at noon in Building 301-127.

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

JPL Toastmasters Club-Meeting at 5:30 p.m. in the Building 167 conference room.

# Thursday, May 28

"Demonstration, Self-Breast Examinations"-This lecture and demonstration will be held from 11 a.m. to 1 p.m., on the half hour, in the Building 167 Cafeteria (closed area). Co-sponsored by the Director's Advisory Council for Women and Occupational Health Services.

# Library celebrates renovation

By MARK WHALEN

To coincide with National Library Week, the newly refurbished JPL Library celebrated its reopening with a ribbon-cutting ceremony April 22.

Staff, guests and visitors toured the new facility and heard remarks by JPL Deputy Director Larry Dumas, Business Operations Director Daryal Gant, Logistics and Technical Information Division Manager Willis Chapman and Library, Archives & Records Section Manager Linda Kosmin.

Following about a year of construction, the renovation succeeded in creating a more wide-open, user-friendly environment as it increased the library's work space without adding any square footage to its volume.

New features include:



PHOTO BY JIM MORAN / JPL PHOTO LAB

Business Operations Director Daryal Gant, left, and Deputy Director Larry Dumas cut a ribbon to dedicate the newly renovated JPL Library April 22.

An enlarged lobby area;

· State-of-the-art, movable shelving units, which increase book storage space by 30 percent;

· Reconfigured online computer

 New display units for historical books and other documents;

New furniture.

The facility, which was moved to its current location in the west wing of Building 111 in 1951, last underwent a major renovation in 1974, according to Kosmin.

Dumas praised the efforts of those who contributed to the project, noting that "Modern information technology is at the core of getting our jobs done. It is part of JPL's mission to promote individual and organizational excellence, and the library is a key asset in that strategy."

In order to make room for incoming books as well as to increase research space, a key element of the renovation was the installation of new automated shelving units in the periodical and book wings, allowing the library to store its earlier publications in the compact shelf area. The electronically controlled units are similar to traditional library bookshelves, except that there is no walking space between them. Until, that is, a user hits a button that triggers the system's electronics, which moves the shelf to the left or right to create a walking aisle.

The reading room has also been

enlarged to provide more room for current journals and to give customers more comfortable space in which to read.

Ernest Breig of the Construction of Facilities Program Office, who managed the project, said that the remodeling also included upgrades of the library's ceilings, lighting, carpeting and floors. Also added was a new ramp on the outside of the facility for the delivery of books.

"We were able to accomplish this job by being efficient and creative with our planning, since we couldn't add physical space," he said,

Kosmin said that highlights of the new library include a continuously updated journal holdings list as well as electronic, full-text access to all journals published by one of the premier scholarly publishers, Academic Press. Its International Digital Electronic Access Library (IDEAL) is available to all JPL desktops through an arrangement with the California State University library consortium for electronic resources.

For information about the library, call ext. 4-4200 or go online to http://

# Pathfinder design to adorn La Cañada float in '99 Rose Parade

By ENRICO PIAZZA

While the Sojourner rover is quietly resting on Mars' desolate terrain, a bigger, friendlier counterpart will take a victory lap through Pasadena on New Year's Day.

Covered with flowers and surrounded by colorful Martians playing hide-and-seek, a revised Mars Pathfinder rover will be the theme of the La Cañada Flintridge Tournament of Roses Association's entry in the 1999 Rose Parade.

The idea was submitted by Dr. Robert Ferber, a JPL microwave engineer and semiconductor physicist in Section 386 who has long been associated with the non-profit La Cañada association. Since the theme for the 1999 parade is "Echoes of the 20th Century," Ferber said he had little trouble finding inspiration.

"Here at JPL we have done all kinds of great things that could be considered key events of this century," Ferber said. One of the reasons he chose Pathfinder is because the mission was done with a minimum budget and fairly rapidly, he said. "Even better, it was just last year," he added.

People remember it and it got a lot of press. To me it was an ideal way to combine what I do here at JPL with what I do in my community."

While not all of the float's details are finalized, Ferber said one thing is certain: "Martian Mischief" will comply with the La Cañada Flintridge association's requirements mandating the float to be fully animated and, perhaps more importantly, to be humorous.

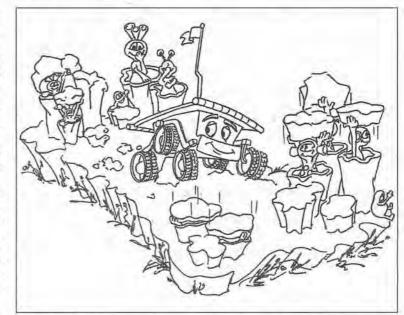
"(Making the float humorous) was easy because people like to think in terms of little green Martians and so forth," he said. "And our rover has moving eyes and a personality."

About the size of a Volkswagen Beetle and constantly moving back and forth on the Martian landscape, the rover will never be able to spot the Martians hidden in the hollow rock formations. The Martians, however, will pop up and wave as soon as the rover moves away from them.

Powered by two propane-burning V-8 engines, the 50-foot float will be built by volunteers under the direction of Dick DeGrey, a retired Lockheed Aircraft designer, and Bob Wallace, a retired JPL engineer. Computers will control all animations. To better visualize what the "real" Mars looks like, Patti Newton, the artist in charge of the final rendering of the float, visited the "sandbox" in the Mars operations area.

Ferber also pointed out that throughout the year, 40 to 50 JPL staffers will voluntarily work on the electrical. mechanical, hydraulic and computer animation components. Also, about 100 JPLers and their families typically decorate the La Cañada float during the week leading up to New Year's Day.

JPLers willing to volunteer their time and talent should contact Ferber at (818) 790-2013.



The design of the La Cañada Flintridge Tournament of Roses Association's entry in the 1999 Rose Parade.

# DS1's critical office-space needs met thanks to compromises

By MARK WHALEN

More JPL missions, shorter development schedules and the movement of off-Lab staff to Oak Grove have recently combined to create a tight squeeze for office space. Even when launches, encounters and other mission milestones come off as planned, balancing the office-space needs of a myriad of projects is a daunting challenge. But the issue came to a head last month when the launch of Deep Space I was delayed from July to October.

So a team representing the impacted Laboratory organizations quickly came up with key decisions that will allow Deep Space 1 to meet an urgent need to collocate additional personnel to the second floor of the Space Flight

Operations Facility, Building 230, through December.

A standing subcommittee of the Facilities Space Council, chaired by Larry Koss and comprising staff members from the Mars Exploration, Telecommunications and Mission Operations, and Space and Earth Science Directorates, was augmented by Deep Space 1, Cassini Program and Facilities Division experts to agree on a series of steps to aid Deep Space 1 in its time of need.

What's unique is that these decisions were reached without the aid of senior management.

"Decisions like this don't need to be made on the 9th floor of Building 180," maintained JPL Associate Director Kirk Dawson.

"Historically, in the facilities area, there has been a tendency for people to articulate their own organization's position with respect to their needs, and everybody states their case," he said. "There's always competition for space. We're trying to get it so that more and more of these decisions can be made at the working level."

The standing subcommittee is in charge of allocating space for office areas in both mission operations buildings, 230 and 264, which together house about 850 people. In fact, the Facilities Space Council has created a long-range strategic plan for space usage that is the framework in which discussions can be held at lower organizational levels.

In the meantime, Koss said, Facilities will work with the NASA Management Office to bring in modular trailers.

Office-space allocation has come a long way in the last few years, noted Winston Gin, executive assistant in the Director's Office. "In the past, Building 264 was simply assigned to the old Flight Projects Office." he said. "Now, so many different directorates are represented. There are now 16 flight projects in the building, and some projects want to have their offices near another project that has related activities, and how you knit it together is a challenge.'

"The key is to get the right people together-in operations, both in 264 and 230, or in project development in Building 301," Dawson said. "In all cases, you do worry about getting the

right set of individual skills and functional capabilities together to do the job at hand."

The work of the facilities subcommittee has been quite successful, he added. "There's a long list of projects we've accommodated in their formation.

"The difference here is the scale of the cooperation that had to occur," he said, "across directorates, among a large number of projects in a fairly confined space in two buildings.

"This is a template for how the Lab would like to operate in lots of arenas, where decisions get made at lower levels, by teams of people thinking very broadly and thinking institutionally-trying to do the right thing for JPL, not just the right thing for their organization."

# Galileo, Stardust sponsor training for educators, communities

By JANE PLATT

Educators and community members from across the country have been selected from a field of hundreds of candidates to participate in educational training and grassroots programs sponsored by JPL's Galileo and Stardust missions.

These programs are part of ongoing JPL and NASA efforts to enhance science and math teacher training in U.S. schools, and to bring the excitement of space travel to the community level.

The Galileo project has named 55 new ambassadors and co-ambassadors to educate the public in communities across America about the Galileo Europa mission's current journey around Jupiter and its moons.

The mission's main focus is on the moon Europa, which may have a liquid water ocean beneath its icy crust. The addition of the new graduates, who span the country from northeast Maine to Hawaii, brings the total number of Galileo ambassadors to 84. Each ambassador has proposed at least five community events, such as planetarium shows, museum displays and programs for Boy Scouts and Girl Scouts.

The ambassadors, primarily K-12 educators, join the recently appointed Galileo Fellows, who instruct other teachers in spreading the word about the Galileo mission. A state-by-state listing of ambassadors, hometowns, contact information and a calendar of ambassador-hosted events can be found on the Internet at http://www.jpl.nasa.gov/

galileo/ambassadors.

The Stardust project, which will launch a spacecraft to a comet next February, has chosen the initial 10 educators from 10 states as Stardust Fellowship winners. An additional 15 will be chosen in the fall. The educators' training is designed to facilitate development of a nationwide teacher training initiative with supporting educational materials. The effort is targeted at grades 4 through 8 and focuses on teaching students about small solar system bodies such as comets and asteroids.

Stardust's Fellows Program is part of an educational outreach partnership between the project, the Virginiabased Challenger Center for Space Science Education and Lockheed Martin Astronautics of Denver, which is assembling the Stardust spacecraft.

Information on Stardust and its Educator Fellows can be found online at http://stardust.jpl.nasa.gov .

# Europa

Continued from page 1 panel discussion.

Many other activities for "A Day on Europa" are planned around the nation by some of the 84 Galileo ambassadors, who bring the spacecraft's findings to their communities. Educational events will include a May 20 "electronic field trip," a satellite video broadcast with a curriculum targeted for grades 5 through 8. The goal is to reach 2 million students nationwide with the theme "Outside the Envelope: Exploring Beyond Earth's Boundaries. Teachers can sign up by calling (703) 503-7492 or at the following website: http://www.challenger.org/ote.html. The Los Angeles Unified School District will carry the event live on its cable station, KLCS.

The series represents a major activity of Space Day, which is being observed nationally on May 21. Space Day information is available at http://www.spaceday. com.

# Oil

Continued from page 2

trans-Alaska pipeline, which stretches from Prudhoe Bay to Valdez, Alaska. A total of 675 kilometers (420 miles) of pipe are above ground on special horizontal supports; the remaining 611 kilometers (380 miles) are buried as much as 15 meters (49 feet) underground.

For further details about the Technology Affiliates Program, visit JPL's Commercial Technology Program home page at http://techtrans.jpl.nasa.gov/tu.html.

# New timekeeping system closer to implementation

By STEPHEN MARTINEZ New Business Solutions Project

As NBS moves closer to implementing the new timekeeping system on Lab, a number of questions have been raised. This article is one in a series that will address these issues.

The targeted "go live" date is June 29. Employees will be brought up on the system at the rate of 1,000 per week beginning that week, with

training provided during the week when a person is scheduled to begin to use the system. All training will occur in von Kármán Auditorium.

The system is easy to use, with onscreen messages provided to walk users through the process. Additionally, an integrated customer support service (ext. 3-3225) and trained local timekeeping subject matter experts will be available to assist employees with any questions or problems they may have.

