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Dutch Slager / JPL Photolab

By Mark Whalen

"Reaching the moon is not an end in itself; rather, it will be as a steppingstone to go to Mars."

Elachi: 'Future in excellent shape'

Flush with the continuation of mission successes over the last few months—culminating in the current excitement surrounding the Mars Exploration Rovers—JPL is now poised for more challenges with last week’s release of NASA’s proposed fiscal year 2005 budget.

In a Feb. 3 address to staff, Lab Director Dr. Charles Elachi envisioned “an exciting and bold program for JPL over the next five years. Our future is in excellent shape, as good as I can imagine JPL has been over the last decade.”

While the Bush administration’s proposed federal budget for next year calls for a 1 or 2% growth in non-defense discretionary spending—where NASA receives its funding—the agency would get about 5% growth in FY ’05. “NASA has been treated in a much more positive way, because of the President’s commitment to exploration,” Elachi noted.

The proposed FY ’05 NASA budget calls for \$16.2 billion, \$900 million more than this year. It is projected to reach about \$18 billion by FY 2009.

Space science and robotic exploration—which accounts for the bulk of JPL’s funding—is projected to grow to almost \$6 billion by the end of the decade, a 50% increase over the FY ’05 request of about \$4 billion. This total includes an expanded and bold Mars program, as well as Project Prometheus, NASA’s initiative that is making strategic investments in space nuclear power, electric propulsion technologies that would enable a new class of missions to the outer solar system, and the new Lunar Exploration Program. The first mission under study in the Prometheus Program, the JPL-managed Jupiter Icy Moons Orbiter, would launch in the next decade and provide significantly improved

scientific and telecommunications capabilities and mission design options. Project Prometheus has been transferred to NASA’s new Office of Exploration Systems (Code T).

JPL will play a key role in NASA’s “Exploration Beyond Earth Orbit” theme, which Elachi termed “a sustained human and robotic program to explore the solar system and beyond. Reaching the moon is not an end in itself; rather, it will be as a steppingstone to go to Mars.”

Besides the Jupiter Icy Moons Orbiter, the budget proposal fully supports JPL’s work in the Navigator Program: the Space Interferometry Mission, Kepler and Terrestrial Planet Finder.

“This vision is a key element of NASA, but it’s only a part of NASA,” Elachi said. “NASA remains committed to a strong program in Earth science, to understand and protect our home planet.”

Next year’s proposed Earth science budget calls for \$1.49 billion, about \$128 million less than this year. Elachi said the reduction is due to FY ’04 Congressional earmarks and the recent launches of the Earth Observing System Terra and Aqua missions and upcoming launch of Aura.

The bottom line, Elachi said, is that all JPL Earth missions in development have been fully funded—Jason; three Earth probes (Orbiting Carbon Observatory, Aquarius and Hydros); and a wide-swath ocean surface topography radar follow-on for Jason. “In the near term, JPL is in pretty good shape,” he added.

Another impact on Earth science, Elachi said, is that “some of the missions we had hoped to get started have been deferred one or two years.” Among those in NASA’s Earth Science Enterprise strategic plan was an interferometric synthetic aperture radar-based system aimed at detecting natural hazards such as earthquakes and volcanoes. “Although this mission was not in the FY ’05 budget proposal,” noted Earth Science and Technology Director Dr. Diane Evans, “we fully expect to have reconsideration for a new start in FY ’06.”

The Mars Program would see steady and significant growth, based on at least one Mars mission at each opportunity (every 26 months). This year’s approximately \$600 million total would increase to \$691 million in FY ’05, with more than \$1.2 billion proposed for FY ’09.

Within the “Structure and Evolution of the Universe” theme, the Laser Interferometer Space Antenna, originally proposed for a 2010 launch, was delayed for a year. “It’s not a major impact,” Elachi said. In addition, the Jupiter Icy Moons Orbiter, which has been slated to launch no earlier than 2011, will most likely be deferred for a couple of years.

Further, the NASA budget proposal fully funds both ongoing and future Discovery and New Frontiers Program proposals, as well as the Deep Space Network.

NASA’s proposal for lunar exploration begins with a 2008 lunar orbiter and a 2009 lander, and Elachi sees JPL’s potential role “in an area where we can contribute in a unique way, and that’s mostly in the landers. I don’t think we’ll play a major role in the management of the orbiters, but we could play a significant role in the science and the payload for the orbiters,” he said.

Continued on page 3

Rover pictures raise 'muffin' questions

By Guy Webster

Scientists are excited to see new details of layered rocks in Opportunity Ledge, shown at right in an image sent to Earth Feb. 10. Unparallel lines give unparalleled clues that some “moving current” such as volcanic flow, wind or water formed these rocks.

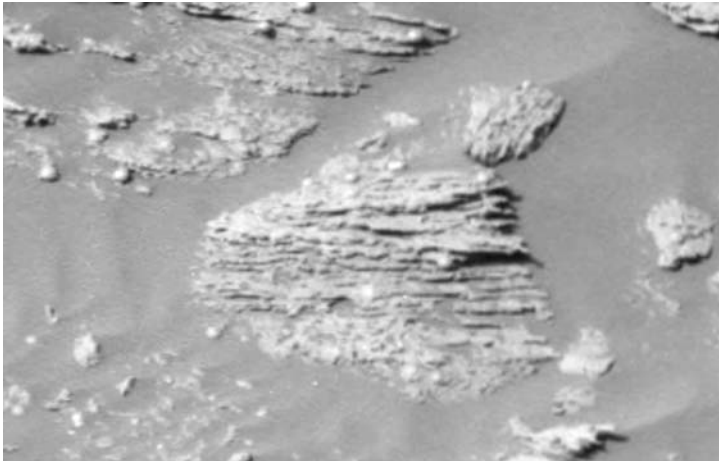
JPL’s Spirit rover has begun making some of its own driving decisions while its twin, Opportunity, is presenting scientists with decisions to make about studying small spheres embedded in bedrock, like berries in a muffin.

Both rovers are on the move. Late Sunday, Spirit drove about 6.4 meters (21 feet), passing right over the rock called “Adirondack,” where it had finished examining the rock’s interior revealed by successfully grinding away the surface. The drive tested the rover’s autonomous navigation ability for the first time on Mars.

“We’ve entered a new phase of the mission,” said Dr. Mark Maimone, rover mobility software engineer at JPL. When the rover is navigating itself, it gets a command telling it where to end up, and it evaluates the terrain with stereo imaging to choose the best way to get there. It must avoid any obstacles it identifies. This capability is expected to enable longer daily drives than depending on step-by-step navigation commands from Earth. On Monday, Spirit was commanded to drive farther on a northeastward course toward a crater nicknamed “Bonneville.”

Over the weekend, Spirit drilled the first artificial hole in a rock on Mars. Its rock abrasion tool ground the surface off Adirondack in a patch 1.8 inches in diameter and 0.1 inches deep. Examination of the freshly exposed interior with the rover’s microscopic imager and other instruments confirmed that the rock is volcanic basalt.

Opportunity made it across about 12 feet Monday and was positioned to continue observing parts of the outcrop up close on Tuesday. In coming sols, Opportunity will “shoot and scoot,” meaning the rover will shoot pictures of the terrain and acquire new scientific measurements



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of the rocks, then scoot up, down, and across the inside of the crater.

NASA now knows the location of Opportunity’s landing site crater, which is about 72 feet in diameter. Radio signals gave a preliminary location less than an hour after landing, and additional information from communications with JPL’s Mars Odyssey orbiter soon narrowed the estimate, said JPL’s Tim McElrath, deputy navigation team chief.

As Opportunity neared the ground, winds changed its course from eastbound to northbound, according to analysis of data recorded during the landing. The spacecraft bounced 26 times and rolled about 220 yards before coming to rest inside the crater, whose outcrop represents a bonanza for geologists on the mission.

News Briefs



Photo courtesy of Ross Salawitch

Instruments are loaded onto the NASA ER-2 aircraft, inside the Arena Arctica research facility at Kiruna, Sweden, prior to a research flight.



DSN veterans sought for celebration

On Dec. 24, 1963, JPL Director Dr. William Pickering announced the establishment of the Deep Space Network, consolidating three communications organizations to create the first integrated global communications capability to deep space. The Public Services Office is looking for past DSN employees who may be interested in attending an upcoming celebration of this 40th anniversary. The evening event will be held on Monday, March 22. Please e-mail psa@jpl.nasa.gov if you'd like to learn more.

Simulation tags ozone destruction

Using measurements from a NASA aircraft flying over the Arctic, Harvard University scientists have made the first observations of a molecule that researchers have long theorized plays a key role in destroying stratospheric ozone, chlorine peroxide.

Analysis of these measurements was conducted using a computer simulation of atmospheric chemistry developed by scientists at JPL.

The common name atmospheric scientists use for the molecule is "chlorine monoxide dimer" since it is made up of two identical chlorine-based molecules of chlorine monoxide, bonded together.

The dimer has been created and detected in the laboratory; in the atmosphere it is thought to exist only in the particularly cold stratosphere over polar regions when chlorine monoxide levels are relatively high.

"We knew, from observations dating from 1987, that the high ozone loss was linked with high levels of chlorine monoxide, but we had never actually detected the chlorine peroxide before," said RICK STIMPFLE, a Harvard scientist and lead author of the paper.

The atmospheric abundance of chlorine peroxide was quantified using a novel arrangement of an ultraviolet, resonance fluorescence-detection instrument that had previously been used to quantify levels of chlorine monoxide in the Antarctic and Arctic stratosphere.

"We've observed chlorine monoxide in the Arctic and Antarctic for years and from that inferred that this dimer molecule must exist and it must exist in large quantities, but until now we had never been able to see it," said JPL researcher ROSS SALAWITCH, a co-author on the paper.

Chlorine monoxide and its dimer originate primarily from halocarbons, molecules created by humans for industrial uses like refrigeration. Use of halocarbons has been banned by the Montreal Protocol, but they persist in the atmosphere for decades.

For more information and images, visit <http://www.gsfc.nasa.gov/topstory/2004/0205dimers.html>.

Caltech undergrads tour Lab

Fifteen Caltech undergraduate students paid a visit to JPL Jan. 20 in the third renewal of the JPL Undergraduate Mentoring Program (JUMP).

The aim of the program is to bring together Caltech women undergraduates and JPL researchers and scientists in order to build a foundation for future collaboration, mentoring, networking and research opportunities.

Students toured JPL facilities such as the Spacecraft Assembly Facility, Biotechnology and Planetary Protection and High Performance Scientific Visualization labs, and saw an autonomous rover tour at the Mars Yard.

The program began as a collaborative effort between JPL's Advisory Council for Women and the Caltech Women's Center. Committee members represent a diverse group from throughout the Lab that includes ANN TAVORMINA, manager of the Exploration Systems Autonomy Section (367); EVA GRAHAM, manager, Minority Education Initiative (185); DR. AYANNA HOWARD, robotic research engineer (34); SUSIE POCINO, secretary, Space Science and Data Systems Section 382; DONNA WU, Information

Systems, Systems Management Office (52), and DR. WILLIAM WHITNEY, deputy manager of the Education Office (185). CANDACE RYPISI and JEN-NIFER CICHOCKI of the Caltech Women's Center also participated.

The guests met with women engineers and scientists to hear about their educational backgrounds, career paths, JPL projects and plans for academic employment. Many of the visitors asked about employment opportunity programs at JPL.

Wu noted that several summer employees and a full-timer, MELISSA SORIANO, have been hired as a result of the program. Soriano, of Section 335, Processing Systems Group, works on software used for tracking and telecommunications in the Deep Space Network. Whitney introduced her to the program. "I heard a lot of great stories from people who work at JPL, and that motivated me to apply," she said.

The event was hosted by the Engineering and Science Directorate, the Education and Public Outreach Office and the Advisory Council for Women.

Summer program seeks applicants

The Summer Science Program, one of the oldest and most prestigious pre-college research programs, solicits applications from 11th-grade students interested in mathematics and science. SSP is affiliated with JPL, Caltech, Harvey Mudd College, New Mexico Tech, Pomona College, Stanford University and UCLA.

Application deadline is March 19. SSP is an intense, six-week college-level program conducted in Ojai, Calif. and Socorro, NM. It is a residential enrichment program in which gifted high school students complete a challenging, hands-on research project in celestial mechanics.

Students describe SSP as an intense, exhilarating intellectual and social environment. Emphasis is on teamwork and cooperation; neither grades nor formal credit are given. Enrollment is limited to 36 per campus, and seven faculty members live on-site with the students.

By day, students learn college-level astronomy, calculus and physics. By night, they take telescopic observations of an asteroid and write software to convert their measurements into a mathematical description of the asteroid's orbit. Stimulating guest speakers and field trips—including one to JPL from the Ojai campus—round out the curriculum.

