Jet Propulsion Laboratory

# Universe

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# TOPEX image shows La Niña weakening, unusual Pacific

By MARY HARDIN

The most recent image from the TOPEX/Poseidon satellite shows the area of lower sea level or cold water, commonly referred to as La Niña, is weakening along the equator and there is an unusual buildup of warm water in the Western tropical Pacific.

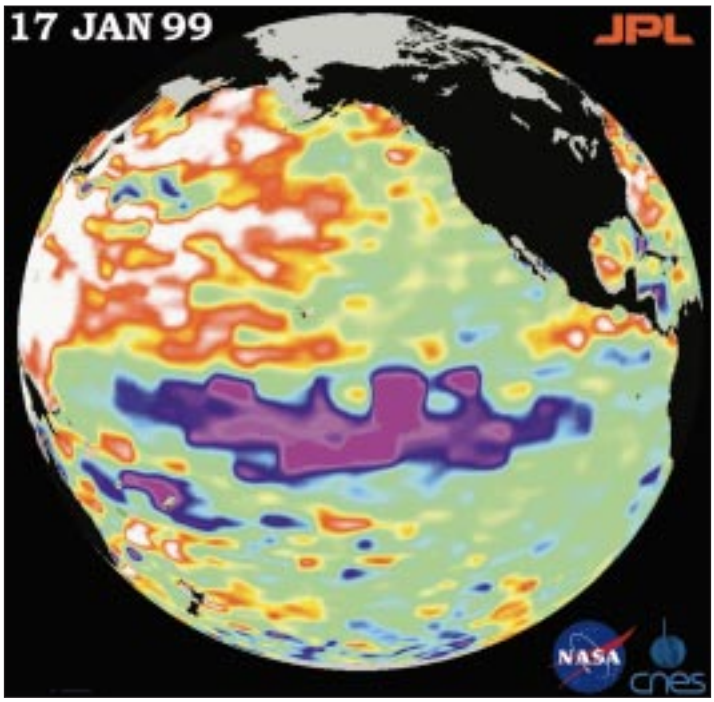
The image shows sea surface height relative to normal ocean conditions on Jan. 17, 1999; sea surface height is an indicator of the heat content of the ocean.

Although weakening, the La Niña pattern continues to exert a strong influence on the worldwide climate system. According to oceanographers, the cold La Niña water acts like a boulder in a stream, steering the planet's prevailing winds and changing the course of storms that are born over the ocean. This change of direction brings a heavy dose of precipitation to the Pacific Northwest and upper Midwest of the United States. For Southern California, the general pattern should continue to be a classic La Niña dry pattern with occasional winter storms.

"It might be raining this week, but we're having a very dry rainy season in Southern California," JPL's Dr. Bill Patzert, a research oceanographer, said Jan. 27.

Equally important to North America's winter weather is the very large area of unusually warm western Pacific ocean. Although the appearance of this feature is not fully understood or anticipated, it is adding energy to the winter storms coming out of the North Pacific, which is fueling the very volatile weather over the continental U.S.

The Jan. 17 image is now available online at http://www.jpl.nasa.gov/elnino . ❑




**This TOPEX/Poseidon image of the Pacific Ocean shows shows sea surface height relative to normal ocean conditions on Jan. 17; sea surface height is an indicator of the heat content of the ocean. The image indicates that the unusual large-scale warming (shown here in red and white) in the northwest Pacific that was first observed by the satellite in November 1998 has increased in size and spread east to the central Pacific and south to the equator. According to oceanographers, the cold La Niña water acts like a boulder in a stream, steering the planet's prevailing winds and changing the course of storms that are born over the ocean.**

## STARDUST LAUNCH

As *Universe* went to press on Wednesday, Feb. 3, the launch of JPL's Stardust spacecraft from Cape Canaveral, Fla., was set for 1:06:42 p.m. PST on Saturday, Feb. 6. The next available launch window is on Sunday, Feb. 7 at 1:04:15 p.m. PST.

Stardust will fly through the dust cloud that surrounds the nucleus of a comet, and for the first time ever will bring cometary material back to Earth. ❑

# NASA budget request includes new projects in Mars program

By MARK WHALEN

NASA's requested budget for fiscal year 2000 includes funding for two new program elements in the Mars Surveyor Program.

As part of the agency's request for five new initiatives in its Space Science Enterprise, NASA Administrator Daniel Goldin on Feb. 1 announced funding for the development of the Mars Network, which would provide a comprehensive network for increased communications capability at Mars, as well as Mars Micromissions, to provide low-cost capability for delivering small payloads to Mars, including telecommunications elements of the Mars Network.

One of the first micromissions is slated to be the Mars Airplane, a fly-over mission scheduled for either 2003 or 2005. The vehicle would provide reconnaissance of sites of possible interest for future scientific exploration, including sample collection sites.

"The responsibilities of the various NASA centers' work on the Mars Airplane are still to be determined," noted Glenn Cunningham, deputy director of the Mars Exploration Directorate at JPL.

Planning for a Mars communications infra-

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# 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. 4-3319.

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

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

**Parent Support Group**—Meets the 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, February 5

**ACW Seminar—**"How to Gain Self-Esteem, Become Assertive and Beat Your Depression" will be presented at noon in von Kármán Auditorium by Dr. Nurit Cohen, a licensed psychologist whose specialties include the treatment of depression, stress and anxiety-related disorders. She is an author, has conducted numerous seminars on stress management, assertiveness and self-esteem, and has consulted for industry, the U.S. Air Force, and the FBI. Sponsored by the Director's Advisory Council for Women.

**Folk Music**—The Caltech Folk Music Society will present the Cache Valley Drifters at 8 p.m. in Caltech's Dabney Lounge. Tickets are $12. For information, call (626) 395-4652.

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

**"The Comedy of Errors"**—Shakespeare's classic is revisited by the Aquila Theatre of London at 8 p.m. in Caltech's Beckman Auditorium. Tickets are $29, $25 and $21. For information, call (626) 395-4652.

## Saturday, February 6

**"The Odyssey"**—The Aquila Theatre of London will perform Homer's classic at 8 p.m. in Caltech's Beckman Auditorium. Tickets are $29, $25 and $21. For information, call (626) 395-4652.

## Sunday, February 7

**Chamber Music**—JPL employees Heide Li (viola) and Tom Lloyd (cello) join Caltech students and violinists Candace Chang and Arjun Mendiratta in performing a free concert at 3:30 p.m. in Caltech's Dabney Lounge. For information, call (626) 395-4652.