The new system will not be the same as punching a time clock. That is, time can be entered either at the end of the day or at the beginning of the next morning for non-exempt employees. Exempt employees can enter their hours for the current week anytime on Friday.

For more information about the new timekeeping system, go online to http://eis/nbs/TEAM/PHRAT/

phrat.htm . 🗖

# Open house

Continued from page 1

Earth in 1999.

Close-up images of El Niño will be on display at the Earth Sciences booth, as scientists and engineers display the different ways JPL has tracked this weather-altering phenomenon with satellites.

The Mars Yard, which was recently relocated to the east of Building 280, will feature two full-scale models of Pathfinder's Sojourner royer.

Also on display will be a full-

scale model of Galileo, along with a colorful exhibit of stunning images of Jupiter's moon Europa, which is thought to have a water ocean beneath its icy surface. A full-scale model of the three-story-tall Cassini spacecraft, launched to Saturn in October 1997, can be viewed in JPL's Spacecraft Assembly Facility.

Engineers who use the Deep Space Network will be on hand to explain spacecraft telecommunications.

The Space Flight Operations Facility viewing gallery, where spacecraft communications take place, will also be open to visitors.

Other featured projects will include JPL's Origins program, which is aimed at developing new technologies to detect other solar systems; JPL's Center for Space Microelectronics Technology, which develops miniaturized instruments and sensors for future space flight; and the New Millennium program, which is developing revolutionary high-tech instruments for space flight in the

Food and beverages will be available, along with space souvenirs and NASA and JPL merchandise.

21st century.

# **Passings**

Frank Arteshian, 65, a senior mail handler from Section 644, died of cancer Feb. 20 at his San Diego home.

Arteshian worked at JPL from 1979-95. He is survived by three sisters.

Services were held at Forest Lawn Memorial Park in the Hollywood

D. Kyle Brown, 35, a staff engineer from Section 353, died April 1 at his home in Glendale.

Brown had worked at JPL since 1987. He is survived by his father, Roger, and sister Leslie.

Memorial services were held

Donald Jacobs, 64, a paint shop lead from Section 662, died of cancer April 21 at Emmanuel Health Care Center in Glendora.

Jacobs joined the Lab in 1981 and retired in 1997. He is survived by his wife, Barbara Brock-Jacobs.

Burial was private.

Verner Fredricksen, 69, a retired engineering assistant from the former Section 512, died of respiratory arrest

Fredricksen worked at JPL from 1966-92. He is survived by his wife, Romona, and daughters Margie

April 22 at Kaiser Hospital in Riverside.

Siano, Marilyn Hale and Pam Mays. Burial services were held at National Cemetery in Riverside.

# Retirees

The following JPL employees

Herbert Holbeck, 42 years, Section 352; Warren Apel, 41 years, Section 390; Dale Ferrin, 36 years, Section 210; Enrique Garcia, 31 years, Section 394; John Daeges, 28 years, Section 333; Salvatore Mansolino, 26 years, Section 662; Andrey Sergeyevsky, 25 years, Section 312; Ronald Murray, 24 years, Section 394; John Scott-Monck, 21 years, Section 353; Sanford Jones, 20 years, Section 503; Ralph Parrish, 20 years, Section 313; William Berkley, 19 years, Section 336; Edward Lin, 18 years, Section 353; Craig Elliott, 17 years, Section 313; Alan Holland, 16 years, Section 391; Eugene Herrington, 15 years, Section 391; Jean Aichele, 14 years, Section 644; Ann Bagne. 10 years.

#### LETTERS

Phyllis Kaplan sent me the following thank-you note, expressing her family's appreciation for all the effort that went into the establishment of the memo-rial bench at JPL for her son Jordan. She directed the note to me but the thanks belong to such a diffuse group of people that I'm going to air this note as widely as I can (Universe, JPL Forum, email distributions) in hopes that it reaches all the people tributions) in hopes that it reaches all the people who helped, including people whose names I don't even know (anonymous contributors and folks from transportation, facilities, visitor control, credit union, cateteria, plant protection, etc.). This was truly a magnificent grass roots effort, supported by people all over JPL. Thanks to all.

Jancis Martin for the Patio Players

Many thanks to you from all of us for the tremendous effort you made in providing the wonderful tribute to Jordan. From the overseeing of the design of the bench, to the collection of the funding and getting approval from JPL, to deciding on the beautiful and appropriate placement of the bench and running the dedication including the beautiful music and refreshments, and your thoughtful and sensitive talk, we cannot express to you sufficiently our gratitude. It is so comforting to us to know that Jordan had so many wonderful friends at JPL and that we, in turn, have received so much support during this past year. We hope that you will convey this note to all of those at JPL that were involved in this lasting memorial to Jordan.

Dr. and Mrs. Henry Kaplan and children

000

Thanks to all of my co-workers for their cards and expressions of sympathy in the loss of my mother. Ray and Kathy Freeman 000

I want to say a big thank you to everyone who attended my retirement send-off on May 1, and to everyone for the great gifts. My sincere appreciation to the Division 39 office staff for this very special event, and to the speakers, for their recollections, comments and stories. It's hard to leave JPL, mainly because of the wonderful people. You sure demonstrated that with my retirement party, which

# FOR SALE

AUTO HITCH, EZ Lift, H.D., attaches to frame type (welds), 2" receiver bar, 41"L x 2 1/2" tubing,

## NOTICE TO **ADVERTISERS**

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

# Universe

Editor Mark Whalen

Photos JPL Photo Lab

Universe is published every other Friday by the Public Affairs Office of the Jet Propulsion Laboratory, California Institute of Technology, 4800 Oak Grove Drive, Pasadena, CA 91109.

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. E-mail ads are limited to six lines.

Ads are due at 2 p.m. on the Monday after publication for the following issue.

For change of address, contact your section office or the HRS Help Desk at ext. 4-9559 (on-Lab personnel) or Xerox Business Services at (626) 844-4102 (for JPL retirees and others).

\$95/obo. 626/303-5595

\$6/box, 626/398-4960

BASEBALL CARDS, 1998 Topps unopened box, 36 packs, major stars & rookies, \$35, 626/914-6083. BEDROOM SET, oak; incl.: dresser w/mirror, chest of drawers, 2 nightstands, and single bed kit; sell only as complete set, \$275, 909/596-5774. BEDS, antique twin, head & fibrds. w/rails, mahogany (reddish), \$285/obo, 626/303-5595. BLANKETS for water heaters, 3 avail., never used;

\$10 each/obo, 626/568-8298. BREAD MACHINE, Dak "Auto Bakery", exc. cond.,

\$50. 790-0692. BRICKS, red, 4" x 8" x 0.5"; perfect for walkways; quantity of 550; \$.15 ea. or \$75 for the whole set

obo. 626/568-8298. BUMPER, chrome, used, '91 Chevy S-10 Blazer,

BUNK BEDS, solid pine, with 3 built-in drawers each for storage, mattresses incl., stack or use side-by-side as twin beds; \$200, 626/584-6518. CANDLES, boxes of 12, 12" & 8", various colors;

CANISTERS, ceramic; for tea, sugar, coffee; two 5" and two 6"; white w/blue flower designs; all four for \$15/obo. 626/568-8298.

CELLULAR TELEPHONES, AT&T #3630, 1 yr. old. leather case, 3 batteries & home charger, \$950/obo; Tele T.A.C #250, 1 yr. old, leather case, home & car chargers, \$75/obo; Technophone #405, leather case, home & car chargers, \$75/obo.

CLUB CHAIR, burgundy, dark red, and burnt orange leather, \$200, 626/795-6538. COFFEE TABLE, wood frame w/glass inserts, 2' x

61: \$20, 547-0705 COMPUTER MEMORY, 32 MB RAM, EDO, 60 ns;

new, never opened; \$50/abo. 909/902-5664. COSMETICS, Mary Kay; creams, eye pencils, mas-cara, etc.; getting out of the business; 40% off on all products. 626/914-6083.

DASH COVER, new, for '94 Toyota Corolla; light black/charcoal color; in box, new \$40, sell \$30, 626/795-7217, Bruce.

DESK, executive, med. oak, 62°, exc. cond., \$200/obo. 352-9957, Wayne or Sharon. DESKS, child's, 1 left drawer, 2 right + 1 file, 30°w x

21"d x 30"h, painted white, \$50/obo; mahogany (reddish), middle, left and right drawers, 42"w x 21"d x 30"h, \$175, 626/303-5595.

DINING TABLE SET, walnut color; 6 chairs (2 w/arms), all padded in beige fabric; table, 39" w x 58" l; HUTCH, 78"h x 48"w x 17d, upper cabinet glass display, lower buffet portion is enclosed cabinets and drawers; \$595 selvobe. 626/303-5595. DRESSER, 4 small drawers, 6 larger, 42°w x 15°d x 34°h, white, \$50/obc. 626/303-5595.

DRYER, gas, top-of-the-line Whirlpool; heavy duty with all electronic controls; works great; \$125/obo. 626/568-8298.

DRYER, Whirlpool electric heavy duly w/auto, moisture sensing; 2 yrs, old; exc. cond.; \$175. 626/584-6518. EXERCISE MACHINE, "Aerobicrider", like new,

\$100. 790-0692. FILM, 35mm negatives and slides, professional/

amateur, Fuji/Kodak, 50/100/200/400 ISO<sub>4</sub> kept in a cool and dry place, expire mid-1999, much cheaper than stores. 548-9274. FURNITURE: dining table, \$50; dresser, oak, \$100; waterbed, oak, \$100; 3 dining chairs, \$10 ea.; coffee table, \$20; love seat, \$30; stereo cabinet, \$50;

entertainment center, \$20, 626/398-6386, eves GATE, variable width for pet confinement, made of \$15/obo. 626/568-8298 GMAT MATERIAL: The ETS Powerprep software

2.0; The ETS Guide For GMAT Review, 9th Ed.; Kaplan GMAT CAT (w/CD), 98-99 Ed.; Princeton Review Cracking The GMAT CAT, 98 Ed.; Peterson's GMAT Success (w/CD), 98 Ed.; all \$120. E-mail: panda711@hotmail.com.

GOWNS, 2 elegant matching emerald green full length, w/matching shoes, dress sizes: 10 & 22, shoe sizes: 9 & 8; periect for fall bridesmaids; best

LOVESEAT/SOFA, camelback rust labric, 64", gd. cond., \$75/obo. 352-9957, Wayne or Sharon. LUGGAGE, commuter carry-on. American Tourister, exc. cond., S50; woman's 26" w/wheels, soft cover green, exterior shoe holders, exc. cond., \$45, 626/793-3561.

MAGAZINES, vintage Playboy; make offer. 957-MAT, plastic, for office chair, 5' x 5'; \$5/obo.

626/568-8298. MOVING: drawing table, 6' x 3' steel adjust., \$150 (new \$500); drafting stool, \$75 (new \$250); drafting light, \$25 (new \$120); a/c wndw. unit, ½ ton, almost new, 110v, \$150; bike, viritage 24" BMX/freestyle hi-end Chromolly, \$150; all in exc. shape and working cond. 626/398-4455

PIANO, 6' 1" Knabe Baby Grand, cherry finish; recently reconditioned by tech.; appraised S5-6K; moving, sell \$4,500/abo, 626/351-8601.

SECURITY ALARMS, Quorum brand, all new, 10 personal alarms, 10 sports style personal, 1 personal property, 1 auto, 2 auto external, 1 auto Immobilizer, 1 home + 1 external, 2 starter kits, 1 demo case; retail value \$1,634, wholesa first \$695/obo takes it all. 626/303-5595. SKI PARKA, men's sz. 44, n. blue, zip out lining, never used, new \$175, sell \$100, 626/793-7879.