JPL and SSP share a long affiliation. Several SSP alumni work at JPL or other NASA locations, including NASA Chief Technologist DR. SCOTT PACE.

For detailed information, see <http://www.summerscience.org>.

Tell them: I want my NASA TV

If you've enjoyed watching the exploits of the Mars Exploration Rovers on NASA TV in the comfort of your home, let your cable company know about it.

Although NASA TV is always available to cable channels and satellite providers, local providers carry NASA programming sporadically. This being one of the busiest years for the Lab and for NASA, there will be plenty of interesting programming. So, if you want to keep your NASA TV, the cable companies need to hear from you—their customers. Call your local provider, and let them know you'd like to see more.

Special Events Calendar

Ongoing Support Groups

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

Caregivers Support Group—Meets the first Thursday of the month at noon in Building 167-111 (the Wellness Place). For more information, call the Employee Assistance Program at ext. 4-3680.

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

Gay, Lesbian and Bisexual Group—Meets the first Friday and third Thursday 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.

Parents Group for Children With Special Needs—Meets the second Thursday of the month at noon in Building 167-111 (the Wellness Place).

Working Parents Support Group—Meets the third Thursday of the month at noon in Building 167-111. For more information, call the Employee Assistance Program at ext. 4-3680.

Friday, February 13

"Creating an Investment Strategy"—This Fidelity workshop, to be held from 11:30 a.m. to 1 p.m. in Building 180-101, is designed for employees who are currently participating in JPL's employer-sponsored 403(B) retirement plan and are 10 years or more from retirement. Topics covered will be allocating current investments with future savings needs, and the importance of reviewing, reevaluating, and rebalancing your portfolio regularly.

Investment Advice—Fidelity Investments will offer one-on-one counseling appointments in T1720-131. To schedule an appointment, call (800) 642-7131.

Tuesday, February 17

Credit Union Annual Meeting—To be held at 5 p.m. in Caltech's Beckman Auditorium.

JPL Hiking Club—Mike Kleine of Section 263 will present a slide show on Death Valley at noon in Building 238-543.

Wednesday, February 18

TIAA/CREF Enrollment Meeting—Held at noon in T1720-137, this monthly gathering is designed to assist employees newly eligible for Caltech/JPL retirement plan participation in selecting investment options and completing enrollment forms.

Thursday, February 19

Earth and Space Science Colloquium—Project Scientist Dr. Mike Werner will present "The Spitzer Space Telescope: New Views of the Cosmos" at noon in von Kármán Auditorium.

Thu.-Fri., Feb. 19-20

Von Kármán Lecture Series—Join Dr. Chris Adami, principal scientist in JPL's Quantum Computing Technologies Group, for "Artificial Life: Life NOT As We Know It" at 7 p.m. Thursday in von Kármán Auditorium and Friday in Pasadena City College's Vosloh Forum, 1570 E. Colorado Blvd. Thursday's lecture will be webcast at <http://www.jpl.nasa.gov/events/lectures/feb04.cfm>. For more information, call Public Services at ext. 4-0112.



Saturday, February 21

Gypsy Spirit: Journey of the Roma—Gypsy music and dance from India, Turkey and Europe, featuring the Budapest Dance Ensemble, will be presented at 8 p.m. Caltech's Beckman Auditorium. Tickets are \$25, \$21 and

\$17; high school age and under, \$10. For more information, call (626) 395-4652.

Sunday, February 22

"NASA and the Future of Human Space Exploration: A Skeptical View"—Dr. Robert Zubrin, president of the Mars Society, will give this Skeptics Society-sponsored lecture at 2 p.m. in Caltech's Baxter Lecture Hall. Donations: \$5 for members, \$8 nonmembers; free for Caltech/JPL community. For more information, call (626) 794-3119.

Monday, February 23

Technology Assets Forum—JPL Chief Technologist Dr. Erik Antonsson will host a panel discussion at 11:30 a.m. in von Kármán Auditorium on how to protect JPL's intellectual property. Patents, licensing and royalties will be discussed, as will recent changes in the Innovative Technology Assets Management Office. Learn how licensing and intellectual property can impact your missions, technology proposals and your pocketbook.

Mon.-Tues., Feb. 23-24

Investment Advice—TIAA/CREF will offer one-on-one counseling appointments in Building 249-114. To schedule an appointment, call (877) 209-3140, ext. 2614 or visit the TIAA/CREF Web site at www.tiaa-cref.org.

Wednesday, February 25

"GeoMap: Understanding Geological Structure from Remote Sensing Data"—Dr. Ken Hurst of the Exploration Systems Autonomy Section will lecture at noon in the 167 conference room.

JPL Softball Organizational Meeting—All team managers and interested individual players not currently affiliated with a team should attend at noon in the 238-543 conference room. Information is available at <http://jplrecclubs.caltech.edu/softball>, or call Scott Morgan at ext. 4-4972 or Rich Benesh at ext. 4-3748.

JPL Toastmasters Club—Meeting at 5 p.m. in the 167 conference room. Call Debbi Llata at ext. 3-3690 for information.

Volunteer Professionals for Medical Advancement—Meeting at 10:30 a.m. at the Caltech Credit Union, 528 Foothill Blvd., La Cañada.

Thursday, February 26

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

Clogging Class—This new class for beginners will be offered every other Thursday at noon in Building 300-217. For more information, call Shary DeVore at ext. 4-1024.

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

JPL Stories—Tom Rivellini, airbag cognizant engineer for the Mars Pathfinder Project; entry, descent and landing mechanical systems lead for Mars Science Laboratory; and deputy mechanical systems architect for Mars Exploration Rovers, will present "Airbags, They're Not Just For Cars Anymore!" at 4 p.m. in the Library, Building 111-104. This is the story of how the Mars Pathfinder lander and airbag system were invented and developed. For more information about this or other series lectures, call Teresa Bailey at ext. 4-9233.

Saturday, February 28

David Crosby Concert—The two-time Rock and Roll Hall of Famer will perform at 8 p.m. in Caltech's Beckman Auditorium. Tickets are \$32, \$28 and \$24; high school age and under, \$10. For more information, call (626) 395-4652.



For the period of October through December 2003, the following JPL recipients celebrated 25 or more years of service and were invited to attend a luncheon and ceremony in their honor on Dec. 10:

- 45 years: Rudolf Schindler.
- 40 years: Robert Chamberlain, Jay Holladay, Michael Jacobs, Albert Kirk, Frank M. Ott.
- 35 years: Margaret Bundschuh, Robert Bunker, Donald Collins, Mary Ann Gero, Mark Herring, Linda Lievense, James Lumsden, Sylvia Miller, Arthur Murphy Jr., Richard Norman, Paul Reichley, Barbara Toth, Robert J. Wilson, Shiao-Pin Yen.
- 30 years: Michael Abrams, Nicholas Alvarado, Sheryl Bergstrom, Chester Borden, Torrence Johnson, David Morabito, Shirley Pang, James Renfrow, Terry Swanson, Victoria Wang, Joe Waters, Steve Yee.
- 25 years: William Banerdt, James Baughman, Vincent Bethel, Julian Breidenthal, DonnaLee Campbell, David Deats, Steven Dinardo, Dariush Divsalar, Martha Fredholm, Robert Gershman, Roger Gibbs, Nancy Greenberg, Benjamin Holt, Robert Hughes, Mitoji Iwanaga, Victor Legerton, Tetsuo Miyahira, Robert Miyake, Marc Montgomery, Edward Motts, Don Noon, James Oyama, Krystal Poole, Carl Ruoff Jr., Christopher Stevens, John Tallon, Tuyet-Lan Tran, Stephen Wall, Amy Walton, Daniel Winterhalter, Alfred Ziegler.

COLLABORATION COMBINES EARTH, MARS OUTREACH

By Annie Richardson,
Earth science outreach coordinator

JPL's Earth Science Public Engagement Team has been collaborating with the Monrovia campus of the Lycée International de Los Angeles (LILA) since September 2003. The JPL/LILA Earth Science Seminar Series involves the presentation of monthly seminars and/or Lab visits to provide the students and teachers with information on JPL's Earth science activities.

On Jan. 20, school director Philippe Detzen and a group of 40 LILA students, teachers and parents made their first visit to JPL as part of the collaboration. Earth team coordinators Mona Jasnow and Annie Richardson scheduled the visit to take advantage of the Mars Exploration Rover Spirit's successful landing and to show the students the importance of Earth science research to exploration at other planets.

Anton Ivanov, a Mars team Engineer and LILA parent, co-hosted the visit. Earth team members Peter Falcon and Margaret Srinivasan participated as tour escorts.

This visit presented the perfect opportunity for a doubled-up outreach effort with members of both the Earth and Mars Public Engagement teams and participating scientists. JPL Director Dr. Charles Elachi welcomed the visitors, encouraging the students, grades K-5, to dream big but not to neglect the hard work necessary to make those dreams come true.

Guests first visited the Mars In Situ Laboratory, where MER Deputy Project Scientist Dr. Albert Haldemann showed them the sandbox and rover engineering models, and talked about their flight counterparts, Spirit and Opportunity. Our visitors learned about the different components of the rovers and landers and about the extensive testing done to assure flight and mission readiness. At this stop, the adults were so fascinated that they had to be reminded to let the students ask questions too!



In JPL's Regional Planetary Image Facility, librarian Debbie Martin shared her enthusiasm for space while showing some of the many types of image data and material available to researchers.

Mars outreach coordinator Connie Gennaro had the students' full attention as she described her part in the Mars adventure and reminded them that it takes more than just scientists and engineers to make a mission successful. She used airbag fabric and models of a rover tire and robotic arm to explain different flight hardware.

Then came the big moment: Connie let the students officially become rover "road kill" by being run over by her remotely controlled rover. When Connie asked if any of the adults wanted to participate, only a split second passed before not one of them was left standing.

In the Digital Image Animation Laboratory theater, Dr. Eric DeJong treated guests to some spectacular 3-D image animations as well as a flyover that had everyone squealing with delight.

The tour ended with a demonstration of 3-D photography by Kris Capraro of the Multimission Image Processing Laboratory. As the group was leaving, a LILA parent said this had been their most exciting field trip yet.

Throughout the visit, the students were prompted to talk about how Mars is similar to and different from Earth. They were reminded that it is only through exploration and discovery of Earth that we are able to explore and discover worlds far from our own. We can certainly say that this field trip did much to awaken and inspire the explorer in each of these students.

Local French
American
school visits
Lab



From top:
Kids enjoyed the way the
rover rolled over them.
Mars outreach
coordinator Connie
Gennaro encourages
hands-on examination of
the robotic arm and tire.
Dabria Kaki closely
examines simulated
rover tire.

Elachi

Continued from page 1

Elachi reiterated that the Lab has a very busy year coming up. In addition to operating the two Mars Exploration Rovers for the next few months, JPL has instruments on the Microwave Instrument on the Rosetta Orbiter (planned for launch later this month), and the Tropospheric Emission Spectrometer and Microwave Limb Sounder (both aboard NASA's Aura spacecraft); will operate the Spitzer Space Telescope; guide Cassini toward its encounter with Saturn this summer; and will retrieve solar wind samples via the Genesis spacecraft. Deep Impact is also scheduled for launch later this year.

Adding that JPL now has 17 spacecraft and three major instruments flying throughout the solar system, Elachi said, "During this decade, we'll be launching more missions than JPL has conducted in 40 years. We have a lot of exciting things to do, and that comes with a lot of challenge. But I have no doubt we all will rise to the occasion as we always have."

He also took the opportunity to discuss a few institutional highlights from the past six months.

- More than 550 people attended the Research and Technology Development Program's poster session in November, including more than 70 principal investigators. "For FY '04, we funded 17 strategic initiatives and 75 individual tasks, and augmented the R&TD budget from \$12.5 million to \$25 million." Elachi said he's committed to increase that amount to \$35 million in FY '05.

- The Human Resources Discretionary Fund made a number of offers to key researchers and early-career hires. "Looking at the backgrounds

and letters of recommendation, I think we have set the standards extremely high, and that's where we should be."

- Admitting "we are crowded," Elachi said progress is being made in the facilities area. "We are in the process of leasing some space not too far from here, for a few hundred people." He also reported that construction on a proposed new Flight Projects Center building has been delayed by one year.

- Elachi will assess over the next few months a possible reorganization of the Engineering and Science Directorate. "Looking at the next 10 years and 24 missions that are coming up, I want to make sure we are organized for the future, not for the past. Also, I'm going to look at the program offices to see whether we are aligned most appropriately with the new Code T and the new Exploration Initiative."