## Tuesday, February 9

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

## Wednesday, February 10

**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. Guests welcome. For more information, contact Mary Sue O'Brien at ext. 4-5090.

**Russian Language Workshop**—Meets from 7 to 9 p.m. on the Caltech campus. Some knowledge or previous study of the language is essential. For location and further information, call Joyce Wolf at ext. 4-7361.

**"The Inside of Earth: A Top-Down Approach to Deep Earth Science"**—Caltech geophysics professor Don Anderson will deliver this free lecture at 8 p.m. in Caltech's Beckman Auditorium. For information, call (626) 395-4652.

## Thursday, February 11

**Investment Advice**—TIAA-CREF will present a workshop titled "Basics of Asset Allocation" at 11 a.m. and 1:30 p.m. in Building 180-101.

## Friday, February 12

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

## Fri., Feb. 12–Sun., Feb. 14

**"Richard III"**—Shakespeare's tragedy will be presented by Theater Arts at Caltech in the campus' Ramo Auditorium at 8 p.m. Friday and Saturday, 3:30 p.m. Sunday. Tickets are $15. For information, call (626) 395-4652.

## Wednesday, February 17

**Associated Retirees of JPL/Caltech**—Members will hear a lecture on memory improvement by Ventura College Professor Dr. Jeffrey Barsch at the La Cañada Country Club. Cost: $25; luncheon is included. For information, call Lila Moore at (818) 790-5893.

**Computer Help**—Jeff Sachs of Section 394 will provide an overview of the benefits of using the AFS distributed file system to manage computer files. Learn how to share files, set up group space, access data, publish web pages, obtain online help, change your password, create protection groups, protect data and more. A 15-minute question-and-answer session will follow. At noon in the Building 167 conference room.

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

**JPL Hiking Club**—Meeting at noon in Building 238-543.

**Russian Language Workshop**—Meets from 7 to 9 p.m. on the Caltech campus. Some knowledge or previous study of the language is essential. For location and further information, call Joyce Wolf at ext. 4-7361.

## Thursday, February 18

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

**Von Kármán Lecture Series**—Dr. Michael Klein, manager of the Deep Space Network Science Office, will discuss "Science and Communications, Billions of Miles Away," at 7 p.m. in von Kármán Auditorium. Open to the public.

## Friday, February 19

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

**Travel Film**—"China: The Middle Kingdom" will be shown at 8 p.m. in Caltech's Beckman Auditorium. Tickets are $9 and $7. For information, call (626) 395-4652.

**Von Kármán Lecture Series**—Dr. Michael Klein, manager of the Deep Space Network Science Office, will discuss "Science and Communications, Billions of Miles Away," at 7 p.m. in The Forum at Pasadena City College, 1570 E. Colorado Blvd. Open to the public.

## Fri., Feb. 19–Sat., Feb. 20

**Caltech Glee Clubs**—The men's and women's clubs will together present a program featuring "Songs of War and Love" at 8 p.m. in Caltech's Dabney Lounge. Admission is free. For information, call (626) 395-4652.

## Fri., Feb. 19–Sun., Feb. 21

**"Richard III"**—Shakespeare's tragedy will be presented by Theater Arts at Caltech in the campus' Ramo Auditorium at 8 p.m. Friday and Saturday, 3:30 p.m. Sunday. Tickets are $15. For information, call (626) 395-4652.

## Sunday, February 21

**Chamber Music**—The Tokyo String Quartet will perform in Caltech's Beckman Auditorium at 3:30 p.m. Tickets are $25, $21, $17 and $13. For information, call (626) 395-4652.

## STATE OF LAB ADDRESS COMING MARCH 2

Laboratory Director Dr. Edward Stone will present the annual State Of The Laboratory address Tuesday, March 2, in von Kármán Auditorium at noon. All employees are invited to attend; the briefing will also be televised on the Laboratory's closed-circuit network. ❑

# Mars Polar Lander completes first trajectory correction maneuver

Mars Polar Lander successfully completed its first trajectory correction maneuver Jan. 21 to fine-tune its flight path to Mars.

The maneuver, which lasted three minutes, removed a small bias in the lander's trajectory that was introduced at launch to send the third stage of the Delta II rocket, which was trailing behind the spacecraft, past Mars rather than directly toward the planet. The maneuver also corrected minor injection errors caused by the spacecraft's liftoff from Earth on Jan. 3.

The spacecraft was turned 180 degrees in preparation for the maneuver, in which it fired four of its eight thrusters. After the burn was completed, Mars Polar Lander automatically slewed itself back to its standard orientation for

**See TCM, page 4**

# *Lab celebration honors Dr. King*

**Last month's JPL celebration honoring the birthday of Dr. Martin Luther King Jr. included a talk by former Galileo engineer and current astronaut Stephanie Wilson, right, and songs by the Victory Bible Full Gospel Choir of Pasadena.**

PHOTOS BY JPL PHOTO LAB

# News Briefs

Volunteers are sought to staff competition rooms and coordinate activities during regional action of the annual Department of Energy Science Bowl competition, to be held at JPL Feb. 20.

At least 80 volunteers are needed to ensure the success of the event, said Public Services Office Manager **Kim Lievense**.

Volunteers will be trained as moderators, timekeepers, scorekeepers and rules judges. Science judges also are needed to rule on challenged questions, and escorts are needed to move the teams to and from competition rooms.

Practice sessions for volunteers will be held in the 186-123 conference room Feb. 9–11, noon to 1:30 p.m.; Feb. 12, all day (Science Bowl judges review); and Feb. 17–18, noon to 1:30 p.m. It is not necessary to attend all practice sessions.

Interested employees may sign up by contacting the Public Services Office at ext. 4-0112. ❑

JPL's Benefits Office is sponsoring several on-Lab investment and retirement counseling sessions in February. Each requires an appointment to attend, and seating is limited.

A representative from Fidelity will be available for counseling on Feb. 16, and a TIAA-CREF representative will be available Feb. 17 and 18.

To schedule a half-hour appointment between the hours of 9 a.m. and 3 p.m., call Fidelity at (800) 642-7131 or TIAA-CREF at (800) 842-2007, ext. 1045.

All counseling sessions will be held in Building 241-107. ❑

The next JPL/Red Cross Blood Drive will be held in von Kármán Auditorium on Feb. 16 from 10 a.m. to 3:15 p.m. and Feb. 17 from 7 a.m. to 12:15 p.m.

