

55,000 jam Lab's open house



A record crowd of about 55,000 people attended JPL's annual open house June 5 and 6 and were treated to a variety of all that is JPL. Left photo shows some of the hundreds who lined up to enter before the gates opened Saturday. Among the dozens of exhibits were the current and future technologies showcased at the Mars Yard, below left; the "Build Your Own Spacecraft" activity for kids, below; and solar panels at the ground truth display, bottom.



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Special Events Calendar

Ongoing

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

Codependents Anonymous—Meeting at noon every Tuesday. For more information, call Occupational Health Services at ext. 4-3319.

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

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

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

Friday, June 11

Dodger Baseball—Last day to purchase tickets at the ERC for the June 22, 7:10 p.m. game between the Dodgers and the San Diego Padres (Cooler Bag Night). Tickets are \$13.

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

JPL Perl Users Group—Meeting at noon in Building 301-127.

Von Kármán Lecture Series—James Polk, supervisor of the Advanced Propulsion Technology Group, and Stephanie Leifer, advanced propulsion concepts program manager, will speak at 7 p.m. in The Forum at Pasadena City College, 1570 E. Colorado Blvd. Open to the public.

Saturday, June 12

Folk Music—John Wilcox and the Rincon Ramblers will perform bluegrass at their 8 p.m. concert in Caltech's Dabney Lounge. Tickets are \$12. For information, call (626) 395-4652.

Monday, June 14

"The Indian Subcontinent: A Report from the Nepal Himalaya"—Ted Clarke will present a slide show that outlines his trip through northern India, Kathmandu and the rugged Himalaya mountain range in Nepal. At noon in von Kármán Auditorium.

Tues., June 15–Wed., June 16

Investment Advice—A TIAA-CREF representative will be available for individual investment and retirement counseling. To schedule an appointment, call (800) 842-2007, ext.1045.

Wednesday, June 16

International Microwave Symposium & Exhibition—Conrad Foster, Section 333 group supervisor, will lecture at the Institute of Electrical and Electronic Engineers' International Microwave Symposium & Exhibition at the Anaheim Convention Center. His 2 p.m. talk on JPL's contributions to deep-space exploration is part of the June 13-18 symposium's technical program, called Southern California Historical Firsts in Microwave Systems. A one-day registration for talks and exhibits is available at the Convention Center at \$105 for members and \$150 for non-members. See <http://www.mtt.org/ims1999> for full details.

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

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

Thursday, June 17

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

Friday, June 18

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

Wine-Tasting Benefit—The Child Educational Center's annual fundraiser will be held from 7 to 11 p.m. at Caltech's Athenaeum. Also included are samplings of food from local restaurants and merchants, live music, gaming tables, and silent and live auctions. The event supports the non-profit CEC, which serves JPL and Caltech families as well as the general public. Tickets are \$20 and are available at the ERC as well as the CEC office at 140 Foothill Blvd., just west of La Cañada High School. For more information, call the CEC at ext. 4-3418.

Tuesday, June 22

Sharing International Data—Jeanne Holm of Section 174 will discuss the rules and tools available to help cut through the frustration and bureaucracy in working with international partners, including "virtual" meetings and sharing information. At noon in von Kármán

Auditorium.

Wednesday, June 23

Investment, Retirement Advice—A Fidelity representative will be available for individual investment and retirement counseling. To schedule an appointment, call (800) 642-7131.

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.

Thursday, June 24

ACW/ACMA Networking Social—To be held at 5 p.m. at McCormick & Schmick's restaurant, 111 N. Los Robles Ave., Pasadena. RSVP to Gail Watson-Ashe at ext. 4-2703. Sponsored by the Advisory Council for Women and the Advisory Council for Minority Affairs.

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 1½ hours. Meet at the Athenaeum front hall, 551 S. Hill, Pasadena. For information and reservations, call Susan Lee at (626) 395-6327.

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

Social Security—A representative will be available from 9 to 11 a.m. in the Building 167 cafeteria. Employees can request a personal earnings and benefits statement and ask general questions about Social Security benefits.

Friday, June 25

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

Heritage Week starts Monday

JPL's annual American Heritage Week will be held Monday, June 14 through Thursday, June 17.

Entertainment and guest speakers representing a variety of ethnic groups will be featured each day starting at 11:30 a.m. in the mall. On Thursday, the popular International Cuisine Night will be held, with free food tasting beginning at 4:45 p.m. Family & friends are welcome to this portion of the event. □

QuickScat launch set for next week

Satellite to provide daily snapshots of ocean winds, greatly improve weather forecasting

By DIANE AINSWORTH

Built in record time in just 12 months, the Quick Scatterometer, or QuickScat, JPL's new ocean-observing satellite, will be launched on a Titan II rocket from California's Vandenberg Air Force Base at 7:15 p.m. Pacific Daylight Time on June 18. This satellite will be NASA's next "El Niño watcher" and will be used to better understand global weather abnormalities.

QuickScat will provide climatologists, meteorologists and oceanographers with daily, detailed snapshots of ocean winds as they swirl above the world's oceans. The mission will greatly improve weather forecasting.

QuickScat Project Manager Jim Graf of JPL said the project team's accomplishment of getting the spacecraft ready to fly one year after initial approval "signifies a new way of doing business for NASA." He praised the teamwork between JPL and the Goddard Space Flight Center, which managed the development of the satellite, and also lauded Ball Aerospace & Technologies Corp. of Boulder, Colo., which designed and built QuickScat.

Winds play a major role in every aspect of weather on Earth. They directly affect the turbulent exchanges of heat, moisture and greenhouse gases between Earth's atmosphere and the ocean. To better understand their impact on oceans and improve weather forecasting, the satellite carries a state-of-the-art radar instrument called a scatterometer for a two-year science mission.

"Knowledge about which way the wind blows and how hard it is blowing may seem simple, but this kind of information is actually a critical tool in improved weather forecasting, early storm detection and identifying subtle

changes in global climate," said Dr. Ghassem Asrar, associate administrator of NASA's Office of Earth Science.

