

# Universe

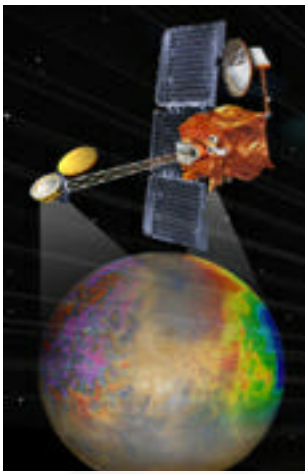
Jet Propulsion Laboratory

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|                                     |                                    |
|-------------------------------------|------------------------------------|
| News Briefs . . . . . 2             | Processes, Rules & ISO . . . . . 3 |
| Special Events Calendar . . . . . 2 | Software team honored . . . . . 4  |
| Earth Proposals Proceed . . . . . 2 | Passings, Letters . . . . . 4      |
| Service Awards . . . . . 2          | Retirees, Classifieds . . . . . 4  |

## Odyssey approaches Mars



### THE MARS

#### ALL SYSTEMS ARE GO FOR THE OCT. 23 ARRIVAL OF JPL'S 2001 MARS ODYSSEY SPACECRAFT AT THE RED PLANET.

Odyssey is nearing the completion of its journey of 460 million kilometers (286 million miles). As this article was written, a final trajectory correction maneuver—the fourth one during cruise phase—was planned for the evening of Oct. 11. Orbit insertion begins at 7:30 p.m. Pacific time on the 23rd.

"The flight team has completed its preparations for Mars orbit insertion," said Odyssey Mission Manager David A. Spencer. "The commands for orbit insertion will be uplinked to the spacecraft on Oct. 15. After that, we will closely monitor the spacecraft's progress as it approaches Mars and executes the orbit insertion burn."

Spencer said another contingency maneuver will only be exercised if Odyssey's trajectory is significantly off-course within a day of arrival. "While TCM-5 has been fully tested and we are ready to do it if necessary, there is a very low probability that it will be needed," he said.

Mars orbit insertion is expected to result in an orbit period of just under 20 hours. However, if Odyssey's post-insertion orbit period is 22 hours or greater, a procedure called a period reduction maneuver will be performed to fire the spacecraft's thrusters to lower the orbit period to the needed 20 hours. If needed, this maneuver will be executed three orbits after orbit insertion.

Two days after orbit insertion, aerobraking will begin, a technique that brings the spacecraft into its circular science orbit. Aerobraking slows the craft down by using frictional drag as it flies through the upper part of the planet's atmosphere. It is expected that aerobraking will take about 80 days, and 380 orbits, to complete.

Odyssey carries three scientific instruments designed to tell us what the Martian surface is made of and provide vital information about potential radiation hazards for future human explorers.

The thermal emission imaging system will determine Mars' surface mineralogy, including providing data on localized deposits associated with hydrothermal and subsurface water. The gamma ray spectrometer will play a lead role in determining the elemental makeup of the Martian surface; an experiment using this instrument and two neutron detectors will possibly be able to calculate Mars' hydrogen abundance, thus inferring the presence of water. The Martian radiation environment experiment will characterize aspects of the radiation environment both on the way to Mars and in the Martian orbit. This experiment will attempt to predict anticipated radiation doses that would be experienced by future astronauts and help determine possible effects of Martian radiation on human beings.

Launched on April 7, 2001, Odyssey's primary science mapping period runs from January 2002 to early August 2004.

## Lockheed will build Mars '05 recon orbiter

NASA has selected Lockheed Martin Astronautics, Denver, to build the JPL-managed Mars Reconnaissance Orbiter, a spacecraft scheduled for launch in August 2005 to return the highest-resolution images yet of the Red Planet.

Lockheed Martin will build the orbiter bus and be responsible for integrating and testing six science instruments and two engineering payloads. Lockheed Martin will also provide spacecraft operations support for the five-and-a-half year mission.

The contract awarded to Lockheed is for \$145 million, including the development and operations phases.

The 1,800-kilogram (3,970-pound) orbiter is twice the mass and will return more than 12 times the data of Mars Global Surveyor, which has been in orbit around Mars for more than four years and has returned more than 101,000 images of the surface. The Global Surveyor spacecraft was also built by Lockheed Martin under contract to JPL.

The Mars Reconnaissance Orbiter science payload currently includes the following instruments: a high-resolution camera, a visible-near infrared imaging spectrometer, an atmospheric sounder, a wide-angle color imager, a shallow sub-surface sounding radar and a context imager. The engineering payload consists of a telecommunications package, which will provide surface communications relay and approach navigation support, and an optical navigation camera that will demonstrate precision entry navigation capability for future landers and orbiters.

"With its specially designed instrument complement, this mission will investigate the surface of Mars at a resolution never before achieved from orbit," said Jim Graf, the Mars Reconnaissance Orbiter project manager at JPL. "We will be able to resolve features the size of beach balls. The images will help determine future landing sites that are both scientifically interesting and free from landing hazards."

"The goal of this orbiter is to understand the history of water on Mars by observing its atmosphere, surface and subsurface in unprecedented detail," said Dr. Richard Zurek, the Mars Reconnaissance Orbiter project scientist at JPL. "This mission will identify the best sites for a new generation of landed vehicles to explore, by virtue of its ability to find local evidence of the chemical and geological 'fingerprints' of water and other critical processes. The orbiter will explore from orbit several hundred localities on the surface of Mars, observing details that were previously only visible to landers."

## Surprise! Galileo spots tallest-ever volcanic plume

By Guy Webster

Color images of the volcanic plumes on Io are available online at <http://www.jpl.nasa.gov/images/io>.

### THE SOLAR SYSTEM

Jupiter's moon Io has pulled a surprise on JPL's Galileo spacecraft, hurling up the tallest volcanic plume ever seen, which arose from a previously unknown volcano.

A different volcano had been lofting a plume seven months earlier, but Galileo saw no sign of that plume during its latest Io flyby in early August.

Adding to the surprise, for the first time a Galileo instrument has caught particles freshly released from an eruption, giving scientists a direct sample of Io material to analyze. "This was totally unexpected," said the leader of that experiment, Dr. Louis Frank of the University of Iowa. "We've had wonderful images and other remote sensing of the volcanoes on Io before, but we've never caught the hot breath from one of them until now. Galileo smelled the volcano's strong breath and survived."

The Jupiter-orbiting spacecraft has been gradually transmitting to Earth the new pictures and data from its flight over Io's north pole in early August, said Dr. Eilene Theilig, Galileo project manager at JPL. "Io just keeps amazing everyone," she said. "Now we're eager to see what will be happening there when Galileo flies near Io's south pole in two weeks."

Galileo engineers and scientists had anticipated that the Aug. 6 flyby (Aug. 5, Pacific time) might take the spacecraft right through gases rising from a volcano named Tvashtar near Io's north pole. Tvashtar had been lofting a high

plume when last seen seven months earlier by both Galileo and the passing Cassini spacecraft. However, the Tvashtar plume has not been found in images from the August flyby. Researchers were startled to find, instead, that a previously unknown volcano just 600 kilometers (370 miles) from Tvashtar was spewing a grand plume as Galileo passed.

"After not seeing any active plumes at all in Io's high-latitude regions during the first five years of Galileo's tour, we've now seen two this year," said Galileo imaging team member Dr. Alfred McEwen of the University of Arizona. The latest appears as a back-lit bulge above Io's surface in two newly released images. A third new image shows a white ring of material from the plume that has fallen back to the moon's surface, painting a circle around the source of the eruption. A fourth shows another new large plume deposit near Io's north pole.

The new plume rises at least 500 kilometers (more than 300 miles) above ground, McEwen estimated, nearly 10 percent higher than the tallest ever seen before on Io.

Scientists using Galileo's infrared mapping instrument have pinpointed the site of the eruption as a new hot spot at a location that was not known to be an active volcano, said JPL volcanologist Dr. Rosaly Lopes. It was surprising that the site leapt to such intense activity so abruptly with so little evidence of former volcanism,

she said.

"Galileo flew between two great volcanoes," Lopes said. "The plume we knew about might have settled down before we got there, but this new one sprang up suddenly."

The particles detected in Galileo's plasma science instrument as the aging spacecraft sped within 194 kilometers (120 miles) of Io's surface likely came from the new hot spot rather than Tvashtar, Frank said. The volcanic material reached the spacecraft no more than a few minutes after rushing out of the source vent on the ground. The particles are apparently snowflakes made of sulfur dioxide molecules with as many as 15 to 20 molecules clumped together in each flake.

Galileo is on course to fly about as close to Io again on Oct. 15 at 6:23 p.m. Pacific time. Its trajectory will take it close to Io's south pole, which may provide a look at details of another new hot spot near there identified from infrared mapping data this year. The polar passes in August and this month were also designed to provide data indicating whether Io generates its own magnetic field, as its sibling moon Ganymede does and Earth does.

Io is the innermost of Jupiter's four largest moons and the most volcanically active world in the solar system. Galileo will get its sixth and final encounter with Io in January 2002. It has also flown 27 close approaches to Jupiter's other three large moons: Europa, Ganymede and Callisto.

# Earth science proposals proceed

The NASA Earth Science Enterprise has announced the selection of six missions to proceed to Step 2 of the Earth System Science Pathfinder proposal process. JPL has project management responsibility for four of the six selected proposals.

After evaluation of the Step 2 proposals, which are due on Jan. 11, 2002, NASA intends to select three or four missions to proceed through a one-year formulation phase. Two or three will then be selected to proceed through implementation and flight.

These \$200 million-class exploratory Earth science missions are designed to make first time measurements of key Earth system phenomena, producing conclusive scientific results addressing focused science questions.

The four JPL-led proposals are:

#### Aquarius

For the first time, NASA will measure the global concentration of salt at the ocean surface, which will lead to discoveries about the ocean circulation, the global cycling of freshwater, and climate. The Aquarius satellite mission will make these measurements using a very accurate active/passive radiometer system. The principal investigator is Dr. Chester Koblinsky, NASA Goddard Space Flight Center.

#### Orbiting Carbon Observatory

This mission will make the first time-dependent, global measurements of atmospheric carbon dioxide with the precision and resolution needed to characterize its production and loss rates. These measurements will improve our understanding of the processes that regulate atmospheric carbon dioxide, enabling more reliable forecasts of climate change. The principal investigator is Dr. David Crisp, JPL.