Sign-up sheets are available at Occupational Health Services, Building 263, prior to the blood drive. If you have not signed up ahead of time or wish to change your appointment, call the Red Cross at (626) 799-0841, ext. 630. Signup is also available through Occupational Health Services' web site at http://eis/medical .

The Red Cross collected 130 pints of blood in the November blood drive at JPL, down from the August collection of 143 pints of blood. According to Occupational Health Services, 390 lives will benefit from the November collection. ❑

# NASA issues annual fitness challenge

NASA Headquarters is promoting the Presidential Sports Award Annual Fitness Challenge through Dec. 31, 1999, and is encouraging JPL and contractor personnel to participate. No entry fee is required.

This program is intended to motivate all Americans to become more physically active throughout life, emphasizing regular exercise rather than outstanding performance.

NASA's Healthy People Fitness Goal would have 30 percent of its employees exercising regularly by the year 2000.

The gymnasium in Building 180 (for JPL employees only) has been designed to encourage physical fitness at JPL, and can be used as a vehicle for participation in the Fitness Challenge. Because the gym is only open to JPL employees at this time, JPL affiliates may want to consider the many other forms of exercise that are also included in this program.

To enter the competition, pick up a Presidential Sports Award brochure from Occupational Health Services, Building 263 lobby area, or the ERC, Building 114. The brochure will have a list of categories for competition in areas such as walking, running, weight training, swimming, etc., and the distance required for the participant to meet each day. This can be calculated on a monthly basis as well for your convenience.

Participants are able to go at their own pace, and keep track of their exercise routine, or their distances, weekly and monthly. Completed logs are mailed to Occupational Health Services by Dec. 31.

NASA Headquarters will present engraved plaques and certificates for participants from the top two centers with the highest employee participation.

For more information, call Occupational Health Services at ext. 4-3320. ❑

# Abstracts due March 1 for packaging workshop

Abstracts are due March 1 for the Electronic Packaging for Space Applications Workshop, co-sponsored by JPL and scheduled for mid-May in Pasadena.

To be held in concert with the International Microelectronics and Packaging Society SoCal'99 Symposium & Exhibition, the workshop intends to provide a forum for the exchange of information between spacecraft electronic systems designers and those engaged in developing and validating advanced electronic packaging techniques that have potential uses in space applications.

In addition, workshop organizers also invite device and system designers with unsolved packaging problems to formally present their concerns to the workshop.

The International Microelectronics and Packaging Society exhibition is seeking presentations in all areas of microelectronic packaging and not limited to electronic packaging for space applications.

Submit abstracts of presentations for consideration and a brief author biography by March 1 to Lora Mitchell by e-mail or fax (ext. 3-6994).

The event is co-sponsored by JPL's Electronic Packaging and Fabrication Section and Quality Assurance Section and will be held May 12 and 13 at the Pasadena Convention Center.

Selected abstracts and a schedule of presentations will be available online at http://137.79.61.135:2001/workshop/package.htm.

For more information, call Phil Zulueta of Section 506, International Microelectronics and Packaging Society Southern California regional director, at ext. 4-1566. ❑

# TCM

**Continued from page 3**

the early cruise phase of its journey to Mars. In this configuration, the lander's solar arrays, which are shaped like gull wings, are pointed about 20 degrees away from Earth to allow the spacecraft to generate enough solar power for onboard operations and still support daily communications with Deep Space Network ground stations. The maneuver changed the spacecraft's velocity by about 16 meters per second (35.8 mph).

Mars Polar Lander remains in excellent health. Three science investigations aboard the spacecraft—the Mars Volatiles and Climate Surveyor instrument package, Mars Descent Imager and Light Detection and Ranging (Lidar) instrument—are currently turned off. The flight team was scheduled to conduct an initial health check of the Mars Volatiles and Climate Surveyor's meteorology instrument package on or about Feb. 3. ❑

# *Extreme environments conference Feb. 9-11*

The 1999 NASA/JPL Conference on Electronics for Extreme Environ-ments is set for Feb. 9-11 at the Pasadena Convention Center.

The conference is the first to address all three major technology areas associated with hot (greater than 250 degrees C), cold (-200 to -60 degrees C), and high radiation (greater than 1Mrad total dose) electronic components and systems. This is the first forum sponsored by the JPL Center for In-situ Exploration and Sample Return (CISSR) and Center for Integrated Space Microsystems (CISM) where members of all three technology communities can interact and assess the current state and future of extreme electronic technology relative to meeting NASA's future missions.

Registration form and information are available at http://extremeelectronics.jpl.nasa.gov/ conference. There is a registration fee of $120. Credit cards are not accepted. Checks should be made payable to Caltech.

Send completed registration form with check to Pat McLane at mail stop T-1200.

There will be late registration at the conference on Feb. 9, starting at 7:30 a.m. ❑

# REWARD & RECOGNITION

## Space Flight Awareness, Process Improvement, NOVA awards bestowed

Above, Ed Caro of Section 334, right, reacts when presented NASA's Silver Snoopy award by astronaut John Grunsfeld. Grunsfeld also presented Space Flight Awareness awards to Paul Andres, below, and James Okuno, bottom.

# 3 teams take process improvement awards

In, January, JPL Director Dr. Edward Stone and Deputy Director Larry Dumas presented three teams with the Lab's Process Improvement Award. The award recognized teams that have made exemplary improvement to JPL processes.

Chosen by a peer committee with concurrence from Stone and Dumas, the teams were selected based on process improvements that demonstrate performance improvement through metrics, initiative and return on investment, and are alignment with JPL strategies.

This year's Process Improvement Award recipients are:

**Thermal Reengineering Team:** *For reducing cycle time of the Design, Build and Test (DBAT) process by enabling thermal modeling, analysis and results sharing with other DBAT sub-processes*: Lloyd French (Section 353), Gary Kinsella (353), Virgilio Mireles (353), Glenn Tsuyuki (353).

**Develop New Products Project Libraries Team:** *The effort created a new process for establishing and operating project libraries*: Lynne Cooper (311), Robert Elliott (351), Bonnie Lund (644), Tu-Anh Phan (393), Julie Reiz (311), Susan Roberts (480), Jeff Saenz (393), Chinh Tran (393).