The mission will help Earth scientists determine the location, structure and strength of severe marine storms—hurricanes in the Atlantic, typhoons near Asia and mid-latitude cyclones worldwide—which are among the most destructive of all natural phenomena. The National Oceanic and Atmospheric Administration (NOAA), a chief partner in the QuickScat mission, will use mission data for improved weather forecasting and storm warning, helping forecasters to more accurately determine the paths and intensities of tropical storms and hurricanes.

QuickScat will also be used to better understand global El Niño and La Niña weather abnormalities. Changes in the winds over the equatorial Pacific Ocean are a key component of the El Niño/La Niña phenomenon. QuickScat will be able to track changes in the trade winds along the equator.

SeaWinds, a JPL-built, 200-kilogram (450-pound) radar instrument onboard QuickScat, will provide ocean wind coverage to an international team of climate specialists, oceanographers and meteorologists interested in discovering the secrets of climate patterns and improving the speed with which emergency preparedness agencies can respond to fast-moving weather fronts, floods, hurricanes, tsunamis and other natural disasters.

Scatterometers operate by transmitting high-frequency microwave pulses to the ocean surface and measuring the "backscattered" or echoed radar pulses bounced back to the satellite. The instrument senses ripples caused by winds near the ocean's surface, from which scientists can compute the winds' speed and direction. The instruments can acquire hundreds of

times more observations of surface wind velocity each day than can ships and buoys, and are the only remote-sensing systems able to provide continuous, accurate and high-resolution measurements of both wind speeds and direction regardless of weather conditions.

Fifteen times a day, the satellite will beam down collected science data to NASA ground stations, which will relay them to scientists and weather forecasters.

By combining QuickScat's wind data with information on ocean height from another ocean-observing satellite, the joint NASA-French TOPEX/Poseidon mission, which is also managed by JPL, scientists will be able to obtain a more complete, near-real-time look at wind patterns and their effects on ocean waves and currents, said Dr. Timothy Liu, QuickScat project scientist at JPL. He added that QuickScat will complement data being collected by other Earth-monitoring satellites such as NASA's currently orbiting Tropical Rain Measurement Mission (TRMM) and Terra, which will be launched later this year.

The 870-kilogram (1,910-pound) QuickScat satellite will be placed in a circular, near-polar orbit with a ground speed of 6.6 kilometers per second (14,750 mph). The satellite will circle Earth every 101 minutes at an altitude of 800 kilometers (500 miles).

The satellite is the first obtained under NASA's Indefinite Delivery/Indefinite Quantity program for rapid delivery of satellite core systems. The procurement method provides NASA with a faster, better and cheaper method for the purchase of satellite systems through a "catalog," allowing for shorter turnaround time from mission conception to launch. Total mission cost for QuickScat is \$93 million. □

Astronomers find sun's coolest neighbors

By JANE PLATT

A pair of near-infrared telescopes sponsored by NASA and the National Science Foundation has detected the coolest brown dwarfs ever seen—celestial objects that are neither fish nor fowl, or in this case, neither planet nor star.

Brown dwarfs are often thought of as "stellar wannabes." They are failed stars that never got hot enough to ignite the nuclear fusion process that makes stars shine brightly. On the other hand, they tend to be more massive than planets and do not form around a star, as the planets in our solar system did.

"These latest discoveries are merging the fields of stellar astronomy and planetary science," said Adam Burgasser, a physics graduate student at Caltech. He is leading the hunt for these objects along with Dr. Davy Kirkpatrick, senior staff scientist at the JPL/Caltech Infrared Processing and Analysis Center.

After sorting through millions of celestial

objects, Burgasser discovered four brown dwarfs in images taken by a pair of 1.3-meter (51-inch) telescopes near Tucson, Ariz., and at Cerro Tololo, Chile. The telescopes, used for the Two-Micron All Sky Survey (2MASS), study near-infrared wavelengths that can't be seen by the naked eye. They sense heat and thus detect heat-emitting objects like stars and galaxies normally hidden by curtains of cold dust. In this case, the brown dwarfs are too cold to be seen in visible wavelengths, but 2MASS was able to detect the small amounts of heat they emit.

Armed with this information, Caltech assistant professor of planetary astronomy Michael Brown studied the objects using the Keck Telescope atop Mauna Kea, Hawaii, to look for the presence of methane, a telltale chemical fingerprint of very cool brown dwarfs.

"Methane forms only in objects cooler than 900 degrees Celsius (1,652 Fahrenheit)," Burgasser said. "That's only four times hotter than the maximum setting on a conventional

kitchen oven."

"We think these brown dwarfs are only 30 light years away," said Kirkpatrick. "Because our telescopes can only see the closest examples, this means the Milky Way must be brimming with objects like these." The newly discovered brown dwarfs are located in the constellations of Ursa Major (the Big Dipper), Leo, Virgo and Corvus.

The 2MASS telescopes are in the midst of a 3½-year survey of the entire sky. The survey is designed to catalog 1 million galaxies, 300 million stars, and other celestial objects throughout our Milky Way galaxy. The 2MASS telescopes actually discovered five methane brown dwarfs, but one of them had been found previously by the Sloan Digital Sky Survey, also supported by NASA and the National Science Foundation.

The 2MASS project is based at the University of Massachusetts, Amherst, where its principal investigator, Dr. Michael

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Thanks from a royal visitor



BOB BROWN / JPL PHOTO LAB

Norway's Crown Prince Haakon thanks JPL Director Dr. Edward Stone following Stone's presentation of a gift of a satellite image of the San Francisco Bay area, as seen from JPL's Shuttle Imaging Radar. The crown prince began a two-week U.S. goodwill tour June 13 with a stop at JPL, where he visited the von Kármán museum and the Space Flight Operations Facility. Crown Prince Haakon is particularly interested in the Bay area, because last month he received his bachelor's degree in political science from the University of California, Berkeley. Haakon, 25, represents the fourth generation of the Norwegian royal family.