#### Earth Change and Hazard Observatory

This is an unprecedented, dedicated interferometric radar mission that addresses two of the NASA Earth Science Enterprises research priorities: the relation between earthquake and volcano hazards and minute surface deformations, and the relation between sea level and climate change and changes in polar ice sheets and glaciers. The principal investigator is Dr. Jean-Bernard Minster, Scripps Institution of Oceanography.

#### Hydrosphere State Mission

The mission will provide the first global view of the Earth's changing soil moisture and surface freeze/thaw conditions, enabling new scientific studies of global change and atmospheric predictability and making new hydrologic applications possible. The principal Investigator is Dr. Dara Entekhabi, Massachusetts Institute of Technology.

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

45 years: Robert Mueller, Joseph Savino, Wayne Arens, William Breckenridge, John Biles Jr.

40 years: Fred Tomey, Walter Walker, Walter Mushagian.

35 years: Peter Breckheimer, Robert Keskinen, Kenneth Harstad, Roger Dick, Jerry Neal, James Campbell, Neil Yarnell, Arthur Lane, Dennis Page.

30 years: Joseph Ajello, Irene Chan, Ara Chutjian, Parker Cowgill, James Curtis, Moroni Dewegeli, Bruce Goldstein, John McKinney, Gerald O'Connell, Tetsuo Ozawa, Anthon Rasmussen, David Rodgers, Donald Sweetnam, Sandi Thomas, James Weese.

25 years: Vincent Anicich, Robert

Aster, Bryan Bell, F. Sharon Chapman, Taher Daud, John Davidson, Allen Hubbard, John Lai, Blair Lewis, Juergen Linke, Gary Parks, Neil Toy, Peter Wannier, Sien-Chong Wu, Richard Zurek.

20 years: Annie Aroyan, Teresa Bailey, Suzette Baugh, Gregory Bearman, Charles Bell, Stephen Benskin, Marie Case, Alice Cobbin, Norberto Cresta, Valerie Duval, Deborah Fambro, Charles Garner, Paula Goodrich, Jeffrey Hilland, Cheng-Hsien Hsieh, Andrew Kwok, Lynn Lowry, Colleen Miyahara, Karen Moran, Patrick O'Brien, Kermit Pederson, Rodney Rohla, Charles Simon, Wallace Tai, David Thiessen, Chris Webster.

For a complete list of honorees for the third quarter, log on to the Employee Services & Recognition home page: <http://eis/sec614/reward>.

JPL's annual benefits enrollment period is now underway through Oct. 31. The Benefits Office urges employees to review their benefits and decide if changes are needed for the year to come.

Information packages have already been sent to employees. These packets include a summary of benefit changes for 2002, new premium rates and plan comparisons. Also included are instructions on how to use the Web to verify your current benefit elections and submit desired changes. Review this information carefully.

If you want to change your benefits or enroll in a Health Care or Dependent (Day Care) Spending Account, you need to enroll through the Web. Your enrollment takes effect Jan. 1, 2002. Unless you want

to make a change or have a spending account for 2002, you don't have to do anything.

To assist employees in comparing each of JPL's medical plans, the Benefits Office has invited representatives from each health plan—Kaiser, CIGNA, Blue Cross and CaliforniaCare—to participate in a panel discussion on Monday, Oct. 15 from 1:30 to 3 p.m. in the 167 conference room.

In addition, representatives from the Benefits Office and each health plan will be on Lab from 11:30 a.m. to 1:30 p.m. on the following days to answer individual questions:

- Oct. 17, 167 cafeteria
- Oct. 24, 167 cafeteria
- Oct. 30, 303 cafeteria

For more information, call the Benefits Office at ext. 4-3760.

## Correction

An article in the Sept. 28 issue of Universe on the Labwide cleanup effort should have indicated that among the organizations represented on the cleanup teams were Occupational Safety Office, Property, Acquisitions, Facilities, Environmental Affairs Office and the Flight Hardware Logistics Program.

# Special Events Calendar

## Ongoing Support Groups

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

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

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

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

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

## Friday, October 12

Travel Film—"The Best of Portugal" will be presented at 8 p.m. in Caltech's Beckman Auditorium. Tickets are \$9 and \$7. Call (626) 395-4652.

## Monday, October 15

Caltech Ballroom Dance Club—A lindy hop class, taught by a professional instructor, will be held from 7:30 to 9 p.m. in Winnett Lounge, followed by a half-hour practice session. Cost: \$8 per lesson. Contact Megan Knight at [knight@its.caltech.edu](mailto:knight@its.caltech.edu).

## Tuesday, October 16

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

"Knowledge Capture: Part II"—Lynne Cooper, Section 346, will discuss solutions to challenges that she identified in a January 2001 knowledge capture presentation. Sponsored by the Institutional Computing and Information Services Office. To be held from 2:30 to 3:30 p.m. in von Kármán Auditorium.

## Tues., Oct. 16–Wed., Oct. 17

Investment Advice—TIAA-CREF will hold individual counseling sessions. For an appointment, call (877) 209-3140, ext. 2614.

## Wednesday, October 17

Caltech Ballroom Dance Club—A volunteer-taught cha-cha class will be held from 7:30 to 9 p.m. in Winnett Lounge, followed by a half-hour practice session. Cost: \$1 per lesson. Contact Megan Knight at [knight@its.caltech.edu](mailto:knight@its.caltech.edu).

Ethics Training—A class is available to all personnel from 1:30 to 2:30 p.m. in von Kármán Auditorium. A list of training sessions is available at <http://hr/et>; search on the word "Ethics." The one-hour session is offered monthly or can be arranged for group presentation by calling Martha Avina, ext. 4-3154.

"Planning Your Retirement Income"—This Fidelity Investments workshop from 9 to 11 a.m. in Building 180-101 is for those who are less than five years from retirement. The presentation reviews in detail distribution options and building a financial plan as well as tax considerations and estate planning.

## Thursday, October 18

TIAA/CREF Enrollment—At noon in T1720-137, employees newly eligible for Caltech/JPL retirement plan participation can receive help in selecting investment options and completing enrollment forms.

Social Security—A representative is available from 9:30 to 11:30 a.m. in the 167 cafeteria. No appointment is needed.

Von Kármán Lecture Series—Dr. Robert Parker, director of the NASA Management Office at JPL and a former astronaut, will present "The Earth as Seen from Space" at 7 p.m. in von Kármán Auditorium. Open to the public. For more information, see <http://www.jpl.nasa.gov/events/lectures/oct01.html>.

## Friday, October 19

Von Kármán Lecture Series—Dr. Robert Parker, director of the NASA Management Office at JPL and a former astronaut, will present "The Earth as Seen from Space" at 7 p.m. in The Forum at Pasadena City College, 1570 E. Colorado Blvd. Open to the public.

## Saturday, October 20

Celtic Music—Scottish harpist William Jackson will appear at 8 p.m. Caltech's Dabney Lounge. Tickets are \$12 for adults, \$4 for children under 12. Call (626) 395-4652 visit <http://www.cco.caltech.edu/~folkmusi>.

Luma Theatre of Light—This troupe, which uses illuminated objects to paint a world of colorful motion, will perform at 2 p.m. in Caltech's Beckman Auditorium. Tickets are \$10 for adults, \$5 for youth. Call (626) 395-4652.

## Monday, October 22

Caltech Ballroom Dance Club—A lindy hop class, taught by a professional instructor, will be held from 7:30 to 9 p.m. in Winnett Lounge, followed by a half-hour practice session. Cost: \$8 per lesson. For more information, contact Megan Knight at [knight@its.caltech.edu](mailto:knight@its.caltech.edu).

## Wednesday, October 24

Caltech Ballroom Dance Club—A volunteer-taught cha-cha class will be held from 7:30 to 9 p.m. in Winnett Lounge, followed by a half-hour practice session. Cost: \$1 per lesson. Contact Megan Knight at [knight@its.caltech.edu](mailto:knight@its.caltech.edu).

Caltech/JPL Flying Club—The fall general membership meeting will be held on campus at 7:30 p.m. 201 E. Bridge. Learn about the club's six planes at El Monte Airport and the opportunity to get your pilot's license.

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

JPL Toastmasters Club—Meeting at 5 p.m. Guests welcome. Call Joy Hodges at ext. 4-7041 for location.

Nobel Prize Centennial—In celebration of the 100th anniversary of the Nobel Prize, Caltech will host a half-day symposium in Beckman Auditorium, starting at 2:30 p.m., highlighting the achievements of the institute's active Nobel laureates: Dr. David Baltimore, Dr. Edward Lewis, Dr. Rudy Marcus and Dr. Ahmed Zewail. Free admission. Call (626) 395-4652.

## Thursday, October 25

Caltech Architectural Tour—The Caltech Women's Club presents this free service, which is open to the public. The tour begins at 11 a.m. and lasts about 1 1/2 hours. Meet at the Athenaeum front hall, 551 S. Hill St. Call Susan Lee at (626) 395-6327.

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

## Saturday, October 27

Inti-Ilumani—This ensemble that performs traditional Andean music using more than 30 wind, string and percussion instruments will appear at 8 p.m. in Caltech's Beckman Auditorium. Adult tickets are \$29, \$25 and \$21; high school age and under, \$10. Call (626) 395-4652.

# Service awards

# Benefits enrollment this month

Medical insurance panel discussion set for Oct. 15



DR. JERRY SUITOR, MANAGER OF THE ENTERPRISE PROCESS AND STANDARDS PROGRAM OFFICE, DISCUSSES JPL'S ONGOING EFFORTS TO STREAMLINE, SIMPLIFY AND MAKE MORE EFFECTIVE THE PROCEDURES, POLICIES AND RULES UNDER WHICH THE LABORATORY OPERATES.

*Q Dr. Charles Elachi has said he wants to simplify the management methods at the Lab. What does that mean?*

Among its many attributes, JPL is a system engineering organization. Dr. Elachi wants us to apply the systems engineering discipline to the way we manage work. Our management system then becomes simple and straightforward.

*Q What is the end result the Lab management is seeking?*

A management system that simplifies, streamlines and standardizes the way we do our work. It is a system of interconnected processes tightly aligned with the current organizational structure. The system is supported by a clear set of rules and it adheres to an internationally acknowledged framework.