SKIS. Autier w/Marker II titanium bindings, 194 cm, exc. cond., \$75; SKI BOOTS, Lange 55, men's sz. 12, exc. cond., \$75, 626/793-3561.

SKIS, Rossignol Strato w/Look bindings, 195 cm; SKI RACK, Barecrafters gutter mount; TIRE CHAINS for BMW; \$100 takes all. 626/793-7879. SLIDE/PLAY CENTER, Little Tikes, small, \$25/obo

SOFA, carnelback, dusty rose velour, nearly new, 8 H. matching throw pillows, \$200/obo. 352-9957, Wayne or Sharon.

SOFA & LOVE SEAT, southwest pattern, blue, w/oak panels, gd. cond., \$150 for both. 213/550-1500

SOFA BED, qn. size, \$60; TYPEWRITER, electric, early '80s Smith Corona, \$20. 626/797-8636. STEREO EQUIPMENT: 2 stereo receivers, \$50 each; cass. deck, \$20; turntable, \$25; 6 CD player, Sony, Sec., Sec., Sec., turnable, Sec., 6 CD player, Sony, Sec., Speakers, S50; TV, Sony 19" Trinitron, S200; VCR, Sony Hi-Fi, S150, 626/398-6386, eves. STEREO RECEIVER, Ploneer, with 12" 3-way speakers, S90; DART BOARD, Bristle, 18" dia, x

1.5", \$20. 626/304-0737. STOVES (2), cast iron wood or coal burning, \$375 ea. or both for \$700; BIKES, Huret men's off road 10 spd. and Murry women's off road 10 spd., \$45 ea. or \$80 for both; VIDEO CAMERA, RCA color pro, and JVC studio VHS recorder, \$300/obo. 626/358-4722

TANNING BED, new bulbs, \$250/obo; MANICUR-ING TABLE, w/light, \$40, 628/963-2577. TEACUPS, Franciscanware, Desert Rose pattern, \$7/ea: 626/398-4960.

TENT (dome), light, 6.5 x 6.5 ft. square; exc. cond. new, have orig. box; \$35/obo. 626/795-

7217, Bruce.
TIMESHARE:Trendwest Resorts, go to Hawaii,
Oregon, Canada, Cabo, parts of Calif. + more; 1
night to 1 wk., 1 to 3 bd.; anytime of the year, very
flexible; 6K annual credits, 12K credits accumulated; \$77,25 main. due per qtr.; \$6,000 for lifetime ownership; serious calls only. 213/263-1224. TREADMILL, DP "Life Walker", EZ fold, manual

incline, heart rate monitor; \$200, 957-5382. TRICYCLE, adult 2-seater, side-by-side, w/trailer, exc. cond.; pd. \$1,200, sell \$395 total. 805/251-

TV, 5" b/w portable, never used; \$50/obo. 626/568-

WASHING MACHINE, super capacity, gd. cond.,

\$75. 909/596-5774. WASHING MACHINE, top-of-the-line Whirlpool (2 spd., 4 cycles, perm. press); needs new motor; \$25/obo, 626/568-8298. WATERBED, qn., tube type, looks like standard mattress, \$100, 353-5201.

WORK BENCH, Sears, metal base, 2 lockable doors, 3 drawers, exc. cond., new \$135, sell \$75. 626/793-7879.

YARD SALE, multi-family; Sat., May 16, 8 a.m.-12 p.m.; furnishings, housewares, clothing, domestics; great buys; collector items; everything must go; 1335 North Sierra Bonita Ave., Hollywood.

#### AUTOS / RVs / MOTORCYCLES

'87 BMW 325e 2 dr. sedan, black w/spoiler; exc cond., recent rebuilt engine and trans.; \$5,500. 909/899-0457, Herman/Terry. 83 CADILLAC Seville, white, V8, all extras (i.e., a/c,

standard equip, rebuilt engine and trans.; 09/899-0457, Herman/Terry

77 CADILLAC Brougham, luxury edition, beautiful classic car, beige leather and teak wood custom int., deep brown ext. w/leather trim, garaged & driven locally, 50K orig. mi., exc. cond.; \$4,980/obo.

CHEVROLET Tahoe, 2 dr./4 WD, leather, AWFM/cass./CD stereo, pwr. everything, towing pkg.; as new, 18K mi.; \$28,995, 909/596-2848, Mike.

'91 CHEVROLET Geo Storm, 5 spd., a/c, alpine

CD, recent tune-up & tires, orig. owner, runs exc., exc. mi.; sporty, lun to drive, hop in and go; \$3,400. '89 CHEVROLET Silverado pickup truck, 3/4 ton

350 eng., long bed, axtended cab, loaded incl. tow pkg., 106K mi., \$7,200/obo. 626/303-5595, Paul. '85 CHEVROLET Monte Carlo SS all orig., alc. auto, ps, pb, orig. interior, orig. SS wheels, paint w/accent strips, \$5,000/obo, 714/435-9972, Kathy 70 CHEVROLET El Camino, big 350 engine, big tires, exc. cond., leather seats, 82,400 mi., \$3,500/obo. 626/914-6083.

95 HONDA Civic DX, 2 dr., manual, air, cruise, AM/FM/cass., new tires, 24K mi., exc. cond., \$9,750, 626/398-6386, eves. '90 HONDA Accord LX, 5 spd., exc. cond., orig.

owner, \$7,500, 248-0521. '86 HONDA Accord, 4 dr. sedan, 115K mi., auto,

gray, cruise, ong. pwner, exc. cond., new brakes, \$3,000, 626/449-9885 or 626/798-1643. 85 HONDA Prelude Si, red, auto, great running & body cond., well-maintained in & out, pwr. windows/sunroof/steering, AM/FM cass. stereo, cruise, a/c, alarm, 127K mi., \$2,800/obo. 548-9274. '89 ISUZU Trooper II, 4 WD, a/c, p/s, Sony faceless

radio/10 CD rmt. cngr./amp., new: head manifold, fuel/wtr. pump, clutch, clutch fan; rebuilt: trans., radiator, fuel injectors; all paperwork, front brush guard bumper, trl. hitch, \$6,500/obo. 626/303-4939. 93 JEEP Grand Laredo, \$13,900, 626/441-2150. 90 MAZDA 626 LX, 4 dr. sedan, 103K mi., auto, AM/FM/cass., cruise, orig. owner, vg cond., clean, \$3,800. 805/259-7032.

187 MAZDA RX-7, rotary engine, dark blue sport coupe; 97K mi.; orig. owner, service & maint. paperwork avail., new brakes and tires; like new; no echanical problems; \$4,000. 954-3571 day, 557-'94 MERCURY Sable wagon, only 28K mi., full pwr.

cruise, remôte & keyless entry, alarm, 3rd seat, dual air bags, 4-wheel disc ABS brakes, alloy wheels, top cond., orig. perfect silver-gold paint; \$10,700 626/798-2925 '82 MERCURY LN7, vg cond., white, 67K orig. mi.,

1 owner, maint, records, good family 2nd car or starter for teen; \$1,199/obo, 626/797-2475 or leave msg., 626/726-4393, Gloria. '86 OLDSMOBILE Delta 88 Royale, white/blue

velour, 3.8 V6, 4 dr., 91K mi., auto OD trans., air, st. AM/FM, gd. cond. 626/914-1715.

83 SUZUKI 650 GS motorcycle, 25K mi., exc. cond.; must sell, \$500, 790-4811.

82 VW camper, stove, refrig., pop-top, slps. 4; new engine, tires and shocks; \$4,500/obo. 626/355-

'70 VW Bug, rebuilt engine; new: seats, chrome wheels, tires, battery; not running, needs wining completed, good project car, as is \$950/obo, 626/309-0429. 68 VW, 1835cc, needs cosmelics, \$1,900/obo.

'86 WINNEBAGO Chieffan, 22', 454 eng., a/c, double bed, dinette table folds into bed, ded drop over driver/passenger seat, refrig., stove, oven, Onan generator, less than 26K mi., \$10,000/obo. 248-2638, after 5 p.m.

## WANTED

CARPOOLER in Arcadia/Temple City/Monrovia area; 7:15-4:00. Ext. 4-1024, Shary.

HOUSING, 1 bd. furn. apt., studio or unfurn. rm. in La Canada or Pasadena (Linda Vista area). 626/585-0038, Francois. SPACE INFORMATION & memorabilia from U.S. &

other countries from past & present. 790-8523, VOLLEYBALL PLAYERS, coed, all levels of plays

every Tuesday night from 8-10 at Eagle Rock High School; \$4/night. 956-1744, Barbara.

# LOST / FOUND

Lost: Brown leather amulet/medicine bag necklace, w/silver feather charm on top, has fringe and leather cord, approx. 3 " long x 1 1/2 " wide; has sentimental value. Ext. 4-1065.

FREE DOG, black lab mix, small female, 315 yrs, old, good w/children, needs loving home and lots of attention

male, 2-3 yrs., gd. w/people and dogs, bad w/cats.

DOGS to good home, 2 adorable Shepherd mix puppies; male, approx. 3 mos.; female, approx. 8 weeks, 626/919-5476.

FILL DIRT, clean (mostly gravel like); several cu. yds.; take as little or as much as you like; located 3 blks. ESE of NY & Hill, Altadena. 798-5152. WASHER & DRYER, Kenmore, both work. 353-

# FOR RENT

AZUSA, 2 bd., 1 ba. house, hdwd. firs., detached garage, fenced front and bkyd., faundry room, \$870, 626/812-0872, Debbie. GLENDORA, young professional looking for same

to split huge home with a lg. fenced yd. in a quiet cul-de-sac; extra im. is a fully equipped office; 25 min/JPL; pets OK; gardener incl., \$425 + ½ expenses, 626/335-4409.

LA CRESCENTA, 2 bd., 1 ba. apt. in duplex, front unit, 1 space in shared garage, window a/c, lg. front and fenced bkyd., quiet st.; water pd., gardener provided, \$950, 991-8774.

LA CRESCENTA, room w/private ba. in lg. home, limited kitchen privileges, \$375 + utils, 957-5774. LA VERNE/CLAREMONT area townhouse, 2 master bd., 21/2 ba., 2-car attached garage w/washer & dryer hookups, approx. 1,400 sq. ft., priv. bkyd.; avail. June 21; 5925. 909/596-5774. MONTROSE duplex, T bd. + bonus rm., lg. kitchen,

new carpet, stove, a/c, yd. w/fruit trees, prkg., no pets, avail. June 1; \$630. 248-9561. MONTROSE, furn. room w/ba., refrig. & microwave; close to Lab; priv. entrance; \$350 + sec. dep. 249-

PASADENA, roommate needed; futon, furn, living rm. avail. May 16-Aug. 30; \$400 + 35 util. 626/564-0171. SOUTH PASADENA, bungalow studio apt., lurn., good area on 1718 Huntington Dr. near Marengo; electric heat/air cond., parking and laundry facil.; non-smoker; \$565 incl. utils. 526/792-9053, Marilyn.

VALLEY VILLAGE townhome (near Studio City), 2

bd., 3 ba., attached 2-car gar. (+ storage rm.), secu rity syst., fireplace, breakfast nook in kitch., appliances incl., lease/rent, \$1,050, 909/272-0622.