- The Lab has discussed entering a float in the next Rose Parade. "We will be calling on you if you want to volunteer," he said. "It will be a nice team-building effort we can all contribute to." This would be a joint effort with Caltech and NASA.

The director acknowledged those who have contributed to the recent achievements of Galex, the Spitzer Space Telescope, Stardust, and the Shuttle Radar Topography Mission. Elachi proudly noted that the Defense Mapping Agency called SRTM's data "the biggest (mapping) advance that has happened since Mercator, which was 400 years ago."

Elachi praised Mars Exploration Rover mission engineers for their work in restoring the Spirit rover's health since it developed computer-memory and communications problems in late January. "The pressure was very high—not only on us to be successful, but on making sure all of NASA is

successful. All of this was happening the day before the landing of Opportunity." He also acknowledged those who worked in the Mars testbed to make sure commands sent to the rovers were all tested ahead of time.

Elachi also thanked staff of the Office of Communications and Education who were on Lab at all hours of the day and night to support media relations efforts surrounding the Mars landings. He noted that JPL was featured on the front cover of 185 major newspapers worldwide, and thanked media relations officer Guy Webster for his tireless efforts to secure news media coverage. The director also told JPL television producer John Beck, who captured much of the activity of the last month on video, "John, either go home or we're going to start charging you rent."

Public Services Office Manager Kim Lievense, her team and all the volunteers were also recognized for guest-relations support, which reflected very positively on JPL. Between the two landings, about 3,000 people were guests of the Lab, in addition to another 1,500 guests at Caltech and at Pasadena City College. Elachi said he received hundreds of letters of thanks for JPL's efforts.

In conclusion, Elachi displayed a favorite quote by former President Theodore Roosevelt: "Far better is it to dare mighty things, to win glorious triumphs, even though chequered by failure, than to take rank with those poor spirits who neither enjoy much nor suffer much, because they live in the gray twilight that knows not victory or defeat."

"That should be the motto of JPL," Elachi said. "Despite the risk of failure, it is a credit to all of you that we dare to do great things and we don't linger in the gray twilight."

A few words about Universe advertising

JPL'S ONLINE NEWS SOURCE



Classified ads will be available the day before Universe is published at

<http://dailyplanet>

View this and previous issues of Universe at

<http://universe.jpl.nasa.gov>

E-mail us at

universe@jpl.nasa.gov

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Notice to Advertisers

Advertising is available for JPL and Caltech employees, contractors and retirees and their families. No more than two ads of up to 60 words each will be published for each advertiser. Items may be combined within one submission. Ads must be submitted via e-mail to universe@jpl.nasa.gov and are due at 2 p.m. on the Monday after publication for the following issue.

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

- Universe is not responsible for the quality of merchandise sold or claims made through its ads.
- Ads are for the exclusive use of JPL and Caltech employees, contractors and retirees, and their immediate families.
- Please provide your full name, as well as your home phone number. If applicable, indicate Caltech (campus) employee or retiree.
- Only home phone numbers and e-mail addresses are to be used for items for sale or rent and in the Wanted and Free sections; work extensions may be published for Lost and Found and carpool/vanpool information only.
- No more than two ads of up to 60 words each will be published for each advertiser.

- E-mail is preferred; send your ads to universe@jpl.nasa.gov. Ad cards are available at the JPL Store; mail to Building 111-B29.
- No faxes, handwritten ads or photocopies of ad cards are accepted, with the exception of submissions for the Letters column. Also, ads are not taken over the telephone.
- Unless otherwise noted in Universe, the normal deadline is the Monday following publication, at 2 p.m., for the next issue. (The next issue is the exception. Due to Presidents Day, the deadline for the Feb. 27 issue is Tuesday, Feb. 17.)
- We ask that readers not submit ads for "work sought," such as babysitting or housekeeping services or other types of private businesses. Also not accept-

- able are ads for franchises, dealerships, distributorships, etc., and products sold through those means.
 - Ads for weapons, ammunition, etc. are not accepted.
 - Real estate ads (for rent and sale) must be signed on the back of ads (non-discrimination clause). E-mail ads will be returned to advertisers with this clause included for your "electronic" signature.
 - Those placing housing and vehicle ads should be listed as an owner on the ownership documents.
 - Prices listed on rental ads are shown per month unless otherwise specified.
 - Telephone numbers on ads are in the 818 area code unless otherwise specified.
- Thank you very much for your compliance.

Passings

WILLIAM GARDNER, 50, program manager for Division 810's Defense and Intelligence Space Program, died Jan. 25.

Gardner had worked at JPL since October 2002. He is survived by sons Ryan and Brandon.

Letters

Friends and coworkers: I wanted to thank you all for the outpouring of support and comfort that you have put forth in this very difficult time in my life. Your kind words and the assistance you provided, here on Lab and in all the many details that I have been bombarded with has been really overwhelming. During the first two weeks after the death of my wife your caring and concern helped me get through some of the most difficult struggles I have ever faced and I continue to be amazed and moved by the quality and compassion you have shown me. Thank you all very much.

Robert Beswick, Section 312

I would like to thank all my friends and co-workers for their kindness and thoughtfulness after the passing of my dear mother. Thank you for the plant and Section 21 for your support.

Laura Hollis

Classifieds

For Sale

AMPLIFIER, Marantz power THX MonoBlock MA500, THX certified, 125 watts/8 ohms, 180 watts/4 ohms, can be bridged for 450 watts total, near mint cond., \$350/pair, not sold individually. 249-6786.

AUDIO EQUIPMENT: amplifier, Bryston 3B, \$325; preamp, Bryston 0.5B, \$150; equalizer, audio control, C101 Series 2, \$135; Bryston units have 2 yrs. remaining on warranty, exc. cond. 626/358-8941.

BABY ITEMS: crib, wood, made in Italy, incl. mattress, height adjustable, exc. cond., \$150/obo; car seat, made by Century, front-facing, up to 40 lbs., gd. cond., \$25/obo. 626/791-6101.

BABY ITEMS: breast pump, Medela, pump-in-style, used twice, paid \$300, sell for \$175; swing, Graco, paid \$60, sell for \$30. 626/574-7431.

BED, sleigh-style, made by Hooker, queen, solid cherry wood, beautiful matte finish, bought at Fedde's for \$1,300; astrange@mac.com for pics; \$500/obo. 541-9455.

CHINA CABINET, approx. 4.5 W x 6.5 H x 1.5' D, exc. cond., \$400. 909/596-5774.

COMPUTER, Apple PowerPC 9600/233, 4 GB HD, 1 GB, Jaz drive, data cartridges, CD ROM, floppy, USB port, OS 9; MONITOR, View Sonic, 17," color; PRINTER, HP DeskJet, all cables; incl. MS Word, Adobe Photoshop and Illustrator (older versions); everything works, I'm still using it; \$290/obo. 626/755-1579.

CUPBOARD, antique, 18th century vitrine, dk. oak, recently appraised at \$3,000, best offer; pictures: <http://www.e-neighborhood.net/neighborhood/vitrine>. 626/568-9890, Tracy.

DESK, oak, roll-top, very nice cond., medium oak color. \$200. 352-5688.

DRYER, Kenmore, gas, basic model, white, 10 years old, exc. cond., \$50. 953-2841, Max.

DRYER, Roper, electric, extra-large capacity, 2 temperatures, 3 cycles, 5 yrs. old, \$75. 957-2805.

FIREPLACE, double walled w/glass doors, gd. cond., \$300/obo. 899-7797.

FURNISHINGS: rocking chair, antique-style, folding, carved wood w/tapestry seat & back, \$59; bassinet attachment for Trend Traveler playpen, \$10; desk chair, blue & oak, high-back, swivel, \$69; recliner, teal, \$49; porch chair, large, white, wicker, w/arms and matching side table, \$29/set; bathroom rug set, blue, never used, \$7; lawn chairs, 2, folding, \$5/each. 626/798-4510.

FURNITURE: dining table, imported, Danish teak, wide center pedestal w/2 leaves, seats up to 8, exc. cond., \$395; dining chairs, companion teak, no bottoms, \$5/each. 832-4681.

GOLF BALLS, used, clean, \$0.50/each. 626/398-3681 or 626/584-3852.

INCOME TAX GUIDE BOOK for 2004, J.K. Lasser's, w/forms, brand new, \$10; DIET TAPES, Jenny Craig, set of 14, \$25; CARD SHUFFLER, Johnson, collectible, all-metal

construction with the exception of friction wheels that drive the cards and the carved-wood dowel handles; stands ~6" handle-high, and ~9 by 6," flanges and handle inclusive; \$35. 790-3899.

JACKET, men's, deluxe, for hunting or walking, sz. 40 long, inside bandolier pockets, like new, \$25; SLEEPING BAG, adult, inside like new, summer weight, \$10; BED PILLOWS, never used, std. sz., \$5/each. 626/793-1895, Albert.

MISC: ham radio home-brew transmitter & pwr supply, c. 1940, \$39; tire/wheel, spare donut, T105 80D-13, used once, \$39; mass-ager, electric, fits in chair, \$39; inter-com set, wireless, \$39; golf ball retriever, tele-scoping aluminum, 12", \$19; duffle bag, kid's, rolling, multicolor, never used, \$19; luggage set, Pierre Cardin, 3 pc., \$19; turn-table w/amp & speakers, \$15. 626/798-4510.

MISC: dining table, smoked glass top, 72 x 42," w/6 upholstered fabric chairs, exc. cond., \$149/obo; bike, men's, 26", 15 spd., helmet, gd. cond., \$20; camcorder, Panasonic, digital, PVDV203, 6 mini-DV tapes, digital still camera, SD card, 700x zoom, 1 lb., new, in box, never used, full warranty, \$379. 909/592-2279.

MISC: juicer, Breville Juice Fountain, exc. for daily juicing, used 2-3 times, \$120/obo; book, Oregon Catholic Press, guitar accompaniment + binder for English mass hymns, vol. I & II, 2003, barely used, \$40/obo; rug, oriental, 4 x 8, dark blue w/patterns, hardly used, \$40. 626/840-0955, msg., Mary.

MISC: ski rack, used once, \$25; ski boots, men's, 1 pr., used once, exc. cond., \$25. 626/449-6799, Bob.

MISC: tricycle, girl's, exc. cond., \$25; girl's cottage, Little Tykes, telephone, stove/sink for cooking, 4 shutters/windows, door, mint cond., always kept indoors, orig. price \$300, sell for \$200, will deliver if in the Pasadena area; air conditioner, Durcraft Hepa, w/filters; dog house, med. size, \$30; bird cages, assorted. 626/798-6248.

MOWER, McLane, self-propelled, 20" front throw, needs sharpening; EDGER, gas, King of Lawn; both old but work, \$30/ea. or \$50/both. 248-9708.

OPERA TICKETS, 2, "Madame Butterfly," 2/21 at 2 pm. 957-8813, Allan Eisenman.

ORGAN, Yamaha 415, electronic console w/13 pedals, 3 keyboards, 144 rhythm patterns, pd. \$7,500, sacrifice for \$2,000; PORT REPLICATOR, for IBM Thinkpad, works with T20, T21, A20, A21 or X, R series, like new, \$85; CONTROLLER CARD, Ultra ATA, w/cable, fits into 32-bit PCI 2.1 or 2.2 expansion slot on motherboard, brand new, \$20. 790-3899.

PATIO TABLE, 42," square, glass top, 4 matching swivel-mesh fabric chairs, bar height (table is 40,"), beige, only 3 yrs. old, exc. cond., \$150. 626/256-6606.

POSTER PHOTO, 11 guys sitting & eating lunch on a raw steel ledge atop a sky-scraper, framed, 1930s, 24 x 32, \$15/obo. 909/593-4046 or vivdavies@earthlink.net.

REFRIGERATOR, Kenmore, ice maker, 14 cu. ft., white, 3 or 4 yrs. old, exc. cond., 65.5 x 29.75 x 29," Arcadia, \$250. 626/446-2989.

SOFA, 5 ft. + LOVESEAT, 4 ft., paisley print pattern, lovely for any living room or sitting room; COFFEE TABLE, wrought-iron, glass insert; all in vg cond.; recently moved, need to downsize; all for \$350 or sell separately. 626/446-4338, Ann.

SOFA, beautiful, like new, folds out into a comfortable queen-size bed, beige w/smart green trim, 84 x 40 x 34" unfolded, seldom used; always covered w/fitted, blue, heavy cloth coverlet that comes w/sofa at no extra charge. \$400. 310/278-4032.

TREES: red banana plant, 5' tall, \$60/obo; ficus, 10' tall, braided, in 30" plastic pot, \$250/obo; CERAMIC BOWL, gray, 2" diam. w/planted geraniums, \$40/obo. 626/791-6101.