*Q How do process, DMIE and ISO relate to each other?*

They are all part of our management system. Process describes how work flows at JPL. The Design and Maintain the Institutional Environment (DMIE) Information System is the system of rules that governs the operation of that work. ISO gives us the framework for that system. ISO 9001 tells us the parts that make up a good management system and how those parts are supposed to interact. It also helps to identify deficiencies in the operational systems and correct them.

*Q How did the concept of process come to JPL?*

Process in the form of Process Based Management came to JPL as an attempt to better respond to the changing business environment that confronted the Laboratory in the early 1990s. Being faced with many smaller projects, we needed to work faster, eliminate duplication of efforts and share lessons learned so that we didn't waste time reinventing the wheel each time we began a new project. In the past, large projects such as Cassini and Galileo provided process and maintained the process infrastructure.

Today process management provides the institutional infrastructure by streamlining the non-creative, repetitive processes to help us get a quick start on each smaller project. Process is also an outgrowth of the Total Quality Management effort at the Lab. TQM had "continuous improvement" as one of its four "attitudes." In order to improve, you had to know the processes that you wanted to improve.

*Q Does process relate to "Faster, Better, Cheaper?"*

In order to have as many missions on the books as we currently have, we need a consistent way to conduct our business. A simple process-oriented management system provides a large part of that consistency. It can help us become more flexible and proactive by streamlining our work to move at a faster pace, reusing data, eliminating duplication of efforts and becoming more cost effective. Process and ISO 9001 also provide a mechanism of capturing lessons learned and guaranteeing that the lessons will propagate into future missions.

*Q Is the process model being eliminated?*

No. The model of interrelated processes continues to be used to describe how we get the work done here.

*Q What is being done with respect to Process?*

Process structure and the relationships of the processes are being completely reexamined. We are looking at ways to simplify the structure so that it is both easily understood and easier to use. We have allowed uncontrolled process growth to get in the way of doing our business in the effective manner that was the original motivation for structuring around processes. We need to re-examine and streamline the process structure. We also need to get that process structure fully aligned with the functional organizational structure. Some of the recent re-organization activities at JPL have made significant strides in that direction.

*Q Are there any examples of how this is going?*

Yes. A team led by Dr. Sharon Langenbeck, the Mechanical Engineering Section (352) manager, has looked at the hardware development process. The team is composed of section managers and others involved in hardware development. They have created a single, high-level procedure for how to develop hardware at JPL. They have even tailored the procedure for each of the project life cycles. This single procedure replaces six existing procedures and it is accepted by all organizations developing hardware. This activity represents a model of alignment of process and organization. It also represents a great example of how processes can be simplified.

*Q Will certain "processes" be eliminated?*

We will continue to do our work using processes. We have always used processes and will continue. We must. That being said, certain currently identified processes will be combined with other processes. We are currently discussing the realignment and streamlining of the processes and we hope to develop a simplified process structure soon.

# PROCESS, RULES & ISO

Making things simpler and more meaningful



Photos by Bob Brown / JPL Photo Lab

**"... JPL is a system engineering organization.**

**Dr. Elachi wants us to apply the systems engineering discipline to the way we manage work."**

*Q What is being done with respect to DMIE?*

In his inaugural speech on May 2, Dr. Elachi said that "we are going to re-examine the rules in DMIE and make them simple, clear, understandable, and accessible by all." The process called "Design and Maintain the Institutional Environment" covers a lot of territory, from process design to capture of rules in a data repository. The acronym DMIE has become a euphemism for the rules repository at JPL. That set of rules is currently being scrutinized and restructured in conjunction with Dr. Elachi's desire to simplify the rules system. The restructuring is also leading to simplification and substantial reduction in the rules.

Additionally, the repository access is being redesigned to provide easier access in a more intuitive manner. We have listened intently to the users of the system and have incorporated a large number of changes to the Web-based interface to the rules. More than 600 employees participated in selecting a new, more descriptive name for the rules repository. The DMIE Web site will be renamed "JPL Rules!" and will debut in November. We have also made use of outside experts in the area of documentation to better structure the documents for easier readability and understandability.

*Q How do process and rules overlap?*

Process and the rules are inextricably linked. The rules are organized around common processes that all organizations use. This avoids the replication of the same rules in multiple organizations.

*Q What is the difference?*

Processes are the way we do work. The JPL Rules! system is the repository of the rules that govern how we use our processes.

*Q How soon do you anticipate the entire task will be complete?*

We are hoping for the rules work to be completed in November of this year. Deputy Director Eugene Tattini is working with us on process restructuring, and we hope to have the work completed on a similar timeframe.



Back row, from left: Chief Information Officer Tom Renfrow; Patrick Ko; NASA Management Office Director Dr. Robert Parker; Division 360 manager Dr. Richard Doyle. Front row: Martin Orton, Lee Elson, David Hanks, Hari Nair

## Software team honored

JPL Chief Information Officer Tom Renfrow on Oct. 1 presented a NASA Honorable Mention Award to the JPL team that developed the Distributed Object Visualization Environment (DOVE) software application that enables scientists, educators and students to visualize and analyze meteorological data on most computer platforms.

Lee Elson, David Hanks, Patrick Ko, Hari Nair and Martin Orton received certificates and monetary awards for their contribution to NASA's suite of tools that support mission success.

Access to DOVE, also known as WebWinds, and information about the application are available at <http://webwinds.jpl.nasa.gov>. Also, a copy of a recent DOVE presentation is available on the CSMISS Web site at <http://csmiss>.



## Passings

**EVERETT HERRICK**, 75, a retired senior storekeeper in Section 357, died of cancer Sept. 5 at his home in Altadena.

Herrick joined JPL in 1983 and retired in 1992. He is survived by his wife, Teri; daughters Julie and Vicki; sons David and John; and six grandchildren.

Services were private.

## Retirees

The following JPL employees retired in October:

- David Norris, 41 years, Section 387;
- Nancy Short, 40 years, Section 252;
- Larry Dumas, 39 years, Section 100;
- Michael Ebersole, 38 years, Section 402; Antal Bejczy, 32 years, Section 345; Moroni Dewegeli, 30 years, Section 282; George Shultz, 21 years, Section 274; Louis Jespersen, 14 years, Section 512.

## Letters

On behalf of my family and myself, I would like to thank everyone at JPL, both past and present, for the wonderful support, sympathy and enduring friendship that has been shown to us over the years and most recently upon the death of my husband. May God bless you all.

Ruth James and family

It has been a privilege to be allowed to explore the solar system with the greatest engineers and scientists in the world for the past three decades. As I set out on new uncharted trails I thank you all for giving me a career that has exceeded my wildest dreams.

Mike Martin

## Classifieds

### For Sale

- AIRLINE VOUCHER**, for America West flights to the continental USA & Mexico, \$450/obo. 714/526-1375.
- ARTWORK**, framed, professional matting, home/office, signed and numbered by artist, 32 x 28 in., \$10-20. 323/258-4464, after 6 p.m.
- BABY ITEMS**, low prices. 626/850-4378.
- BEDROOM SET**, full size, iron frame, box and mattress complete, exc. cond., \$200.
- MATTRESS**, queen-size, good cond., \$50. 353-0841.
- BOOKCASE**, black, 6' 8" tall x 2' 8" wide x 11" deep, 5 adjustable shelves, attached light, IKEA modern, \$75. 626/798-4265.
- BOOTS**, brand new, Stride Rite, hiking boots for a little girl, size 8 1/2, deep magenta color, excellent support and sole, \$18. 626/798-6248.
- CAMERA**, Pentax, 28-80mm/3.5 autofocus zoom lens with skylight filter, great cond., in box, \$50/obo. 550-7555, Rob.
- CEMENT MIXER**, small, motorized, \$75. 323/662-4089.
- CHAIR/LOVESEAT**, exc. cond., hardwood frames, made in USA, nice stuff, see at <http://people.we.mediaone.net/futilitarian/page3.html>, \$250/obo for the pair. 730-5807.
- ENTERTAINMENT CENTER**, holds 27"- 30" TV, 4 adjustable shelves, glass front, VHS/CD storage, 5" wide x 4" tall x 20" deep, IKEA black modern, \$150. 626/798-4265.
- ENTERTAINMENT CENTER**, includes 54" Sony TV, complete stereo system with 5 CD changer and Dolby digital sound, custom-made cabinet, \$2,900/obo. 790-0112.
- EXERCISE EQUIPMENT**, Soloflex with butterfly attachment, vg. cond., \$300/obo.

661/296-4332.

**FOSSILS**, reducing a large collection, incl. starfish from Canada, Green River formation fish, fossils from Solnhofen Germany, dino tracks & others, view photos at <http://mow.ecn.purdue.edu/~stough/fossils.html>. 626/798-4265.

**FURNITURE**: oak, captain's bed, twin size, 4 drawers plus storage, \$90; dining table, square, dark solid oak, \$275. 710-7694 or banerdt@earthlink.net.

**FUTON**, made with cover and frame, \$250/obo. 626/796-8803.

**HOCKEY TICKETS**, Kings season ticket holders selling selected games, 2 exc. seats, \$95 for both. 626/852-0821.

**LAMP**, 1960s tiffany hanging, 2-tone light and dark gold glass, handmade, \$40/obo.

**MEDICINE CABINETS**, new mirrored, 1 small oak frame, 1 small chrome frame, call for measurements, make offer. 626/798-3235.

**PIANO**, Clavinova digital, Yamaha CLP 411, 3 yrs. old, exc. cond., black, \$1,600/obo. 626-475-5790.

**PLANTS**, two purple Wisteria trees in 17" clay pots, \$25/ea/obo; rubber tree in 17" clay pot, \$25/obo. 626/791-6101.

**POCKET PC**, Cassiopeia E-125, 32 MB, \$350. 626/398-7262.

**TABLES**, coffee, fair cond., and 2 end tables, good cond., cherry wood, \$50/all; **REFRIGERATORS**, G.E., (2), white, 15 yrs old, runs well, \$100, beige, 17 yrs. old, side-by-side, \$100; **SOFA/SLEEPER**, makes into queen size bed, abstract design in black, blue & mauve, good cond., \$300. 626/357-8210.

**TELESCOPE**, 8", Celestron C8, Schmidt-Cassegrain 6, 17, 25, 40 mm eyepieces, Pelican case, bought in 1996, like new, \$1,300. czrider@pacbell.net or 626/798-4016.