#### REAL ESTATE

BIG BEAR, new cabin 2 blks, from lake, 2 bd., 2 ba., mud/laundry rm., \$129,000. 909/585-9026. GREEN VALLEY LAKE, a secluded village in the San Bernardino Mtns.: custom 3-story log home and buildable adjacent lot; beautiful 180 deg, view w/lg. decks, shade trees; walk to lake and skilic cabin \$149,000, adjacent lot \$19,900. 303-1927. LAKE CO., N. Calif., 2 1/2 acre lot, in beautiful Kelseyville near Clear Lake, perfect site for a permanent or retirement home, 30 walnut trees, paved

road, electricity, \$36,000, 626/337-7522. NEWHALL house, 2 bd., 1 ba., hdwd. floors, lg. den w/skylights, fp/wood stove and bar, huge fenced vd. w/brick patio, 2+ car garage, evap. cooler, walk to all schools, great loc., 30 min./JPL; \$150,000. 249-

PASADENA. 3-level townhouse. Dr./Orange Grove, across Victory Park; 3 bd., 2 ¼ ba., fireplace, balcony, pool, spa and sauna, 1,300 sq. ft.; sharp and close to JPL; no agents; \$166,000. 626/398-5303. SUNLAND townhouse, Alpine Meadows complex, 2

bd., 1.5 ba., 2-story, 2-car garage, pool, spa, tennis ct., rec. rm., well-maintained; \$110,000. 248-0178. WALKER BASIN, new custom home, 2,200 sq. ft., 3 bd., 2 ba., panoramic views, 2 1/2 acres, many oak trees, 2-car garage + work area, + 2,800 sq. ft. Dutch barn (guest house); \$175,000 (OMC). 626/446-007B.

# VACATION RENTALS

BIG BEAR cabin, quiet area near village; 2 bd., slps. 8, completely furn.; (/p, TV, VCR; \$75/night. 249-8515. BIG BEAR LAKE cabin, near ski area, lake, shops,

village, forest; 2 bd., slps, up to 6, fireplace, TV, VCR, phone, microwave, BBQ and more; JPL disc. price from \$65/night, 909/599-5225.

BIG BEAR LAKEFRONT luxury townhome, 2 decks, slps. 6; tennis, pool, spa. 714/786-6548. BIG BEAR, 7 ml. from slopes, full kitch., 1/p, 2 bd., 1 ba., sleeps 6; reasonable rates; 2-night min.; no smokers, no pets, exc. hiking, biking, fishing near-by, 909/585-9026, Pat & Mary Ann Carroll.

CAMBRIA, ocean front house, exc. view, slps. up to 4, \$125/night for 2, \$175/night for 4, 248-8853. KONA, HAWAII (Big Island) condo, 1 bd., 1 ba., slps. 4; 50 yds. from ocean; all amen., private beach; lots of activities and good restaurants near-by; avail. July 10-17; \$75/night or \$450 full week. 790-8069, after 5.

KONA, HAWAII, on 160 ft of ocean front on Keauhau Bay; priv. house and guest house com-fortably slp. 6, 3 bd., 2 ba.; swimming, snorkeling, lishing, spectacular views; nr. restaurants, golf courses and more. 626/584-9632. LAKE TAHOE, North Shore condo, 2 bd., 2 1/2 ba.,

slps. 6-7; great location, all amen., private beach, pool, sauna; special JPL disc. rates; 3-day min. through mid-June; weekly summer rates. 626/355-3886, Rosemary/Ed, MAMMOTH condo in Chamonix; 2 bd., 2 full ba.,

slps. 6, fully equipped elec. kitchen, incl. microwave & extras, f/p & wood, color TV, VCR, FM stereo; sauna, game, & Indry, rms.; pool, sun area, & o/d Jacuzzis; play & BBQ areas; conv. to shops, hiking, MAMMOTH condo, 2 bd. + loft, 3 ba., slps. 8, pool, spa, full kitchen, TV/VCR, nr. Canyon Lodge, JPL

disc. rates, 249-8088. MAMMOTH condo, studio + loft, 2 ba., fireplace w/wood supplied, Jacuzzi, sauna, game rm., color cbl. TV/VCR, full kitchen w/microwave, terrace, view, amen., spring rates; great snow. 714/870-

MAUI condo, on beach w/ocean view, 25 ft, from surf, 1 bd. w/loft, compl. furn., incl. phone, color TV, VCR, microwave, 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, less 10% JPL & Caltech disc. 949/348-8047.

OCEANSIDE, on the sand, charming 1 bd.+ condo, panoramic view, walk to pier/marina; pool, spa, game rm. 714/786-6548. PACIFIC GROVE hse., 3 bd., 2 ba., 1p, cable tv/vcr,

stereo/CD, well-eqpd. kit. w/microwave, beaut-furn., close to golf, beaches, 17 Mile Dr., Aquarium, Cannery Row, JPL discnt. 441-3265. ROSARITO BEACH condo, 2 bd., 2 ba., pool, tennis cl., ocean view, short walk to beach on priv. rd.,

18-hole golf course w/in 5 mi., priv. security prkg, SAN FRANCISCO, Nob Hill honeymoon suite (for 2 only); kitchen, maid, concierge, \$105/night.

626/797-3156 SOUTH LAKE TAHOE KEYS waterfront home, 4 bd./3 ba., slps. 12+; f/p on 2 levels, decks overlooking priv. dock + ski lifts; gournet kitch.; bikes, sail & pad-die boats, 3 TVs, VCR, stereo w/tape & disk; assn. indoor/outdoor pools, hot tub & beach; lighted tennis cts.; 10 min, to skiing, casinos, golf; 1 hr. to wine country; \$995/wk, for high season (June 15-Sept. 15; Nov. 22-Mar, 1); \$495/wk, low season, + \$90 cleaning; 3-day min. 626/578-1503, Jim Douglas.

May 15, 1998

let Propulsion Laboratory

# Mverse Pasadena, California Vol. 28, No. 11 May 29, 1998

# NASA begins Astrobiology Institute

JPL is among first members of project, which will launch a major component of Origins Program

JPL is one of several NASA centers selected as the initial members of the agency's new Astrobiology Institute, thus launching a major component of the Origins Program.

NASA last week named 11 academic and research institutions to be the initial partners in the venture. The selected institutions represent the best of 53 uniformly first-class proposals submitted, according to NASA officials. Given that the institute members will remain at their home organizations, the partnership among the members and NASA will be carried out primarily via the Internet. This electronic "virtual" institute will bring together astrophysicists, biologists, chemists, physicists, planetologists and geologists to conduct interdisciplinary research on the multifaceted issue of life in the universe and its cosmic implications. It will also help to train young scientists in this emerging field.

"These initial members of NASA's Astrobiology Institute will be at the forefront of the increasingly important link between astronomy and biology, which has been a fundamental interest of mine for the past several years," said NASA Administrator Daniel Goldin. "The 'office hallways' of this virtual institute will be the fiber optic cables of the Next Generation Internet, and the groundbreaking research that this group generates will help guide our space exploration priorities well into the 21st century."

Astrobiology Institute members will conduct a broad range of interdisciplinary and synergistic research on topics including:

· The formation of organic compounds important to the origins of life, such as from meteorites:

· The formation and characteristics of habitable planets;

The emergence of self-replicating systems

and possible pre-biotic worlds;

· How the Earth and life have influenced each other over time, including the evolution of ancient metabolism and the interplay of evolved oxygen;

The evolution of multicellular organisms and the evolution of complex systems in simple animals; organisms in extreme environments such as hydrothermal vents; and

· The identification and development of biomarkers to determine terrestrial and extraterrestrial biosignatures.

JPL's role in the five-year project will be managed by senior research scientist Dr. Kenneth Nealson. JPL will lead a consortium of 20 principal investigators responsible for three broad themes of study: Earth as a laboratory for understanding life and its relationship to its host planet; Mars as an analog; and the identification of biosignatures that can be used to detect and identify life.

Nealson said that among the "world class" experts from various disciplines comprising the program are JPL scientists Dr. Mark Allen, Dr. Diana Blaney, Ken Herkenhoff, Dr. Daniel McCleese, Dr. Gene McDonald and Dr. Jeffrey Plescia. Joining them will be representatives of Caltech, the United States Geological Survey in Tucson, Ariz., the University of Wisconsin (Madison and Milwaukee campuses), Carnegie Institution, Washington, D.C., the University of Rochester (New York) and NASA's Marshall Space Flight Center.

"Our biosignature program will include the development of methods for detecting life, and the testing of those methods on extreme environments here on Earth-places like Antarctica, dry and cold deserts, very hot areas and alkaline or hypersaline lakes," Nealson said.

The analysis of Martian meteorite ALH8400 over the last two years, Nealson pointed out, "taught us that we don't know how to distin-

guish life from non-life. If we knew how to do that, scientists wouldn't still about it. We don't want to be in the same situation when we bring samples back to Earth." entists analyzing alien samples

Senior research scientist Dr. ods that will not Kenneth Nealson heads a only be safe but

JPL-led consortium that will will contribute to NASA's new unequivocal evi-Astrobiology Institute. dence that past life either was or

was not present. "Up to now, no one's bothered to develop those methods. That's the major push of the biosignatures part of our work."

In Nealson's field of microbiology, "it's unusual for a microbiologist to think 10 years into the future," he added, noting that indeed the first samples from Mars will not be returned until 2008.

"We also hope to get very heavily involved with in-situ science," he noted. "But the first mission for which we would use our methods would probably not be launched until 2007.

We really believe that Earth is the laborato--we know there's life, we know how to study it, and we can use the places where the signals of life are really subtle to test our methods.

"In some ways, this is the perfect job for an environmental microbiologist, because you get to keep doing your science, but you get to think about other things while you're doing it. You get to look down the road to the future and

See Astrobiology, page 2

arguing

He said sci-

will need meth-

# Computer upgrade to aid asteroid tracking

By DIANE AINSWORTH

NASA astronomers conducting a monthly sweep of the night sky to identify previously unknown asteroids and comets will be able to double their coverage and the number of discoveries they make, thanks to new, state-of-theart computer and data analysis hardware.

The new equipment was purchased with funds from NASA, which recently doubled its resources for near-Earth object research.

The new real-time analysis system, which serves a fully automated charged-couple device (CCD) camera and telescope atop Mt. Haleakala, Maui, Hawaii, is part of the Near-Earth Asteroid Tracking (NEAT) project, based at JPL. The new system features four 300megahertz processors that will be devoted solely to the enormous amount of data coming back from the NEAT telescope on a nightly basis.

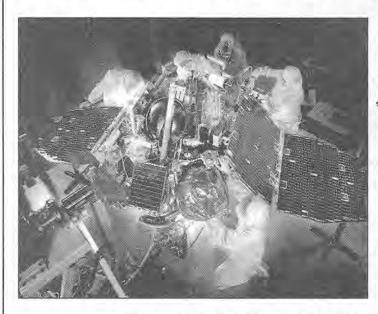
This new system will speed up the processing of data and allow us to analyze up to 40 gigabytes of data each night, or the equivalent of nearly 70 CD-ROMs," said Dr. Steven Pravdo, NEAT project manager at JPL. "We will be able to double the amount of sky we search each night, which is currently 500 square degrees, as well as the number of new asteroids and comets we find during each monthly observation cycle."

Installed in 1995, the NEAT camera uses a very large, very sensitive 4,096- by 4,096-pixel CCD chip. The camera is located on a 1-meterdiameter (39-inch) telescope operated by the U.S. Air Force and located at an elevation of 3,000 meters (nearly 2 miles) above the Pacific Ocean. With stable climate, clear, dry air and little light pollution, the NEAT tracking system has been highly successful and continues to operate six days out of each month. With additional support, the project hopes to increase this six-day observational run to 18 nights of observations each month.

Asteroids are considered relics of the formation of the early solar system. Most of them are rocky materials, with some composed of nickel and iron. Most range in size from boulders up to

See Asteroids, page 3

# Work progresses on Mars '98 orbiter, lander



The Mars Surveyor '98 Climate Orbiter and Polar Lander, set for launch in December 1998 and January 1999, are entering the final stages of testing this summer at Lockheed-Martin Astronautics. Denver. To the right is the Climate Orbiter as it was undergoing acoustic testing recently to simulate conditions that might occur at launch. The Polar Orbiter, above, is shown during deployment and testing of its surface solar panels. The 1998 mission will address the behavior of Martian volatiles, such as water vapor and ground ice, and reveal more about the history of Mars' climate and current resources.