**Mars Surveyor Operations Project Flight Operations Process Improvement Team:** *This process improvement reduced workforce required during Mars Global Surveyor's aerobraking period*: Bryan Allen (394), Vijayarag Alwar (312), Belinda Arroyo (391), Joseph Beerer (490), Charles Boreham (391), Joy Bottenfield (314), Robert Brooks (314), Eugene Brower (391), Noel Burden (393), Paul Burkhart (312), John Callas (323), Laureano Cangahuala (312), Bradley Compton (391), Glenn Cunningham (490), Saterios Dallas (310), Stuart Demcak (312), Joe Diep (391), Theodore Drain (312), John Ekelund (312), Pasquale Esposito (312), Kirk Goodall (393), Eric Graat (312), Fred Hammer (314), Susan Hofmann (490), Benhan Jai (314), Chester Joe (391), Martin Johnston (312), Jonathan Kakumasu (394), Young Lee (391), Linda Lee (314), Wayne Lee (311), Stephen Licata (393), Thomas Loesch (345), Saturnino Lopez (314), Daniel Lyons (312), Scott Maxwell (393), James McClure (391), John McKinney (920), Kevin Miller (960), Judith Morris (314), Michael Mossey (312), Robin O'Brien (391), Cindy Oda (393), David Recce (930), Frank Singleton (314), Gary Smith (391), Richard Southern (314), Richard Springer 314, John Swift 391, Peter Theisinger 490, Thomas Thorpe (490), Bruce Waggoner (314), Victoria Wang (314), Robert Warzynski (391), Charles Whetsel (313), Steven Wissler (314). Team members from Lockheed Martin Astronautics in Denver were also honored. ❑

# *Astronaut honors JPLers*

Astronaut John Grunsfeld presented JPL winners of Space Flight Awareness (SFA) honoree awards and a Silver Snoopy award during his appearance at the Laboratory last month.

Grunsfeld, a former senior research fellow at Caltech, gave a lecture at JPL that was co-sponsored by SFA and the Caltech Management association.

Members of the Confined Helium Experiment (CHeX) team earned an SFA team award, while SFA individual awards were presented to Paul Andres of Section 388 for his significant contributions to the KidSat payload on STS-76 and to James Okuno of Section 507 for his outstanding work in the Electronic Parts Engineer-ing Office, where he specializes in failure analysis.

Ed Caro of Section 334 received the Silver Snoopy award for his outstanding work in support of the space shuttle program as a member of the Spaceborne Imaging Radar-C (SIR-C) and Shuttle Radar Topography Mission (SRTM) teams.

CHeX team members honored were Robert Axsom, Robert Barnford, Kirk Barrow, Regina Bernardini, Sherry Casson, Talso Chui, Michael Devirian, Steven

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# Budget

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structure has been in the works at JPL since last fall, following the conclusion of a redesign of Mars architecture strategy led by JPL Space and Earth Sciences Program Director Dr. Charles Elachi. Five teams of experts from the international scientific community helped form the new strategy; a team led by Dr. Chad Edwards, manager of the Telecommunica-tions and Mission Operations Directorate (TMOD) Program Office, studied systems for communications, navigation and information transfer to and from Mars.

"The eye-opening thing that emerged from that study was that there are low-cost opportunities to fundamentally change the link between Earth and Mars," Edwards said, "in terms of increasing bandwidth and increasing connectivity."

Current technology allows only a few hours or less each day for communications between a Mars lander and Earth, which would prove constraining for the operations of sample-return missions planned for 2003 and 2005. The amount of data and imagery that could be brought back to Earth is also severely limited, Edwards added.

Enhanced telecommunications capability at Mars could include the development of a constellation of low-cost microsatellites, the first of which would be developed for a 2003 mission. These would provide much more frequent contact and data return as well as navigation determination, much like the Global Positioning System (GPS) satellites do on Earth. The microsatellites would "piggyback" on a commercial Ariane V launch vehicle for a ride into Earth orbit before heading for Mars.

The mass of the entire spacecraft at launch, including propellant, would be limited to about 200 kilograms (440 pounds).

Edwards said two of these satellites might be launched at every Mars opportunity (about 26 months), with a lifetime of five to six years for each satellite.

Another idea under consideration for the 2005 timeframe and beyond is a further enhanced capability called the Mars Areostationary Relay Satellite (MARSAT), which would provide near-continuous communications between a Mars surface site and Earth. This satellite would orbit over a landing site or other interesting area and would provide video capability back to Earth, Edwards said.

"This quantum leap in communications capability would change the way we do science at Mars, and create new opportunities for how NASA can engage the public in the adventure of Mars exploration," he said.

A "phase A" study—led by Shel Rosell of TMOD's Technology Program Office and sponsored by Johnson Space Center's Space Operations Management Office—is currently under way to refine technical and cost issues.

Rosell said JPL is working with five companies on feasibility studies on the forementioned low-cost microsatellites, with a request for proposal for their development to follow.

In addition, Rosell said, "We are trying to develop a common spacecraft bus with the Mars Exploration Directorate that would satisfy three requirements: the telecommunications/navigation orbiter, a science orbiter, and a science probe carrier." JPL and industry teams have been working on a common design for the spacecraft, which he said would eventually be beneficial for lower-cost Discovery missions and Earth missions.

Complete details on NASA's fiscal year 2000 budget request are available online at http://www-nasa.gov/budget/budget_index.html .❑

# *United Way campaigners honored*

More than 300 campaigners participated in JPL's 1998-99 United Way drive, and those representing top-performing sections were recognized for their efforts during a von Kármán Auditorium ceremony last month.

Following is a list of the sections on Lab—and campaigners in those sections—that showed the greatest increase in United Way participation from the beginning to the end of the donor campaign.

**Section 170**: Jacquie Bouck, Ester Lawrence, Flora Wilcox.

**Section 210**: Dora Montano.

**Section 211**: Marc Lowenthal, Robert Marinovich, Nerissa Parmelee, Cindy Williams.

**Section 383**: Mary Romejko, Debra Camp, Robert Spina.

**Section 388**: David Hodges, Tom Logan, Frank Sun, Bill Tuk, John R. Wright, Jan Yoshimizu, Payam Zamani, Jia Zong.

**Section 389**: Rosemary Hagerott, Rosemary Guerrero.

**Section 393**: Marge Burris, Jill Figueroa, Marian Kuri, Judith Ryken, Angela Smythe.

**Section 501**: Sylvia Ascencio.

**Section 622**: Richard Flores, David Burow, Keith Hardy.

**Section 643**: Clara Thoms. ❑

## 1998-99 United Way campaign summary by directorate

*JPL personnel contributed more than $432,000 to the 1998-99 United Way campaign. Per capita contributions were $91.17, up $1.28 from 1997-98. Following are contributions by directorate.*