Ground broken for optical telescope at Table Mountain

JPL has begun the development of optical communications capability for future deep-space mission support with the dedication of a new telescope laboratory at the Table Mountain Observatory near Wrightwood.

A ground-breaking ceremony was held May 28 for the new Optical Communications Telescope Laboratory, which signals NASA's expansion of its telecommunications capability to optical frequencies, according to Dr. Keith Wilson of the Optical Communications Group in the Communications Systems And Research Section 331.

"As NASA aggressively pursues its solar system exploration strategy, telecommunications support of smaller spacecraft with more sophisticated instruments will require the Deep Space Network to operate at higher frequencies and higher data rates," said Wilson, the new laboratory's telecommunications systems engineer. "Optical communications is a rapidly evolving telecommunications technology that supports high data rate communications in a small, low-power consumption and low-mass telecommunications package."

The laboratory will house a 1-meter optical telescope that will support simultaneous transmission and reception with spacecraft from low-Earth orbit to deep-space ranges. "As an research and development facility, the Optical Communications Telescope Laboratory will allow JPL's optical communications engineers to perform experiments to answer key questions and develop strategies that can be implemented in future operational optical communications stations," Wilson said.

Dr. Laif Swanson, program manager for the Telecommunications and Mission Operations Directorate's Data Technology Office, which is funding the telescope lab's development, said, "This telescope will serve for optical frequencies the same way an antenna serves for radio frequencies."

She added that two previous optical communications experiments have been conducted at Table Mountain. The Galileo Optical



TOM WYNNE / JPL PHOTO LAB

Dan Sidwell, left, retired site manager at the Table Mountain Observatory, joins Dr. Keith Wilson, the new optical telescope facility's telecommunications systems engineer, in a ground-breaking ceremony. Looking on are Section 331 manager Joe Yuen, second from right, and Hamid Hemmati, supervisor of the Optical Communications Group.

Experiment (GOPEX) successfully transmitted laser beams to Galileo at distances up to 6 million kilometers (3.7 million miles) in December 1992 as the spacecraft flew by Earth. Also, a December 1995 experiment uplinked laser beams from Table Mountain's 60-centimeter (24-inch) telescope up to Japan's Engineering Test Satellite VI. The second

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“ All the changes—the customer’s different expectations, rethinking the kind of missions we fly, the reduction in the size of our staff, and asking our people to change how they do their work—it’s all been a lot to ask. But JPLers are known for getting the job done.

” A year from now, when people have learned to do the job in a new way, they will find the new way is often easier and provides more flexibility than the old system provided. It’s just getting to understand how to use the new system, and it takes time to do that.

Lab’s mission: best in business

To keep pace with JPL’s challenging workload in the current era of smaller, less expensive and more frequent space missions, the Laboratory is undergoing a reorganization of its administrative support systems.

It’s all part of JPL’s commitment to be a “best-practices” organization—to be as strong on the business side as it has traditionally been in building spacecraft and in its other technical work. In one of an ongoing number of articles about change at JPL, Associate Director Kirk Dawson answers *Universe’s* questions about the implementation of New Business Systems automated business applications.

Question: *What is the history behind the reorganization of JPL’s business processes?*

Answer: In earlier years, during the Cold War, how we did the work and even how much it cost didn’t matter as much as today. That began changing in the early 1990s. As the Cold War wound down, Congress heightened its interest in how national labs were managed. Since that time, on the business side, there is now increased interest in how taxpayers’ money is being spent. For JPL, that meant examining our business systems and moving toward best business practices.

Why has JPL reduced its work force in recent years when we actually have more projects than ever before?

Part of all the changes taking place included looking at the size of our work force. Earlier this decade, the Laboratory staff totaled about 7,600 work-years for employees and accountable contractors. It was clear, given NASA’s funding picture, that JPL would have to become a smaller organization. And that’s exactly what happened. Ultimately, in fiscal year 1995, as a result of NASA’s zero-base review, the Lab set 4,782 work-years as a downsizing target. This was later adjusted to 5,000 work-years for fiscal year 2000.

But reducing the size of the staff while taking on more projects was not an easy thing to do. We had to do more than adopt the slogan, “Faster, Better, Cheaper.” We had to live it. We had to turn those words into not only action, but we had to change how we think about our work. It meant getting smarter and more efficient.

We focused first on making sure we had the core staff for the programmatic, engineering and scientific skills so indispensable to our mis-

sions. Then we looked to outsourcing activities to contractors; more of the business side of the Lab. The outsourced work included facilities maintenance and operations, reproduction and printing, security, and desktop computing and network services. In addition, it was decided that the Laboratory ought to team with contractors more on programmatic work. A good example is Lockheed Martin Astronautics’ work with our Mars Program.

The good news is that we are almost to our target staffing number of 5,000. So the pain of downsizing is pretty much behind us now.

(Editor’s note: A work-year is equivalent to the work of one full-time employee for one year. It may, however, be used to combine the work of part-time staff; e.g., two half-time employees working a full year is equal to one work-year.)

How exactly has the Laboratory prepared itself for managing more missions, with quicker turnaround, with less staff?

It’s happened because of the incredible dedication and hard work of our employees. Nothing gets done without them. But beyond that, we’ve also worked hard at providing ways to help everyone cope—and get on top of—all the changes. For instance, we introduced initiatives such as Total Quality Management—which stressed strategic planning, customer focus, process improvements and employee empowerment. All these were powerful attitudes we had to embrace wholeheartedly if we were going to be successful.

All this sounds good, but it hasn’t always been easy putting it into practice. All the changes—the customer’s different expectations, rethinking the kind of missions we fly, the reduction in the size of our staff, and asking our people to change their habits about how they do their work—it’s all been a lot to ask. But JPLers are known for getting the job done. And that’s exactly what they’ve done.

So where does NBS fit into all these changes?

In the midst of all these other changes, the Lab realized it also needed to redo its business systems. Our software came from the early 1980s; one way of saying it is that it was just about obsolete. Neither was it Y2K compliant. So it really was about to be obsolete.