PHOTOS COURTESY OF LOCKHEED MARTIN ASTRONAUTICS



# Open house here May 30-31

Up to 50,000 visitors are expected for JPL's annual open house May 30-31. The event will be open both days from 9 a.m. to 5 p.m.

The majority of exhibits and displays will be presented in the mall and nearby areas, which will be divided into the following regions:

Area A, Solar System: Area A1, the Cassini display, will be the closest to the main gate. A2, Mars Exploration, will be next, followed by A3, Small Bodies.

Area B, Earth: All of JPL's Mission to Planet Earth projects.

Area C, Children's Activities: Hands-on activities for all ages.

Area D, Universe: Current, future and proposed astrophysics missions.

Area E, Technology: Deep Space Network, New Millennium Program, Technology and Applications Program, X-2000 and more.

Lab buildings housing exhibits: 79, 111, 148, 150, 167, 168, 170, 179, 180, 186, 230 and 301.

Parking is available in the east and west parking lots. Shuttle service to the Lab will be provided.

# Security services outsourced

By MARK WHALEN

JPL has announced the outsourcing of its guard force and the physical security function.

The Laboratory has selected Florida-based Wackenhut Services Inc. to take over the physical security functions for the Oak Grove site, effective June 22, said Joe Charles, manager of the Security and Protective Services Section 665.

See Security, page 3

# News Briefs

Sylvia Miller, manager of JPL's Mars Surveyor Preprojects Office and a graduate of Rutgers University's Douglass College, has been elected to the New Jersey university's Douglass Society in honor of her career achievements.

Miller joined JPL in 1968, the same year she graduated from the college. She has served as mission design manager for the Comet Rendezvous Asteroid Flyby (CRAF) project, and also as team chief on the Infrared Astronomical Satellite (IRAS) mission, for which she was awarded the NASA Exceptional Service Medal. □

Due to the fact that many people have changed e-mail systems in recent months, some original subscribers to the monthly e-mail newsletter ICIS News Bytes may have been dropped from the distribution list,

Those who suspect they may have been dropped from the list, or never subscribed and would like to, may subscribe online at http://icis.jpl.nasa.gov/iis/resources/ bytes.home.htm.

ICIS News Bytes, which contains information technology highlights, warnings, announcements and upcoming events, is also posted to JPL bulletin and the ICIS home page. □

Nearly 300 people attended JPL's semiannual Briefing for Industry May 14 at the Doubletree Hotel in Pasadena.

The event provides an update to industrial partners and suppliers on JPL's programs and procurement opportunities. It also provides a forum for companies to make new contacts and network with key JPL personnel.

Key themes included the fact that JPL and its partners need to reduce cycle time together; more programs and a smaller Laboratory mean more work for industry; and the transitioning to the Develop New Products project implementation process, especially model-based design, which requires effective alignment with partners.

Co-sponsoring the event with JPL was the National Space Club, with participation from the NASA Management Office. □

# Way wins NASA's Silver Snoopy; KidSat, IPEX teams honored

Dr. Jo Bea Way, team leader for JPL's KidSat project, was awarded NASA's Silver Snoopy award in mid-May.

Part of NASA's Space Flight Awareness Program, the Silver Snoopy is selected and presented personally by astronauts to employees for outstanding performance. Former JPL engineer and current astronaut Stephanie Wilson bestowed Way with the Silver Snoopy during a ceremony that also honored the entire KidSat flight team with the Space Flight Awareness Program team award.

The KidSat team was responsible for mission planning, flight software development, test and integration, astronaut crew training, image data system development and operations for three KidSat shuttle missions: STS-76, STS-81, and STS-86.

KidSat team members: Laraine Amy, John Beck, Nevin Bryant, Kris Capraro, Sherry Casson, Chris Cordell, Eric De Jong, Michael Devirian, Greg Earle, Tim Fogarty, Richard Fretz, Greg Goodson, Zareh Gorjian, Jeffrey Hall, Dave Hodges, Ben Holt, Robert W. Johnson, Steve Levoe, Myche McAuley, Fred O'Callaghan, Sheryl Owen, Fredrick Shair, Shigeru Suzuki, Marguerite Syvertson, Mark Wensnahan, Gail Yepez, Stephanie Zeluck.

Also receiving the the Space Flight Awareness



PHOTO BY DUTCH SLAGER, JPL PHOTO LAB

For her work as team leader on the KidSat project, Dr. Jo Bea Way, with daughter Annie in tow, accepts NASA Silver Snoopy award from astronaut Stephanie Wilson on May 15. Wilson, a former JPL employee who was an attitude control engineer on the Galileo project, has been in astronaut training since 1996.

Program team award was the Interferometery Preparatory Experiment I (IPEX-I) Flight Team, which developed the IPEX software, hardware and electronics with significant reuse of the flight equipment from the Brilliant Eyes Ten-Kelvin Sorption Cryocooler Experiment (BETSCE).

IPEX-1 team members: Parker Cowgill, Roger Klemm, Lermont Khachikyan, Marie Levine, Jeffrey Umland, John Waters. □

# The latest in office safety and comfort

Ergonomically configured keyboards, new furniture and state-ofthe-art computer mice are some of the features of the new ergonomic viewing area in Building 171-104

JPL employees may try a number of items on for size, including under-the-table keyboard holders; computer tables, some with corner units; contour chairs and several types of footrests.

Also available in the viewing area are catalogs that describe the new furniture and equipment. Char Fliege of the Safety Operations Section noted that employees wishing to order from the Just-In-Time system should first have an "ergonomic evaluation" of their workstation.

For more information, call Fliege at ext. 4-4396 or Alison Weisbin at ext. 4-8527, or go online to http://techinfo.jpl. nasa.gov/jpl/safety. \(\square\$\square\$



JPL PHOTO LAB

Char Fliege of the Safety Operations Section tries out a new chair and footrest in the ergonomics viewing area.

# 3,500 attend Family Day

About 3,500 family members of JPL personnel enjoyed a day just for them at the Laboratory on May 16 as they celebrated Family Day.

Nancy Kapell of the Human Resources Directorate said she received numerous positive responses from employees, who indicated their appreciation on behalf of themselves and their families.

"Everyone seemed to have a great time," Kapell said. "Many people said they would love for Family Day to be an annual event."

Employees brought visitors to their work areas, and family members were also allowed access to a number of facilities, operations areas and laboratories. Everyone received gifts and a complimentary lunch.

Kapell said one employee told her "I have to say that this was the nicest thing JPL has ever done for its employees. It was obvious that a lot of thought and planning went into making this event such a success. Normally, this kind of effort is something we only see done for the public or for high-ranking personnel."

"The hats were an excellent idea—I can't tell you how many peo-See Family, page 3

# Astrobiology Resea

Continued from page 1

develop methods that will lead you where haven't been before."

Funding for the institute will begin with \$9 million in 1999 and \$20 million in 2000. This total is expected to grow as research directions are developed and the capabilities of the Next Generation Internet are expanded and fully utilized.

In addition to the JPL consortium, the selected initial members of the institute are:

Universities: UCLA, Harvard University, University of Colorado, Arizona State University, Pennsylvania State University.

Research institutions: Scripps

Research Institute, La Jolla; Carnegie Institution, Washington, D.C.; Woods Hole Marine Biological Laboratory, Woods Hole, Mass.

NASA centers: Ames Research Center, Moffett Field, Calif.; Johnson Space Center, Houston.

The selection of the members, encompassing academic institutions and government labs, was based on a competitive evaluation process that began with the release of a cooperative agreement announcement last October. The next solicitation opportunity for new members will take place in about a year.

The institute's director and staff will reside at NASA Ames. For further information on the institute and the field of astrobiology, go online to http://astrobiology.arc.nasa.gov.

# Special Events Calendar

## Ongoing

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

Codependents Anonymous—Meeting at noon every Wednesday. For more information, 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. For more information, call employee assistance counselor Cynthia Cooper at ext. 4-3680 or Randy Herrera at ext. 3-0664.

Parent Support Group—Meets the fourth Tuesday of the month at noon. For location, call Jayne Dutra at ext. 4-6400.

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. For more information, call (626) 397-3110.

#### Friday, May 29

"Decision Theory and Psychological Models"—This lecture by Colin Camerer, Caltech professor of business economics, will illustrate how crucial experiments have in some cases turned researchers away from theories based on optimizing, into new directions, while maintaining mathematical rigor and empirical focus. At 4 p.m. in the

campus' Baxter Lecture Hall.

Bowl of Fireworks—Last day to purchase tickets at the ERC for the Hollywood Bowl's annual 4th of July fireworks show, which starts at 7:30 p.m. Tickets are \$18.

Dodgers Baseball—Last day to purchase tickets at the ERC for the Dodgers' June 9 game against the Oakland A's (Beach Towel Night) and the June 14 game against the Colorado Rockies. Tickets are \$12.

JPL Dance Club—Meeting at noon in Building 300-217.

JPL Genealogy Club—The club will hold a special meeting at noon in Building 180-101 with guest speaker Bill Dollarhide, a noted genealogist from Salt Lake City whose topic is "American Migration Trails." The meeting is open to anyone interested in genealogy, family history or general American history.

#### Fri., May 29–Sun., May 31

"Someone Who'll Watch Over Me"—This Theater Arts at Caltech production explores the minds of three innocent Middle East hostages attempting to come to terms with their situation. Held in the Underground Theatre, located in the basement of the campus' Student Activities Center, Friday and Saturday at 8 p.m., Sunday and Monday at 2 p.m. Tickets are \$8. For information, call (626) 395-4652.

# Sunday, May 31

Jazz Special-This free program at

3:30 p.m. in Caltech's Dabney Lounge will include a short lecture on the history of west coast jazz, followed by a concert of some of the leading practitioners of that jazz form.

# Tuesday, June 2

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

#### Wednesday, June 3

Associated Retirees of JPL/ Caltech—Meeting at 10 a.m. at the Caltech Credit Union, 528 Foothill Blvd., La Cañada.

**JPL Drama Club**—Meeting at noon in Building 301-127.

# Thursday, June 4

JPL Dance Club—Clogging class will be held at noon in Building 300-217.

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

#### Friday, June 5

JPL Dance Club—Meeting at noon in Building 300-217.

## Fri., June 5–Sun., June 7

"Someone Who'll Watch Over Me".—This Theater Arts at Caltech production explores the minds of three innocent Middle East hostages attempting to come to terms with their situation. Held in the Underground Theatre, located in the basement of the campus' Student Activities Center, Friday and Saturday at 8 p.m., Sunday and Monday at 2 p.m. Tickets are \$8. For information, call (626) 395-4652.

# Tuesday, June 9

JPL Scuba Club—Meeting at noon in Building 168-427.

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

## Wednesday, June 10

Grand Challenge Initiative—An informal follow-up discussion will be held from 11:30 a.m. to 1:30 p.m. in the Building 167 conference room to answer any questions regarding the initiative and provide an open forum for anyone who wants to present a concept and have it discussed.

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

JPL Drama Club—Meeting at noon in Building 301-127.

JPL Toastmasters Club—Meeting at 5:30 p.m. in the Building 167 conference room.

SESPD Lecture Series—Muses-CN Project Manager Ross Jones will speak at 11 a.m. in Building 180-101.

# Thursday, June 11

JPL Dance Club—Clogging class will be held at noon in Building 300-217.



# Heritage Week starts June 1

"One Nation, Many Cultures" is the theme for this year's rendition of JPL's annual American Heritage Week celebration, which will take place from Monday, June 1 to Thursday, June 4.

The events, sponsored by the Advisory Committee on Minority Affairs, will take place from 11:30 a.m. to 1 p.m. each day. In addition, the traditional International Cuisine Night will be offered on Thursday from 4:45 to 7 p.m., when JPLers and their families and friends may sample foods from a variety of cultures.

Twelve groups representing JPL's diversity will provide entertainment during the four-day event. A group from Elliot Middle School will also perform.