TURKEY ROASTER, covered, self-basting, 15 x 11 x 7," \$8; COOKING KETTLE, covered, 5 qt., alum., like new, \$30 value, \$8; VEGETABLE DISH, covered, porcelain, handles, rose patterns, \$9; H'DV TRAY, wooden, 17 x 5.5, \$7. 626/793-1895.

Vehicles/Accessories

'88 ACURA Legend, 4 dr., new tags, needs work, \$1,200/obo. 626/300-0949, Patty.

'87 CADILLAC Seville, 4 dr. sedan, gold, 128K mi., new tires/brake pads, a/c, leather interior, power windows, am/fm/cassette, runs great, \$1,100. 310/804-1858, Ken.

'93 CHEVY Suburban 2500, 2 x 4, 350, V8, exc. cond., red, street scene front grill, well-maint., low mi., a/c, power doors/windows, wood trim dash, custom front seat/sheepskin covers, running boards, new tires w/Weld wheels and Flow Master exhaust, \$10,500/obo. 626/359-7666.

'72 CHEVY El Camino 396 SS Malibu, 375 HP, runs strong, cowl hood, Holley Street Avenger dbi, pump carb, Edelbrock performer manifold, headers, cam, Turbo 350 w/B&M shifter, rally pk., Mallory ign. & dist., flows, 12 bolt rear, new front shocks, rally wheels, dress-up kit, buckets, AM/FM/CD, much more, smog exempt. \$13,900 obo. 661/993-9239.

'02 CHRYSLER PT Cruiser, exc. cond., 14K mi., inferno red, limited edition, one owner, extra clean, sunroof, power steering/brakes/doors/windows/seats, cruise control, tilt wheel, dual front airbags, blk. leather interior, am/fm/stereo/cassette/CD, a/c, garage kept, still under warranty, 3 yrs. (36K mi.), \$19,500/obo. 626/355-2957, Dan or Carolyn.

'97 FORD Aspire, good for cheap transportation, \$1,295. 909/606-6722.

'89 GMC Suburban, orig. owner, gd. cond., 350 V8, cruise cont., a/c, pwr. steering/brakes/windows, roof rack, towing package, new tires, recent valve job, \$3,200/obo. 352-4102.

'99 HARLEY DAVIDSON, custom-made Ultra, fat boy style, 113 ss engine, custom paint/wheels, blk. w/dark blue flames, many extras, must sell soon, \$14,000. 909/585-8519, Kyle.

'92 HONDA Civic DX sedan, 112K mi., 4 dr., manual, power steering, no air, \$3,000/obo. 626/448-8927, Elynn.

'93 JEEP Wrangler, 4 cyl., 5 spd., am/fm/CD, oversize tires, locking trunk, new muffler, fun to drive, runs great, exc. cond., \$5,600/obo. 352-4102.

'95 MERCEDES S420, exc. cond., 76K mi., blk./tan, loaded, solid/smooth ride, \$17,000/obo. 247-3637.

'87 MERCEDES 300E, new injectors/ignition system/front tires, rebuilt transmission, 120K mi., \$5,000. 360/981-2104.

'92 OLDSMOBILE 88 Royale, white, 4 dr. sedan, exc. cond., loaded, one owner, 45K mi., \$3,500. 899-7797.

'00 SATURN SL2, 5 spd., CD, tint, exc. cond., blackberry color, must see, loaded, \$4,900. 626/379-3503.

'89 SEA RAY boat, open bow, 205 Hp 4.3L, Bi-mini top, dual batteries, Trail Rite Tandem trailer. 626/945-0780, day or 626/794-2158, night, Curtis or Johnnie.

'99 TOYOTA Avalon XL, automatic, pwr doors/seats, alarm, am/fm/cass./CD, gray/sage w/tan interior, 51,800 mi., vg. cond., \$11,800/obo. 248-4003.

'98 TOYOTA Sienna minivan, V6 LE, 194 HP, 63K mi., lt. blue, exc. cond., dual a/c & sliding doors, 12-disc CD changer, 1 owner, under ext. warranty, \$13,999/obo. 909/592-2279.

'83 TOYOTA Cressida, 6 cyl., 4 dr., silver, loaded, exc. shape, 130K mi., \$1,800/obo. 909/585-5819, Kyle.

'92 VW Cabriolet, 2 dr., conv., 4 cyl., 5 spd., manual, 120K mi., a/c, pwr steering/windows, am/fm stereo, navy blue, maint. records, gd. cond., \$3,000/obo. 626/795-3175.

WHEELS, '00 Toyota Tacoma, stock 15," orig. hubcaps, \$200/obo; MOTOR, '70 Datsun, \$200/obo; RIMS, '69 El Camino, stock, \$100/obo. 899-7797.

Free

CATS (2) to good home due to new baby and issues with allergies; friendly; one is a lap cat; both are indoor only; can be adopted separately. 661/263-2993, Tammy.

DOG, show Boxer, Josh, 9 years old, 24" tall, 80 lbs., beautiful, gentle, loving, pedigree incl. 8 generations of champions, unable to keep, looking for love and care for him as he deserves, has AKC registration papers, not been neutered. 661/259-3095, Valerie.

FILL DIRT, clean, 13 cu. yds. avail., as much as you like, near Los Robles/Jack-son, Pas. 626/791-3103 or dtrask6@its.caltech.edu.

MICROWAVE, GE, 1,250 watts, full-size, countertop model, 15 x 15 x 24," needs service. 626/794-2965, msg.

PHOTO OF LA, NASA, from San Pedro to Mojave, taken from 65K ft. by a U-2 pilot in '81; mounted, legend on back, 21 x 24, shows curvature of Earth; from Caltech bookstore. 909/593-4046 or vivdavies@earthlink.net.

POOL, above ground, pump and filters, about 15' diameter, liner needs repair, came w/house, working cond. unknown, South Pasadena. 626/441-2712, Paul or Molly.

Wanted

CHRISTMAS TREES for future fundraiser, artificial, can be pre-lit or plain w/all the parts. 626/797-1310, msg.

HOME-STAY EXCHANGE for French student, to improve his English; my 16-yr-old nephew seeks to spend July in U.S. in exchange for France visit. 626/287-3225, Peter Halverson.

MATH TUTOR, Jr. & Sr. high school level classes: pre-algebra, geometry, algebra I & II, SAT math, etc. 888/784-1639, eves and or weekends, msg., David.

SINGER, Chinese female to help guitar group for occasional performances, volunteers only. 626/840-0955, msg.

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

VOLLEYBALL PLAYERS, coed, no beginners please, Tues. nights 8 to 10 p.m. at Eagle Rock High School, \$4/nt. 956-1744, Barbara.

For Rent

GLASSELL PARK home, 1 bd., 1 ba., small backyard, small 1-car garage, 10 min. to JPL, \$875. 323/255-1106.

LA CRESCENTA rear duplex, 2 bd., 1 ba., stove & refrig., washer/dryer, nice patio, storage shed, prime location, st. parking, \$1,125. 541-9133.

LA CRESCENTA house, 2 bd., 1.5 ba., den/sunroom, cent. air/heat, Mountain Ave. Elem. School, \$2,200, incl. gardener. 957-3410.

MONROVIA cottage, fully restored, near Old Town, on large/newly landscaped lot, new kitchen/deck, 2 bd., 1 ba., water and trash paid, \$1,550. 626/256-4224.

PASADENA apt., 2 bd., 1 ba., garage, private patio, laundry rm., a/c, stove & refrig.,

fireplace, carpets, mini blinds, good closet/cabinet space, outdoor lighting, garden-er, water & trash paid, great area, Sierra Madre Blvd. near California, close to Caltech, \$1,325. 805/967-7725.

PASADENA apt., furnished & unfurn., 2 bd., 1.5 ba., 2-story townhome-style, dishwasher, cent. a/c, refrig. & stove, laundry room, patio, parking, close to Caltech & JPL, \$1,150-\$1,175 + util. 626/577-3060, ext. 14, Dennis.

PASADENA condo, good area, within 1 mi. of Old Town, Paseo, Caltech, close to mass transit, 1 bd., 1.5 ba, 2-car parking, \$1,275, first, last, sec. 909/598-9734.

PASADENA / SOUTH PASADENA border, roommate wanted to share beautiful 2/1 house; hardwood flrs., fireplace, huge yards, no pets, 5-7 minutes to and from JPL, great location, \$750. 626/676-3911.

SUNLAND room, immaculate hardwood floors, entirely new bathroom, 12.3 miles from JPL, furnished or unfurnished, TV, VCR and linens provided; roomie shares driveway, laundry, kitchen, bathroom, utilities; private entry room opens onto quarter-acre yard, BBQ, vegetable garden, fruit trees, patio; pets invited; storage in garage; nonsmoker; \$450. 951-9744, Shannon or e-mail itsypoo@yahoo.com.

Real Estate

ALTADENA, N.E., home on lg. lot in prime area north of NY Drive, 2 bd., 1.5 ba, den, formal dining room, fireplace, French doors in den + dining rm lead out to lg. yard, newly painted in and out, refinished wood floors and new tile floors; plus a new 500 sq. ft. bonus room w/lots of storage, \$549,000. 952-6007.

CRESTLINE, 4 bd., 3 ba., 1,986 sq. ft. beautiful mtn. home, 2 fireplaces, one in master, lg. build-up storage, str.-to-street lot, San Moritz area w/lake view, walking dist. to Lake Gregory and LGE school, \$225,000. 909/338-5406.

LA CANADA, traditional, 3 bd., 1.5 ba., 1,428 sq. ft., living rm. w/fireplace, dining rm., laundry rm., attached 2-car garage, patio w/arb, walk to JPL, La Canada schools, \$610,000. 952-7485.

PASADENA, beautiful Madison Heights townhouse, 1 bd., 1 ba., 3 floors, end unit, vaulted ceiling, beautiful landscaping, Pergo flrs., 1-car garage, a lot of light, great association reserves, 2-block walk to Gold Line Fillmore stop, location: 249 Alpine St, \$275,000. 626/297-7219, Donald.

Vacation Rentals

BALBOA ISLAND, cute upstairs apartment, fully furnished, 2 bd., 1 ba., deck, parking, laundry, steps to bay; avail. weekly, June-September, \$1,000-\$1,500/week. 626/429-3677 or bettyrs@earthlink.net.

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

FLORIDA, New Smyrna Beach, fully furn. condo, 2 bd., 2 ba., full kitchen, half-hour to Cape Canaveral, quiet, relaxing, overlooking beach; BBQ, pool, game rm., great ocean view, easy walk to stores and restaurants; slps. 6; weekly or monthly. 909/981-7492, Darlene or dfhaug@yahoo.com.

HAWAII, Maui condo, NW coast, ocean front view, 25 ft. fr. surf, 1 bd. w/loft, compl. furn., phone, color TV, VCR, microwave, d/v, pool, priv. lanai, slps. 4, laundry fac., low season rate \$115/nite/2, high season rate \$130/nite/2, \$15/nite/add'l person. 949/348-8047 or jackandrandy@cox.net.

MMAMOTH, Snowcreek, 2 bd., 2 ba., + loft, slps. 6-8, fully equip'd kitchen incl. microwave, D/W, cable TV, VCR, phone, balcony w/view to mtns., Jacz., sauna, streams, fishponds, close to Mammoth Creek, JPL disc't, 626/798-9222 or 626/794-0455 or valeriec@caltech.edu.

OCEANSIDE deluxe condo, 2 bd., 2 ba., slps. 6+, great ocean views, newly decorated, fully furn., full kitchen, fireplace; restful setting close to many attractions, easy walk to pier/harbor/restaurants; amenities incl. BBQ, pool/spa, game rm., tropical landscaping, gated garage/ grounds; weekly or monthly. www.beachvisitors.com, Ginger 831/425-5114 or Grace 760/433-4459.

OCEANSIDE deluxe condo, 1 bd., 1 ba., slps. 4, garden view, newly decorated, fully furn., full kitchen, fireplace; restful setting close to many attractions, easy walk to pier/harbor/restaurants; BBQ, pool/spa, game rm., tropical landscaping, gated garage/ grounds; weekly / monthly. beachvisitor.com, Ginger 831/425-5114 or Grace 760/433-4459.

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

OCEANSIDE condo, fully furnished 2 bd., 2 ba., fireplace, full kitchen, quiet, relaxing, in beautiful setting, located at beachside, barbecue, pool/spa, game rm., great ocean view; easy walk to pier and restaurants, slps. 8; weekly or monthly. 909/98

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Rovers keep on rocking

Mars Exploration Rover

Opportunity casts a shadow over the El Capitan area that the rover examined with tools on its robotic arm.