**VANITY DRESSING TABLE**, antique wood, Art Deco, circa 1930s, mirror and 5 drawers, exc. cond., \$300. 368-9520.

**VIDEO GAMES**: for Sony Playstation, Shadow of Destiny, \$20; Ridge Racer V, \$15; Midnight Club, \$15; Fantavision, \$10; X-Squad, \$15; Gradius III, and IV, \$15; exc. cond., like new. 368-9520.

### Vehicles/Accessories

'87 ACURA Integra LS, hatchback, 2 dr., coupe, 153K mi., good cond., 5-speed manual, moon roof, a/c, cassette deck, graphic equalizer, \$1,900. 249-8735.

'97 BMW 740i, white, loaded, all possible extras, exc. cond., 1 owner, \$29,500. 360-6364.

'99 FORD Mustang, white, exc. cond., 40K miles, orig. owner, leather interior, CD, cruise control, 100K bumper-to-bumper, like new, \$16K. 909/971-9405, eves.

'96 FORD Escort LX, 5 speed, 2 dr., 59,000 miles, a/c, am/fm/cassette, pwr. mirrors, original owner, all records, exc. cond., cherry red with gray interior, \$5,700/obo. 909/980-3508.

'93 FORD Explorer XLT, wht. w/beige leather, 4 x 4, 4 L, V6, new LTX tires, all power, tow package, 122K mi., LoJack, immaculate, \$6,000. 626/441-2150.

'68 FORD Ranchero, 390, V8, GT package, C-6 auto w/console and bucket seats, 90% restored, almost everything new or rebuilt, fresh red paint, correct GT wheels and C-strips, bed liner and cover, \$7,500/obo. 952-8984.

'95 HONDA Civic LX Sedan, 5 spd., a/c, new tires, 115K miles, 1 owner, exc. service cond., good body cond., great car, will miss it, \$5,500/obo. 626/564-1733.

'91 HONDA Accord LX wagon, 114K mi., auto. trans., runs well, 1-year-old tires, replaced battery, alarm, \$5,000/obo. 626/840-0555, leave msg.

'90 HONDA Accord LX, 4 dr., 5 spd., 1 owner, vg cond., w/maint. recs., 74K mi., a/c, am/fm/cass., cruise control, pwr. window/lock, new tires, \$5,500. 626/574-5733.

'90 JAGUAR XJ6 Sovereign, blue, 115,000+ miles, lic. no. 45BJ836, gd. cond., no service reqd., located in La Crescenta \$5,700. 541-0751.

'95 LINCOLN Mark VIII, loaded, full power, beige over tan leather, CD changer, chrome wheels, 84 k miles, well maintained, exc. cond., \$10,000/obo. 952-8984.

'90 MAZDA RX-7, convertible, 138K mi., 2 dr., white w/black top, blue leather, a/c, CD/tape/HIFI, glass rear window, RacingBeat exhaust, fast and fun, \$5,500. 841-4849 or hje@rocketship.com.

'91 NISSAN Pathfinder, 15,000+ orig. miles, 1 owner (rarely driven), 3.0 L V6, rear spoiler & running boards, burgundy (interior & exterior), \$7,000/obo. 626/284-9664.

'90 NISSAN 240SX SE Fastback, red, 5 speed, flip-up/removable sunroof, power steering, tilt wheel, cruise, AM/FM stereo, single owner, all records, 100K miles, good cond., \$3,500/obo. 323/467-4742.

'84 NISSAN 300Z, 2-dr. coupe, blue, 150K

mi., 1 owner, fair cond., \$1,500. 626/355-9723, Neil.

'92 PLYMOUTH Grand Voyager, 3.3 L, V6, very clean, runs good, gray, \$3,400/obo. 957-8463.

'98 PONTIAC Grand Prix GT, 2 dr., V6, 3.8 L, supercharged, showroom condition, 14K mi., black/black leather, all extras, \$17,000/obo. 310/937-1609.

'90 PONTIAC Transport van, 7 passenger, red with gray trim exterior, gray interior, good running cond., drastically below wholesale blue book value, \$1,750. 626/850-4378.

'92 SUBARU Legacy L Sedan, 4 dr., automatic trans, a/c, airbag, cassette, 161K mi., good cond., \$2,500. 626/398-5853.

'91 TOYOTA Camry V6 Wagon Deluxe, exc. cond. in and out, auto, A/C, orig. owner, \$4,700/obo. 548-5656.

'90 TOYOTA Camry LE, V6, exc. cond., loaded, including power moon roof, 125K miles, original owner, \$4,900. 626/398-3240.

'90 TOYOTA Camry LX, 4 dr., 4 spd., 4 cyl., 1 owner, vg. cond., a/c, am/fm, well-maintained, new tires, \$2,100. 790-3802, leave msg., or wd Wong3@aol.com.

'85 TOYOTA Tercel, 2 dr., hatchback, white, red int., 4 cyl., vg cond., air, am/fm, p/b, 68K mi., 10K on tires, just tuned up, new brakes, master cyl, \$1,100. 248-1549.

'83 TOYOTA Celica GTS, white, hatchback, body/interior in good cond., 5 spd., 120K mi., single owner, maintenance records available, \$1,600. 353-3325.

'85 VOLVO DL wagon, 94,000 miles, good cond., \$2,000/obo. 790-4455.

### Wanted

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

**COMPUTERS**, used; start-up boys & girls club in underprivileged area seeks donations for a computer lab/homeowork program, also in need of sports equipment such as tennis rackets, balls, etc. 909/338-0225.

**MOTORCYCLE**, road, cross or dirt bike, inexpensive in working condition, 250-500 cc. 626/399-4449.

**RENTAL**, guest house/house/etc for elderly, handicapped (wheelchair) but independent woman who enjoys gardening, safe neighborhood, not too distant from JPL. 952-2581 or hbjulie@aol.com.

**ROTISSERIE OVEN**, in good/clean condition. 626/966-3677, Felipe or Paty.

**SOPRANO**, for 5-member a capella singing group, rehearsals on-Lab, varied repertoire, from barbershop to vocal jazz, now gearing up for Christmas performances. 626/303-4750, Karen McLaughlin.

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

**VIOLINS**, for Loma Alta elementary students in Pasadena district: full, 3/4, and half-sizes needed, donations are tax-deductible. 626/791-2574.

**VOLLEYBALL PLAYERS**, coed, no beginners please, Tuesday nights 8-10 p.m. at Eagle Rock High School, \$3/night. 956-1744, Barbara.

### Lost & Found

**LOST**: Key ring w/3 Ford keys, 1 Camry & 1 house key, lost 3 wks ago, between 126 & 111. 4-3356.

### For Rent

**ARCADIA** townhouse, unfurnished, bed & master bath, 15 minutes from JPL, walk-in closet, garage, d/w, w/d, a/c, fireplace, pool, quiet, professional roommates, convenient to grocery, restaurants, 10 minutes from Old Town, responsible professionals only, \$650 w/o garage, \$700 with + 1/3 utilities (-\$25) and deposit. 626/222-6943, Luke.

**ARCADIA** unfurn. bedroom in apt.: share bath with professional, male roommate; rest of place is nearly fully furnished: w/d, dishwasher, a/c, fireplace, off-street parking (limited); share w/2 other professional, quiet roommates in a convenient location; responsible professionals only: \$550 + 1/3 utilities (-\$25) and deposit. 626/222-6943, Luke.

**BURBANK**, 2-bd. house to share, beautiful built-ins, formal dining, exc. Verdugo Hillside area, lg. shaded yd. w/pool, spa, fruit trees, housecln. and water pd., will consider dog, \$740 + util. 848-4541.

**LA CRESCENTA**, spacious condo, 1 bd., 1 ba., above Foothill, 1-car enclosed garage, incl. gas, water and hot water, central a/c, + heat dishwasher, stove, trash compactor, hardwood floors, mountain views, laundry room, 10 min. to JPL, \$845. 952-5626.

**LAGUNA HILLS**, elegant house, 4 bd., 3 ba., a/c, wood floors, family room w/fireplace, wet bar, mirror walls, formal dining & living room, master bd. w/deck, large yard, garden-

er incl., \$2,300. 323/258-4464 or 949/859-2237.

**MONROVIA** house for lease, beaut. 2 bd., 1.5 ba., new paint in & out, new carpet, new ctrl air/ht., spacious rooms, f/p, attach dbl. gar., d/w, blinds, stove, lots of storage, 2 blks. from Arcadia, restaurant row, Huntington Bl. & 210 fwy, best for single or couple, \$1,200. 626/437-6214.

**MONROVIA**, room in house, no pets, female preferred, central a/c, driveway parking, kitchen privileges, \$600 including utilities + 1 month security deposit. 626/305-0914.

**NORTH ALHAMBRA**, borders South Pasadena, 2 bd., 1 ba., upstairs rear unit apartment, kitchen furnished with all appliances, all utilities incl., very private, \$1,150 + \$1,150 dep. 626/570-6123.

**PASADENA**, 1921 restored Mission-style house, 3 bd., 1.75 ba., 2,150 sq. ft., recent kitchen and bathrooms, 2 miles from Caltech, no pets, \$2,200. 790-4249.

**PASADENA** house near JPL, 2 bd., 1 ba., fireplace, central heat/air, tiled kitchen and bath, large yard, walk to Rose Bowl area. 626/683-1721.

**PASADENA**, furn. apt. to share w/Caltech student, 2 bd., 1.5 ba., central air, parking, laundry, \$575 + utilities. 626/351-9641.

**PASADENA**, furnished apt., 1 bd., 1 ba., newly renovated, close to PCC and Caltech, covered parking, \$895 + utilities. 626/351-9641.

**PASADENA**, studio condo, 1115 E. Cordova, gated facility, fully furnished, pool, patio, lounge areas, carport, laundry, no pets, non-smoker, tenant pays electric, \$825. 626/792-9053, Marilyn or Ray.

**PASADENA**, roommate to share 2-bd., 2-ba. apt., female preferred, near Lake and 210, separate phone line, secured bldg., pool, whirlpool, BBQ, laundry facilities in complex, \$600 + half utilities (gas, electric, cable - \$60), month-to-month lease. 626/795-8197, Denise.

### Real Estate

**MAMMOTH LAKES** condo unit, 1 bd./loft, 2 ba., exc. cond., newly redecorated & refurn., floor to beamed ceiling, fireplace in living room, balcony offers superb Mammoth Mtn. view, all elec. kitchen, desirable location in complex, close to Canyon Lodge & lifts, potential rental income, \$189,500. 249-8524.