One of the highlights of the celebration will be the Wheel of Scientific Knowledge, which identifies scientific accomplishments of the various groups represented.

For more information, call event chairs Eileen Pablo at ext. 4-8670 or Carmen Bustamante at ext. 4-4739. □

# Lab helps bring tomorrow(land) up to date

amusement parks, the Happiest Place on Earth just got quite a bit happier, thanks to JPL.

The much-anticipated debut of Disneyland's new Tomorrowland last week showed off not only new rides, attractions and restaurants, but also included an unveiling of an area titled "The American Space Experience," with exhibits from JPL and NASA.

JPL Director Dr. Edward Stone and selected other guests from the Laboratory attended opening ceremonies for the updated attraction and got the first look at Disney's version of tomorrow.

The Lab's contributions to the area include full-scale models of Pathfinder spacecraft and Sojourner rover, both within a faux Martian landscape. Dipping into the past just a bit to compare the spacecraft of JPL's early history to those of today and tomorrow, models of Pioneer and Explorer are also on hand.

JPL also provided three Internet home pages-describing Origins, planets and comets/asteroids-in addition to interactive displays on the Deep Space 2 mission and Earth Science Enterprise, featuring TOPEX/Poseidon, the Shuttle Radar Topography Mission (SRTM), QuikScat and LightSAR, in addition to other radar and future Earth science missions.

Non-JPL contributions from NASA include a model of the space suit that could be worn by astronauts onboard the international space station next century, as well as ongoing NASA TV broadcasts and space shuttle infor-

The JPL displays will be kept intact in Tomorrowland for at least a vear.

# Disneyland's new attractions debut with a definite JPL flavor



Visitors check out JPL's contributions to Tomorrowland's new American Space Experience. In foreground are models of the Pioneer spacecraft (in case at left) and the Explorer spacecraft aboard its launch vehicle (far right). At the top center of the picture is a model of JPL's Shuttle Radar Topography Mission (SRTM) within a space shuttle; further right is a TOPEX Poseidon model. NASA and JPL exhibits in the background, from left, showcase Deep Space 2, an international space station spacesuit, monitors showing up-to-the-minute NASA TV and space shuttle information, the Earth Science Enterprise, and a web site display including JPLcreated home pages for Origins, planets and comets/asteroids.



At left, JPL Director Dr. Edward Stone accepts a gift of a crystal sculpture reminiscent of Snow White's castle at Disneyland-from the park's president, Paul Pressler, at the new Tomorrowland's debut. Above, as Mickey Mouse, Pressler and Pathfinder Project Scientist Dr. Matthew Golombek look on, Stone cuts a cake shaped like Pathfinder's Sojourner rover.

# Lab partners with Mattel for new Hot Wheels Galileo toy

By JOHN G. WATSON

A toy version of JPL's Galileo spacecraft will be produced under a licensing agreement between JPL and

Mattel plans an early 1999 debut for the new Hot Wheels Jupiter/ Europa Encounter Action Pack, a highly detailed reproduction of the Galileo spacecraft. Also included in the set are reproductions of the Galileo descent probe that entered Jupiter's atmosphere in 1995 and of one of the giant ground-based antenna dishes now used to communicate with the spacecraft.

The toy marks the second time Mattel has partnered with JPL for a Hot Wheels toy. Under a previous

licensing agreement, Mattel produced a Hot Wheels JPL Sojourner Mars Rover Action Pack Set based on the Mars Pathfinder mission that landed

Both toys came into being thanks to JPL's Technology Affiliates program. Through the program, corporations form alliances with JPL either to license intellectual property, as is the case with Mattel, or to gain access to JPL's engineers and scientists to help solve a range of technological problems. To date, more than 120 companies, large and small, have utilized the program to solve upwards of 200 specific technology challenges.

"The Mars rover Hot Wheels toy See Toy, page 4

# Asteroids

Continued from page 1

the largest main belt asteroid, Ceres, which is approximately 965 kilometers (600 miles) in diameter. Comets, on the other hand, are bodies of ice with embedded rock and organic materials that heat up and become active, spewing gases and dust as they approach the sun.

The NEAT telescope detects these small bodies by observing the same part of the sky three times during an interval of about one hour and comparing the three images to determine the location of objects moving across the sky. Since its inception, this fully automated system has detected more than 25,000 objects, including 30 near-Earth asteroids, two long-period comets and the unique 1996 PW, which has the most eccentric orbit of all objects discovered to date. More information about NEAT discoveries, along with black-and-white images of the objects, is available at http://huey.jpl.nasa. gov/

~spravdo/neat.html .

Most recently, the NEAT team has discovered two new Earth-crossing asteroids. One, designated 1998 HT31, is a relatively small Apollo-type asteroid 270 meters (800 feet) in diameter; the other, 1998HD14, is the 30th Aten to be discovered since JPL astronomer Eleanor Helin first identified this class of asteroid 22 years ago, and the fifth discovered with the NEAT tracking system. Both are classified as potentially hazardous asteroids because their orbits come within 5 million kilometers (3 million miles) of Earth, or about 20 times the distance of the moon

However, neither currently poses a threat to Earth.

'Atens are a rare class of asteroid because of their small orbits, which are smaller than that of Earth's, and which never allow them to wander far from our planet," said Helin, who is the principal investigator of the NEAT program. "1998 HD14 passed within 5 million kilometers (3 million miles of Earth) just a week after we discovered it on April 29. This is

mance-based pact that includes two one-year options.

The guard force will continue to provide service at JPL 24 hours a day, seven days a week, and Charles is confident the guards will continue to provide outstanding protection for the Laboratory.

tives of other NASA centers have applauded our guards' sense of prohe said. "That will not change, and in fact, may be enhanced, with the contractor's input.

"Any time you transition to a new job, you tend to elevate whatever level of performance you've had in the past a few levels higher just out of pride," Charles said. "This is a new task and all the guards feel they are worthy of it. That's the type of resolve that's permeated the entire force."

relatively close but poses no threat in the foreseeable future. Atens are of particular interest to us because they stay so close to Earth's orbit."

Along with near-Earth asteroids, astronomers are also interested in tracking long-period comets, which travel vast distances from the Oort Cloud, a region far beyond Pluto's orbit, which is believed to house trillions of incipient comets. These objects travel in very long paths through the solar system, and can appear unannounced, with no calling cards.

"We are particularly interested in these comets because they give us little time before appearing in Earth's vicinity," Helin said.

Astronomers dedicated to discovering and tracking near-Earth objects are eager to find all of the potentially dangerous asteroids and comets long before they are likely to approach Earth. For instance, the NEAT team at JPL is developing two new CCD cameras and hopes to install them at Mt, Haleakala or other facilities.

"With additional telescopes, longer observational runs and our new operating system, we will be able to detect 90 percent of the Earthcrossing asteroids that are larger than 1 kilometer (6/10 of a mile) in diameter in the next 10 years," Pravdo said. "As our knowledge about these objects grows, we will be able to provide better information which can be used in studies of ways to divert Earth-crossers on threatening orbits loward Earth."

# Family

Continued from page 2

ple expressed excitement when we told them that was the gift," added another employee. "The whole plan was perfect, and perfectly executed."

"A big thank you goes out to all those who made it happen," Kapell said. "It was a real team effort."

# Security

Continued from page 1

Charles said 44 section employees-37 guards, six supervisors and one clerical staffer-will join Wackenhut. No employees will be laid off or terminated, he added.

"All who were working at JPL will remain here and they are assured of employment for at least one year," Charles said. "We came away from negotiations with a strong assurance that the staff who want to remain here do so for as long as they wish, depending on their job performance.

This transition also offers opportunities for growth within the Wackenhut organization, because JPL's guard force is so small and growth opportunities have not been as abundant here within the organization," he added.

JPL retirement and medical plans

for the affected staff members will terminate in this transition, but Charles said that Wackenhut's benefits are comparable to those offered at JPL.

The outsourcing is part of the Lab's efforts to reducing its infrastructure to help attain its goal of about 4,800 contractors and employees by fiscal year 2000.

According to Charles, JPL took a 'more humane" approach by outsourcing, rather than having large layoffs and terminations. "This gives the guard force a very slight change in the way they've worked," he said. "It gives the Lab a chance to utilize billets for what JPL is famous for. We don't lose employees; they just change status. It helps us meet standards levied by NASA and Congress.

"Wackenhut has worked very closely with us to make it all go smoothly," he said. Guards' uniforms will be very much the same as before, and the force will gradually transition into Wackenhut's training program, which Charles said is similar to JPL's guard training. Also, support of JPL's hazardous materials squad and fire department will remain unchanged. Myron Hitch, the current supervisor of plant protection, will service as the technical contract manager.

Wackenhut has about 45,000 employees and serving business, industry and government and has operations in every state and nearly 50 countries. Charles said that honors garnered by the well-renowned firm include the Department of Energy Central Training Academy's National Performance Service/Reinventing Government Hammer Award and the National Safety Council Award in 1996.

JPL's contract with the company is a three-year, fixed-price, perfor-

"When visiting here, representafessionalism, duty and commitment,"

# SP-100 manager Truscello dies Anniversaries

Dr. Vincent Truscello, who managed two JPL projects for the Department of Energy as part of a career that spanned nearly 30 years at the Laboratory, died of cancer May 11 at his home in South Carolina. He

Truscello joined the Laboratory in 1968 and did early work in the development of radioisotope thermoelectric generators (RTGs) that would later be used extensively on JPL spacecraft. In 1976 he was appointed manager of the Solar Thermal Power Systems Project, a DOE program to develop the technology and applications for the use of solar energy to generate electricity.

In 1983 he was appointed manager of the Space Power 100 Project. This work sought to develop a 20- to 300kilowatt space reactor power system for nuclear electric propulsion outerplanetary missions and surface power for manned lunar and Mars missions.

Truscello retired in 1996. He is survived by his wife, Joann, daugh-



Dr. Vincent Truscello

ters Ann Marie and Mary, and grand-

Services were held May 13 in Conway, S.C.

Service award ceremonies were held May 7 to honor the following JPL employees, who have completed 20 or more years of service:

45 years

Jay Bondi.

40 years

George Jaivin, Dennis Carpenter, George Fraschetti, George Ladner Jr., Harry Reilly Jr., Takeshi Sato, Robert Tausworthe, Marc Trummel.

35 years

Reinhard Beer, Franz Borncamp, Robert Conover, David Curkendall, Marshall Gram, Clyde King, Brian McGlinchey, Wesley Menard, Rodney Stanley, Hugo Velasquez, Joseph Witt.

30 years

Sylvia Amrick, Henry Doupe, Kenneth McGraw, Neil Mottinger, Donald Palmieri, Ronald Ross Jr., Michael Sander, Ronald Slusser, Fred Soltis, Gary Stevens, John Wellman.

25 years

Barbara Anderson, Larry Bergman, Alan Brothers, Paul Esposito, Larry Hovland, TimMcstay Kaufman, Kenneth Klaasen, James Lesh, Susan Lavoie, Katherine Moyd, Gail Robinson, Andrey Sergeyevsky, Ellen Sherman, William Stromberg, Frank Surber.

20 years Barbara Amago, Cindy Coryell,

Ron Dotson, David Escoto, Dennis Flower, Steven Friedman, Rizalina Gordon, Linda Graham, Carl Guernsey, Stanley Krauthamer, Kristan Lattu, Richard Levin, Jean Lorre, Michael Marcucci, Sharon Miller, Dusan Petrac, Baltazar Rosales, Richard Rudd, Mary Helen Ruiz, Lawrence Seeley, Mahadeva Sinha, George Stephan, Bobby Williams, William York, Lawrence Young.

# Toy

#### Continued from page 3

helped educate kids and parents alike about the Mars Pathfinder mission in the most user-friendly fashion imaginable," explained Joan Horvath, a business alliance manager with JPL's Technology Affiliates Program. "Along the way, it also helped alert the business community to the many facets of JPL's technology transfer programs."

