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Mars orbiter hits its target

By Guy Webster

Top photo: Celebrating the successful orbit insertion are, from left,

Dr. Fuk Li, Jim Graf, Dr. Charles Elachi, Dr. Colleen Hartman and Tom Gavin.

In bottom row, from left: Texas Congressman John Culberson congratulates

Mars program deputy manager Pete Theisinger; Cindy Schulz of Lockheed

Martin Space Systems gets a hug; Yubsyen Shen of the Deep Space Mission System

Program Office (left) and MRO Flight System Manager Howard Eisen;

Jim Crocker of Lockheed Martin (left) and MRO Project Scientist Dr. Rich Zurek at press briefing.



Dutch Slager, Tom Wynne / JPL/Photolab

WITH A CRUCIALLY TIMED FIRING OF ITS MAIN ENGINES on Friday, March 10, JPL's new mission to Mars successfully put itself into orbit around the red planet.

The spacecraft, Mars Reconnaissance Orbiter, will provide more science data than all previous Mars missions combined.

Signals received from the spacecraft at 2:16 p.m. Pacific Time after it emerged from its first pass behind Mars set off cheers and applause in control rooms at JPL and at Lockheed Martin Space Systems, Denver.

"This is a great milestone to have accomplished, but it's just one of many milestones before we can open the champagne," said Colleen Hartman, deputy associate administrator for NASA's Science Mission Directorate. "Once we are in the prime science orbit, the spacecraft will perform observations of the atmosphere, surface and subsurface of Mars in unprecedented detail."

The spacecraft traveled about 500 million kilometers (310 million miles) to reach Mars after its launch from Florida on Aug. 12, 2005. It needed to use its main thrusters as it neared the planet in order to slow itself enough for Mars' gravity to capture it. The thruster firing began while the spacecraft was still in radio contact with Earth, but needed to end during a tense half hour of radio silence while the spacecraft flew behind Mars.

"We couldn't have scripted it any better," said JPL's Jim Graf, the project manager. "Our spacecraft has finally become an orbiter. The celebration feels great, but it will be very brief because before we start our main science phase, we still have six months of challenging work to adjust the orbit to the right size and shape."

For the next half-year, the mission will use hundreds of carefully calculated dips into Mars' atmosphere in a process called "aerobraking." This will shrink its orbit from the elongated ellipse it is now flying, to a nearly circular two-hour orbit. For the mission's principal science phase,

scheduled to begin in November, the desired orbit is a nearly circular loop ranging from 320 kilometers (199 miles) to 255 kilometers (158 miles) in altitude, lower than any previous Mars orbiter. To go directly into such an orbit instead of using aerobraking, the mission would have needed to carry about 70 percent more fuel when it launched.

The instruments on Mars Reconnaissance Orbiter will examine the planet from this low-altitude orbit. A spectrometer will map water-related minerals in patches as small as a baseball infield. A radar instrument will probe for underground layers of rock and water. One telescopic camera will resolve features as small as a card table. Another will put the highest-resolution images into broader context. A color camera will monitor the entire planet daily for changes in weather. A radiometer will check each layer of the atmosphere for variations in temperature, water vapor and dust.

"The missions currently at Mars have each advanced what we know about the presence and history of water on Mars, and one of the main goals for Mars Reconnaissance Orbiter is to decipher when water was on the surface and where it is now," said JPL's Dr. Richard Zurek, the project scientist.

"Water is essential for life, so that will help focus future studies of whether Mars has ever supported life."

The orbiter can radio data to Earth at up to 10 times the rate of any previous Mars mission. Besides sending home the pictures and other information from its own investigations, it will relay data from surface missions, including NASA's Phoenix Mars Scout scheduled for launch in 2007 and Mars Science Laboratory in development for 2009. Both of those missions are managed by JPL.

Additional information about Mars Reconnaissance Orbiter is available online at <http://www.nasa.gov/mro>.