We put together a plan for a three-year effort to reexamine our business processes, make them more reliable and efficient, and implement those



Kirk Dawson

processes using proven commercial software systems. The Lab, through a competitive process, selected Oracle, which teamed with Ernst & Young, a consulting firm, to provide the business software. This development was named New Business Solutions (NBS).

In mid-1998, NBS first rolled out online timekeeping, followed by finance and asset management. In January of this year, human resources and payroll systems were deployed.

You’ve had problems with the rollout. What’s caused that?

You’re right. There’s no doubt we’ve had our share of problems. But that’s not unexpected when rolling out such a massive and complex process. It’s not uncommon for a transition like this to require six to nine months. And that’s what we’ve been going through. What’s made it tougher, though, is that all this has occurred while we were transitioning to a new NASA contract.

What kinds of problems have there been?

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NASA, cancer institute sponsor biotech workshop

If NASA is involved in the search for life, shouldn't it have working alliances with life sciences institutions? Can future spacecraft be modeled after life forms, being born and growing in remote corners of the solar system? Can the search for the cure for cancer be accelerated through new applications of space program technologies?

These and other such thought-provoking questions were the topic at the first NASA/National Cancer Institute (NCI) workshop on Sensors for Bio-Molecular Signatures, held June 4-6 at the Doubletree Hotel in Pasadena. The workshop was organized jointly by JPL's Center for Integrated Space Microsystems (CISM) and NCI.

JPL and Caltech scientists

were among many other scientists who presented the wide variety of themes at the program, which included recognition of biomolecular signatures, molecular imaging and signal amplification, nanosystems and bio-informatics.

The subject matter of the workshop, said Dr. Leon Alkalai, CISM manager and coordinator of the event, will lead to a new technology focus for NASA and NCI that will combine expertise in bio-molecular nanotechnology, nano electro-mechanical systems, molecular electronics, nanorobotics, integrated and distributed nano-sensor systems, and end-to-end systems engineering toward solving important biological and medical challenges. □



TOM WYNNNE / JPL PHOTO LAB

Joining JPL Director Dr. Edward Stone, left, at the NASA/National Cancer Institute workshop were, from left, NASA Administrator Daniel Goldin; Caltech President Dr. David Baltimore; NCI Director Richard Klausner; Dr. Carol Dahl, Director, Office of Technology and Industrial Relations, NCI; and Dr. Leon Alkalai, manager of JPL's Center for Integrated Space Microsystems.

Goldin awards honors for Lab leadership

As part of his June 2 visit to Pasadena, NASA Administrator Daniel Goldin made a special Honor Awards presentation for leadership recognition at JPL.

John Casani, JPL's chief engineer, received the agency's Exceptional Achievement Medal for organizing and leading the Lab's successful ISO 9001 certification campaign, culminating his career of shaping and implementing the Mariner, Voyager, Galileo and Cassini-Huygens spacecraft. The medal honors "significant, specific accomplishment or contribution clearly characterized by a substantial and significant in operations, efficiency, service, financial savings, science or technology that

contributes to the NASA mission."

Receiving the Outstanding Leadership Medal, awarded for "notably outstanding leadership that has had a pronounced effect on NASA technical or administrative programs," were Stardust Project Manager Dr. Kenneth Atkins, Deep Space One Project Manager David Lehman and Mars '98 Climate Orbiter and Polar Lander Project Manager Dr. John McNamee.

The Distinguished Service Medal, the highest honor that NASA confers, was awarded to Space and Earth Sciences Director Dr. Charles Elachi for his management of SESP and his vision and leadership in new Mars architecture. The honor also went to Norm Haynes for

his excellent systems engineering, mission design and project management contributions to JPL flight pro-

jects and his leadership of the Telecommunications and Mission Operations Directorate and the Mars Exploration Directorate. □

2MASS

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Skrutskie, is a physics and astronomy professor. The JPL/Caltech Infrared Processing and Analysis Center combines and processes 2MASS images into usable data.

As part of NASA's Origins Program, which is managed by JPL, 2MASS is funded by NASA's Office of Space Science and the National

Science Foundation. Results from 2MASS will benefit future Origins missions, including Space Infrared Telescope Facility and the Next Generation Space Telescope.

The current images, and additional 2MASS information and images, are available online at <http://www.ipac.caltech.edu/2mass>. 2MASS information and images are also available at <http://pegasus.phast.umass.edu>. □

Security, Health Services to move

The Security and Protective Services Office, Section 665, will be the first to occupy the new Building 310, located on Surveyor Road between Explorer and Sergeant Roads.

On June 19 and 20, Section 665 services that will move from Building 180 to Building 310 are Investigations, Emergency Preparedness, Special Programs, Locks and Keys, Badging, Central Document Control, Parking and Rideshare.

The Security entrance will be at the east end of the building.

In addition, the Occupational Health Services Office will move

from its current location in Building 263 to Building 310 and will begin occupation June 28. The offices will be located on the second floor, with entrance from Aero Road.

Occupational Health Services, which includes the Employee Assistance Program, will continue its current hours of operation of 7:30 a.m. to 4:15 p.m.

The JPL Fire Department and the Wackenhut guard force will move into the new facility sometime in July.

Building 310 is located at the former site of the Mars Yard and Building 72. □

News Briefs

NASA is currently accepting applications for mission specialist and pilot astronaut candidates to join the agency as it enters the era of the international space station. The deadline to submit an application is July 1, 1999.

An application package may be obtained by contacting the Astronaut Selection Office at (281) 483-5907, or writing to Johnson Space Center, Astronaut Selection Office, mail code AHX, Houston, TX, 77058-3696. Additional information on selection criteria and application forms is available online through the Astronaut Selection Office web site at <http://www.jsc.nasa.gov/ah/jscjobs/aso/ascan.htm>.

Applications received after the

July 1 cut-off date will not be considered for this selection cycle but will be considered for future selection cycles. □

JPL Ombudsperson **Lewis Redding** served as one of five panelists for a session titled "Ethical Dilemmas for Ombuds" at the Ombudsman Association's 1999 annual conference in Phoenix May 21-24. At the same conference, he also facilitated a roundtable discussion called "Adding Value: New Ideas for Ombuds Programs."