**SEQUOIA**, R-Ranch, 1 share with grant deed, 750 acres, horses, lake, cabins, nature, \$1,400. 626/287-3146.

### Vacation Rentals

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

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

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

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

**MAMMOTH**, Chamomix condo, 2 bd., 2 full ba., walk to lifts 7, 8, 16, 17 and Canyon Lodge, sleeps 6, fully equipped elec. kitchen, w/microwave & extras, f/p and wood, color TV, cable, FM stereo, VCR, pool & sun areas, o/d Jacuzzi, sauna, game, rec. & Indry rms., conv. to shops, special events, daily/weekly rates, summer rates thru Oct. 249-8524.

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

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

**OCEANSIDE** condo, fully furn. 2 bd., 2 ba., fireplace, full kitchen, quiet, relaxing, beautiful setting at beachside, with barbecue, pool, spa, game room, and great ocean view, easy walk to pier and restaurants, sleeps 6, available weekly or monthly. 909/981-7492, Darlene or dfhauge@yahoo.com.

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

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

View this and previous issues of Universe online <http://universe.jpl.nasa.gov>

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|                                       |   |
|---------------------------------------|---|
| News Briefs . . . . . 2               | Neighbor to Neighbor, . . . . . 3<br>Heart to Heart |
| Special Events Calendar . . . . . 2   | Benefits Enrollment . . . . . 4                     |
| "I Give Because . . ." . . . . Insert | Letters, Classifieds . . . . . 4                    |

## Bullseye! Odyssey hits the mark

"Hundreds and hundreds of things had to go right, and they did. We are all excited about our success and I am proud of all the members of our team."

— Matt Landano,  
2001 Mars Odyssey project manager

Odyssey Deputy Project Manager Roger Gibbs, right, embraces Mission Manager David A. Spencer following successful Mars orbit insertion. At left is Bob Berry, Odyssey program manager at Lockheed Martin Astronautics.



Photo by Dutch Slagter / JPL Photolab

With a heroic effort led by JPL's 2001 Mars Odyssey team, the United States returned to Mars on the evening of Oct. 23 as the spacecraft fired its main engine at 7:26 p.m. Pacific time and was captured into orbit around the Red Planet.

At 7:55 p.m., flight controllers at the Deep Space Network station in Goldstone, Calif., and Canberra, Australia, picked up the first radio signal from the spacecraft as it emerged from behind Mars.

On Wednesday morning, flight controllers reported the spacecraft is in excellent health and is in a looping orbit around Mars of 18 hours and 36 minutes.

"Odyssey flawlessly achieved (Tuesday's) one-time critical event of Mars orbit insertion," said Project Manager Matt Landano. "Hundreds

and hundreds of things had to go right, and they did. We are all excited about our success and I am proud of all the members of our team."

The navigation proved to be equally precise. "We were aiming for a point 300 kilometers (186.5 miles) above Mars and we hit that point within one kilometer (.6 miles)," noted Bob Mase, the Mars Odyssey lead navigator at JPL. "Because of the excellent main engine burn, we will not need to do any more maneuvers to adjust the orbit before we begin aerobraking on (Oct. 26)."

Over the next three months, aerobraking will reduce the long elliptical orbit into a shorter, two-hour circular orbit of approximately 400 kilometers (about 250 miles) altitude.

On Wednesday, the team turned on the electronics for the gamma ray spectrometer subsystem and began taking data with the high-energy neutron detector and the neutron spectrometer instruments. These detectors may help scientists locate water near the surface of Mars, if it exists.

Scientists were scheduled to take the first picture with the thermal emission imaging system on Sunday, Oct. 28. That image is expected to be a wide-angle view of the southern hemisphere taken when Odyssey is farthest away from Mars. The primary science mission will begin in January 2002.

Landano thanked George Pace, the Odyssey project manager from the development of the mission through launch, "for providing us with an excellent spacecraft and an outstanding team."

Added Mase: "The navigation team was challenged to hit a bullseye for this mission. I'm pleased to report that's exactly what we were able to deliver.

"Over the last couple of months, with all of the world events, it's been hard for the team to not be distracted and be able to focus on the work it needs to do. But that's what we're trained and equipped to do. And I'm very proud as an American that we were able to do our part and bring a success to our country."

A number of NASA officials were on hand to share in the success. In addition to the agency's administrator, Daniel Goldin, those who visited mission control in Building 230 included Associate Administrator for Space Science Dr. Ed Weiler; Mars Program Director Orlando Figueroa; his predecessor, Dr. Scott Hubbard; and Dr. Jim Garvin, Mars program scientist.

Also, recently retired JPL Director Dr. Ed Stone and Caltech President Dr. David Baltimore dropped by to congratulate the flight team.

## Goldin says goodbye to JPLers

By Mark Whalen

Outgoing NASA Administrator Daniel Goldin addresses JPL staff in von Karman Auditorium on Oct. 24.

With his retirement coming up in less than a month, NASA Administrator Daniel Goldin paid a visit to JPL Tuesday evening, hoping to share in the excitement of a successful Mars Odyssey orbit insertion.

He got his wish in a big way. Wednesday morning, Goldin praised the efforts of the Odyssey team and also bid farewell to JPLers, acknowledging his ongoing challenges to JPL since he became administrator in 1992 and the Lab's positive response.

"You folks are unbelievable," he told the audience. "I'm tougher on JPL than on any organization I deal with because I think you're so good and you have such potential.

"In your lifetime, we're going to peer hundreds of light years into our galaxy, and if life is ubiquitous to this universe, you folks, based on the work here, are going to do it. Our society won't have to wait hundreds of years; they'll only have to wait decades to make this happen."

Goldin also praised the Lab's work in the area of active sensors, noting that "JPL will have a huge impact on the defense of the country. And as important as it is for the science that we do on our own planet, and in

exploring other planets, it's going to have huge impacts on the national defense.

He also praised the Lab's work in microwave sensing, thermal sensing and robotics.

Goldin related that when he first took over as director, someone at JPL asked him "if we take risks, are we going to get in trouble?" "I said, 'No. I'm in charge of NASA, and if failure occurs, it's my responsibility, not yours.'"

As he has so many times during his tenure in leading the agency, Goldin urged JPL to work on the cutting edge. "When you take risks and fail, you learn," he said. "JPL has proved to the people of the world that you're not afraid of taking risks, you're not afraid of failing—because in failure, you learn and you do better.

"You must hold your head high, and never succumb to the external pressures that live vicariously through you. Don't blame your peers, subordinates or bosses. Look inward and see what you've learned from that failure."



Photo by Enrico Piazza

JPL Director Dr. Charles Elachi thanked Goldin on behalf of the Laboratory for his vision, his integrity and for "giving JPL a hard time."

"Dan cares about us," Elachi said. "I would rather have somebody giving us a hard time because they cared than having a good time because they don't care."



# News Briefs

## Alexander honored by Women at Work

DR. CLAUDIA ALEXANDER of Earth and Planetary Atmospheres Element 3233 has been named a winner of the 2001 Medal of Excellence Award by Women At Work, a Pasadena-based non-profit job and career resource center.

Alexander is both project scientist and project manager for the United States component of the Rosetta mission, an international effort to study the nuclei of comets close-up, scheduled for launch in early 2003. "Her multiple roles reflect her abilities as a scientist and manager: her skill at negotiating with administrators at NASA Headquarters on behalf of science, at carrying the interests of the United States scientific contingent to colleagues at the European Space Agency, and at the nuts-and-bolts management of a space mission at JPL," noted Women At Work in its citation.

Added her supervisor, DR. RALPH KAHN: "Dr. Alexander's energy and enthusiasm extend to scientific outreach and education as well. She is one of the leaders of the University of Michigan's "Windows to the Universe" Web site (<http://www.windows.ucar.edu>), aimed at pre-college education in astronomy. On her own time, she is also writing a series of children's books to creatively promote science literacy in entertaining ways, a task that could only be realized by an accomplished scientist having superb ability as a communicator. Claudia's strength of personality, competence, and broad range of interests, make her an inspiration to us all."

Businesses throughout the Los Angeles area honor women employees through the Women at Work award. At JPL, nominations are submitted by the Director's Advisory Council for Women.



Dr. Claudia Alexander

## Halpern honored for air-sea research

DR. DAVID HALPERN, Senior Research Scientist and manager of the Earth Science and Technology Directorate's Climate Variability Program, has been elected a fellow of the American Association for the Advancement of Science. The honor is for Halpern's basic research in air-sea interactions in tropical oceans and for coordinating international efforts in measuring ocean surface quantities from satellites.

Halpern, who also is adjunct professor at UCLA's Department of Atmospheric Sciences, is a fellow of the American Geophysical Union, fellow of the American Meteorological Society, and honorary fellow of the California Academy of Sciences.



Dr. David Halpern

## Cassini's Grazier returns to alma mater

JPL's DR. KEVIN GRAZIER, investigation scientist and science-planning engineer for the Cassini-Huygens mission, returned to his undergraduate alma mater this month as keynote and honorary chairperson for the "Week of Champions" at Oakland University, Rochester, Mich.

Grazier also spoke to students in the university's physics and engineering departments. He is active in the Los Angeles area in teaching the public, particularly children, about space sciences, through programs of Griffith Observatory, the Challenger Center for Space Exploration, several colleges, and television and radio shows.

Grazier's research involves computer simulations of solar-system dynamics and evolution.

## Mars '03 logo contest underway

JPL employees, resident contractors, and members of the Mars Exploration Rovers community (science team members and subcontractors) are welcome to submit designs for a logo for the project. Collaboration with others is allowed, but each design must be submitted by a JPLer, resident contractor or member of the project community.

No prizes are offered except for the gratitude of the project and, of course, bragging rights.

Criteria include the design's appropriateness for the mission, appearance (enlarged and reduced size) and visual appeal. Format: an electronic version of the design is preferred, but any

medium is acceptable. Winning designs may be modified by the project and/or by JPL Graphics.

A background information sheet on the Mars Exploration Rover Project may be obtained by e-mailing your request to ANDREW MORRISON. Deadline for entries is Nov. 9. Include your full name, phone number, e-mail address and mail stop.

Electronic designs should be submitted to Morrison and include the name of the application used to create the design. Designs in other media should be submitted to either Morrison or CONNIE GENNARO at mail stop T1722.