Enceladus may be all wet

Possible geysers seen by Cassini

By Carolina Martinez

Plumes of icy material extend above the southern polar region of Enceladus as imaged by Cassini in February 2005.

JPL'S CASSINI SPACECRAFT MAY HAVE FOUND EVIDENCE of liquid water reservoirs that erupt in Yellowstone-like geysers on Saturn's moon Enceladus. The rare occurrence of liquid water so near the surface raises many new questions about the mysterious moon.



"We realize that this is a radical conclusion—that we may have evidence for liquid water within a body so small and so cold," said Dr. Carolyn Porco, Cassini imaging team leader at Space Science Institute, Boulder, Colo. "However, if we are right, we have significantly broadened the diversity of solar system environments where we might possibly have conditions suitable for living organisms."

High-resolution Cassini images show icy jets and towering plumes ejecting large quantities of particles at high speed. Scientists examined several models to explain the process. They ruled out the idea that the particles are produced by or blown off the moon's surface by vapor created when warm water ice converts to a gas. Instead, scientists have found evidence for a much more exciting possibility—the jets might be erupting from near-surface pockets of liquid water above 0 degrees Celsius (32 degrees Fahrenheit), like cold versions of the Old Faithful geyser in Yellowstone.

Mission scientists reported these and other Enceladus findings in the March 10 issue of Science.

"We previously knew of at most three places where active volcanism exists: Jupiter's moon Io, Earth, and possibly Neptune's moon Triton. Cassini changed all that, making Enceladus the latest member of this very exclusive club, and one of the most exciting places in the solar system," said Dr. John Spencer, Cassini scientist, Southwest Research Institute, Boulder, Colo.

Continued on page 4

News Briefs

Cassini, Deep Impact earn Laurels

Aviation Week & Space Technology magazine has included two JPL missions in its 2006 Laurels awards. Laurels are compiled by the magazine's editors and honor winners in eight discrete categories.

In the Space Laurels category, the Cassini/Huygens spacecraft team and Deep Impact team received awards.

The Cassini/Huygens team was recognized for the successful landing of the European Space Agency Huygens probe on Saturn's moon Titan, and "for the science return and poetic images from NASA's Cassini orbiter that will continue for many years," the magazine said. "DENNIS MATSON, the project scientist at JPL, and JEAN-PIERRE LEBRETON, the European Space Agency's project scientist and mission manager, have strived since the beginning to create, protect and operate the Cassini/Huygens mission, and are good representatives of the larger team that made this two-decade international project possible."

The Deep Impact team was cited for "the successful mission that scored a direct hit on the comet 9P/Tempel 1 to see what comets are made of, and left the flyby spacecraft to live another day. The team was an academia/NASA/Ball Aerospace collaboration and is well-represented by MICHAEL AHEARN of the University of Maryland, RICHARD GRAMMIER of JPL and MONTE HENDERSON of Ball Aerospace."

Aviation Week will honor the winners on April 7 at a Laureate Awards event near Washington, D.C.

Software award candidates sought

The call for candidates for the NASA Software of the Year Award has been announced. This competition selects one or more software packages developed within NASA for a special Space Act award. Each center submits one candidate.

Last year, JPL's submission, the Autonomous Sciencecraft Experiment package, submitted by STEVE CHIEN and his team, was co-winner of the award.

A general description of the competition, eligibility requirements, and forms and procedures may be found at <http://icb.nasa.gov/swoinfo.html>.

For consideration, submit candidate packages to the JPL Software of the Year selection board at SOYA@jpl.nasa.gov with the subject line "NASA Software of the Year Candidate." Entries are due Monday, April 10.

Plan for summer students

It's not too early to start planning for JPL's Summer Student Employment Program, which runs from the beginning of May to the end of September. The program is targeted to providing paid employment opportunities for college students, although a few positions may be available for high school seniors.

Children of JPL employees will be eligible to apply for and accept positions as part of the program. However, children will not be eligible to work in positions that would establish a reporting relationship with a family member (including the entire reporting chain from first-line management to the Director's Office).