| Directorate | Employees | Contributors | % Participation | $ Amount | Per Capita |
|---|---|---|---|---|---|
| 1 | 156 | 116 | 74 | $ 25,949.00 | $ 166.34 |
| 2 | 280 | 156 | 56 | 12,848.00 | 45.89 |
| 3 | 3,305 | 1,604 | 49 | 287,114.16 | 86.87 |
| 4 | 37 | 27 | 74 | 6,700.00 | 181.08 |
| 5 | 198 | 140 | 71 | 19,995.20 | 100.99 |
| 6 | 419 | 264 | 63 | 26,740.80 | 63.82 |
| 7 | 163 | 99 | 61 | 20,046.00 | 122.98 |
| 8 | 65 | 41 | 63 | 9,285.84 | 142.86 |
| 9 | 124 | 101 | 82 | 24,113.68 | 194.47 |
| Total | 4,747 | 2,548 | 54 | $432,792.68 | $ 91.17 |

# JPL strides toward ISO registration in March

By DR. JERRY SUITOR
*ISO 9000 Implementation Team*

The March 29 ISO registration audit is rapidly approaching, and activities at the Laboratory are at a fever pitch. With less than eight weeks to go, documentation, training and organization readiness is the focus of ISO implementation activities. The internal assessment process is a major method to evaluate organization readiness.

The recently completed ISO 9001 internal assessment suggests the Laboratory is making good progress toward ISO 9001 registration. The fifth round of internal assessments were completed during the week of Jan. 15. The assessment used 10 teams of internal assessors, who interviewed nearly 500 people at the Laboratory.

The interviews probed the readiness of JPL for ISO 9001 registration in areas of documentation, familiarization with the documentation, and records. The assessment teams used corrective action notices to report the areas of deficiencies. The deficiencies were primarily in the areas of lack of documentation, documentation requiring updates, and lack of properly calibrated equipment.

One hundred seventy-five corrective action notices were generated from this round of assessments. The notices are an important part of the ISO requirements and represent the formal notification of deficiencies to conformance to JPL requirements, including ISO requirements. The corrective action responsibility is assigned to the cognizant manager of the work where the deficiency was found. The manager is required to develop a plan for action and the complete the action.

A JPL internal assessor is assigned to verify the effectiveness of the action, then the corrective action notice is closed. For further information about corrective actions notices and the corrective action process, go online to http://techinfo.jpl.nasa.gov/iso9000 .

JPL Chief Engineer John Casani, the ISO management representative, said the results were encouraging. "We are now seeing deficiencies related to updating documentation. Six months ago, there was little in the way of available documentation. Now, thanks to the work of a number of groups, we have documentation deployed and we need to only improve on it."

DNV Certification Inc. is the third-party registrar who will certify JPL's compliance with the ISO 9001 standard. They conducted a pre-assessment audit in November and those audit results prompted a large effort in getting JPL documentation in order. A number of working groups worked through the recent holidays to get documentation developed and deployed to all JPL employees. The latest internal assessment suggests the documentation deployment is under way but not complete. ❑

# NOVA winners announced

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

**Section 212**: Ellen Sherman.

**Section 314**: Theresa Anderson, David Bliss, Jeffery Boyer, Clark Dilley, Douglas McElroy, Lanny Miller, Richard Romer, Aniwat Sheurpukdi.

**Element 3232**: Iain McDermid.

**Section 334**: Kevin Wheeler.

**Section 336**: Luis Amaro, William Folwell, Kenneth Kelly, Suzanne Spitz, Jan Tarsala.

**Section 361**: Belinda Arroyo, Ralph Ouellet Jr.

**Section 387**: Priscilla Ottley.

**Section 391**: Antonio Sanders.

**Section 395**: Vijay Daggumati.

**Section 660**: Dave Press, Karen Taylor, Marilyn Williams.

**Section 761**: Georgene Peralta.

The NOVA award is a decentralized, formal program that is administered at the local level by organizations termed NOVA Units. Awards include mementos and an ERC voucher. ❑

For information about JPL's Reward & Recogniton Program, go online to **http://eis/sec614/reward/rr.htm**

# Awards

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Elliott, James Fanson, Robert Frazer, Ulf Israelsson, Albert Kuchler, Anthony Lai, Donald Langford, Melora Larson, Thomas Luchik, Mark Lysek, Paul MacNeal, Gina McAfee, Karla Miller, Diane Montini, Michael Parks, Patricia Parrett, David Pearson, Jim Peterson, Dusan Petrac, Reuben Ruiz, Choon-Foo Shih, Marc Walsh and Robert White.

Members of the CHeX team from Stanford University, North-eastern University and Kennedy Space Center were also recognized on the SFA team award.

The SFA team award is given to groups of employees who have demonstrated exemplary teamwork while accomplishing a particular task or goal in support of the human space program.

The SFA program, the highest tribute paid by NASA to government and industry workers, is part of JPL's Reward & Recognition Program. The Silver Snoopy is an SFA award personally nominated and presented by NASA astronauts to employees in the recipient's local work area. To meet the criteria for this award, the individual's job outstanding performance must be directly oriented to flight safety or mission success. ❑

## LETTERS

I want to thank all my colleagues at JPL and the ERC for the cards, floral arrangements and other expressions of concern that I received because of my recent illness and also the death of my mother-in-law. They meant a great deal to me, my wife Diane, and our family. They were very much appreciated.

Tom Renfrow

❑❑❑

A special thanks to all my friends and co-workers at JPL for the beautiful flowers, plants, cards and expression of sympathy and support following the passing of my beloved mother, Mary. She was truly blessed by being married to my wonderful father for 73 years. She will be missed so very much. Also, thank you, ERC, for the gorgeous azalea plant.

Vita Warren

❑❑❑

My aunt and I would like to take this opportunity to thank the ERC for the beautiful plants, and to everyone for the outpouring of support shown to usduring the passing of our beloved mother/grandmother. We are truly blessed to have the opportunity to work within such a classy organization as JPL. Thank you all from the bottom of our hearts.

Brett Boettcher and Cheryl Duca

## FOR SALE

AQUARIUM for fish, 40 gal., rectangle w/wood stand; filter, light and lid, $85/obo. 626/303-5595.

BASEBALL COINS/CARDS, Pinnacle, unopened box, mint '98, 16 packs, 2 commemorative coins, 3 cards in each pack, major stars & inserts, $40/obo; Nolan Ryan reprint cards, different yrs., $5; '88 Topps baseball coins, unopened box, 36 packs, McGwire, Ryan, Garvey, $20. 626/914-6083.