## Radar studies may help oil industry

Radar images of the surface of an oil field are helping scientists understand how rocks deep within the field behave, which may help oil companies reduce costs and increase production.

Researchers are monitoring where and how much the ground surface sinks as oil is pumped from a large oil field.

In this pilot study, JPL geophysicist DR. ERIC FIELDING and DR. TADEUSZ PATZEK, associate professor of petroleum engineering at UC Berkeley, looked at Chevron's Lost Hills oil field, located about 40 miles northwest of Bakersfield. Parts of the oil field have subsided 3 meters (10 feet) since 1989.

The researchers compared radar images of the oil field taken during 1995, 1996, 1998 and 1999 using radar interferometry, which involves precisely aligning two radar images taken at different times. Scientists found that parts of the oil field were subsiding unusually rapidly, more than 3 centimeters (1.2 inches) a month, in 1995 and 1996. They also discovered that while the ground subsidence rate decreased in the center part of the oil field, it increased in the northern part in every year observed between 1995 and 1999.

## X-rays show scientists the way

A type of celestial object that has long stumped astronomers has been found to emit X-rays, thus proving a theory of how the objects form.

DR. STEVEN PRAVDO of JPL and other scientists have concluded that these objects, called Herbig Haro objects, are produced by high velocity shocks. Pravdo is the lead author of a paper published in the Oct. 18 issue of the journal Nature.

Herbig Haro objects are found in nebulae, regions of dust and gas clouds where new stars are forming. They form when high-velocity gas emitted from young stars collides with clouds of interstellar material.

Observations for the past 20 years showed no evidence of X-ray emission from these objects, which are named for astronomers George Herbig and Guillermo Haro. Previous instruments lacked the resolution and sensitivity necessary to "see" these X-rays. The discovery of the X-ray emissions was possible through the very powerful Advanced CCD Imaging Spectrometer on NASA's Chandra X-ray Observatory.

## Blood drive coming in November

The next JPL/Red Cross Blood Drive will be held in von Kármán Auditorium on Nov. 13 from 10 a.m. to 4 p.m. and Nov. 14 from 7 a.m. to 1 p.m.

Prior to the blood drive, sign-up sheets will be available at Occupational Health Services (Building 310-202) and online at [http://eis/medical/blood\\_form.html](http://eis/medical/blood_form.html).

Last-minute signups will be taken at von Kármán at your preferred time. Be prepared to wait a little longer if you do not have an appointment.

If you wish to change your appointment, call the Pasadena Red Cross at (626) 960-6956, ext. 224.

The Occupational Health Services Office and the Red Cross wish to thank everyone who participated in the Aug. 14-15 blood drive. Occupational Health Services said the Red Cross collected 206 pints of blood in two days and 618 lives will benefit from that collection.

The Red Cross is currently experiencing a critical shortage of all types of blood, especially O-negative, and their inventory continues to remain below desired levels.

# Special Events Calendar

## Ongoing Support Groups

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

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

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

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

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

## Monday, October 29

Caltech Ballroom Dance Club—A lindy hop class, taught by a professional instructor, will be held from 7:30 to 9 p.m. in Winnett Lounge, followed by a half-hour practice session. Cost: \$8 per lesson. Contact Megan Knight at [knight@its.caltech.edu](mailto:knight@its.caltech.edu).

## Tuesday, October 30

Ethics Training—A class is available to all personnel at 11:30 a.m. in von Kármán Auditorium. A list of training sessions is available at <http://hr/et>; search on word "Ethics." The one-hour session is offered monthly or can be arranged for group presentation by calling Martha Avina, ext. 4-3154.

## Wednesday, October 31

Caltech Ballroom Dance Club—A volunteer-taught cha-cha class will be held from 7:30 to 9 p.m. in Winnett Lounge, followed by a half-hour practice session. Cost: \$1 per lesson. Contact Megan Knight at [knight@its.caltech.edu](mailto:knight@its.caltech.edu).

## JPL Stories—

Tom Gavin, Associate Director, Flight Projects and Mission Success, will present "What Could Go Wrong? ... A Halloween

Story" at 4 p.m. in the Library, Building 111-104. Gavin will tell the tales of project managers' worst nightmares, how they survived and the lessons learned. For a copy of the flyer, see <http://beacon.jpl.nasa.gov/WhatsNew/Stories/Gavin.pdf>. For more information, call Teresa Bailey at ext. 4-9233.



## Thursday, November 1

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

## Friday November 2

Caltech Women's Club—A Welcoming Coffee will be offered from 9 to 10:30 a.m. at a member's home, 2167 E. Crescent Drive, Altadena. For more information, call Tema Halpern, (818) 952-6214.

## Saturday, November 3

Political Satire—Comedian Mark Russell will present *Patriotic Comedy* at 8 p.m. in Caltech's Beckman Auditorium. Tickets are \$35, \$31 and \$27 for adults; \$10 for high school age and under. Call (626) 395-4652.

## Sat., Nov. 3—Sun., Nov. 4

*The Notebook of Trigorin*—Tennessee Williams' adaptation of Chekov's The

Sea Gull will be presented by Theater Arts at Caltech at 2 p.m. in Dabney Lounge. Admission price is to be determined. For information, call (626) 395-4652.

## Sunday, November 4

Chamber Music—The Orion String Quartet will perform at 3:30 p.m. in Caltech's Beckman Auditorium. Tickets are \$27, \$23, \$19 and \$15. For information, call (626) 395-4652.

## Monday, November 5

Caltech Ballroom Dance Club—The first in a five-week series of professionally taught samba classes will be held from 7:30 to 9 p.m. in Winnett Lounge, followed by a half-hour practice session. Cost: \$35 for the series or \$8 per lesson. Contact Megan Knight at [knight@its.caltech.edu](mailto:knight@its.caltech.edu) or visit <http://www.its.caltech.edu/~ballroom>.

## Tuesday, November 6

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

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

## Wednesday, November 7

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

Caltech Ballroom Dance Club—The first in a five-week series of amateur-taught waltz classes will be held from 7:30 to 9 p.m. in Winnett Lounge, followed by a half-hour practice session. Cost: \$1 per lesson. Contact Megan Knight at [knight@its.caltech.edu](mailto:knight@its.caltech.edu) or visit <http://www.its.caltech.edu/~ballroom>.

## Friday, November 9

Folk Music—Chulrua (pronounced Cool-Roo'-Ah), an Irish trio specializing in old instrumental dance music of Ireland, will appear at 8 p.m. in Caltech's Winnett Lounge. Tickets are \$12 for adults and \$4 for children under 12. For more information, call (626) 395-4652 or check the Caltech Folk Music Society Web site at <http://www.cco.caltech.edu/~folkmusi>.

## Sat., Nov. 10—Sun., Nov. 11

*The Notebook of Trigorin*—Tennessee Williams' adaptation of Chekov's The Sea Gull will be presented by Theater Arts at Caltech at 2 p.m. in Dabney Lounge. Admission price is to be determined. Call (626) 395-4652.

## Monday, November 12

Caltech Management Association—JPL Deputy Director Eugene Tattini will present "An Illinois General in King Charles" Court: Perspectives on Technology Management" in von Kármán Auditorium at

4:45 p.m. Tattini will review past and current technology management practices of the Department of Defense, give his impression of the appropriateness of current NASA and JPL management practices, and compare JPL and Department of Defense practices. Tattini will also suggest areas in which he believes JPL management techniques could be improved. Admission is free. For Caltech Management Association membership (\$10 per year for JPL and Caltech personnel) information, call Priscilla Frascchetti at ext. 4-4964.





This year's JPL United Way Campaign is called "Neighbor to Neighbor, Heart to Heart." Executive Council member Blaine Baggett is the campaign chair. Universe spoke with Baggett about this year's drive.

**QUESTION** *We understand this year's campaign is going in a different direction. How so?*

We're trying some new approaches and being more aggressive in rolling out the campaign. We want to provide JPLers with the facts about what United Way is doing right here in our community. I'm convinced that if we provide the information, the giving will flow naturally.

**QUESTION** *What's the significance of the slogan 'Neighbor to Neighbor, Heart to Heart'?*

It's a great slogan, created by JPLers for JPLers. We wanted to emphasize the importance of JPL in this community. The JPL United Way campaign provides an opportunity to demonstrate that we are good neighbors. And for me, 'Heart to Heart' hints of the emotionally intrinsic values of giving.

**QUESTION** *How so?*

How does that great Lennon/McCartney line go? 'And in the end, the love you take, is equal to the love you make.' Learning how to give, in whatever form it takes, seems an essential part of all of our journeys. One small personal example: being the chair of the campaign requires giving of my time. In that time I've gotten to know wonderful people from all across the Lab who I otherwise might not have met for years. It's been time well spent. And already I've gotten back more than I have given.

**QUESTION** *How much do you expect the campaign to raise?*

The Lab has been fairly steady at raising about just under half a million dollars annually for the last seven years. That's impressive on one level. But inflation has been eating away at that figure. If you take inflation into consideration, we were not nearly as generous in 2000 as we were in 1993. We have to reverse this trend. We need to start thinking about 10% increases each year and every year.

Perhaps even more important is increasing the number of JPLers participating. In the early '90s, three out of four JPLers gave to the campaign. By 2000, that number has decreased to just one in two.

**QUESTION** *Any explanation for the decrease?*

We're not certain. I think it may have something to do with how people have been asked. In most cases I think it's simply because people haven't been asked. Or if they have been asked, they may have needed more information to make an informed decision. We hope to provide those facts this year.

What I'm certain of is that JPL is a generous and caring community of people. In fact, our first donation of the year has already come in—from a JPLer who works for the Deep Space Network in Australia. If a JPLer from 'down

under' can get us his contribution before the campaign even kicks off, I can't imagine any good excuse why we all can't take a few moments out of our busy professional lives to make a donation.

**QUESTION** *What reason would you give for participating in the campaign?*

If I had to choose just one, it's understanding that the United Way knows of the needs of our community better than any other single organization. And they can use that knowledge to move resources where they're needed most at any particular time. United Way/LA supports some 250 charities. Name a need; odds are United Way/LA is already there providing support. And if you prefer to designate your gift to a particular charity or need, United Way can accommodate that wish. All you have to do is note your charity by naming it on the one form you fill out. Then the amount can be automatically deducted from your paycheck. It's a simple procedure. And when your donation is spread out over an entire year, it's painless.