Students interested in summer positions should visit JPL's Employment website at http://careerlaunch.jpl.nasa.gov/program_summer.htm and submit a resume before April 30.

Conference signups coming up

Early bird registration is due March 24 for User2User 2006, the Mentor Graphics International User Conference, which will be held May 2-5 in San Jose.

Visit www.mentor.com/User2User. JPL's FARROKH SHOAR is the conference chair. For more information, call him at ext. 4-5126.



Dennis Matson



Richard Grammier

JPLer credited with life-saving maneuver

By Mark Whalen



Frank Mortelliti

Recently, Frank Mortelliti's past caught up with him. But he's very proud it happened.

Mortelliti, manager of the Environmental, Health and Safety Program Office (530), was attending a NASA Operations Engineering Panel review at Ames Research Center in early February. While dining with NASA colleagues at a local restaurant, Mortelliti heard a commotion at a nearby table, jumped up and rushed over. Seconds later, Mortelliti successfully performed the Heimlich maneuver on a young woman who had been choking.

Fortunately for her, Mortelliti has a history of saving lives, having worked for seven years as an emergency medical technician and paramedic before joining JPL. He has also trained lifeguards.

"It was a classic choking case," Mortelliti recalled. "The first sign of a choking victim is that they can't speak. Her color changed dramatically; she turned blue. Then she collapsed and fell limp."

The Heimlich maneuver propels a foreign body toward the mouth, away from the lungs. Mortelliti quickly applied two Heimlich "strokes" on the 24-year-old victim; on the second one a large piece of meat flew out of her mouth. Soon, she was breathing normally.

It had been many years since Mortelliti had to perform the procedure. But "it's like riding a bike," he said. "You never forget."

He would like to use the incident to encourage others—particularly parents—to get training in CPR and the Heimlich maneuver. The Red Cross is among the agencies offering training.

Mortelliti is matter-of-fact about the incident, but a witness saw a hero in action.

"There is absolutely no doubt in my mind that Frank saved that young lady's life that night," noted Pete Allen of Marshall Space Flight Center, who was at the restaurant. "When I first saw her, the look on her face was one of sheer terror. I looked around the restaurant and, remarkably, no one else seemed to be paying a bit of attention to what was going on. Therefore, I have concluded that if Frank hadn't acted (and those at the table with her were paralyzed with fear), no one else would have, and a young life would have ended then and there. While we are fortunate in our business to have the opportunity to work with national heroes, there are also much lesser-known heroes in our midst."

Special Events Calendar

Ongoing Support Groups

Alcoholics Anonymous—Meets Wednesdays at 11:30 a.m.

Caregivers Support Group—Meets the first Thursday of the month at noon in Building 167-111 (the Wellness Place).

Codependents Anonymous—Meets at noon every Wednesday.

Lambda (Gay, Lesbian, Bisexual and Transgender Networking Group)—Meets the first Friday and third Thursday of the month at noon in Building 111-117. For more information, call Randy Herrera, 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).

For more information on any of the support groups, call the Employee Assistance Program at ext. 4-3680.

Wednesday, March 15

JPL Chorus—Meets at noon in Building 233-303. For more information, call Shary DeVore at ext. 4-1024.

JPL Library Orientation—Stop by Building 111-104 at 11:30 a.m. for an overview of the Library's products and services, and learn how to access numerous electronic resources from your desktop. For more information, call the reference desk, ext. 4-4200.

Thu.-Fri., March 16-17

Von Kármán Lecture Series—Dr. Gerard van Belle, Keck operations

scientist at Caltech's Michelson Science Center, will present "New Views of Hidden Worlds: Revealing the Depths of Venus, Jupiter, Saturn and Titan with 21st-Century Spacecraft" 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 www.jpl.nasa.gov/events/lectures/mar06.cfm. For more information, call Public Services at ext. 4-0112.