This fall, Redding will serve as registrar for the 1999 California Caucus of College and University Ombuds annual conference in Pacific Grove, Calif. □

NBS

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Have other problems arisen, and have they been solved?

Because of some of the bugs in the new systems in the first few months of this year, there was some difficulty paying our vendors on time. We have worked aggressively to fix that and are essentially caught up. Along with that, the Laboratory borrowed some cash from Caltech to help pay the vendors. Much of that loan has now been repaid. During this time, the systems for timekeeping, asset management and payroll have worked relatively well.

What other steps have been taken to help the Lab in the transition?

Carolyn Stevens has established the Project Resource Administration Office, Division 25, as an institutional home for project resource administrators supporting programs and projects throughout the Lab. They report administratively to her, and I think this setup will go a long way toward establishing a "professional cadre" for those who have these administrative responsibilities on Lab.

What is next in the NBS implementation?

When we stabilize NBS and Oracle so they are working well, we will then proceed with Oracle's next release, called release 11, which will have a lot more web interfaces and capabilities. It's more user-friendly, especially for Human Resources.

When is this scheduled for release?

It will happen during the calen-

dar year 2000, when Oracle stops supporting their current release. The system will be visible to employees in the last quarter of 2000.

What other challenges are involved in the transition to JPL's new business systems?

The transition is not just technical—getting the software installed and the databases switched over and turned on. Relearning the way you do work in a system is, well, a lot of work.

A lot of people in all the affected functional areas—acquisition, asset management, finance, payroll and HR—have to learn to do their job differently, but a lot of the general users have to learn the new system as well.

But a year from now, when people have learned to do the job in a new way, they will find the new way is often easier and provides more flexibility than the old system provided. It's just getting to understand how to use the new system, and it takes time to do that.

We're not going through anything that many other companies haven't gone through. But they survived and ended up with a much more capable and modern system.

We really didn't have an option. We had to change from the old system, which was not a relational database system, wasn't serving our projects well and wasn't Y2K compliant. We had to move on to this new technology.

Why has there been a staff reduction in Institutional Business Systems (IBS), which manages JPL's Oracle New Business Systems?

NBS and IBS have been merged.

Now that a major part of NBS development has been completed and we have transitioned to operations in IBS, there's a natural reduction in staff when you combine the two organizations. We're no longer supporting "legacy" systems through a mainframe computer.

All of the new systems have been programmed, and the processes have been defined and integrated into the Oracle system. Now that we have the systems up and running, the debugging of the systems doesn't take up as many resources.

How can there be downsizing in one area of the Lab and hiring in other areas?

There will always be skill-mix changes, where you don't need as many people with certain skills, while having the need for different skills in other areas.

Is there a system to help displaced employees find new jobs on Lab?

Yes. The Lab's Personnel Development Committee, chaired by Ron Ploszaj, represents all divisions on Lab. One of the committee's functions is to see that there is visibility for people whose skills are no longer needed in one area so that they can be picked by another organization or project on Lab, if a project needs that talent. There is movement among organizations as they wind down the need for certain skills and build up others. That's just a natural evolution within our organization. Resumes of those who are available after ending their work on a project are identified and circulated by the committee; that's the mechanism for making sure that no one goes unnoticed.

If anyone has concerns or comments, whom should they contact?

Employees may contact Marc Montgomery, the IBS program manager, at ext. 3-4864. □

Telescope

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demonstration also included the first space-to-ground communication by laser, as the satellite beamed signals back to another telescope at Table Mountain.

Those two demonstrations, Swanson said, were conducted from existing telescopes, whereas the new Table Mountain Facility will have a permanent optical telecommunications presence.

Optical Communications Group Supervisor Dr. Hamid Hemmati said that optical communications has been identified as a key tech-

nology slated for development in the X-2000 program roadmap.

The laboratory will be the primary ground receiver for a planned space-to-ground optical communications demonstration with the international space station in 2003. Dr. John Sandusky, task leader for the demonstration, said that the optical link will be used to demonstrate space-to-ground transmission at data rates up to 2.5 Gbps.

Dr. Nasser Golshan, task manager for the Optical Communications Telescope Laboratory, said that a contract award is expected by the end of this month with delivery and installation at the facility by year-end 2000. □

LETTERS

I would like to express my sincere thanks and appreciation to my fellow JPL friends for their support in the recent passing of my mother. The cards and flowers were a surprise and very helpful. Thank you all for your thoughtfulness.

□□□

Kermit Pederson

The family of Mrs. Patricia Gail Edwards sincerely wishes to thank all of you for your warm, sympathetic thoughts and every attentive moment during her illness and demise. I do wish to thank you for your patience and understanding. I will really need this now and in the future. Some of you were personally acquainted with "Pattie," since was a former employee. Again, your sincere thoughts and deeds are appreciated.

Dr. Gregor Q. Edwards

FOR SALE

AUDIO EQUIPMENT, (B&O) turntable/CD/cassette/ speakers/receiver, \$450; FUTON MATTRESSES (2), \$25/each; VCR, Magnavox 4 head stereo, \$100. 626/294-1927.

BABY ITEMS: cradle with mattress, \$40; baby exersaucer, \$35; assorted baby and toddler clothes and shoes; all in good condition. 626/798-6249.

BASEBALL/FOOTBALL CARDS, 200 assorted, inserts, stars, rookies; specify favorite team or players to be included, \$20/ea.; BEANIE BABIES, '99 McDonald's, full sets of 12 in packages. 626/914-6083.

BURIAL LOTS (2), Glendale Forest Lawn, "Vale of Faith," prime location (no remaining lots available), moving to be near grandchildren, \$3,000 each. 248-7945.

CAMERA, Kodak DC260 digital, brand new, never been used, still in box; up to 1536 x 1024 pixel resolution, 3x zoom lens, 3 shot modes (still, burst, time-lapse), audio notation recording, includes 8 MB memory card, too many other features to list; worth \$800, sell \$625. 323/667-1960, Zack Stromberg or 626/932-3269, pgr.