**QUESTION** *Is it possible to give funds to support the victims of Sept. 11th?*

Yes. United Way/LA has established a dedicated emergency response fund. I would encourage people who wish to give a donation to Sept. 11th to do so, and at the same time I would urge everyone to also set aside other funds to give back to our own community. There were tremendous needs in our backyard prior to Sept. 11, and those needs haven't gone away. Sept. 11 showed us powerful examples of courage and sacrifice for us to follow in our giving.

**QUESTION** *When does this year's campaign kick off?*

JPL's annual food drive is already underway. Last year, JPL employees and contractors donated enough food to help feed more than 1,000 families. We need items such as canned stew, pork and beans, soup, chili and dried foods such as cereal, coffee, flour and sugar. You can find food donation barrels placed throughout the Lab.

Of course, the annual kickoff celebration for the JPL's 2001-02 United Way campaign, "Neighbor to Neighbor, Heart to Heart," will take place Wednesday, Oct. 31 on the mall, in conjunction with the annual ERC Halloween Fashion Show. To help with the kickoff, and staying with the food drive theme, Caltech Dining Services will provide a \$6 lunch special, of which 50 cents per meal will be donated to United Way.

By the way, Halloween is a very special day for the Laboratory. The very first rocket experiment that led to the creation of the Lab occurred on Halloween back in 1936. So there are many reasons to

be festive on that day, including the fashion show.

**QUESTION** *Are you dressing up for the fashion show? And if so, as what?*

It's a time-honored tradition

for the JPL United Way chair to wear a costume—something they didn't tell me when I signed on, by the way. But I'm not telling what I'm wearing. You'll have to come out and join the fun.

**EDITOR'S NOTE:** For more information, go online to <http://hr/unitedway> or contact Nancy Kapell at ext. 4-9432 or Laurie Lincoln at 4-1612.



# Benefits enrollment ends Oct. 31

JPL's annual benefits enrollment period is now underway through Oct. 31. The Benefits Office urges employees to review their benefits and decide if changes are needed for the year to come.

Information packages sent to employees include a summary of benefit changes for 2002, new premium rates and plan comparisons. Also included are instructions on how to use the Web to verify your current benefit elections and submit desired changes. Review this information carefully. If you want to change your

benefits or enroll in a Health Care or Dependent (Day Care) Spending Account, you need to enroll through the Web. Your enrollment takes effect Jan. 1, 2002. Unless you want to make a change or have a spending account for 2002, you don't have to do anything.

Representatives from the Benefits Office and each health plan will be on Lab from 11:30 a.m. to 1:30 p.m. on Oct. 30 in the 303 cafeteria to answer individual questions.

For more information, call the Benefits Office at ext. 4-3760.

# United Way food drive underway



In conjunction with the Halloween kickoff of JPL's annual United Way campaign, a food drive is underway on Lab through Nov. 16.

Examples of needed items include canned meats, canned meals, canned fruits and vegetables, and packaged dry foods. Food and cash donations will be accepted at the kickoff celebration, to be held Oct. 31 at noon on the mall.

The following collection points have been set up for food donations:

Building 114 (ERC lobby); 180, 1st floor lobby, 2nd floor entrance; 183, 3rd floor lobby; 190 cafeteria; 198-105, Division Office; 230 guard desk; 238, lobby; 241-208, Travel Reservations; 301, 2nd floor; 302, lobby; 303, lobby; 306, lobby; 601, guard station.

## Letters

My family and I gratefully acknowledge with deepest appreciation the many kind expressions of sympathy on the passing of my father. I would like to thank my friends in Section 388 and 3239, TES, AAC, and ERC for the contributions made to the Relief Fund in his name, the beautiful flowers and plants, gifts, and words of comfort and support.

Reggie Sakurai

## Classifieds

### For Sale

ARMOIRE, antique English, dark wood, \$350 obo. 626/797-6824.

BEDROOM SET, girl's, white & pink wood, 7 matching pieces, stacking bunk beds, 5-drawer chest, desk, hutch, chair & 2 mattresses, vg cond., 1 owner, originally from Kid's Room, whole set \$450/obo. 790-9772.

BEDROOM SET, full size, adjustable iron frame, box, and mattress complete, exc. cond., \$200/obo; MATTRESS, queen-size, good cond., \$50. 353-0841.

CAMPGROUND MEMBERSHIP, Mountain Lakes Resorts in Lytle Creek, San Bernardino Mountains, only 1.5 hours from JPL, 2 lakes for fishing, pools, Jacz.; hiking, tent, motor home, or cabin camping; beautiful, close enough for a weekend, camp any time of the year as often as you want, pd. \$6,000 two years ago, sell \$5,000/obo. 626/358-1228.

CHAIR, recliner, mauve velvet, exc. cond., \$100/obo. 848-4541, Mary.

CHANDELIER, solid brass for hanging over dining room table, about 20-inch diameter, with five arms, each with bulb. 547-0705.

CHINA CABINET, 1950s Drexel mahogany, lelson@altavista.com for photo, \$600 cash and carry. 353-9367.

COOLERS, Coleman, two, large, good cond., \$15/ea.; BICYCLES, four, children's, \$15/ea.; SHOVELS, six, compact, squarepoint, \$5/ea.; FIREPLACE SCREEN, black, and accessories, \$50/all. 626/357-8210.

COUCH, Italian leather, brown, \$350; TAPE DECK, Sony duel, Dolby sound, \$50. 626/844-9228.

DINING ROOM TABLE and 6 matching chairs, Ikea Abo, upholstered chairs, solid patinated pine; 41" diameter, one 19" leaf; chairs 17.5" seat, 35" back; fair to good with table top scratches, couple of paint drips, easy to fix; see http://mow.ecn.purdue.edu/~stough/forsale.html; \$400/obo. 626/798-4265.

DOGGIE DOOR, for small to medium dog, fits 79" slider, exc. cond., \$75/obo; CURTAIN ROD, adjustable, includes hardware, 2.5" wide, extends approx. 78" to 140" long, exc. cond., \$15. 661/263-2216.

ENTERTAINMENT CENTER, holds 27"-30" TV; 4 adjustable shelves, glass front, VHS/CD storage; 5 ft. wide x 4 ft. tall x 20" deep; Ikea black modern; see http://mow.ecn.purdue.edu/~stough/forsale.html. \$150. 626/798-4265.

FOSSILS: great holiday present for a kid or kid-at-heart, reducing lg. collection that incl. several dinosaur tracks and many other fossils; photos at http://mow.ecn.purdue.edu/~stough/fossils.html. 626/798-4265.

FURNITURE: classic Chesterfield leather set sofa/chair/ottoman, burgundy, exc. cond., \$1,600. 805/490-0986 or wlerchner@hotmail.com.

GATE, wrought iron, painted black, 1.5 yr. old, 4-ft wide, 7-ft tall, curved top, with 9 inside vertical bars spaced 4", comes with standard lock, hinge bar and locking bar, \$80/obo. 626/791-6101.

HOCKEY TICKETS, Kings season ticket holders selling selected games, 2 exc. seats, \$95/both. 626/852-0821.

KEYBOARD for PC, new, standard, Dell, \$10. 547-0705.

LASER POINTER, brand new, high quality, 4 different pattern heads, key chain, hard case and three batteries, great in presentations for engineers, teachers, tour guides, and fun for kids and pets, perfect as a gift for almost any occasion, \$5. 661/257-4350.

MATTRESS, spring, for queen size sofa bed, never used, \$100/obo. 661/263-2216.

CAR RACE TICKETS, Marlboro 500, Nov. 4 in Fontana, 4 tickets, Section 76, Row 28, Seats 1, 2, 3, 4, face value price, \$85/per ticket. 626/284-1851.

MISC: baby monitor, \$12; car seat, 20-40 lbs, \$20; infant car seat, \$10; baby gym, \$5; security gates, \$5; crib mattress, \$20; all in exc. cond. 626/850-4378.

MOVING SALE: dining table, rectangular, temper glass top, smoke color, w/6 matching chairs, contemporary style, \$55; sofa/chair, matching, light color fabric, no stains, well maint., contemporary style, w/2 coffee tables, \$100; take all for \$200. 626/688-7334.

PLANTS, two purple Wisteria trees in 5-gal plastic pots, \$15/each/obo. 626/791-6101.

REFRIGERATOR, Amana, 22 cu. ft. side-by-side, white, exc. cond., \$250. 626/795-6538.

REFRIGERATOR, G.E., 18 cu. ft., white, top freezer, great cond., \$150. 661/263-2760.

SHOES, men's Hush Puppies, black, sz. 8 1/2, hardly worn, pd. \$59, sell \$39/obo. 626/351-0348.

SLIDE RULE, with case, collector's item, 4", Sun Hemme, about 1960 vintage. 790-5643.

SOFA, vg cond., blk. leather, \$100; SOFA BED, vg cond., \$100; COFFEE TABLE, mirror top, vg cond., \$40. 909/591-3312.

SPEAKERS, for home theater, Harman Kardon HKTS1, 5 satellites + 75W powered subwoofer, cables, brand new in box, \$200. 550-7555, Rob.

STAIR MACHINE, good cond., \$39. 626/793-9907, leave msg. for Dan.

TABLES: coffee, fair cond., and 2 end, gd. cond., cherry wood, \$50, dining rm., + 4 chairs, cherry wood, black, \$100; REFRIGERATORS (2), G.E., white, 15 years old, beige, 17 years old, side-by-side, \$100 ea.; SOFA/SLEEPER, makes into qn. size bed, abstract design, black, blue and mauve, good cond., \$300. 626/357-8210.

WASHING MACHINE, Magic Chef, white, 20 lb. capacity, 3 wash spd. combos (permanent press, cotton/linen, knit/delicate), 8 wash cycles, perf. cond., \$80. 626/688-7334.

WEDDING GOWN, Mori Lee designer, scalloped neckline, short capped sleeve, satin bodice overlaid w/lace and re-embroidered appliques, trimmed w/sequins, pearls, deep v-back meets satin bow at waist, no train, purch. late 2000, worn once, clean, size 12, fits 5" 8", http://www.morileeinc.com/catalog/C200155pix1.html, \$199/obo. 241-3779.

WHEELCHAIR, power, Everest & Jennings, exc. cond., easy-to-use joystick, foot rest, removable battery for travel. 626/798-0033.

WOODWORKING TOOLS: Dewalt radial arm saw, \$300; tabletop drill press, commercial grade, \$100; jointer/planer, \$100; table saw, \$100. 353-5671.