Saturday, March 18

Mark Twain Tonight!—Hal Holbrook portrays the legendary literary figure in a one-man show at 8 p.m.

in Caltech's Beckman Auditorium. Tickets are \$35, \$31 and \$27; \$10 for high school age and younger. For more information, call (626) 395-4652 or visit www.events.caltech.edu.



Sunday, March 19

Chamber Music—Works by Martinu, Schoenberg and Brahms will be featured at 3:30 p.m. in Caltech's Beckman Auditorium. Tickets are \$32, \$27,

\$22 and \$18. For more information, call (626) 395-4652 or visit www.events.caltech.edu.

Tuesday, March 21

"Giant Planet Formation: Theory vs. Observations"—Dr. Alan Boss, a research staff member at the Carnegie Institution's Department of Terrestrial Magnetism, will speak at 11:30 a.m. in von Kármán Auditorium.

Staff Education, Career Development at Caltech—Claremont Graduate University will present information about their Master of Science in Information Systems degree program at noon in the Avery Library. Class start dates depend on an adequate number of students enrolled. Feel free to bring your lunch. For more information, contact Diane Williams at (626) 395-8055 or diane.williams@caltech.edu.

"Stromatolites: Microbial Evolutionary Mileposts or Environmental Dipsticks?"—Caltech geology professor Dr. John Grotzinger will speak at 2 p.m. in von Kármán Auditorium.

Wednesday, March 22

JPL Chorus—Meets at noon in Building 233-303. For more information, call Shary DeVore at ext. 4-1024.

JPL Library Orientation—Stop by Building 111-104 at 11:30 a.m. for an overview of the Library's products and services, and learn how to access numerous electronic resources from your desktop. For more information, call the reference desk, ext. 4-4200.

JPL Toastmasters Club—Meeting at 5 p.m. in conference room 167. Call Dirk Runge, ext. 3-0465, or visit www.jplcaltechtostmasters.com.

Wed.-Thu., March 22-23

Investment Advice—TIAA-CREF will offer one-on-one counseling in T1720-132. For an appointment, visit www.tiaa-cref.org or call (626) 432-6363.

Thursday, March 23

Caltech Architectural Tour—Hosted by the Caltech Women's Club, from 11 a.m. to 12:30 p.m. Free and open to the public. Meet at the Athenaeum front hall, 551 S. Hill Ave. For reservations, call Susan Lee, (626) 395-6327.

Clogging Class—Meets at noon in Building 300-217. For more information, call Shary DeVore at ext. 4-1024.

Saturday, March 25

Space: Are We Alone?—This high-definition film, part of the "Science Saturdays at 2:00" series of family events, will be shown at 2 p.m. in Caltech's Beckman Auditorium. Laura Baker, from Caltech's division of



geological and planetary sciences, will introduce the film and lead a post-screening discussion. Tickets are \$5. For more information, call (626) 395-4652 or visit www.events.caltech.edu.

Haley gets an asteroid

The Comets during their July performance on Lab.



Camil Lachata / JPL Photolab

Bill Haley, the late musician whose 1954 "Rock Around the Clock" helped launch the rock 'n roll era, has had an asteroid named in his honor by the International Astronomical Union.

Haley's band, "The Comets," performed at JPL last July in celebration of the successful Deep Impact mission on Independence Day.

The asteroid, called (79896) Billhaley = 1999 BH5, was discovered in January 1999 by the Klet Observatory in the Czech Republic.

GRACE

DETECTS SIGNIFICANT ANTARCTIC ICE MASS LOSS

By Alan Buis

"The Grace mission is unique in its ability to measure mass changes directly for entire ice sheets and can determine how Earth's mass distribution changes over time. Because ice sheets are a large source of uncertainties in projections of sea level change, this represents a very important step toward more accurate prediction, and has important societal and economic impacts."