CHINA (fine), 12 place settings plus numerous serving pieces, June Bride pattern, beautiful, must see to appreciate, \$300. 626/791-7645.

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

COMPUTER, Intel Pentium, 133 MHz, 16 MB RAM, 1.7 GB HDD, IDE CD-ROM, 16-bits sound blaster, 60W speakers, MID tower case, DS PCI 2 MB video, 15" monitor, 2.5 yrs. old, \$1,000. 626/356-0697.

COMPUTER POWER CONTROL CENTER, 5 power switches + 1 master switch, 5 surge-protected outlets + 2 modem/fax/phone jacks, new, \$20. 790-3899.

CROCK POT square by Rival with Corningware, \$13/obo. 626/568-8298.

DESK, pecan, 54" long, traditional styling, \$100. 248-9561.

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

DINING ROOM SET, Henredon St. Moritz, 74" x 46" table with two 22" leaves, 6 chairs, custom table pads, vg cond., \$995. 626/798-2531.

DINING SET, unique 1920s art deco, 6 chairs & mirror to match, \$1,500. 805/553-9443.

DRYER, Kenmore electric, top model, gd. cond. 626/358-2134.

EXERCISE EQUIPMENT: stationary bike, vg cond., \$50; stair stepper, gd. cond., \$10. 626/345-0079.

EXERCISE EQUIPMENT, Step 2 Slide unit, \$85. 626/643-5553.

FURNITURE, 6 mo. old, 2 beds, twin size, wooden, complete w/mattress, \$150/ea.; 2 chairs, wooden, \$10/ea.; refrigerator, very small, \$100; older but in gd. condition: sofa, \$80. 662-9597.

FURNITURE: dining table (48" x 30" x 29"), wood, plus 4 matching chairs, like new, \$80; futon bed/couch (queen), wood, exc. cond., \$80; floor lamp (black), \$5; 2 table lamps, like new, \$3 each. 626/397-7029.

FURNITURE: sectional couch, beige background, well cared, 2 wood end tables w/glass top, lamp and sofa sleeper, all exc. cond., \$350/obo. 909/593-5838.

GAZEBO, Cal Spas, redwood framing, includes bar w/4 stools, 4 redwood planters, table w/4 chairs (Cal Spas furniture), \$600. 626/444-6156, Bob & Annie.

METEORITES, CV3 carbonaceous chondrite, allende, 30-gram whole stone, 24.5-gram end slice, polished, both @ \$10/gram. 626/798-8777, Paul.

MISCELLANEOUS: stereo cabinet, Kenwood, small, dark, wood-grained, glass door, \$30; queen-sz. mattress & box spring, \$75; queen-sz. box spring, \$40. 626/358-0443.

MONITOR, Magnavox 14" color for Macintosh, great resolution/contrast, yrs. left, \$50. 626/441-8572.

MOVING SALE, near-new: queen-size futon and frame (black), \$150; two torcheres lamps (6' tall, black), \$20 each/obo; foldable

Continued on page 8

chair, \$15. 626/564-1225, Francois.

MOVING SALE: table-top grill, wok, telephone, dishes, glasses, beach chairs, between \$3 and \$8. 626/397-7029.

ORGAN, Yamaha 415 electronic console w/13 pedals, 3 keyboards, 144 rhythm patterns, pd. \$7500, sac. for \$3,000. 790-3899.

PHOTOGRAPHS, 40" x 30", color, framed; 2 tall-ship pics by professional photog., vg cond., 1 of Span. ship in SF bay, 1 of German ship nr Puerto Rico, \$70/ea, \$120/both/obo. 626/568-8298.

PIANO, great for student, upright oak wood, with bench that has music storage, \$1,250. 957-7554, Bob.

PICTURE FRAMES, 3 made of brass, 22" x 28"; \$6/ea, \$15 for all three/obo. 626/568-8296.

PRINTER, Epson LQ-1040+, 24-pin dot matrix, wide carriage, \$50. 626/794-5277.

PRINTER, Xerox Diablo 630 daisywheel with print wheels/ribbons, exc. cond., works great, \$10/obo. 626/568-8298.

REFRIGERATOR/FREEZER, 29" x 27" x 59", good condition, frost free, \$80. 626/397-7029.

SAILBOARD, HiFly 100, 5.6m Pryde sail, 12'4" L x 28" W, excellent for learning and cruising, very stable, \$140. 790-3367.

SKATES, inline, size 7, Trans800, \$10. 626/397-7029.

SOFA-BED, off-white with thin pastel stripes, 93" x 34", qn.-size mattress, gd. cond., 250/obo; **COFFEE TABLE,** walnut, 52" x 26", \$50/obo. 626/355-2157.

SPRINKLER VALVE ADAPTERS, Lawn Genie automatic model 756LG 3/4, new, \$10 each. 790-3899.

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. dia.; \$125/obo. 909/592-0780, Ana.

TABLE SAW, Rockwell 10", low hours, very clean. \$350/obo. 626/303-5595.

TENNIS RACKET, Prince Magnesium Pro, never been used, w/cover, \$40. 626/441-8572.

TV, 13" color RCA, \$30; **RF modulator,** \$5. 661/297-5234.

TV, deluxe portable 5" B&W, 82-channel VHF/UHF tuner, telescopic antenna, compact design (weighs only 5 lbs), AC converter included or uses D size batteries; perfect for beach, RV, sporting events; never used, still in box; \$40/obo. 626/791-7645.

VACUUM CLEANER, Royal upright, all metal parts, \$65; **BED,** double, maple, w/frame & near-new mattress & box spring, exc. cond., \$350; **COMPUTER TABLE,** \$80; **SEWING MACHINE,** in cabinet, all metal parts, \$80. 248-9561.

WASHER-DRYER (gas), extra-large capacity (6 cycles), brand new (1 year old), de-wrinkle option on the dryer, \$150/each or \$250 for the set, can deliver. 626/792-3083.