ZIP 100 DRIVE, w/USB adapter, includes 8 Zip disks, \$50/obo. 248-8139.

### Vehicles/Accessories

'98 BMW 540i, midnight blue with gray interior, 49K, 1 owner, fantastic condition, premium dealer package, fully loaded, a dream car, \$27,500/obo. 203-7999, Andy.

'97 BMW 740iL, white, loaded, all possible extras, orig. owner, exc. cond., \$29,500/obo. 360-6364.

'96 CHEVROLET Silverado ext. cab, excellent, \$1,500 below Kelly BB, 71K miles, lots of extras, home.earthlink.net/~elrey10 for photos and info, \$10,479. 909/482-4425.

'94 CHEVROLET Astro Van LT EXT, blue 2 tone, new tires, pwr. windows/locks, seats 8 with 6 reclining seats, looks and runs great, 118 k miles, one owner, great family van, \$5,500/obo. 953-7215.

'95 FORD Probe hatchback, black, 2 dr., a/c, p/s, am/fm stereo, cassette, cruise control, tilt wheel, dual airbags, 57,600 mi., new tires, brake pads and car cover, super clean, must sell, \$4,900/obo. 626/799-5368, eves. or weekend after 5 p.m., leave message.

'01 FORD Taurus LS plus, 4-dr. sedan, 16K mi., exc. cond., silver, loaded, incl. auto trans, a/c, keyless remote entry, am/fm stereo/cassette, 5-spoke alum. wheels, \$15,800. 909/623-7867 or 213/276-8755.

'86 FORD F150 XLT Lariat, extended cab, 107,000 miles, class 3 tow hitch, gd mechanical & interior cond., fuel injected, 305 V8, auto, a/c, SRW, CC, AM/FM/cass, \$3,000. 805/584-2721 or jcardone@simitnet.net.

'91 HONDA Accord LX wagon, 114K mi., well maintained, 1 owner, air, stereo-cassette, 1-year-old tires, replaced battery, \$5,000/obo. 626/840-0955, leave msg.

'88 HONDA Civic CRX Si hatchback, 2 dr., 4 cyl., 1.6 liter engine, 5 spd. manual trans., front wheel drive, 90,000 mi., air, am/fm cas-

sette stereo, alloy wheels, slide back roof, very good cond., \$3,500. 626/797-5149 or Nomor17@aol.com.

81 HONDA Gold Wing GL 1100 I motorcycle. 180K, fully equipped, includes helmet with speakers for intercom, extra custom leather seats, saddle bags and ferring, \$750/obo. 682-2392, lv. msg.

'90 MAZDA RX-7 convertible, 2 dr., white w/black top, blue leather, a/c, CD/tape/HIFI, dr. A/B, pwr. wind. glass rear window, sport wheels, RacingBeat exhaust, fast and fun, \$5,400. 841-4849 or hje@rocketship.com.

'88 MAZDA 323 SE, 2-dr. hatchback, red, 66K mi, 5-sp, a/c, am/fm, cassette, anti-theft, 1 owner, all records, good cond., \$1,800. 790-0801.

'90 MERCEDES 300 SE, exc. cond., 86K mi., 4 dr., black w/black leather, sun rf. cruise, new tires, \$11,995. 626/797-7589 or ljbuden@juno.com.

'90 NISSAN 240SX SE Fastback, red, 5-speed, flip-up/removable sunroof, power steering, tilt wheel, cruise, AM/FM stereo, single-owner, all records, 100K miles, good cond., \$3,500/obo. 323/467-4742.

'90 PONTIAC Transport van, 7 passenger, two-toned exterior, red with gray trim, gray interior, good running cond., drastically below wholesale blue book value, \$ 1,750. 626/850-4378.

'95 SUBARU Legacy L wagon, 4 dr., automatic, AWD, taupe exterior, 74K mi., a/c, power doors/windows, roof rack, am/fm radio/cass., alloy wheels, good cond., runs great, \$8,000/obo. 790-1099.

'94 TOYOTA Tercel DX sedan, 4 dr., auto., a/c, power steering, am/fm stereo, 120K mi., runs great, \$4,200. 626/445-3808.

'91 TOYOTA Celica ST, blue, good cond., one owner, 82K mi., 5 spd., a/c, \$4,800/obo. 323/255-8071.

'83 TOYOTA Celica GTS, white, hatchback, body/interior in good cond., 5 spd, 120K miles, one owner, maintenance records available, \$1,600. 353-3325.

'71 VOLKSWAGEN Bug, new eng., 1854 high performance, dual carburetor, new interior, 4 spd., 2,600 mi., am/fm & CD, light blue, runs, exc. cond., \$3,000. 626/213-0136.

'93 VOLVO 240 wagon, 82K mi., teal green metallic, automatic, air conditioning, am/fm/cassette, 3rd seat, roof rack, new brakes, great family car, Blue Book \$12,700, sell \$10,500. 626/791-4206.

### Wanted

DAILY AFTER-SCHOOL PICKUP, child care, homework study and light tutoring for La Canada 8th, 5th and 4th grader in family house. 790-8760.

CARPOOLER, Arcadia area, hours are 7:00 to 4:00, even if you are interested in only part time please call Shary DeVore, 4-1024.

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

VOLLEYBALL PLAYERS, coed, no beginners please, every Tuesday night 8-10 at Eagle Rock High School, \$3/night. 956-1744, Barbara.

### Free

COMPUTER, Mac 6100/80, 100mb RAM, 24-bit Nubus display card, modem, tablet, etc, no hard drive, 818/249-1337.

### Lost & Found

FOUND: handheld amateur radio, October 12, call to identify and claim. 3-7786, Marc.

### For Rent

ALTADENA, furn. bd. in home in quiet lush high cyn. area, kitchen/laundry privileges, no pets/no smoking, 10 min./JPL, \$400. 626/797-8082.

LA CANADA-FLINTRIDGE, separate, small room, w/bathroom, a/c partially furn., gated separate entr., temporary OK, close to JPL, very private, \$650. 790-1893, lv. msg.

LA CRESCENTA, charming Spanish house, 2 + 1, Briggs area above Foothill Blvd., tile floors, skylights, \$1,600. 249-0701.

LA CRESCENTA, spacious 1-bd., 1-ba., condo, above Foothill, 1-car garage, includes gas, central air & heat, dishwasher, stove, trash compactor, laundry room, 10 min. to JPL. 952-5626.

LA CRESCENTA, 1-bd. guesthouse, private entrance and parking, patio/garden, fridge, laundry, central a/c, full bath, quiet safe neighborhood, no smoking/pets, single person only, basic cable/utills. included, credit check, avail. Nov., \$695. 957-2173.

MONROVIA, 1-bd. guest house plus large bonus bldg. w/hookups; very private, clean and quiet; water, trash & gardener incl.; avail. Nov.1; \$650. 626/357-6955.

MONROVIA HILLS, in a single family house, 2 rooms with 2 separate bathrooms, share kitchen & laundry facilities, utilities, cable TV included, no smoking, no pets, 14 miles from JPL, \$475. 626/358-7728.

MONTROSE, 2 large bd., 2 full ba., town-home, 2-car garage, near JPL, drive by, 2735 Piedmont Ave, Montrose, \$1,200. 800/205-5009 X222 for application.

PASADENA, 1 bd., 1 ba., apartment, furnished, a/c, parking, newly refurbished, close to PCC and Caltech, \$895 plus utilities. 626/351-9641.

PASADENA, apartment to share, fully furnished, a/c, parking, patio, laundry facilities, no pets, \$575 plus utilities. 626/351-9641.

PASADENA, studio apartment, w/balcony, 2 blks. from PCC, new paint/carpet/blinds, off-street parking, no pets, avail. 11/12, utilities paid, \$500. 352-7484.

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

### Real Estate

MAMMOTH LAKES condo unit, 2 bd., 2 ba., exc. cond., newly redecorated & furnished, floor to beamed ceiling fireplace in liv. rm., balcony offers superb view of Mammoth Mtn., all elec. kitchen, desirable location in complex, close to Canyon Lodge, potential rental income. 249-8524.

PASADENA, executive condo next to Caltech, totally remodeled, 2 bd., + 1.75 ba., 1,200 sq. ft. newly refinished hardwood floors in dining room, newer appliances, carpet & paint, large balcony, just redone, overlooking beautiful trees, top floor unit in park-like setting, walk to Caltech & S. Lake Ave, nice pool and spa, \$259K. 626/585-9048.

SUNLAND house, 5 bd., 3 ba., custom built with den/office, fireplace in liv. rm., separate craft/laundry rm., updated kitchen with built-ins, copper plumbing, ceiling fans, 3 phone lines, 2600 sf, pool/spa, 2-car detached garage, on oversized lot, close to schools, mt. views, 15 min. to JPL, \$352,900. 949-5761, agent.

### Vacation Rentals

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

HAWAII, Kona, ocean front on Keauhou Bay, house & guest house comfortably slp. 6, 3 bd., 2 ba.; rustic, relaxing, beautiful; swimming, snorkeling, fishing; spect. view, nr. restaur., golf, other attractions. 626/584-9632.

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

MAMMOTH, Chamonix condo, at lifts 7, 8, 16, 17, walk to Warming Hut; 2 bd., 2 full ba., sleeps 6; newly refurbished, fully equipped elec. kitchen, w/microwave & extras, f/p and wood, color TV, cable, FM stereo, VCR, pool & sun areas, o/d Jacuzzi's, sauna; game, rec. & Indry rms., play & BBQ area; conv. to shops, lifts, hiking, special events, daily/weekly rates. 249-8524.

MAMMOTH, Courchevel, fully equipped unit, 2 bd., 2 ba., sleeps 6, short walk to Canyon Lodge and ski lifts. 661/255-7958.

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

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

OCEANSIDE condo, fully furnished 2 bd., 2 ba., fireplace, full kitchen, quiet, relaxing, beautiful setting at beachside, with barbeque, pool, spa, game room, great ocean view, easy walk to pier and restaurants, sleeps 6, available weekly or monthly. 909/981-7492, Darlene or dhauge@yahoo.com.

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

ROSARITO BEACH condo. 2 bd., 2 ba., ocean view, pool, tennis, well-eqpd. kit w/microw, beaut. furn. close to golf, bches, 17 Mile Dr., Aquarium, Cannery Row, JPL discont. 626/441-3265.

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