ISABELLA VELICOGNA

The first-ever gravity survey of the entire Antarctic ice sheet, conducted using data from the NASA/German Aerospace Center Gravity Recovery and Climate Experiment (Grace), which is managed by JPL, concludes the ice sheet's mass has decreased significantly from 2002 to 2005.

Isabella Velicogna and John Wahr, both from the University of Colorado, conducted the study. They demonstrated for the first time that Antarctica's ice sheet lost a significant amount of mass since 2002. The estimated mass loss was enough to raise global sea level about 1.2 millimeters (0.05 inch) during the survey period, or about 13 percent of the overall observed sea level rise for the same period. The researchers found Antarctica's ice sheet decreased by 152 (plus or minus 80) cubic kilometers of ice annually between April 2002 and August 2005.

That is about how much water the United States consumes in three months (a cubic kilometer is 1 trillion liters; approximately 264 billion gallons of water). This represents a change of about 0.4 millimeter (0.016 inch) per year to global sea level rise. Most of the mass loss came from the West Antarctic ice sheet. "Antarctica is Earth's largest reservoir of fresh water," Velicogna said. "The Grace mission is unique in its abil-



Ben Holt

ity to measure mass changes directly for entire ice sheets and can determine how Earth's mass distribution changes over time. Because ice sheets are a large source of uncertainties in projections of sea level change, this represents a very important step toward more accurate prediction, and has important societal and economic impacts. As more Grace data become available, it will become feasible to search for longer-term changes in the rate of Antarctic mass loss," she said.

Measuring variations in Antarctica's ice sheet mass is difficult because of its size and complexity. Grace is able to overcome these issues, surveying the entire ice sheet, and tracking the balance between mass changes in the interior and coastal areas.

Previous estimates have used various techniques, each with limitations and uncertainties and an inherent inability to monitor the entire ice sheet mass as a whole. Even studies that synthesized results from several techniques, such as the assessment by the Intergovernmental Panel on Climate Change, suffered from a lack of data in critical regions.

"Combining Grace data with data from other instruments such as NASA's Ice, Cloud and Land Elevation Satellite; radar; and altimeters that are more effective for studying individual glaciers is expected to substantially improve our

understanding of the processes controlling ice sheet mass variations," Velicogna said.

The Antarctic mass loss findings were enabled by the ability of the twin Grace satellites to track minute changes in Earth's gravity field resulting from regional changes in planet mass distribution. Mass movement of ice, air, water and solid Earth reflect weather patterns, climate change and even earthquakes. To track these changes, Grace measures micron-scale variations in the 220-kilometer (137-mile) separation between the two satellites, which fly in formation.

The University of Texas Center for Space Research has overall Grace mission responsibility. GeoForschungsZentrum Potsdam (GFZ), Potsdam, Germany, is responsible for German mission elements. Science data processing, distribution, archiving and product verification are managed jointly by JPL, the University of Texas and GFZ. The results appear in an early-March issue of Science.

For more information about Grace, visit <http://www.csr.utexas.edu/grace> and <http://www.gfz-potsdam.de/grace>.

JPLers Richard Kornfeld (left), Richard Mattingly (with glasses) and Sean Haggart (far right) participate in testing a Mars sample return capsule. Second from right is Joe Parrish, president of industrial partner Payload Systems Inc.



Johnson Space Center photo

ZERO GRAVITY AIDS MARS SAMPLE RETURN TESTS

In February, JPL personnel successfully flew a Mars Technology Program-sponsored Small Business Innovation Research experiment in NASA's C-9 "vomit comet."

The experiment—performed in concert with industrial partner Payload Systems Inc. of Cambridge, Mass.—involved the capture of a "sample canister" by a capture cone in zero gravity. The experiment has direct applicability to a future Mars sample return mission, where a sample canister with Mars soil samples is launched into Mars orbit and then captured by another spacecraft having a capture cone.

The objectives of the test were to evaluate the capture cone prototype and characterize the impact and capture dynamics of the sample canister. This test also served as a pathfinder for future capture-cone validation programs.