Opportunity took this image with its front hazard-avoidance camera on Feb. 23.



THE TWIN MARS *Exploration Rovers, Spirit and Opportunity, diligently continue their geology work on the Red Planet.*

On sol 31, which ended at 3:36 a.m. Wednesday, Feb. 25, Opportunity awoke to “Rock Around the Clock” by Bill Haley and his Comets. At 1 a.m. Local Solar Time, Opportunity sent data to Earth via the Mars Global Surveyor orbiter and then sent another whopping 145.6 megabits of data at 3:30 a.m. Local Solar Time via the Mars Odyssey orbiter.

During the morning hours, Opportunity collected data with the alpha particle X-ray spectrometer for five hours and took measurements with its miniature thermal emission spectrometer from inside its newly formed hole that was created on sol 30 by the rock abrasion tool. Later, Opportunity retracted and closed the door of the alpha particle X-ray spectrometer and swapped the Moessbauer spectrometer into the hole made by the abrasion tool for a leisurely 24-hour observation.

Opportunity also updated its “attitude knowledge,” which fine-tunes the rover’s information about its exact location and position on Mars. Updating the attitude knowledge allows the rover to more accurately point the high-gain antenna toward Earth, which increases the communications capabilities. The attitude adjustment also enables scientists and engineers to point instruments onboard Opportunity more precisely at targets of interest, such as particular rocks and patches of soil. To adjust the attitude knowledge, engineers have the rover turn the panoramic camera

to the Sun and watch the Sun travel across the sky for 15 minutes. The rover is then smart enough to take the Sun movement data collected from the panoramic camera to calculate its own location in the universe—on Mars. The rover gathers attitude knowledge errors over time as it drives and uses the robotic arm extensively, but it only needs an attitude adjustment about once a week or after driving long distances.

The plan for sol 32, which ended at 4:15 a.m. Thursday, Feb. 26, was to take another unique set of Moessbauer measurements to look at the rover-created hole in a different spectrum. The goal was to then crawl slightly forward on sol 33 to position Opportunity to use the rock abrasion tool on the upper target of the El Capitan/McKittrick area.

To inspire a morning “run” on sol 51, which ended at 3:15 p.m. Tuesday, Pacific time, Spirit woke up to Vangelis’ “Chariots of Fire.” The rover deployed its arm, took microscopic images of the soil in front of it and then proceeded toward its target, “Middle Ground.” Spirit drove 30 meters (98.4 feet), breaking its own record for a single-sol traverse. Along the way, Spirit paused to image rocks on both sides of the drive path with its panoramic camera.

The auto-navigational software that drove the last 12 meters (39.4 feet) of the traverse to the “Middle Ground” target warned Spirit that the slope into the hollow that houses it was too steep (according to parameters set by rover engineers). Spirit then paced along the rim, looking for a safe way down. Unable to locate a secure path into the crater before the sol ended, Spirit ended up facing slightly west of north instead of northeast, as the plan called for.

Rosetta set for comet mission

By DC Agle

Like the massive white whale in Herman Melville’s 1851 classic “Moby Dick,” comets have long been considered swift, elusive harbingers of change. So it should be of little surprise that one of the best ways for scientists to study the mysteries of comets is to harpoon one.

The European Space Agency’s Rosetta spacecraft was scheduled to lift off on Wednesday, Feb. 25, at 11:16 p.m. Pacific time from the Kourou spaceport in French Guiana. Rosetta will reach Churyumov-Gerasimenko, a 4-kilometer-diameter (2.5-mile) comet, in May 2014. The journey includes flybys of Mars (2007) and Earth (2005, 2007 and 2009).

Among the instruments aboard Rosetta are three instruments funded by NASA and a key component of a fourth. The NASA instruments will examine Churyumov-Gerasimenko from the orbiter.

“This comet has only about three-hundred-thousandths the gravity of Earth,” said JPL’s Dr. Claudia Alexander, project scientist for the U.S. role in the mission. “Rosetta will be able to make observations from as close as 2 kilometers (1.2 miles). The data from our state-of-the-art instruments will be amazing.”

When this rendezvous occurs, Churyumov-Gerasimenko will be about three times as far from the sun as the Earth is. Over the next 18 months Rosetta will study how the comet changes as it moves closer to the sun.

In November 2014, Rosetta will drop its experiment-laden, harpoon-firing lander on Churyumov-Gerasimenko’s icy nucleus.

“What you have to understand is that comets are primordial remnants of the early solar system,” explained Dr. Paul Weissman of JPL. “They are the keys to understanding the way the whole solar system, the Earth, and how even we came into being. And with Rosetta we will be able to observe, study and analyze this primordial material up close for more than a year,” he said.

JPL supplied the Microwave Instrument for Rosetta Orbiter, the first of its type on any interplanetary mission. This instrument can reveal the abundances of selected gases, their temperatures, the speed at which they are coming off the nucleus and the temperature of the nucleus. Scientists will use it to monitor changes in how vapors are released from the nucleus as the coma and tail grow. They will be studying water, carbon monoxide, ammonia and methanol, four of the most abundant gases from comets. Dr. Samuel Gulkis of JPL’s Earth and Space Sciences Division is principal investigator.



Survey shows JPL gains as preferred employer

By Mark Whalen

JPL experienced significant progress in a recent employer preference survey by the National Society of Black Engineers (NSBE), the largest student-managed engineering organization in the country.

Society members rated the Laboratory the 44th best organization to work for in the United States. That represents an increase of 109 spots from the previous year’s survey and the biggest jump of all companies rated in the survey.

“The remarkable boost in JPL’s standing as a preferred employer among NSBE members is very impressive to say the least,” noted Dr. Eddie Tunstel, a senior robotics engineer in Section 348 and an NSBE member-at-large. “I believe that our strong presence at the 2003 NSBE annual national convention had something to do with it. With this news comes a level of momentum that JPL can capitalize on by repeating a strong presence at the 2004 convention next month—taking with it the heightened popularity of our current missions.”

“This is great news for NASA and JPL,” said Ken Brown, an electro-optical systems engineer currently working on the Terrestrial Planet Finder mission. He is also heavily involved with outreach for Divisions 34 and 38. “I think these numbers really show the power of outreach from the JPL community; specifically the efforts of the technical community,” he said. “Considering that this survey was conducted before the MER twins landed, it really does show that we are doing something right as far as outreach.”

“I think it’s fantastic that college students are holding JPL in high regard when considering career op-

portunities,” added Shonte Wright, Mars Exploration Rover thermal systems engineer. “JPL is a multifaceted organization that benefits from highly motivated students.”

IBM remained the survey’s top employer of choice for the seventh consecutive year. Microsoft, Lockheed Martin, General Electric, Johnson & Johnson, General Motors, Boeing, Dell, Proctor and Gamble, and Intel Corp. round out the top 10 companies. The complete results of the survey are published in the November-December issue of NSBE Magazine.

The results of this year’s survey appear to be influenced by the members’ search for job stability, said Dr. Peter Bachiochi, the Eastern Connecticut State University professor who prepared the 15th annual NSBE 50 Employer Preference Survey. While past surveys may have shown members to have hard and fast requirements for a potential employer, this year’s results show that members are responding to societal uncertainty with a more flexible notion of what defines a preferred employer.

“Even with the instability and uncertainty in the world, NSBE members still look toward the future with hope,” Bachiochi said.

“JPL will continue to work with the NSBE, as well as the Society of Hispanic Professional Engineers, the American Indian Science and Engineering Society and the Society of Women Engineers,” noted Toby Solorzano, of the Diversity Programs Office. “This was a pleasant surprise to see JPL on the list, and we will continue to work to make the Lab an employer of choice.”

News Briefs



Mike Sander



Pete Theisinger



Richard Cook

Three receive Lew Allen Award

Three JPL scientists have received the 2003 Lew Allen Award for Excellence. The annual awards recognize and encourage significant individual accomplishments or leadership in scientific research or technological innovation by JPL employees during the early years of their professional careers.

The recipients are DR. JENNIFER DOOLEY of Division 35, DR. CHRISTOPHE DUMAS of Division 32, and DR. EUI-HYEOK YANG of Division 38.

Dooley received her award for research contributions and leadership in the area of large-apertures technology. Dumas received his award for leadership in both the advancement of the applications of adaptive optics to astrophysical problems, and the establishment of JPL as a leader in the field of adaptive optics. Yang was recognized for his excellence in advancing the use of Micro Electro Mechanical Systems-based actuators for space applications.

Each winner received a wall plaque and a research award of \$25,000 from the Research and Technology Development Fund, which is used at JPL to enhance the professional efforts of the awardees.

The award was established in 1990 in honor of Dr. Lew Allen, who served as JPL's director from 1982-90.



Dutch Slager / JPL Photolab



Ladislav Roth

Roth honored by Slovak homeland

LADISLAV ROTH, a JPL research scientist in the field of planetary physics, returned to his Slovak homeland last fall to receive the Slovak Academy of Sciences' International Prize.

With JPL since 1973, Roth was honored with this prestigious award for his contributions to space exploration, which included returning to Slovakia twice a year to teach crash courses in planetary science and geology, and most importantly for collaborating with scientists in Slovakia to bring planetary science up to date and help under-funded institutions reach the modern level of research.

New appointments announced

To implement President Bush's recently announced Space Exploration Policy, NASA Headquarters has announced formation of the Office of Exploration Systems (Code T). To coordinate JPL efforts in support of Code T, Lab Director DR. CHARLES ELACHI has formed the Exploration Systems and Technology Office.

This new office will be responsible for all JPL activities funded by Code T; Project Prometheus (except the Jupiter Icy Moons Orbiter project), Aerospace Technology Enterprise (Code R) and Space Flight Enterprise (Code M). This office will report to Elachi.

MIKE SANDER will be the manager of this office and will become a member of the Executive Council. PETE THEISINGER has been appointed as the Mars Science Laboratory project manager, replacing Sander. RICHARD COOK has been appointed as the Mars Exploration Rovers project manager, replacing Theisinger.

The appointments were effective Feb. 17.

"Slovakia has a good educational system but they suffer from financial problems, so science is not pursued and cultivated as much as it should be," Roth said.

In addition to helping Slovakia modernize space exploration, Roth has persuaded scientists to inquire about and install the needed equipment to monitor the presence of greenhouse gases at various altitude distributions, which hasn't been performed before.

A veteran of radar and planetary science, Roth has used microwave remote sensing and radar altimetry to explore Mars, Venus, the moon and the satellites of Saturn.

Also last year, Roth was named an honorary professor of Natural Sciences. In 1998, he received an honorary doctorate from a major Slovakia, which recognized natives who have made contributions to their homeland.

Roth was also recognized for co-editing "The Face of Venus," a report on the results of the Magellan radar mapping mission to Venus, published by NASA in 1995.

"It always feels good to be noticed," he said. "Even the humblest person wouldn't mind receiving an award; it feels good."

Space is coming to the JPL Store

The JPL Store will be closing for approximately three weeks beginning March 1. A temporary store will be located in the room in the northwest corner of the 167 cafeteria dining room. Access will be through the cafeteria. Temporary JPL Store hours of operation will be 8:30 a.m. to 3:30 p.m. Monday through Friday.

"During the month of March we will be refurbishing the existing store site to provide customers easier access to merchandise and give us the opportunity to enhance our merchandise selections," said JPL Store Manager JUDI CAPRON. "We are really excited about the project and feel that this enhancement will allow us to better serve the JPL community and visitors."

Capron urged JPLers to visit the temporary site, which will continue to provide film-processing services, tickets sales, and shipping and mail services. Web orders will be filled, and a limited selection of merchandise will also be available.

JPL cafes receive "A" health rating

JPL's three cafeterias each received an "A" rating following Feb. 19 inspections by the Los Angeles County Department of Health Services.

JPL cafeteria liaison BONNIE GERSZT thanked Caltech Dining Services staff for their hard work in resolving areas of improvement identified in audits in November.

Each of the three cafeterias was given a rating of 90 or higher, which merits the "A" rating, defined as "generally superior in food handling practices and overall food facility maintenance."

The county conducts the health inspections annually, Gerszt said.

Volunteers sought for L.A. Marathon

Volunteers are sought to work at a water-dispensing station at the Los Angeles Marathon, to be held Sunday, March 7.

The Caltech Athenaeum is sponsoring the water station at the course's Mile 21, at 3rd Street between Arden and Lucerne.

If interested, call Athenaeum employee JORGE ALVARADO at (626) 395-8261. Volunteers may also register at <http://www.lamarathon.com>. Click "volunteers."

Secretaries may apply for mentoring

JPL's Office Professional Mentoring Group is organizing the next mentoring session for JPL secretaries. Participants will learn from others and share their experiences, while being supported and guided by mentors who have a wealth of experience and who are willing to share their knowledge.