The Technology Affiliates program provides a streamlined way for JPL to do business with the prisector. The payoff: Technologies developed for the space program prove beneficial back on Earth and-in the case of the Mattel toys-help educate and enthuse the public about the space

Through this long-term partnership with JPL, we continue to demonstrate a commitment to making science and space exploration more fun and accessible to children nationwide," said Jim Wagner, Mattel's senior vice president of Hot Wheels marketing and licensing.

# Timekeeping training to start at end of June

By STEPHEN MARTINEZ New Business Solutions Project

All JPL employees should plan on attending training during the week their section is scheduled to begin to use the new timekeeping system.

Training is set to begin the week

For non-exempt employees, train-

ing will be on Mondays, with exempt employees scheduled for Fridays. Every organization has a liaison to NBS, who will send out notifications about specific training dates and times. The contact list is on the NBS training home page at http://eis/ibs/training/ nbstraining.html.

Each training session is scheduled to last 60 to 90 minutes in von Kármán Auditorium and will consist of a demonstration on how to use the new system (i.e., how to enter regular time, vacation time, sick time, leave without pay, etc.). Employees who miss their scheduled training date can view the NBS training schedule on the Internet and select another session, Sign-up will not be required.

Those who cannot attend a training session can contact their local subject matter expert for coaching on how to complete the time card. Subject matter experts are JPL employees, such as administrators, who have volunteered to become content knowledge leaders (e.g., in timekeeping) for their section/groups. If they cannot answer a question, they will forward it to the next level.

In order to ensure that training

materials are up to date and everyone has access to them, NBS will be making the materials available electronically through the NBS training home page. Before attending training, employees will need to copy and bring the training materials for their session.

For further information, view the NBS training home page or contact Kathy Harris, the NBS training manager, at ext. 3-4831 or 4-3752.

#### LETTERS

My family and I would like to thank all of my friends and co-workers for their prayers, condolences and donation to the memorial fund on the recent passing of my mother, Mrs. Rose Chu. Your kindness and sympathy has given us great comfort at this

000 My friend, Marti Brande, and I wish to express our deepest appreciation to the kind people who donated their United Plus airline mileage to Dalmation Dreams, enabling Marti to travel first class to Orlando in April. Marti's trip was solely dependent on the donations of others and because of your generosity and the Dalmation Dreams program, Marti's hopes and prayers were realized. She had the most wonderful and memorable time. Our thanks also to those who offered their prayers on Marti's behalf. Thank you all so much.

Jennifer Kesterson and Marti Brande

000

Carol and I wish to thank our friends at JPL for their support and empathy during the illness and subsequent death of my father, Dr. Logan Jackson. Also, thank you to ERC for the beautiful fily plant we received in his name.

Shannon Jackson

# FOR SALE

AIR CONDITIONER, window style by Goldstar, cools up to 400 sq. ft., exc. cond., incl. all manuals and mounting hardware; \$250/obo. 909/592-4458,

BABY ITEMS: backpack, Gerry, exc. cond., \$25; potty, \$5, 355-9733, after 6 p.m. or leave msg. BED FRAME plus headset, mattress and box, qn. size, Ethan Allen, all for \$450/obo; 2 match nightstands optional, 626/792-8272, Alice.

# NOTICE TO **ADVERTISERS**

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

# Universe

Editor

Mark Whalen

**Photos** 

JPL Photo Lab

Universe is published every other Friday by the Public Affairs Office of the Jet Propulsion Laboratory. California Institute of Technology, 4800 Oak Grove Drive, Pasadena, CA 91109.

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. E-mail ads are limited to six lines.

Ads are due at 2 p.m. on the Monday after publication for the following issue.

For change of address, contact your section office or the HRS Help Desk at ext. 4-9559 (on-Lab personnel) or Xerox Business Services at (626) 844-4102 (for JPL retirees and others).

BICYCLE RACK, ultra heavy-duty, for hatchback or vans, bought new at REI for \$125 last year, in exc. cond., \$75; SKI RACK, Bearcrafte, holds 6 pr. skis or comb. of skis and snowboards, \$50. 626/791-

BICYCLE, Univega Sport Touring, chrome alloy frame, Shimano component set, exc. cond. \$350 626/446-0165.

BRICKS, red, 4" x 8" x 0.5"; perfect for walkways; quantity of 550; \$.15 each or \$75 for whole set/obo.

diameter and two 6" diameter; white w/blue flower designs; all four for \$15/obo, 626/568-8298. CHAIRS (2) and ottoman, overstuffed, matching;

very clean/exc. cond.; high quality furniture, lg. plaid w/flame weave pattern, w/teal blue, rust and beige colors; sold as a sel; \$300. 626/339-5511. COFFEE TABLE and end table, Lane, solid walnut, vg cond., \$125 for both. 249-4603. COFFEE TABLE, white marble, 23" x 69", \$120.

COFFEE TABLE, wood frame w/glass inserts, 2' x

6'; \$20. 547-0705.
COMFORTER, brocade, king size (will fit Cal. king), recently dry-cleaned, w/king shams and bed ruffle; beige, w/varying light colors, mauves, etc.; 1 yr. old; worth over \$250, sell \$100. 626/357-6155, after

COMPUTER CD SOFTWARE for Macintosh, call for list, all \$25 and under. 790-3899.

COMPUTER DESK, oak w/black top: shelf underneath for books; vg cond.; nice piece of furniture; \$100. 364-9726.

COMPUTER PRINTER, laser, Epson Action Laser

COMPUTER, 486DX/33, 8 MB RAM, 210 MB HD. 15" monitor, 14.4 modem, SB Pro sound, mouse, keyboard, lots of software, \$225, 550-7555, Rob. COUCH, 9-ft, oatmeal colored, all hdwd, frame, reupholstered, hardly used; pd. over \$2,000 new, sell \$300/obo, 626/449-9747, eves, COUNTRY CLUB MEMBERSHIP for Braemar

Country Club (Encino), 367-7869, Lottie. DASHBOARD COVER for '78 Volvo 242DL; \$30. 310/618-8977.

DESK, composition w/dark laminate wood grain, 5 drawers; gd. cond.; \$65, 364-9726. DINING ROOM TABLE and 4 chairs, glass top table

w/black finish base plus 4 chairs w/black finish and upholstered seats and backs, \$150/obo. 826/398-

EXERCISE MACHINE, Body by Jake "Hip & Thigh," w/instructional video; \$40/obo. 367-0969. FILE CABINET, 2 drawer metal; \$15. 364-9726.

FILM, 35mm negatives and slides, professional/amateur, Fuji/Kodak, 50/100/200/400 ISO, kept in a cool and dry place, expire mid-'99, much cheaper than stores, 548-9274. GUITAR AMPLIFIER, Peavey 5150, half stack

w/slant cab, Eddie Van Halen model, exc. cond., \$900, 626/446-0165. MAGAZINES, Astronomy, 1973 (Vol. 1, no. 1) to

1983 complete, exc. cond.; \$50/obo, 367-7869, MATTRESS, ex.-long twin, box frame, exc. cond., Sealy Posturepedic, \$125, 626/794-2047.

MOVING SALE: girl's 5 pc. bd. set, vintage 50's sec. living rm. w/table and lamps, 6' walnut stereo cabinet w/speakers, new Cardio Force exercise machine; best offer for each individual item. 790-2570. MOVING SALE: TV, Zenith 27" console, w/remote

\$50/obo; 2 washing machines (name brands), \$100 ea./obo; dryer (name brand), \$100/obo; short surl board, \$200/obo; gas stove, \$75/obo; refrigerator (name brand), \$150/obo; all in exc. cond. 626/442-8615, Dan. ORGAN, Yamaha 415 electronic console w/13 ped-

als, 3 keyboards, 144 rhythm patterns, pd. \$7,500, sacrifice for \$3,000, 790-3899. PALM, giant sago, still in the ground; 5 ft. high, 6 ft. spread, very healthy; will help you dig it out; need a smaller one; \$200. 626/339-5511.

PERSONAL INFORMATION MANAGER, Seiko

"Phone-Pai", \$25, 790-3899.
PLAYER PIANO, antique, manual pump, upright; 90 piano rolls; gd. cond.; \$1,000 for all. 248-5678. PUPPIES, German shepherd, AKC m/f, parents on premises; black mask, short-hair; \$300, deposit will iold, 805/944-3732.

PUPPIES, rotweiler, born 3/31/98, 5 males, 4 females, \$100-200. 626/576-4242, Thomas or

RECORDS, tons of old 78 RPM, from about 1906-1950s, lots of Big Band, low prices; Victoria nee-dles, \$3 pkg. of 100. 248-5282.

RIMS for Jeep, complete set of 5 orig. star-spoke aluminum, nice upgrade to all Wranglers and Cherokees; \$250/obo. 626/794-5349.

SATELLITE DISH, 10 ft., Uniden UST 4800 Receiver with VideoCipher II+, \$225/obo, 550-7555, Rob.
SEWING MACHINE CASE, 1 yr, old, never used; \$20,364,0726

S20. 364-9726. SKIS, Blizzard Thermo VR20's 190 cm, Solomon 857 bindings; exc. cond.; \$75. 248-5568.

SLEEPING BAG, North Face Super Kazoo 550 Down, rated to 10 F, \$125, 790-9681. SWEATER, Coogi, from Australia, new, cost \$325 at Nordstrom, sell \$100. 790-3899.
TABLE, for dining or workspace; 60L x 36W x 30H,

oak top, white detachable legs, exc. cond.; \$60. 547-0705 TICKETS, Dodgers, season location, 7/24, 7/26, 8/11, 8/25, 8/27, 9/16, 626/445-7443.

TV, Zenith 27" console, w/remote, \$50/obo; WASH-ERS (2), \$100 ea.; SURFBOARD, short, \$200; STOVE, \$75; REFRIGERATOR, \$150; all exc. cond. 626/442-8615.

WASHING MACHINE, top-of-the-line Whirlpool (2 spds., 4 cycles, perm. press); needs new motor; \$25/obo, 626/568-8298.

#### AUTOS / MOTORCYCLES

'89 ALFA ROMEO Spider Graduate convertible red, black top, 4 cyl., 5 spd., 85K mi., \$5,200/obo http://members.tripod.com/~Alfa\_Romeo\_Graduate

'80 BMW 633 CSi, 140K mi., V6, 5 spd. man., a/c, pwr, str./win./locks, AM/FM/cass, stereo, 2nd gas tank, alarm, custom wheels/tires, snrl., new front upholstery, clean classic, \$3,950, 790-3367. 95 CADILLAC Sedan DeVille, exc. cond., 44K mi., 4.9L, white diamond finish, shale leather, CD/cass...

loaded, \$21,500, 626/794-2047. '94 FORD Explorer XLT, V6, a/c, auto, AM/FM/cass., trans. cooler, \$13,500/obo. 248-

'91 GEO Storm, 73K, dark blue, 5 spd., a/c, AM/FM/cass. stereo, gd. cond., fun to drive, \$3,900. 893-6084.

'88 GMC 1-ton extended cab, loaded, very clean 61,000 miles, camper shell and carpet kit, orig, owner, \$10,750, 957-7554.

93 HARLEY DAVIDSON, heritage softail custom, lowered, saddle bags, windshield, + many chromed access: \$15.900/obo. 626/798-5477.

'B6 HONDA Accord XL, 4 drs., low mi., exc. cond., a/c, pwr. windows. cruise cont., tan inside/out, drives and feels like new, \$3,995/obo. 626/584-0552. '85 HONDA Prelude Si, red, auto, gr body cond., well-maintained body cond., well-maintained in/out, pwr windows/sunroof/steering, AM/FM cass, stereo, cruise control, a/c, alarm, 127K mt., \$2,800/obo. 548-9274.