The ball-shaped sample canister weighed nine pounds, measured about 10 inches wide, and contained inertial sensors. The capture cone was attached to a baseplate containing a control panel, camera, and a number of sensors. The canister was shot into a capture cone using a launcher system or by hand at moderate speeds of up to 1 foot per second. Both the capture cone/baseplate assembly and the launcher system were attached to a common frame that was free floating during the zero-gravity period.

The C-9 was used because of its ability to fly in a parabolic pattern—in this case, similar to an upside down "V." Taking off near Johnson Space Center, the plane began a steep climb at about 24,000 feet, then started to level off at about 32,000 feet, at that point providing about 20 seconds of zero gravity for testing. Over four days, this process was repeated 160 times.

Task manager Dr. Richard Kornfeld, who also serves as the deputy project systems engineer on the 2007 Mars Phoenix Project, said the tests provided a wealth of data and succeeded in validating the basic operation of the capture cone prototype in weightless conditions. The tests also demonstrated that the C-9 aircraft serves as a useful and cost-effective test venue for future capture cone validation programs.

Mechanical Systems Division (35) personnel, under the leadership of Tom Rivellini and Don Bickler, designed the capture cone. Kornfeld, Richard Mattingly, the Mars Sample Return study manager, and Sean Haggart from the Advanced Mechanical Systems Section served as flight crew from JPL. Payload Systems Inc. built all hardware and software.

Cassini

Continued from page 1

"Other moons in the solar system have liquid-water oceans covered by kilometers of icy crust," said Dr. Andrew Ingersoll, imaging team member and atmospheric scientist at Caltech. "What's different here is that pockets of liquid water may be no more than tens of meters below the surface."

Other unexplained oddities now make sense. "As Cassini approached Saturn, we discovered that the Saturnian system is filled with oxygen atoms. At the time we had no idea where the oxygen was coming from," said Dr. Candy Hansen, a Cassini scientist at JPL. "Now we know that Enceladus is spewing out water molecules, which break down into oxygen and hydrogen."

Scientists are also seeing variability at Enceladus. "Even when Cassini is not flying close to Enceladus, we can detect that the plume's activity has been changing through its varying effects on the soup of electrically-charged particles that flow past the moon," said Dr. Geraint Jones, Cassini scientist, magnetospheric imaging instrument, Max Planck Institute for Solar System Research, Katlenburg-Lindau, Germany.

Scientists still have many questions. Why is Enceladus currently so active? Are other sites on Enceladus active? Might this activity have been

continuous enough over the moon's history for life to have had a chance to take hold in the moon's interior?

"Our search for liquid water has taken a new turn. The type of evidence for liquid water on Enceladus is very different from what we've seen at Jupiter's moon Europa. On Europa the evidence from surface geological features points to an internal ocean. On Enceladus the evidence is direct observation of water vapor venting from sources close to the surface," said Dr. Peter Thomas, Cassini imaging scientist, Cornell University.

In the spring of 2008, scientists will get another chance to look at Enceladus when Cassini flies within 350 kilometers (approximately 220 miles), but much work remains after Cassini's four-year prime mission is over.

"There's no question that, along with the moon Titan, Enceladus should be a very high priority for us. Saturn has given us two exciting worlds to explore," said Dr. Jonathan Lunine, Cassini interdisciplinary scientist, University of Arizona.

For images and more information, visit <http://www.nasa.gov/cassini> and <http://saturn.jpl.nasa.gov>.



Larry Wright

Passings

LAWRENCE WHALEN, 86, retired from Section 344, died Dec. 27.

Whalen joined JPL in 1961 and retired in 1981. He worked for the Rocket Science Division in Pasadena and at Edwards Air Force Base.

Whalen is survived by two nephews, four nieces and a sister-in-law. Memorial services were held at St. Jude Catholic Church in Wofford Heights, Calif., with interment at San Fernando Mission Cemetery in Mission Hills.