Applications for the program can be found at <http://hr/officepros>. Return your application to JOY HODGES, mail stop 301-486, no later than Monday, Oct. 11. For more information, call Hodges at ext. 4-7041.

Special Events Calendar

Ongoing Support Groups

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

Caregivers Support Group—Meets the first Thursday of the month at noon in Building 167-111 (the Wellness Place). For more information, call the Employee Assistance Program at ext. 4-3680.

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

Gay, Lesbian and Bisexual Group—Meets the first Friday and third Thursday 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.

Parents Group for Children With Special Needs—Meets the second Thursday of the month at noon in Building 167-111 (the Wellness Place).

Working Parents Support Group—Meets the third Thursday of the month at noon in Building 167-111. For more information, call the Employee Assistance Program at ext. 4-3680.

Saturday, February 28

David Crosby Concert—The two-time Rock and Roll Hall of Famer will perform at 8 p.m. in Caltech's Beckman Auditorium. Tickets are \$32, \$28 and \$24; high school age and under, \$10. For more information, call (626) 395-4652.

Sunday, February 29

Chamber Music—The Cassatt String Quartet with Humbert Luccarelli will perform at 3:30 p.m. in Caltech's Beckman Auditorium. Tickets are \$29, \$25, \$21 and \$17. For more information, call (626) 395-4652.

Tuesday, March 2

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

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

"Real Women and Other Unseen Images in Hollywood"—Caltech's Beckman Auditorium will host a screening of the movie *Real Women Have Curves* at 6 p.m., followed at 8 p.m. by a talk by author Josefina Lopez. Free admission. For more information, call (626) 395-4652.

Wednesday, March 3

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

"Inventing Historical Truth on the Silver Screen"—Caltech history professor Robert Rosenstone will lecture at 8 p.m. in Caltech's Beckman Auditorium. Free admission. For more information, call (626) 395-4652.

Thursday, March 4

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

Friday, March 5

Caltech Ballroom Dance Club Party—Held in Avery Dining Hall from 9 p.m. to midnight, preceded by a mini-lesson to teach CeroC dancing at 8:30 p.m. The Caltech Ballroom Dance Team will also perform special CeroC and Mambo formations. Refreshments will be served, and as always, no partner or experience is required.

Parametric Analysts Workshop—The International Society of Parametric Analysts' Southern California Chapter workshop will be offered from 8 a.m. to 4 p.m., Building 180-101. It is co-hosted by the Software Quality Improvement Project and the JPL Costing Office (161). For more information, contact workshop co-chair John Powell at ext. 3-4355 or via e-mail.

Saturday, March 6

San Jose Taiko—Japanese drumming is fused with Latin, Brazilian and African rhythms at 8 p.m. in Caltech's Beckman Auditorium. Tickets are \$25, \$21 and \$17; high school age and under, \$10. For more information, call (626) 395-4652.

Tuesday, March 9

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

Wednesday, March 10

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

JPL Toastmasters Club—Meeting at 5 p.m. in the 167 conference room. Call Debbi Llata at ext. 3-3690 for information.

Thursday, March 11

Clogging Class—This new class for beginners will be offered every other Thursday at noon in Building 300-217. For more information, call Shary Devore at ext. 4-1024.

Saturday, March 13

The Gizmo Guys—The duo of Allan Jacobs and Barrett Felker use juggling to demonstrate the science of patterns in this performance for children, set for 2 p.m. in Caltech's Beckman Auditorium. Tickets are \$12 for adults, \$7 for children. For more information, call (626) 395-4652.

Sunday, March 14

Chamber Music—The Juilliard String Quartet will perform at 3:30 p.m. in Caltech's Beckman Auditorium. Tickets are \$29, \$25, \$21 and \$17. For more information, call (626) 395-4652.

Sister city visitors



Dutch Slager / JPL Photolab

Nine high school students from Pasadena's sister city, Xicheng, China, visited the Lab in January. Above, Morris Birnbaum of Section 3449, a member of the Pasadena Sister Cities committee, shows the guests the Mars gallery in Building 317. As part of the U.S. State Department-sponsored exchange program, the students spent several weeks at Pasadena's Blair High School and visited other areas of Southern California.



JPL
Women's
History
Month
Luncheon

Celebrating the Voice of Women— Inspiring Hope and Possibility

h o n o r i n g

Sally Ride

*Former NASA Astronaut
President, Imaginary Lines Inc.
Professor of Physics, UCSD*



Thursday, March 11, 2004

11:00 am – 1:00 pm

La Cañada Flintridge Country Club

5500 Godbey Drive, La Cañada Flintridge

Seating is limited.

All JPL employees are invited to attend.

Ticket Information

Tickets are \$18 and can be purchased by sending a check payable to Katrina Melendez to JPL M/S 125-209 plus the completed Luncheon Ticket Request Form at the bottom of this page. Tickets will be sent to you via JPL mail. No refunds will be given once a ticket has been issued. One ticket per person.

Luncheon Ticket
Request Form

Please Print

Name _____

M/S _____ Phone _____

Are you an ACW Alumnus: ☐ Yes ☐ No

Menu Options (please indicate your choice):

Entrees are served with a mixed green salad with choice of dressings, rolls, dessert, coffee, tea, and iced tea.

☐ Chicken Kiev ☐ Vegetarian Pasta Primavera



ASTRONAUT'S MISSION: SCIENCE CAREERS FOR GIRLS

This year's ACW luncheon theme is "Celebrating the Voice of Women — Inspiring Hope and Possibility." The keynote speaker and honoree for the event is Dr. Sally Ride, a former NASA astronaut and the first American woman in space.

Ride is currently the President and CEO of Imaginary Lines Inc. and a professor of physics at the University of California, San Diego.

Ride was raised in Los Angeles. She attended Stanford University, where she received her undergraduate degree in physics and English in 1973, and her M.S. and Ph.D. in physics in 1975 and 1978, respectively. Shortly thereafter, she was selected for NASA's astronaut corps. Her first flight was aboard the Space Shuttle Challenger in 1983; her second was also aboard Challenger, in 1984. During those flights, she deployed communications satellites, operated the robot arm, and conducted experiments in materials, pharmaceuticals and Earth remote-sensing.

Training for her third spaceflight was interrupted by the Challenger accident. Ride served as a member of the Presidential Commission investigating the accident, and chaired its subcommittee on Operations. She then served as NASA's first director of Strategic Planning, producing a report titled, "Leadership and America's Future in Space." Ride also created and was the first director of NASA's Office of Exploration.

In 1989, Ride joined the faculty at UCSD as a professor of physics and director of the University of California's California Space Institute. In 2001 she founded her own company, Imaginary Lines, to pursue her long-time passion: motivating girls and young women to pursue careers in science, math and technology.

Imaginary Lines is an organization dedicated to supporting the large numbers of girls in 5th to 8th grades and beyond who are (or might become) interested in science, math and engineering and providing this support in ways they will find interesting and entertaining. Imaginary Lines designs, produces and markets programs and products for girls and young women that empower them, engage them and encourage their interests as they grow personally, academically and, down the road, professionally. The organization's aim is to create an environment that will support girls' interests in science, math and technology, and increase the numbers of girls and young women comfortable with science and math. The company also operates the Sally Ride Science Club, whose mission is to keep girls engaged in science by connecting them to people, information and attitudes that will nurture their interest at a critical time in their lives.

Ride has been a member of the President's Committee of Advisors on Science and Technology and the National Research Council's Space Studies Board, and has served on the Boards of the Congressional Office of Technology Assessment, the Carnegie Institution of Washington, and the NCAA Foundation. She is a member of the Corporate Directors' Forum, and has served on the Boards of Veridian and the Mitre Corporation. She is a Fellow of the American Physical Society, a member of the Pacific Council on International Policy, and currently serves on the Board of Trustees of Caltech.

Ride has been inducted into the National Women's Hall of Fame and the Astronaut Hall of Fame. She has also received numerous other honors and awards, including the Jefferson Award for Public Service, the von Braun Award, and the Lindbergh Eagle, and has twice been awarded the National Spaceflight Medal.

Long an advocate for improved science education, Ride has written several science books for children: *To Space and Back*; *Voyager: An Adventure to the Edge of the Solar System*; *The Third Planet: Exploring the Earth from Space*; *The Mystery of Mars*; and *Exploring Our Solar System*. She has also initiated and directed education projects designed to fuel middle school students' fascination with science.

Back to class

Elachi, Cook join astronaut in Explorer School visit

By Mark Whalen

JPL Director Dr. Charles Elachi and Mars Exploration Rovers Project Manager Richard Cook shared the excitement of space exploration with eager youngsters last week with a visit to a local NASA Explorer school.



Bob Brown / JPL Photolab

Elachi and Cook were joined on the Feb. 19 trip to Shirley Avenue Elementary School in Reseda by astronaut Dr. Mike Barratt, a physician, who is training for his first space shuttle flight next year.

The trio spoke with 5th grade students and their teachers in classroom visits followed by talks and presentations in the auditorium. In addition to showing students a video of President Bush's recent announcement of NASA's new vision, Elachi expressed to the students how robotic exploration is one part of a far grander vision of robotic and human space exploration, and that NASA's task is to turn this vision into reality.

Elachi told the students that NASA has three major objectives:

- Understand and protect the home planet. "You have a responsibility to the next generation," he said.
- Explore the universe and search for life. "Within 10 to 15 years technology will allow us to image many of the stars you see in the sky, then we can look for planets around those stars."
- Inspire the next generation of explorers, "And that's you. If you put your mind to it, anything is possible," Elachi said. "There is no doubt in my mind that many of you will be the scientists and engineers making the discoveries of the future."

"There is no doubt in my mind that many of you will be the scientists and engineers making the discoveries of the future."

Dr. Charles Elachi



Tom Wynne / JPL Photolab

Cook told the students that today is not unlike the time when the Lewis and Clark expedition ventured into the uncharted territory of the American west 200 years ago. "In a sense, we're the trailblazers for the exploration of the solar system."

Cook showed the audience video of the events surrounding the two successful Mars Exploration Rover landings in January. He explained how Spirit's and Opportunity's solar panels operate under the same amount of power as 200-watt light bulbs, and talked about the mission's airbag landing system.

He then asked the youngsters to don 3-D glasses to view images of the Martian surface from Spirit's and Opportunity's cameras that had been posted on the auditorium wall.

Invoking his school days, Barratt said to the students, "As a kid, I loved telescopes and the ocean. Then when I got a little older, I got really interested in flying and medicine. I thought, 'How can I put all this together?'"

Prior to his current astronaut training duties, Barratt worked as a NASA flight surgeon, helping to fulfill his dream of being like Dr. McCoy, the doctor in the TV series Star Trek. "The science of space medicine is very new, and it's perfect for me," he said, explaining that, "If someone in space gets sick we have to have trained medical people to help them."

Barratt is now training for a six-month stint aboard the International Space Station. He told the students about the effects of weightlessness on the astronauts, noting that they need to do at least two hours of exercise daily to keep healthy. He said his ex-

"As a kid, I loved telescopes and the ocean. Then when I got a little older, I got really interested in flying and medicine. I thought, How can I put all this together?"

Dr. Mike Barratt



Bob Brown / JPL Photolab

"In a sense, we're the trailblazers for the exploration of the solar system."

Richard Cook

periments will be geared toward long-term spaceflight, leading to a potential human mission to Mars or beyond.

"There is so much to learn," he said, "but I have the best job on the planet."

Students' questions ranged from whether astronauts can communicate with family members in space to the types of flight simulations used in training. Barratt said astronauts can send e-mail and participate in videoconferences with family every day, and "I can call just about any phone number on Earth." He also noted there are many types of flight simulations, specifically one done underwater and another to create conditions in a shuttle cockpit during launches and landings.

Elachi, Cook and Barratt each stressed the need to study hard in school—especially math and science subjects—and to not give up if the subject is hard.

"If you're in a job you love, going to school never stops," Barratt said.

JPL's Education Office supports and provides resources to four NASA Explorer Schools. Besides Shirley Avenue Elementary, Southern California Explorer schools supported by JPL are Washington Middle School in Pasadena, Colton Joint Unified School District GATE program in Fontana and 153rd Street School in Los Angeles.

Explorer Schools have a three-year participation commitment. There are three teachers, all of whom work with 5th graders, and an administrator (the principal). The school builds its team and its instructional or school-improvement objectives. They have an action plan that is implemented with JPL support.

Steven Friedman, the Shirley Avenue principal, said, "as a result of JPL's help, we have a powerful science program." Robert Collins, Los Angeles Unified School District Local District "C" superintendent, added that those from JPL and NASA who have supported the effort "are true American heroes, people to be respected, followed and be proud of."