BLAZER, woman's Lands End wool/cashmere, camel size 12T, like new; cost $160, sell $70. 248-2971.

CALCULATOR, HP 48-GX, graphing, never used, $200/obo. 310/549-0593.

CHAINS (snow) for small car tires, call for sizes, $15. 790-5643.

CHINA SET, 60 pieces for $70/obo. 909/592-0780, Ana.

CIGARETTE CASES, sterling silver, vintage and antique, various sizes, designs and makers, $65-150. 310/399-4502.

COLLECTIBLE, Disney's Tinkerbell, 1972, by Walt Disney Productions and Louis Marx & Company Inc.; blue, nice detail, stands 5" high, 5" wingspan, made of plastic, some injected mold, and made in USA; good condition; $60. 241-3779.

COMPUTER, laptop, Toshiba Satellite 335CDT, 12.1 active matrix screen, 32MB RAM, 4.1GB HD, 56K modem, CD, 2 PCMCI slots, software includes: Windows98, MS Encarta, Quicken, MSWorks, Golf Targus laptop case, $1,600. 645-2606, Stan.

COMPUTERS, 286 system with monochrome monitor, floppy, semi-functional hard drive; Intel 8080A single board computer (no power supply or monitor). 626/351-5485.

COUCH w/fold-out dbl. bed, off-white, w/lg. throw pillows, vg cond., $300/obo; FUTON COUCH, converts to dbl. bed, futon is mauve/beige, solid pine frame, exc. cond., rarely used, $200/obo; BIKES (2), boys; 16", gd cond., $25; and 20", like new, $65; DESKS (2) elemen. schl., metal w/Formica fold up tops, $25/ea. 957-7642.

CROCK POT square by Rival with Corningware, $15/obo. 626/568-8298.

DESK w/hutch, 60 x 30, wood top, 3 metal drawers on left, one metal drawer and one metal file cabinet on right; wood hutch, gd. cond., $80. 790-9772.

DIET TAPES, Jenny Craig, set of 14, $50. 790-3899.

DOGS, golden retrievers, 15 months, 1 red, 1 blond, parents AKA registered, $200/ea. 805/297-7418.

FURNITURE: merging 2 households: 2 matching oak end tables;

**Continued on page 8**

2 short simulated oak bookcases; 5 cu. ft. Kenmore freezer (used for 4 months); glider-rocker chair; brass candelabra chandelier; 5-drawer chest, simulated oak; loveseat hide-a-bed; roll top solid oak desk w/matching chair; solid oak bar w/brass rail, seats 4; fine knitting yarns, mohair, acrylic, cottons, blends. 626/791-1266.
GOLF CLUBS, women's, $95; women's golf shoes, size 9, $20; recently used balls, gd cond. (you select), $3/dozen. 626/584-9632.
LAMPS, brass, two 5-foot lamps with shades, each for $18, both for $30/obo. 626/568-8298.
ORGAN, Yamaha 415 electronic console w/13 pedals, 3 keyboards, 144 rhythm patterns, pd. $7,500, sacr. for $3,000. 790-3899.
PERSONAL INFORMATION MANAGER, Seiko "Phone-Pal", $25. 790-3899.
PICTURE FRAMES, three made of brass, 22" x 28", $7/each, $18 for all three/obo. 626/568-8296.
PICTURES, 40" x 30", two tall-ship pictures taken by a professional photographer, vg condition, with frames; one of a Spanish tall ship in the SF Bay, one of a German tall ship taken near Puerto Rico; $75/each, $130 for both/obo. 626/568-8298.
POWER CENTER for computer, $20. 790-3899.
PRINTER, Diablo 630 with print wheels, excellent condition, $20/obo. 626/568-8298.
SANDWICH MAKER by Oster, makes two sandwiches, $10/obo. 626/568-8298.
SCANNER, for Windows (3.x/95/NT), includes CD, like new, $50. 909/599-2598.
SKIS, Autier w/Marker II titanium bindings, 194 cm, 1 owner, exc. cond., $75; SKI BOOTS, Lange 55, M sz. 12, 1 owner, exc. cond., $75. 626/793-3561.
SOFTWARE, for Mac, all $25 and under. 790-3899.
SPRINKLER VALVE actuators, Lawn Genie model 756LG3/4, new, $10 each. 790-3899.
SWEATER, Coogi, from Australia, new, sells in Nordstrom for $325, $100. 790-3899.
TABLE, dining rm., round, mahogany, sits 8 w/2 extensions, almost new, comes w/6 matching chairs, $650/obo; matching China buffet, $950/obo; all for only $1,400/obo. 909/592-0780, Ana.
TABLES, glass, four 2-shelf tables with brass feet, three make up a coffee table (one round 2.5-ft. dia., two "half-moon"), fourth is a round end table (2.5-ft. diameter), $125/obo. 909/592-0780, Ana.
THEATER TICKETS (2), Friday night, Feb. 19 at the Ahmanson Theatre for the musical Titanic, Row B near the center, price negotiable. 626/355-6445, Frank, nights.
VIDEO GAME, Sega Genesis CD System, 4 controllers, 21 games, $200 for all/obo. 626/309-0429.
VIDEO GAMES, Sony Playstation, exc. cond. ($10-30), ask for listing and price; 4 Nintendo 64 games also available. 368-9520.
WASH TUB, antique copper, w/lid, gd. cond., $10/obo, in LaVerne. 909/593-4046.

## 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.

Advertising is a free service offered only to JPL, Caltech and contractor employees, retirees and immediate families.

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.

To change an address, contact your section's administrative assistant, who can make the change through the HRS database. For JPL retirees and others, call Xerox Business Services at (626) 844-4102.


WASHER/DRYER, Kenmore, exc. cond., $200/each. 957-4828.
WATCHES, vintage, gd. working cond.; all types: Gruen, Bulova, Longines, etc., for men and women, $50 and up. 310/399-4502.