LARRY WRIGHT, 69, former manager of JPL's Flight Hardware Logistics Program Office, died Jan. 27.

Wright joined the Lab in 1959 and retired in 1999. He is survived by his wife, Elizabeth, and daughter Diana.

DONALD ROCKEY, a 29-year employee from Section 313G, died Feb. 6.

He is survived by his wife, Marcelina, mother Lucinda, sister Patricia Hall and nephew Stephen Hall.

Retiree **JOHN HIGH**, 81, died Feb. 9.

High worked at the Laboratory from 1981 to 1990. He is survived by his wife, Pauline; children Deepti, Jane, David, Nick and Paulette; nine grandchildren and two great grandchildren.

The family requests that donations in his memory be made to San Luis Obispo United Methodist Church.

Letters

My most sincere thank you to all my friends and co-workers at JPL for the beautiful cards, kind words and flowers I received after the passing of my beloved father. Your kindness is truly appreciated. May God bless you all.

Georgene Peralta

My family and I thank our friends at JPL very much for your kind thoughts and beautiful plant after the recent death of my father.

Mark Adler

I'd like to express my sincere thanks to my co-workers for their sympathy and kind words on the passing of my father. The anthurium sent by JPL was a very thoughtful touch much appreciated by my family.

Frank O'Donnell

My family and I would like to thank my colleagues in the Radar Section for your expressions of sympathy on the passing of my father. Your generous donations have been forwarded to a fund in his memory at the Cancer Research Institute. Thanks also to JPL for the lovely plant.

Louise Veilleux

Classifieds

For Sale

AQUARIUM, 20 gal., 6 tropical fish, heater, air pump, filter, all supplies plus extras, black cabinet stand included. \$100. 626/357-9739 or knr2@verizon.net.

BICYCLE: boys 20", GT Dyno, excellent condition. \$65. 626/798-1839.

CARRYING CASE (backpack), brand new Dell, large, for notebook computer, \$30. 362-2003.

COMPUTER, HP iPAQ pocket PC; w/sync cable, pwr cord, rechargeable battery, desktop software, color screen, Windows OS, stereo headphones, leather HP belt case; \$50. 653-9501. DIAMOND CROSS w/18" YG chain, 14K YG, total diamond wt. is .75 (round & baguettes), pd. \$350, sell for \$125. kar10026@hotmail.com.

DODGER TICKETS: selected games from season ticket package, Loge level (orange), aisle 134 (at 1st base), 2 tickets per game at face value of \$35/ticket. www.delunac.net/tickets or call 626/296-1253.

DODGER TICKETS (2), from season ticket package, preferred Loge box, aisle 150 row C, \$30/ticket. thinkblue06@hotmail.com.

FUEL DRUMS, 55 gallon, \$10 each; 43-gallon reserve fuel tank with valve and hose. \$15; both last used for diesel. 957-3675.

FUTON, full size, with mattress and stained wood frame (light oak), folds in to be a couch or out to be a bed, \$150. 634-0384.

MATTRESS, Tempur-Pedic, + foundation, queen, exc. cond., great for back, \$875/obo. 352-4033, after 5 p.m.

MATTRESS + BOX SPRINGS (California King), totally refurbished by the factory, manufacturer is Diamond mattress, see to believe, still has 15-year warranty, you need to buy mattress frame, retail \$1,400, sell for \$500. 661/254-4464, Marian.

MISC.: Panasonic DVD recorder/player, brand new, all bells and whistles, hooked up & used only once, pd. \$180, sell \$180 or closest offer; Sharp VCR, no frills, works great, \$50/obo; pool table, kid size, actually just a smaller version of bigger tables, finished pine, really nice, all accessories incl., \$300 firm. 626/859-6393.

MISC.: coffee maker, Cuisinart 2 to Go, new, \$25; Barton's Creek Snuggles doll, 13.25" tall, new in box, \$25; picture, Paradise Waterfall, 46" x 29", moving water & bird sounds (volume control), creates the illusion of moving water, paid \$250, sell for \$100. 653-9037.