Each year, the NASA Explorer Schools program establishes a three-year partnership between NASA and 50 school teams, consisting of teachers and education administrators from diverse communities across the country.

While partnered with NASA, Explorer Schools' teams acquire and use new teaching resources and technology tools for grades 4 through 9 using NASA's unique content, experts and other resources. Schools in the program are eligible to receive funding (pending budget approval) over the three-year period to purchase technology tools that support science and mathematics instruction.

The NASA Explorer School program provides opportunities for schools, administrators, students and their families to partner with NASA to improve student learning; participate in authentic experiences with NASA science and technology; apply NASA science, mathematics, and technology knowledge to real-world issues and problems; and participate in special events and other opportunities.



Dick House

Passings

R.C. “DICK” HOUSE, 76, retired from the Public Information Office and a longtime editor of Universe, died Jan. 28 at his home in Encinitas.

House wrote and edited for the paper for 23 years before his 1992 retirement.

JPL astronomer Eleanor Helin accorded House a rare honor in 1992 by naming a newly discovered asteroid after him.

House is survived by his wife, Doris, daughter Laura and son Jonathan. Donations are suggested to the Homestead Foundation of Western Writers of America, c/o Jim Crutchfield, 1012 Fair St., Franklin, TN 37064.

Letters

Friends, co-workers and the Voyager Team: We wanted to thank you all for your support, comfort, assistance, prayers and sympathy during the recent passing of my father, Tim W. Wong. We wish to thank everyone who sent beautiful flowers and took time to attend the service. We appreciate your kindness, help and caring during this difficult time. Also thank you to JPL for the beautiful plant. Thank you all very much.

Regina Wong and Eric Nicolich

Thank you to all my friends and co-workers for their kindness and thoughtfulness after the passing of my father. Thank you as well for the flowers and cards.

Tom Glavich

Many thanks to my co-workers and friends at JPL for the kind and caring thoughts on the passing of my mother in January. The flowers, phone calls, messages, cards, and notes meant a lot to me during that especially stressful time. The plant and sympathy card sent by the Laboratory arrived just at a moment when I was feeling particularly low, and that thoughtful gesture was much appreciated.

Marilyn Morgan, Section 274

I would like to thank my friends and co-workers for all the kindness and support shown me due to the recent passing of my husband. I would also like to thank you for the beautiful plant and for your donations to the scholarship fund in remembrance of my husband, Tom.

Michele Johnson

Retirees

The following JPL employees retired in February:

David Curkendall, 41 years, Section 367; Robert Keskinen, 38 years, Section 352; William Hullinger, 37 years, Section 319; Irene Chan, 32 years, Section 224; Parker Cowgill, 32 years, Section 354; Szabolcs DeGyurky, 25 years, Section 369; Mukund Gangal, 23 years, Section 810; John Sisino, 21 years, Section 314; Francine Fisher, 19 years, Section 269; Charles Shinbrot, 17 years, Section 108; Conrad Sherman, 14 years, Section 262; Delbert Mitchell, 13 years, Section 252; Robert Sinclair, 13 years, Section 351.

Classifieds

For Sale

AUDIO EQUIPMENT: amplifier, Lightning Audio Bolt B200.2; car speaker, 10," Lightning Audio P1.12.4, 100 watts/4 ohms, all for \$100. 661/299-2490, Yvonne.

BABY ITEMS: crib, wood, made in Italy, incl. mattress, height adjustable, exc. cond., \$150/obo; car seat, made by Century, front-facing, up to 40 lbs., gd. cond., \$25/obo. 626/791-6101.

BAR, custom Mediterr.-style, free-standing or attached w/one bolt to wall, 45" H x 26" D x 52" W, seats 3, two 50" shelves for bottles/glasses, blk. leather padded elbow rest, brown tile surfaces, \$200/obo. 626/793-4871.

BASEBALL TICKETS, Dodgers, selected games from season ticket pkg., loge level (orange), aisle 132 (inside 1st base), 2 tickets/game, face value of \$30/ticket; see at www.delunac.net/tickets. 626/296-1253, for details/games.

BBQ, Weber kettle, 22.5" diam., gd. cond., orig. Weber instruction booklet w/recipes, \$50; CHAINSAW, WEN electric, 12" bar, chain

and orig. instruction book, gd. cond., \$20. 626/793-3393.

BED, Cometa, queen, cherry wood, Ital. design, new, pd. \$1,300, sell for \$900; http://www.modfurniture.com/italian.html for pics. 244-8822.

BIRD: Senegal parrot; 11 mo. old, hand-raised, loves att'n, green w/yellow & red vest, must sacrify, to make rm for new baby, inferior bird is \$600 at Petco, sell for \$350; for more about this breed, go to http://www.wingscc.com/aps/s-desc.htm. 626/806-3378.

BOOKS: "Applied Electronics," WWII M.I.T. classic, publisher John Wiley, 1943, \$12; "The Big Band Almanac," profuse illustrations and stories of the country's popular orchestras from the mid-1950s, \$10; creative cookbook, large, like new, 1,000 recipes, \$20 value, \$7. 626/793-1895, Albert.

CAMERA, Canon Elph APS, \$100; CORDLESS PHONE/ANSWERING MACHINE, Sony, digital, \$40; SPEAKERS, Acoustic Research, \$40/pair; CD PLAYER, Sony Discman, with am/fm, \$50; TUNER/AMP, Onkyo TX-840, 60 W/ch., \$100; GOLF BAG, Calloway pro-tour, blk., \$40; PUTTER, Ping J-blade, \$30; MATTRESSES, Serta, "Perfect Sleeper," w/box-spring and frame, twin, pair, \$300/ea.; GRANDFATHER CLOCK, Howard Miller, \$500. 213/810-8801.

CANOE, Old Towne, Katadyn, 16', burgundy, used once, approx. 6 yrs. old, retails for \$849, sell for \$600. 957-7742.

CEMETERY PLOTS, 4, Rosehills, Garden of Autumn; garden is developed and plots are valued at \$2,500/ea., sacrifice for \$2,300/ea., sell each plot separate if necessary. 562/404-3464, ext. 230, Janelle, btw. 7 am - 4 pm or 909/986-4611, after 6 pm.

CHAIR, Morris, mission style, + matching ottoman, hand built from northern red oak, Aniline dyed leather, English dovetail joinery, exc. cond., extremely classy & comfortable, 40 5/8" H x 34 3/4" W x 37 1/2" D, purch. from Restoration Hardware 3 yrs. ago for \$1,600, sell for \$800; see at www.ginkoleaf.net/morris. 626/798-4265.

DESK for computer, mobile, cherry veneer, O'Sullivan model 61925, exc. cond., bought for \$120, sell for best offer. 626/449-0997.

DINING TABLE, smoked glass top, 72 x 42," w/6 upholstered fabric chairs, exc. cond., \$149/obo; BIKE, men's, 26," 15 spd., helmet, gd. cond., \$20; CAMCORDER, Panasonic, digital, PVDV203, 6 mini-DV tapes, digital still camera, SD card, 700x zoom, 1 lb., new in box, never used, full warr., \$349. 909/592-2279.

DRUM SET w/double pedal base, \$250/obo. 626/447-4734.

DRYER, made by General Electric, electric, heavy duty, extra large capacity, 5 cycle, automatic, gd. cond., \$135. 545-0455.

FURNITURE: sectional, Bassett, 2-pe., 1 is a sleeper, floral print; coffee table, 40," end tables, two, 26," mission style, photos avail., all in gd. cond., parts can be sold separately. \$500/obo. 626/791-6101.

GOLF BALLS, used, clean, \$0.50/each. 626/398-3681 or 626/584-3852.

GOLF CLUBS: men's, MacGregor, 3 thru S, 9, w/bag, \$200; women's, Lange III 5-S, 7, w/bag, \$200; PULL CARTS, 2, \$40/ea.; ROWING MACHINE, \$20; EXERCISE BIKE, \$20. 248-1669.

GITAR, Yamaha, full-size, acoustic, brand new, w/papers & warranty, \$245. 241-8208.

HOT TUB, Hot Springs, 300 gal., redwood finish, new cover, perfect working cond., \$500. 957-1043.

INCOME TAX GUIDE BOOK for 2004, J.K. Lasser's, w/forms, brand new, \$10; DIET TAPES, Jenny Craig, set of 14, \$25; CARD SHUFFLER, Johnson, collectible, all-metal construction w/the exception of friction wheels that drive the cards and carved-wood wood handles; stands ~6" handle-high, and ~9 by 6," flanges and handle inclusive; \$35. 790-3899.

JACKET, men's, for hunting, below hip-length, sz. 40 long, strong, w/inside bandolier pockets, vg. cond., expected remaining life 10 yrs., dark khaki, \$35, make offer; SLEEPING BAG, adult, roll-up, summer/fall weight, inside like new, \$10; TENNIS SHOES, Wilson, sz. 12, like new, \$35 value, \$9. 626/793-1895.

COMPUTER, Power Mac 6500 mini-tower; + Sony monitor, HP DW 600; scanner, Umax, all cables; extra ink cartridges, instruction books, pre-installed software, many CDs, vg. cond.; all for \$20. 626/351-6141, K. Shimada.

MISC: dishwasher, Kitchen Aid, portable, \$50; tricycle, girls, exc. cond., \$25; girl's cottage, Little Tyke's, telephone, stove/sink for cooking, 4 shutters/windows, door, plastic tea sets, pots, dishes, mint cond., always kept indoors, orig. price \$300, sell for \$200, will deliver if within the Pasadena area; toys/puzzles/blocks for toddlers, inexpensive; air conditioner, Dura-craft Hepa w/filters; dog house, med. size, \$30; bird cages, assorted. 249-6248.

MISC: mountain bike, downhill, Stinky Kona Gold, 15," \$600/obo; dishwasher, small Frigidaire built-in, 18," just over one yr. old, \$75; futon, blk., full, \$50; couch, Ethan Allen, flower print, \$100; stack washer and gas dryer, Maytag, \$400. 848-2214, David or Karen.

MOVING SALE: sofa bed, queen size, in brown cloth fabric & solid oak wood frames, accented w/gold trim, bed hardly used, gd. cond., always covered w/slipcover; coffee table, solid oak wood w/glass inserts, gd. cond., all for \$100 or sell separately. 909/896-9685.

MOVING SALE: futon, mattress, cover, \$75; chair, papasan, cushion, \$30; office chair, \$20; 3-shelf bookcases, \$10/ea.; floor pillows, \$10/ea.; VCR, \$25; coffee table, lg., pine, \$35; end table, pine, \$20; microwave, \$40; CD/DVD storage units, \$5/ea.; toaster, \$5; golf bag, \$20; stereo w/CD, tape, am/fm, equalizer, \$25; TV stand, \$15; ceiling fan w/light, \$40; Sega game system w/games, \$30. 248-5848.

MOVING SALE: sofa, black velour, \$175; vacuum, \$30; standing lamp w/3 sm. glass shelves, \$25; coffee table, small, wood/faux marble, \$30; end tables, matching, \$20/ea.; storage unit w/drawers and rollers, small, \$10; picture frames: lg., plastic, \$10; small, plastic, \$5/ea.; rug, small, black/gray, \$15; medicine cabinet, new, wood, \$20; TV, 17," \$40; Sony Play-station 1 w/games, \$30. 626/304-1007.

ORGAN, Yamaha 415, electronic console w/13 pedals, 3 keyboards, 144 rhythm patterns, pd. \$7,500, sacrifice for \$2,000; PORT REPLICATOR, for IBM Thinkpad, works with T20, T21, A20, A21, or X, R series, like new, \$85. CONTROLLER CARD, Ultra ATA, w/cable, fits into 32-bit PCI 2.1 or 2.2 expansion slot on motherboard, brand new, \$20. 790-3899.

OSCILLOSCOPE, Sony Techtronik, model 335, w/accessories, exc. cond., rarely used,

\$550/obo. 626/793-3393.

ROUTER, Cisco Linksys, 4 port, switched Cable/DSL, high-speed, still in box, \$35. 626/794-4541, Jim.

SOFA, dual-recliner, \$250; LOVESEAT, \$100; PIANO, Spinet, \$350; COMPUTER DESK, \$30. 626/799-7593.

SPA, Hotsprings Jetsetter, 2-person, outdoor, portable, w/cover, electric, 110V, always hot, cheap to operate, 10 yrs. old, recon. motor/pump/heater 3 yrs. ago, works great, needs cosmetic work, incl. power cord + GFI breaker switch, you move, \$500/obo. 249-2123.

SURFBOARD, Spyder Jarvis, size 6.5', 1 yr. old, exc. cond., owner moved to Colorado for college. \$500/obo. 790-3109.