## VEHICLES / ACCESSORIES

'91 ACURA Legend L 4D, 57K mi., exc. cond., $13,495. 548-3442, eve.
'96 AUDI Cabriolet, pearl white, navy blue int./top, 27K mi., exc. cond., extended warranty: 4 yr., 75K mi., $25,900. 957-4367.
'87 CADILLAC Brougham d'Elegance 4D, 97K mi., loaded, exc. cond. $3,495. 548-3442 eve.
'96 CHEVROLET Astro LS, exc. cond., 33,000 mi., 3K or 6-mo. warranty, power windows, tinted, dual air, 6-cyl. 4.3 Vortec engine, white w/cloth interior, interior/exterior treatment, roofrack, newer tires, $18,500. 248-5678.
'89 CHEVROLET 3/4 ton pickup, extd. cab, long bed, 350 eng. auto; new tires, radiator, tow pkg. & more; recently had major tune-up, runs great, $5,995/obo. 303-5595.
'91 DODGE Ram 50 LE sport truck, 101,000 mi., good sound bedliner & shell, yellow, $5,000. 626/292-1760.
'92 FORD Aerostar van, red, beautiful cond., black interior, 10-disk CD, must see, $6,900/obo. 626/578-7226.
'90 FORD Mustang GT conv., exc cond, loaded; see http://home.inreach.com/~bhines for details, $7,200. 352-7099.
'90 FORD Thunderbird LX, 100K mi., good shape, $2,600/obo. 626/445-6100.
'97 HONDA Civic EX, 5-speed, black, A/C, 36K miles, excellent condition, original owner, $13,900/obo. 714/278-7773, Dan or email: dan@fullerton.edu.
'96 HONDA Accord LX sedan, white, automatic, power window, power lock, am-fm cassette stereo, excellent condition, very low mileage, $13,200/obo. 626/584-0878, x116.
'95 HONDA Nighthawk 250 motorcycle, black; windscreen; highway bars; 2,400 miles, exc. cond., $2,000/obo. 562/494-4046.
'89 HONDA Accord LXi 4-dr sedan, 5-spd, moon roof, pwr. windows, pwr. locks, pwr. steering, cruise, AM/FM/cassette, prem. sound, prem. wheels, orig. owner, 198,000 miles, excellent running condition, $6,000. 805/254-4375.
'87 HONDA Accord LXi, blue, 2-dr. + hatch, auto, air, cruise control, alarm, am/fm/cass., clean in/out, $3,300. 310/374-4540.
'85 HONDA Accord, 4 dr., auto, air, new trans., 134,000 mi., $2,300. 626/796-2332.
'94 JEEP Grand Cherokee Laredo 4 x 4, loaded, 90K mi., exc. cond., $11,000/obo. 626/441-0150.
'93 JEEP Wrangler sport utility 2D 4WD, excellent condition, 5-speed manual trans., 4.0L inline 6 cyl., soft-top, blue two-tone paint, running boards, pwr. steering & brakes, tilt wheel, AM/FM cassette stereo, premium sound package, locking trunk, alarm w/microwave proximity sensor, 55k miles, $9,500. 626/398-6356.
'95 KAWASAKI Vulcan, 1500 cc standard, great riding & good looking, new rear seat and battery, w/windshield, saddle bag, CB radio, sissy bar, 19,000 miles, $4,500/obo. 895-3000.
'91 NISSAN Maxima SE sedan, pearl white, automatic V-6, power window, power lock, am-fm cassette stereo, sunroof, new tires, tint windows, very clean car, excellent condition, $7,600/obo. 626/584-0878, x116.
'90 NISSAN Sentra, 2-dr. beige sedan, granny-owned, 24K miles, exc. cond., 5-speed man. trans., a/c, am/fm, compl. maint. recs., $2,750. 790-8691.
'90 OLDS Cutlass Supreme, low mileage, new white paint job, great cond., pwr lock/windows, CD, $6,300. 626/578-7226, Erik.
'89 PONTIAC Grand Am SE, quad 4 engine, auto, a/c, power windows/locks, am/fm/cass., orig. owner, $4,000/obo. 323/255-1106.
'90 TOYOTA pickup truck, utility, dual rear wheels, harbor body box, lumber rack, new engine (not rebuilt), auto V6, a/c, stereo cassette, exc. running cond., $5,300. 952-7940.
'88 TOYOTA Celica GT convertible, very well-maint., 5-sp. manual, A/C, AM/FM, cassette, cruise control, power windows, custom-installed Viper alarm, 75K miles, $6,380. 548-9151.
'85 TOYOTA Camry LE, 4-dr, auto, power, 95k miles, clean, good condition; most service records, $2,000 firm. 626/794-9416.
'87 VOLVO 240DL wagon, one owner, treated it well, great condition, $4,000/obo. 626/683-9331.
'84 VOLVO 240 GL, 1 owner, sunrf., burgundy, air (new unit), new front end, 22 mpg, great transp. car, $2,500/obo. 310/540-0675.
'72 VW, 1835 cc, gd working cond., needs paint, $900. 562/464-0446.
'67 VW Bug, fast engine (1300 cc with dual carburetor), new brakes, new sunroof, custom wheels, make offer. 626/797-8898, eve.
'93 YAMAHA Seca II motorcycle, dark green; dynojet; K&N filters; heated grips; factory tail rack, center stand and engine guards; standard and sport mirrors; standard and corbin saddles; 16,000 miles; excellent condition, $2,100/obo. 562/494-4046.

## FREE

CLEAN FILL DIRT [mostly gravel like], you haul, several cu yds., as much as you like, 3 blks. ESE of NY & Hill, Altadena. 791-3103.
PINE CONES, big, approx. 1 dozen, 10 and 12" long, in LaVerne. 909/593-4046.

## WANTED

APARTMENT/GUESTHOUSE (1 bd.), for young physicist visiting JPL for several months. 626/792-1168, 10 a.m.-6 p.m.
LAPTOP PC, would gratefully accept loan or donated (tax-deduc.) portable PC for ornithology field work for Audubon/LA Nat. Hist. Mus.; DOS and/or Win., floppy, battery, AC adap. 213/745-2473, Breeding Bird Atlas (Wed. or Fri.), or 323/221-2022, Larry, anytime.
SPACE INFORMATION/memorabilia from U.S. & other countries, past & present. 790-8523, Marc Rayman.
VOLLEYBALL PLAYERS, coed, all levels of play, Tuesday nights 8-10 at Eagle Rock High School, $4/night. 956-1744, Barbara.

## LOST & FOUND

*Lost:* GOLD CAMEO RING, man's, old, w/chip in cameo;Jan. 13, possibly inside a JPL mailing envelope, from shipping/receiving. Ext. 3-3076,
*Found:* BRACELET, west parking lot; call ext. 4-1612 to identify.
*Found:* KITTEN, needs a good home, very lovable and beautiful, has short silky hair, our dog won't tolerate him. 626-355-6350.