'81 HONDA GS500 motorcycle, V-style eng., runs great, full fairing, windshield, stereo cass., rack trunk, custom seat, vg cond., \$1,400/obo. 310/286

189 ISUZU Trooper II, 4WD, 5 spd., a/c, p/s/b, brushguard front bumper, removable trir, hitch; rebuilt: trans., radiator, injectors; new; head. exhaust, manifold, fuel/water pump, liming belt, clutch, clutch fan; all paperwork, Sony faceless am/fm ster. w/remote 10-CD chngr. + amp., \$5,900/obo. 626/303-4939, John.

'90 JEEP Cherokee Laredo, exc. cond., V6 4.0L, new tires, AM/FM/cass., tow pkg.; pwr., steering, windows, seats; tinted windows, orig, owner, very clean: \$8.700/obo. 213/257-9732.

'89 JEEP Cherokee Laredo, 4x4, low mi., new: brakes, shocks, tires; a/c, auto, all pwr., tow pkg., etc., 4.0L eng., \$9,950. Pasadena, 626/797-8776. '89 MAZDA MPV, V6, runs great, new paint & tires, all records; blue book \$7,000, sell \$5,500/obo. '83 MERCEDES 300TD station wagon, exc. cond.

drives like a new car, pwr. windows etc., sunroof, roof rack, built-in phone, \$5,900/obo. 805/250-0456 or pager 805/222-4390. '89 PLYMOUTH Colt/MITSUBISHI Pricis, 5-speed 2-dr. + hatch, new time belt, white, 109k mi.,

\$2,200. 248-8030. '85 PLYMOUTH Voyager SE Sport minivan, 7 pass., 2.6L, auto, air, pwr., orig. owner, clean, never hit, \$2,100. 213/663-0769. 88 VOLVO 240 DL, 4 dr., spd., 110K, gray, exc. cond., needs paint, good tires & battery, \$5,800.

'70 VW Bug, rebuilt engine; new: seats, chrome wheels tires, battery, not running, needs wiring completed, good project car; as is \$950/obo, \$26/309-0429.

70 VW Bug. 1835cc, needs paint, \$1;800/obo, 562/464-0446.

#### WANTED

COMPUTER CHIP, Intel 387SL math coprocessor.

"HOOKED ON PHONICS" or phonics game. 248-JUICER, Juiceman II and/or Juiceman Jr. 891-

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

VANPOOL RIDER, full-time, for vanpool #20 with stops in Northridge and Granada Hills. Ext. 4-0307

VOLLEYBALL PLAYERS, coed, all levels of play; every Tuesday night from 8-10 at Eagle Rock High School; \$4/night. 956-1744, Barbara.

LOST & FOUND Lost: Prescription eyeglasses in case and one empty case; lost from 171 basement. Ext. 4-6678.

FILL DIRT, clean (mostly gravel like); several cu. yds.; take as little or as much as you like; located 3 blks. ESE of NY & Hill, Altadena. 798 5152. KITTENS (2) rescued, approx. 3-4 wks. old, in exc. health; need permanent home when ready for adoption (at 8 wks.). 626/796-3466.

#### FOR RENT

GLENDORA, young professional looking for same to split huge home with Ig. fenced yd. in a quiet cul-de-sac; extra rm. is a fully equipped office; 25 min./JPL; pets OK; gardener incl., \$425 + 1/2 expenses. 626/335-4409. LITTLEROCK, near Palmdale, furnished rm. in 3bd. home; laundry facil., 2 ba., full house privileges, S425 + 1/4 util. 805/944-3732. MONTROSE, studio, furn. or unfurn., quiet, many

trees, no pets, for a single person; 4 min./JPL, 2332 Montrose Ave., 210 West to Ocean View, 1 blk. south; 5495, 249-7793.

South, 5493-24-7793.

N. ALHAMBRA, Ig. 1 bd, duplex in gd. residential area; 700 sq. ft., clean, hdwd. floor, 1-car garage; stove, window a/c, refrig., washer; water, trash and gardener provided; \$600. 663-9935, eves.

PASADENA cond., professional male looking to share 2 bd./2 ba., plus den, compil furn., centrally legated; 3 blue, from Cld. Town; incl., even bd. and

located, 3 blks, from Old Town; incl. own bd. and ba., full house benefits, with all amen., pool, Jacuzzi, off st. secured parking; prefer non-smoker, no pets; responsible and employed; avail. June 1; \$450 + 1/2 utils, 626/584-5999.

PASADENA, E. Del Mar, across/Caltech, 1 bd. in nice townhouse to share with a JPL fron, and a Caltech PhD stdt.; furn., laundry, shared ba., all hse. privileges, nice bkyd., garage, vg garden, no pets; long term prfrd.; \$340 + 1/3 utils. 626/795-5284.

PASADENA, near Old Town, roommate needed to share 2 bd., 2 ba. apt.; I/p, c/a, Indry. facil., garage; female preferred, non-smoker; avail. June 1; \$462.50 + ½ utils., sec. dep. \$462.50.626/564-9885. ROOMMATE (student or professional) to share charming Spanish home, near PCC and Caltech;

furn., newly decorated, lg. bkyd., \$550 incl. utils. 626/793-1759. SIERRA MADRE apt., 1 bd., \$500. 626/355-6395.

SIERRA MADRE apt., 2 bd., 1 ba., small quiet bldg., views, \$700. 626/355-7318. SOUTH PASADENA, bungalow studio apt., fum., good area on 1718 Huntington Dr. near Marengo; electric heat/air cond., parking and laundry facil.; non-smoker; \$565 incl. utils. 626/792-9053, Marilyn.

#### REAL ESTATE

LA CRESCENTA, by owner, custom 3 bd. + conv. den, 1 3/4 ba., designer kitchen; pool, Ig. covered patio; cul-de-sac of tree-lined priv. street w/view; open Iloor plan great for entertaining; new paint/carpet, new c/a/h; copper plumbing; 2311 Pickens Canyon Rd.; priced to sell quickly at \$435,000, 957-8835. BIG BEAR, new cabin 2 blks, from lake, 2 bd., 2

ba., mud/laundry rm., \$129,000, 909/585-9026. GREEN VALLEY LAKE, a secluded village in the San Bernardino Mins.; custom 3-story log home and buildable adjacent lot; beautiful 180 deg. view w/lg, decks, shade trees; walk to lake and skiing; cabin \$149,000, adjacent lot \$19,900, 303-1927. LOS ANGELES/GLENDALE adjacent, charming house, 2 bd., 1 ba., detached bonus rm., dining rm., indoor and outdoor fireplaces, 2 natios, in, enclosed yd., laundry m., view; close to JPL, Caltech; S174,900, 549-4140.

S174,900, 549-4140.
PASADENA, 3-level townhouse, Altadena Dr./
Orange Grove, across Victory Pk; 3 bd., 2.25 ba., l/p,
balcony, pool, spa and sauna, 1,300 sq. ft.; sharp,
close to JPL; no agents; \$160,000, 626/398-5303.
SUNLAND townhouse, Alpine Meadows complex, 2
bd., 1.5 ba., 2-story, 2-car garage, pool, spa, tennis
ct., rec. rm., well-maintained; \$110,000, 248-0178. SYLMAR, 25 min./JPL; 4-bd., 1%-ba. house on 10,000 sq. ft. lof w/mtn. view; \$187,500. 367-7869, Ken. WALKER BASIN, new custom home, 2,200 sq. ft., 3 bd., 2 ba., 2-car garage, panoramic views, 2,800 sq. ft. new Dutch barn (guest house), 2½ acres; \$175,000 (OMC), 626/446-0078.

## VACATION RENTALS

BIG BEAR LAKE cabin, near lake, shops, village forest trails; 2 bd., slps. up to 6, t/p, TV, VCR, phone, microwave, BBQ and more; JPL disc. price from \$65/night. 909/599-5225.

BIG BEAR LAKEFRONT luxury townhome, 2 decks, slps. 6, tennis, pool, spa. 714/786-6548. BIG BEAR, 7 mi. from slopes; full kitchen, f/p, 2 bd., 1 ba., slps. 6; exc. hiking, biking, fishing nearby; no smokers, no pets; reasonable rates, 2 night min. 909/585-9026, Pat & Mary Ann Carroll.

CAMBRIA, ocean front house, exc. view, slps. up to 4, \$125/night for 2, \$175/night for 4, 248-8853. KONA, HAWAII, on 160 ft. of ocean front on

KONA, HAWAII, on 160 ft. of ocean front on Keauhau Bay; priv. house and guest house comfortably sip. 6, 3 bd., 2 ba.; swimming, snorkeling, fishing, spectacular views; nr. restaurants, golf courses and more. 626/584-9632.

LAKE TAHOE, N. Shore; 2 bd., 2 1/2 ba. condo; great location, all armen; private beach, pool, sauna; walk to golf, fishing 150 yds. from front door; 2 mi. to N. Shore casinos; special JPL disc. rates. 626/355-3886, Rosemary/Ed.

MAMMOTH at Snowcreek, 2 bd., 2 ba., + loft. sips. MAMMOTH at Snowcreek, 2 bd., 2 ba., + loft., slps.

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; JPL disc. 626/798-9222 or MAMMOTH condo in Chamonix; 2 bd., 2 full ba.

slps. 6, fully equipped elec. kitchen, incl. microwaye & extras, I/p & wood, color TV, VCR, FM stereo sauna, game, & Indry. rms.; pool, sun area, & o/d Jacuzzis: play & BBQ areas; conv. to shops, hiking, MAMMOTH condo, 2 bd. + loft, 3 ba., slps. 8, pool,

spa, full kitchen, TV/VCR, JPL disc. rates; walk to Canyon Lodge. 249-8088.

MAMMOTH condo, slps. 5, nr. shuttle stop.; downtown; \$50 Sun.-Thurs., \$65 Fri. & Sat. 353-7839, MAMMOTH condo, studio + loft, 2 ba., fireplace w/wood supplied, Jacuzzi, sauna, game rm., color

cbl. TV/VCR, full kitchen w/microwave, terrace, view, amen., spring rates. 714/870-1872. MAUI condo, on beach w/ocean view, 25 ft. from surf, 1 bd. w/loft, compl. furn., incl. phone, color TV, VCR, microwave, dishwasher, pool & priv. lanai, s/ps. 4, 4/15-12/14 rate \$95/nite/2, 12/15-4/14 rate \$110/nite/2, \$10/nite/add'l person, less 10% JPL &

Caltech disc. 949/348-8047.

OCEANSIDE, on the sand, charming 1 bd.+ condo, panoramic view, walk to pler/marina, pool, spa, game rm. 714/786-6548.
PACIFIC GROVE hise., 3 bd., 2 ba., fp, cable tv/vcr,

stereo/CD, well-eqpd, kit. w/microwave, beaut furn., close to golf, beaches, 17 Mile Dr., Aquarium, Cannery Row, JPL discnt. 441-3265. ROSARITO BEACH condo, 2 bd., 2 ba., pool, ten-

nis ct., ocean view, golf course w/in 5 mi., priv. prkg. SAN FRANCISCO, Nob Hill honeymoon suite (for 2. only); kitchen, maid, concierge; \$105/night.

626/797-3156. SOUTH LAKE TAHOE KEYS waterfront home, 4 bd./3 ba., sips. 12+; f/p on 2 levels, decks overlook private dock + ski lifts; gournet kitch.; bicycles, sail & paddle boats, 3 color TVs, VCR, stereo w/tape & disk; indoor/outdoor pools, hot tub & beach; lighted tennis cts.; 10 min./skiing, casinos, golf; 1 hr. /wine country; \$995/wk. for high season (June 15-Sept. 15; Nov. 22-Mar. 1); \$495/wk. low season, + \$90 cleaning fee; 3-day min. 626/578-1503, Jim Douglas.

May 29, 1998