VIDEO GAME, Sega Genesis w/Sega CD; includes 2 game pads and 2 joysticks, 12 CDs: Space Ace, Dragons Lair, Lethal Enforcer w/gun, etc.; 30+ cartridges: Road Rash, John Madden, etc.; all like new in orig. boxes, \$300/obo. 626/355-6350, Paul.

WEDDING DRESS, exc. cond. used once, in garment bag, white, straight, long sleeves, bow in back, \$40/obo. 626/568-

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

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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.

8298.

YARD SALE, huge, multi-family, Sat., June 19, 8:00-12:00, 1215 Dominion Ave., Pasadena; household items, antiques, furnishings, baby items, gardening items, clothes, books, much more.

VEHICLES / ACCESSORIES

'89 BMW 3.25i convertible, red w/black top & tan interior, automatic, low mileage, premium wheels and sound, leather interior; blue book over \$12,000, sell for \$9,500. 247-8827, Cynthia, evenings.

'94 BUICK Park Avenue, metallic beige, exc. cond., original owner, touring package, owner's/service/ electrical systems manuals included, \$11,000. E-mail lsukamoto@aol.com.

'89 CHRYSLER New Yorker, auto, all pwr., air, auto door locks, digital instrumentation, premium sound system, minor body work needed, must sell, \$2,500. 626/795-1687.

'87 DODGE Ram van, 50K mi. orig. gd. cond., \$5,000. 249-3677.

'97 GMC Sierra SL pickup 1500 1/2 long bed, V6, auto w/OD, dual airbags, ABS (4 wheel), AC, CC, AM/FM stereo cass., 3-4 gal fuel tank, bed liner & shell, emerald green, exc. cond., 21,800 mi., \$16,500. 626/798-5596.

'90 HONDA Accord EX 130K miles, exc. cond., \$5,500 or make offer. 310/641-2556.

'83 HONDA ATC 200X, runs good, \$850/obo. 626/303-5595.

'98 LEXUS ES 300, CD, moonroof, auto, loaded, leather seats, 5,000 miles, salvage title, \$22,998/obo. 909/599-3230.

'96 LEXUS LS 400 sedan, 28,900 mi., 4 door, V8, loaded, Nakamichi audio, \$35,500. 790-5195, Sandy.

'77 MGB convertible, white ext./black int., 54K mi., stick, runs great, great for summer, reliable, \$2,900. 626/536-4446 or 661/269-0926.

'97 NISSAN Altima GXE, auto, a/c, power windows/door locks/ antenna, am/fm/stereo, tape, 22,000 miles, exc. cond., \$11,250/obo. 909/599-3230.

'84 NOMAD travel trailer, 4 new tires, 21 1/2 foot, sleeps 6, stove, fridge, air conditioner and heater, \$3,000/obo. 626/798-6249.

ROOF RACK system by Thule, adjustable width, includes 2 bicycle attachments, requires car with rain gutters, \$75. 790-3367.

'89 SUZUKI Katana 750, 38k mi., runs great, looks OK, lots of extras (luggage, leathers, parts, rain gear, etc.), \$1,500. 626/794-8737.

'97 TOYOTA Camry, 15K miles, 4-cyl. automatic 4-door, white w/tan leather int., power steering/locks/ steering, alum. wheels, a/c, am/fm cassette, \$18,000/obo. 249-2432.

'94 TOYOTA 4-Runner, 36,000 mi., 2WD, \$19,000. 626/643-9769.

'91 TOYOTA Camry sedan, 2.0L, 4 door, auto, 88K, A/C, am/fm/CD, new brakes, PS/PB, alarm, cruise ctl. exc. 2nd car, exc. cond., \$6,000/obo. 909/624-3181, Jay.

'90 TOYOTA Corolla, 4-dr. sedan, red, vg shape, new tires & brakes, sole owner, 92,000 mi., 5-sp. manual, \$3,500/obo. 790-0297.

'90 TOYOTA Corolla station wagon, auto, a/c, stereo/cass., tinted windows, one owner, service records, exc. condition, \$4,850/obo. 714/255-8612.

'90 TOYOTA Cressida, 115K miles, exc. cond., all extras, leather seats like new, \$8,650 or make offer. 310/641-2556.

'88 TOYOTA Tercel, 5 speed, 2 door, red, air, am/fm/cassette; many new parts, including tires, clutch, radiator, struts; have receipts, \$2,000/obo. 661/254-2128.

TRAILER, 18 ft., in secure RV park in Rosarito, Mexico, super clean, everything works, must relocate to another space in RV park, \$2,000/obo. 909/986-5811.

'95 VW Jetta 4-door sedan, immaculate cond., very clean, champagne color, 5 sp., a/c, p/s, sunroof, CD changer w 8 spkrs., alarm, great fuel econ. (33 mpg), \$8,900/obo. 951-3566.

'91 YAMAHA Virago 1100, black with gray accent, lots of chrome, Jardine pipes and foot controls, \$3,550/obo. 626/355-6350, Paul.

WANTED

ANVIL or related blacksmith and silversmith tools. 626/798-6588.

BEACHFRONT CONDO, apt. or house, 2 bd., prefer 2 ba., to sleep 4 adults; Oct. 1-8 or 9; prefer Laguna or La Jolla, but will consider other beaches south of Laguna. 626/577-6638, Suzanne or sbarber@flash.net.

COFFEE TABLE & END TABLE, oak, in good/ excellent condition. 957-7554, Bob.

HOUSE TO RENT in South Pasadena/Montrose area; 2-3 bd., \$1,000/mo. or less; family 2 children, no pets, non-smoking; in area for 2 years attending grad school. 626/335-9576.

JPL JACKET, old, Dunbrooke "Pla-Jac," light jacket w/nylon shell & cotton liner, lg. or extra lg. sz. 848-7072.

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

VANPOOL RIDERS, #3 from Fontana, Rancho Cucamonga, Upland, Claremont La Verne area to JPL. Ext. 4-8343, Mike Taylor or 4-5831, Rhea Clearwater.