## FOR RENT

ALTADENA, charming 2-bd., 1-ba. house near Christmas Tree Lane; hardwood floors, fireplace, refrig., stove, washer/dryer, fenced backyd., fruit trees, roses; $1,350, incl. water, gardener, trash; negotiable. 626/794-9579.
ALTADENA, Rubio Canyon area, room in private residence, kitchen & laundry OK, no smoking, no pets, $350. 626/797-8082.
ALTADENA room, non-smoker, ~1.5 mi./JPL, $320 + utility. 626/398-8109.
GLENDALE, townhouse-style 2 story, C/A, 2 bd., 2.5 ba., kit/blt.-ins, built in 1987, $775, one-year lease. 240-1523, mgr.
LA CRESCENTA area, cozy 1 bd., $675. 248-3640, lv. msg.
MONTEREY HILLS (outside S. Pas.) condo, bright/airy, priv. end unit on 3rd flr. w/great view, 2 bd., 1 ba., sep. vanity area, hwd. floors, frplc., cathedral ceil., cent. air/heat, balcony, stove, dishwasher, garb. disposal, cable, some util., pool, laundry rm for w/d in unit (or use of lndry. facil. on 3rd flr.), security bldg., sec. parking (2 spaces), close 110 frwy. access, 10 min./JPL, avail. 2/22, $1,000. 626/296-9073.
PASADENA house in prestigious Hastings Ranch area, 3 bd., 2½ ba., den, attached 2-car garage, yard, $2,000. 626/351-8473, Esther.
ROOM in lg. house, close to JPL, clean person, must like dogs, non-smoker, shared bath & furnished, kitchen/laundry privileges, $450 + utility. 626/797-5570.
SAN DIMAS townhouse, 3 bd., 2 ba., CAC, stove, 2-car covered garage, full carpeting, drapes, $900. 909/592-2933.

## REAL ESTATE

BIG BEAR, new cabin 2 blocks from lake, 2 bd., 2 ba., mud/laundry room, $129,000. 909/585-9026.
YOSEMITE/MARIPOSA home on 2 wooded acres w/mtn. view, immac. 2 bd., 1 ba., cent. forced heat & a/c, large decks, all appliances incl. 2-car gar., exc. well, RV parking, room to add on, beautiful setting, perfect retirement or getaway home, $115,000. 209/742-6735.

## VACATION RENTALS

BIG BEAR, 7 mi. from slopes; full kitchen, f/p, 2 bd., 1 ba., sleeps 6; reasonable rates; 2-night minimum; no smokers, no pets; exc. hiking, biking, fishing nearby. 909/585-9026, Pat & Mary Ann Carroll.
BIG BEAR cabin, quiet area nr. village, 2 bd., slps. 8, compl. furn., F/P, TV/VCP, $75/night. 249-8515.
BIG BEAR LAKE cabin, near lake, shops, village, forest trails, 2 bd., sleeps up to 6, fireplace, TV, VCR, phone, microwave, BBQ and more, JPL disc. price from $65/night. 909/599-5225.
BIG BEAR LAKEFRONT lux. townhome, indoor pool/spa, nr. skiing, beaut. master bdrm. suite, slps. 6. 949/786-6548.
CAMBRIA, ocean front house, exc view, sleeps up to 4, $125 per night for 2, $175 per night for 4. 248-8853.
CORNWALL, ENGLAND, Aug. '99 total solar eclipse; prime loc. campsite; incl. lecture series by Caltech, JPL,d UK astronomers; http://www.ctg-windows.co.uk/eclipse.html. 626/ 356-2998.
HAWAII, Kona, on 166 ft. of ocean front on Keauhou Bay, priv. house and guest house comfortably slp. 6; 3 bd., 2 ba., swim, snorkel, fish; spectac. vws., nr. restaur., golf, other attrac. 626/584-9632.
HAWAII, Maui condo, NW coast, on beach w/ocean vw., 25 ft. fr. surf, 1 bd. w/loft, compl. furn., phone, color TV, VCR, microwv., dishwasher, pool, priv. lanai, slps. 4, 4/15-12/14 rate: $95/nite/2, 12/15-4/14 rate: $110/nite/2, $10/nite/add'l person. 949/348-8047.
MAMMOTH condo, 2 bd. + loft, 3 ba., slps. 8, spa, full kitch., TV/VCR, covrd prkng; walk to Cyn Lodge; JPL disc. 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. 714/870-1872.
MAMMOTH condo in Chamonix at lifts 7, 8, 16, 17; walk to Warming Hut, 2 bd., 2 full ba., slps. 6, fully eqpd. elec. kitch., microwv. & extras, frplc/wood, color TV, VCR, FM stereo, o/d Jacz., sauna; gm., rec. & lndry. rms., walk to shops, lifts; spec. midwk rates. 249-8524.
MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft; sleeps 6-8; fully equipped kitchen incl. microwave, D/W; cable TV, VCR, phone, balcony w/view to mtns., Jacuzzi, sauna, streams, fishponds; close to Mammoth Creek; JPL discount. 626/798-9222 or 626/794-0455.
OCEANSIDE, on the sand, charming 1 bd. condo, view, walk to pier or harbor, pool, spa, game rm., sleeps 4. 949/786-6548.
PACIFIC GROVE house, 3 bd., 2 ba., fp, cable tv/vcr, stereo/CD, well-eqpd. kitchen w/microwv, beaut. furn, close to golf, beaches, 17 Mile Drive, Aquarium, Cannery Row, JPL discount. 626/441-3265.
ROSARITO BEACH condo, 2 bd., 2 ba., ocean view, pool, tennis, short walk to beach on priv. rd., 18-hole golf course 6 mi. away, priv. secure parking. 626/794-3906.
SAN FRANCISCO, Nob Hill honeymoon suite (for 2 only); kitchen, maid, concierge; $105/nite. 626/797-3156.
S. LAKE TAHOE Keys waterfront home, 4 bd., 3 ba., slps. 12+, 2-lev. frplacs, decks overlk. priv. dock/ski lifts, gourm. kitch., bikes, boats, color TVs, VCR, ster. w/tape/disk, pools, hot tub & bch.; tennis, 10 min./skiing, casinos/golf, 1 hr./wine cntry; $995/wk. hi seas. [15 June to 15 Sept; 22 Nov. to 1 March]; + $90 clean fee; 3-day min. 626/578-1503, Jim Douglas.