TABLE for computer, oak, 48" W, w/keyboard tray and 2 drawers; HUTCH w/2 shelves behind door and open bookcase, all for \$150/obo. 626/795-7419.

Vehicles/Accessories

'92 ACURA Integra GS, 2 dr, hatchback, 1.8L, 4 cyl., 5-spd. manual, 155K mi., white/graphite, a/c, ABS, pwr. windows/locks/mirror/antenna, cruise control, sun/moon roof, rear spoiler, no modifications except radio/CD/MP3 player, exc. interior, well-maint., service records avail., major service at 150K mi., 1 owner, \$4,200/obo; see at http://home.earthlink.net/~ck000/integra. 626/791-7219 or KheeChan@earthlink.net.

'90 AUDI 90, 4 dr., pearl white, fairly gd. cond., \$2,000/obo. 626/797-4807.

'00 CHEVY Corvette coupe, blk./blk., 14K mi., 6 spd., ext. warr., CD changer, loaded, \$30,000/obo. 248-5253 or reverb2020@yahoo.com.

'00 CHEVY Silverado, LS 1500, ext. cab, Vortec 5.3, loaded, CD, custom exhaust, exterior color pewter, bedliner, tonneau covers, tow package, 66K mi., exc. shape, \$16,795/obo. 626/285-8069.

'93 CHEVY Suburban 2500, 2 x 4, 350, V8, exc. cond., red, street scene front grill, well-maint., low mi., a/c, power doors/windows, wood trim dash, custom front seat/sheepskin covers, running boards, new tires w/Weld wheels and Flow Master exhaust, \$10,500/obo. 626/359-7666.

'87 CHEVY van conversion, V8 EFI, 146K mi., new catalytic converter & tires, updated a/c, captain's chairs, rear seat opens into queen size bed, \$3,000/obo. 957-3130.

'86 CHEVY Suburban 3/4 ton, 454, all power, dual a/c, 180K mi., new alternator/battery, current tags, must sell, \$4,000/obo. 562/902-0321 or 562/587-7394.

'98 FORD Ranger, 77K mi., auto, air, exc. cond., very clean, \$5,995. 626/798-8071, Renee.

'89 GMC Suburban, orig. owner, gd. cond., 350, V8, cruise control, a/c, ps/pb/pw, roof rack, towing package, new tires, recent valve job, \$3,200/obo. 352-4102.

'70 HARLEY DAVIDSON Shovelhead/Chopper, all S&S motor parts, rebuilt motor, extra parts, very fast, must see, \$11,500. 244-8822.

'01 HONDA Prelude, 17K mi., platinum, manual 5 spd., power windows/moonroof, CD, meticulously maintained, near exc. cond., \$18,000/obo. 626/975-8824.

'03 JAGUAR S-Type, 3.0, V6, silver, 11K mi., under warranty, take over lease payments. 310/748-4745, Alireza.

'98 JEEP Grand Cherokee, special ed., 5.2L, V8, 4WD, 75K mi., pwr everything, cass/CD, prem. sound, dual airbags, pwr seats, moonroof, roof rack, tinted windows, tow pkg., tilt wheel, over-sized tires w/new spare, prem. whls., 4-whl. ABS, lots of after-market additions, must sell, great cond., \$11,400/obo. 352-6646, Ben, or verdugo_verde@comcast.net., pics. avail.

'93 JEEP Wrangler, 4 cyl., 5 spd., am/fm/CD, oversize tires, locking trunk/console, new muffler, fun to drive, runs great, exc. cond., \$5,600/obo. 352-4102.

'97 NISSAN Maxima GLE, great car, V6, JN1CA21D3VT866307, auto., 91K mi., blk. w/blk. leather, all tint, all pwr., airbags, a/c, CD Bose sound, cc., factory alarm, moonroof, \$6,750/obo. 621-4809 or car@vahag.net.

'97 OLDSMOBILE 88 LS, beige, leather, a/c, cruise, am/fm/CD, power locks/windows, low mi. (48K), gd. cond., \$5,740/obo. 790-4448.

'02 TOYOTA Avalon XL, automatic, 4-dr. sedan, silver spruce w/ivory leather int., pwr. steering/doors/windows/seats/cruise control, CD/cassette player, exc. cond., 60K mi., \$17,000. 909/228-9302.

'98 TOYOTA Sienna minivan, V6 LE, 194 HP, 63K mi., light blue, exc. cond., dual a/c & sliding doors, 12-disc CD changer, 1 owner, ext. warranty, \$12,999/obo. 909/592-2279.

'97 TOYOTA Tacoma, 2 dr. pickup truck, only 42K mi., \$5,500/obo. 667-5535.

'89 TOYOTA Camry sedan DX, 4 dr., 4 cyl., white, automatic transmission, gd. cond., only 83K mi., orig. owner, \$2,700. 502-1282.

Free

DOG: Female Husky mix; small in size, approx. 50 lbs., very sweet and smart, lives on a chain in the area. 626/292-1520.

SPA/JACUZZI, lg., working, N.E. Pasadena, gd. rigid cover, heater, pumps, hoses, supplies, paperwork & more, seats 10 friends, new in '88, used regularly, well-maint. 626/405-2206.

Wanted

PICKUP TRUCK, previously owned, reasonably priced. 626/449-9563, Nick.

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

STORAGE SPACE for 22' travel trailer; would like to exchange use of 4-person Softub as monthly storage fee. 439-3730, Todd.

TRANSISTOR RADIOS, old, especially odd shaped and advertising. 248-5282.

VOLLEYBALL PLAYERS, coed, no beginners please, Tues, nights 8 to 10 p.m. at Eagle Rock High School, \$4/nt. 956-1744, Barbara.

For Rent

ALTADENA, 3 mi. from JPL, nice neighborhood, furnished, includes linen, laundry, parking, kitchen, patio; late March or early April, \$500 + sec. dep. 626/798-4821.

HOLLYWOOD, large single apt., 1 block from Metro and shopping, util. paid, stove & refrig., sec. bldg., newly decorated, street parking, \$695. 310/377-0316, Gerri.

LA CANADA guesthouse, 1 bd., liv. rm, full kitch., very priv., \$1,200. 241-8208, Irena, eves.

LA CRESCENTA apt., 1 bd., 10 min. from JPL, \$825. 626/445-0884, John.

MONTEREY PARK house, 3 bd., 2 ba., 2-car garage, convenient area, exc. Brightwood School, near Atlantic & Harding, \$2,000. 626/576-5059.

PASADENA condo to share, quiet, exc. location, lg., freshly painted, very private wing (room + bath w/generous closets), shared kitchen, living rm., lg. balcony w/peaceful view, laundry facility, secure parking, CA/Los Robles, female pref., \$470. 626/796-9221.

PASADENA studio, completely remodeled, walking distance to PCC, util. and parking included, no pets, \$550. 590-2793.

PASADENA bungalow home, nr. JPL/Caltech, fireplace, wood floors, nice kitchen, lots of storage, 3 bd., one is a master bd., 2 ba., laundry room, 2-car garage w/working shop area, enclosed backyard w/fruit trees and flowers, gardener, no pets, \$1,500 + \$1,500 sec. dep. 626/794-0455, Oil or Bill.

PASADENA apt., 2 bd., 1 ba., garage, priv. patio, laundry rm., a/c, stove & refrig., fireplace, carpets, mini-blinds; gd closet/cabinet space, outdoor lighting; gardener, water & trash pd.; great area, Sierra Madre Blvd., nr. California, close to Caltech, \$1,250. 805/967-7725.

PASADENA apt., unfurnished, 2 bd., 1.5 ba., 2-story townhome-style, dishwasher, cent. a/c, refrig. & stove, laundry room, patio, parking, new carpet, close to Caltech & JPL, \$1,095 + util. 626/577-3060, ext. 14, Dennis.

PASADENA, roommate wanted to share 2 master bd. apt. on S. Madison, large closets, balcony, central a/c, dishwasher, gated complex w/sun decks, pool, fitness center, laundry facilities, secure parking, within 1 mi. of S. Lake, Paseo, Old Town, Caltech, minutes to JPL, \$800. 626/372-1111, Sonya and cat.

PASADENA, Spanish house, 2 bd., 1 ba. + large den, near Caltech & PCC, lg. living/dining/bonus rooms, new carpet, laundry hookups, gated yard, pets invited, 15 min. to JPL, \$1,650 + dep. 626/676-1482.

PASADENA bungalow, 1 bd., 1 ba., stove & refrig., washer/dryer, a/c, Pergo floors, pets invited, close to Caltech, \$1,050. 626/796-0406.

SUNLAND room, immaculate hardwood flrs., entirely new ba., 12.3 mi. from JPL, furnished or unfurn., TV, VCR, linens provided; roomie shares driveway, laundry, kitchen, bathroom, util.; priv. entry rm. opens onto 1/4- acre yard, BBQ, vegetable garden, fruit trees, patio, pets invited, storage in garage, non-smoker, \$450. 951-9744, Shannon, or itsypoo@yahoo.com.

TEMPLE CITY, 2 bd. plus lg. office/bonus rm., remodeled kitchen, top of the line appliances, central air, hardwd. floors, travertine, custom paint, private yard, \$1,850. 760/633-3857.

Real Estate

ALTADENA, N.E., home in prime area north of NY Drive, 2 bd., 1.5 ba, den, formal dining room, fireplace, French doors in den + dining rm. lead out to lg. yard, newly painted in and out, refinished wood floors and new tile floors; plus a new 500 sq. ft. bonus room w/lots of storage, \$549,000. 952-6007.

NATIONAL FOREST, 68 acre, 2 lg. bd., 1 ba., lg. den, fireplace, kitchen, 2 refrig., pantry, washer/dryer tools, electric propane 288 gal., barn, tools, workshop, tractor, etc. 790-5586 or 542-2411, Chris Thomas.

OXNARD, mobile home nr. beach, 2 bd., 1 1/2 ba., stove, refrig, w & d, large priv. lot, room for 3 cars in driveway (2 covered), large storage "barn" at rear of property; highest monthly space rent has been \$548, which includes all util. except phone; senior park, must be 55 or over; \$48K cash. 292-6028, Steve, cell.

Vacation Rentals

BALBOA ISLAND, cute upstairs apartment, fully furnished, 2 bd., 1 ba., deck, parking, laundry, steps to bay, slps. 5; avail. weekly, June-September, \$1,000-\$1,500/week. 626/429-3677 or bettyrs@earthlink.net.

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

CAMBRIA house, ocean front, exceptional white water view, accom. up to 4 people, all amenities provided. 702/256-1359.

FLORIDA, New Smyrna Beach, fully furn. condo, 2 bd., 2 ba., full kitchen, half-hour to Cape Canaveral, quiet, relaxing, overlooking beach; BBQ, pool, game rm., great ocean view, easy walk to stores and restaurants; slps. 6; weekly or monthly. 909/981-7492, Darlene or dfhauge@yahoo.com.

HAWAII, Maui condo, NW coast, ocean front view, 25 ft. fr. surf, 1 bd. w/loft, compl. furn., phone, color TV, VCR, microwave, d/w, pool, priv. lanai, slps. 4, laundry fac., low season rate \$115/nite/2, high season rate \$130/nite/2, \$15/nite/add'l person. 949/348-8047, or jackandrandy@cox.net.

MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, slps. 6-8, fully equip'd kitch. incl. microwave, D/W, cable TV, VCR, phone, balcony w/mtn. view, Jacz., sauna, streams, fishponds, close to Mammoth Creek, JPL disc'nt. 626/798-9222, 626/794-0455 or valeriec@caltech.edu.

OCEANSIDE deluxe beach condo, 2 bd., 2 ba., gated complex, JPL disc'nt. 760/433-4459 or beachvisitors.com.

OCEANSIDE deluxe beach condo, 1 bd., 1 ba., gated complex, JPL disc'nt. 760/433-4459 or beachvisitor.com.

OCEANSIDE condo, fully furn. 2 bd., 2 ba., fireplace, full kitch.; quiet, relaxing, beautiful beachside setting; BBQ, pool/spa, game rm., great ocean view; easy walk to pier + restaurants, slps. 8; weekly or monthly. 909/981-7492, Darlene or dfhauge@yahoo.com.

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

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.

TIMESHARE, weeks and single days avail., you pick date and location. 626/676-1408.

TIMESHARES: Choose from 1,900+ 5-star vacation resorts in 75 countries, incl. Hyatt & Marriott; luxurious residential-style studios w/turn. kitchenette, starting at \$511 for 7 nts; larger units w/1-3 bd., living rm, full kitch. 626/794-9579 or livestarresorts@earthlink.net.