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

LOST & FOUND

Lost: EARRING, multicolor dangling pierced; top sort of diamond shaped, turquoise in color w/gold sun; three oval rings attached, two outside are red, middle is solid purple, smaller overlay yellow w/gold and another overlay orange; has 6 little beads, 2 blue, 2 yellow, 1 red and 1 turquoise; lost May 27 somewhere between Bldg. 264 and/or Bldg. 233. Ext. 4-8829 or 626/289-3960.

FOR RENT

GLENDALE, darling, large 1-bd. apt. with small bonus rm., newly re-decorated, wall-to-wall carpets, air conditioning, dishwasher,

\$650 incl. water, gas and basic cable. 241-9448.

GLENDALE house, 2 bd., 1 ba., 15 min./JPL, LR, DR, work room, covered & walled play/patio area, garage parking for 1 car, water/gardener paid, \$850. 249-3602.

GLENDALE house to share, 20 min./JPL, exc. loc., lg. rm. w/Persian carpet avail., courtyard w/fountain, deck w/gazebo, ba. w/garden view, utli./cable incl., for 1 pers., no smoking/drinking, \$525. 246-4750, Emma.

LA CANADA guest house with its own addr./mail service, 1 bd., includes off-street parking, water, gardeners, shared access to tennis court, \$840. 952-1304.

PALM SPRINGS, 1 bd., comp. furn., pool, spa, tennis, cable, VCR; carpets, paint, furnishings all new; weekends, weekly or monthly. 626/445-0884.

PASADENA fourplex, 2 bd., 1 ba. with service porch, large kitchen, hookups for washer, small yard, \$725. 790-1209.

PASADENA, near Allen and Orange Grove, charming, spacious, Spanish 2-story, 2 bd., 1 1/2 ba. duplex with formal dining rm., polished oak floors, knotty pine kitchen with garden view, service porch, enclosed garage, fenced yard, \$1,075. 790-1209.

PASADENA, room in 3-bd. apt. to share with two others; pool, parking, a/c, washer/dryer; \$460 + 1/3 utilities. 626/564-1078.

STUDIO CITY, near Coldwater/134 fwy., exc. neighb'hd, 3-bd. home, cent. air, den, encl. gar., yd. w/fruit trees, \$1,495. 790-1209.

STUDIO CITY, 1 full bd., 1 full ba., shared kitch., living and dining rms. in a townhouse-style apt.; subterr. parking, in-building laundry, security gates included; close to 170, 101 & 134 frwys; \$500. 875-4744, Aaron or e-mail AJA79@yahoo.com.

REAL ESTATE

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

PASADENA, 3-bd., 2-ba. home in Lower Hastings; move-in condition, new roof, new plumbing, hardwood floors, cent. air/hvac, upgraded kitchen, new paint in/out, lg. fenced yd. in rear. \$349,500. 626/446-1140.

SAN DIMAS, secluded Via Verde area, 4 bd., 3 ba., alarm, 3-car garage, marble floors, large landscaped backyard w/automatic sprinkler syst., BBQ area, Spanish fountain, automatic wireless outdoor lighting, palm trees, covered patio, red brick pathways/walls; built in 1988; \$530,000. 626/568-8298.

VACATION RENTALS

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

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

BIG BEAR CITY, 2 bd., 1 ba. cabin, nicely furnished, sleeps 8; fireplace, TV, full kitch., microwave; \$100 refundable cleaning deposit; \$75/nite weekdays, \$250/weekend (2 nites). 909/982-2986.

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

BIG BEAR LAKEFRONT lux. townhome, 2 decks, tennis, pool/spa, nr. skiing, beaut. master bdrm. suite, sleeps 6. 949/786-6548.

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

HAWAII, Kona, on 166 feet of ocean front on Keauhou Bay, private house and guest house comfortably sleep 6; 3 bd., 2 ba., rustic, relaxing and beautiful; swimming, snorkeling, fishing, spectacular views, near restaurants, golf courses and other attractions; low-season rates began May 1. 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, dishwasher, pool, priv. lanai, slps. 4, 4/15-12/14 rate: \$95/nite/2, 12/15-4/14 rate: \$110/nite/2, \$100/nite/add'l person. 949/348-8047.

LAKE TAHOE, North Shore, 2 bd., 2-1/2 ba., sleeps 6-7, private sandy beach, great location, all amenities, pool, walk to golf course, fishing 150 yards from front door, great hiking, kayaking, river rafting, bike trails, 2 miles/casinos, 15% JPL discount. 626/355-3886, Rosemary or Ed.

MANMOTH condo in Chamonix, 2 bd., 2 full ba., slps. 6, fully eqpd. elec. kitch., microw. & extras, frpic./wood, color TV, VCR, FM stereo, o/d Jacz., sauna; gm., rec. & Indry. rms., play & BBQ areas, conv. to shops, lifts, hiking, summer events; daily/weekly rates. 249-8524.

MAZATLAN, Pueblo Bonito resort, week of Oct. 11-18, 1 bd., partial kitchen, sleeps up to 6, on the beach, airfare not included, \$900. 626/917-0231.

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

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

PALM SPRINGS, 1 bd., comp. furn., pool, spa, tennis, cable, VCR; carpets, paint, furnishings all new; weekends, weekly or monthly. 626/445-0884.

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

SOUTH LAKE TAHOE KEYS waterfront vacation home, 4 bd./3 ba. (1 bd. & living room upstairs, handicap access fair), sleeps 12+, fireplace on 2 levels, decks overlooking private dock & ski lifts, gourmet kitchen, bicycles, 20' sail & paddle boats, 3 color TVs, VCR, stereo with tape & disk, assn. indoor & outdoor pools, hot tub & beach; 8 lighted tennis courts. 10 min. to skiing, casinos, golf; 1 hour to Western Sierra wine country, \$1,095/week for high season [15 June to 15 Sept; 22 Nov. to 1 March]; \$495/week low season, plus \$90 cleaning fee, 3-day min. 626/578-1503, Jim Douglas.