MISC.: diamond ring, David Yurman "x" sterling silver w/pave diamonds, size 6, new, paid \$900, sell for \$700; ring, pearl and diamond, 14K white gold, size 6, \$140; handbag, new in box, Dooney & Bourke, black with brown accents, all-weather leather 2 collection mini skinny case, H 4", L 6", W .75", detachable dog-hook in brown, lined, paid \$65, sell for \$50. 653-9037.

MISC.: fax cartridge (model pc-102rf) for Brother machines; brand new; \$20; Jenny Craig diet tapes, set of 14, \$25; computer power control center, 5 power switches + 1 master switch, 5 surge-protected outlets + 2 modem/fax/phone jacks, new, \$20. 790-3899.

MOVING SALE: rectangular glass dining table with 4 chairs, \$50; beige/off-white stripped couch & loveseat, \$90; green queen sleeper couch & loveseat, \$200; living room entertainment center, \$45; rectangular oak coffee table (some scratches), \$50; microwave table, \$10; 2 stools, \$10; queen bedrm, set w/2 night tables & dresser, \$200; computer desk & bookcase, \$40; tall white bookcase, \$15. 626/284-4080, www.stefanini.us/4sale, Heather/Mike.

MOVING SALE: Whirlpool 19 cu. ft. refrigerator, \$200; full bed, 53" x 75", \$60; bedrm. furniture set (2 chests of drawers, 2 night tables, desk, chair), \$200; love seat, blue, \$80; sofa, blue, \$50; microwave cart, \$25; parquet cocktail table, \$20; matching parquet end table, \$20; spice jar lamp, \$15; computer stand, \$20. 323/344-7209, eves.

MOVING SALE: small dresser, \$20; cable spool table, \$15; GE toaster oven, \$6; blender, \$5; electric coffee pot, \$5; ironing boards (2), \$5/ea.; electric broom, \$10; carpet sweeper, \$5; electric hedge trimmer, \$5; lawn edger, \$4; lawn spreader, \$5; flatware set (missing a few pieces), \$6; dishes, brown, service for 4, \$8; bicycles (4), various stages of disrepair, \$25/ea.; bricks & boards for bookcases, make offer. 323/344-7209, eves.

MUSIC GEAR: Parker Nitely-M, like new, made in USA, \$650/obo; Line-6 Duoverb stereo amp head w/shortboard controller, \$550/obo. reverb2020@yahoo.com.

ORGAN, Yamaha 415 electronic console w/13 pedals, 3 keyboards, 144 rhythm patterns, pd. \$7,500, sacrifice for \$2,000. 790-3899.

PERSIAN RUGS, handmade in Iran, various sizes and designs, must sell; make offer for any or all. 790-2179.

PRINTER CARTRIDGES (4), black inkjet compatible Epson T044120 (T0441) standard capacity (C64 / C66 / C84 / C86 / CX4600 / CX6400 & CX6600), 362-2003.

TABLE, kitchen/dining room, white tile top, painted and natural wood construction, seats 6, great condition, 6 matching chairs incl., \$100/obo. 310/489-8308, Peter.

TABLE, solid pine, oblong, seats 6, upholstered chairs, pine settee & china hutch, exc. cond., \$700/obo. 909/861-2610, Barbara.

TROPICAL PLANTS, plumerias, variety of colors and sizes; shell gingers. 626/444-6156.

Vehicles / Accessories

'02 BMW 325i, 4-dr. sedan, 2.5 inline-6, 5-sp.

manual, power locks/mirrors/windows, CD, iPod adapter, keyless entry & alarm, white on sand leatherette, exc. condition, only 25K miles, free maintenance until 48K miles, \$21K. 626/449-0997.

'02 BMW 330i, 3.0 L, 4 dr., Sea Foam Green metallic, beautiful, low mileage (28,700 mi.), still under full factory warranty, 5-spd. manual transmission; with sport package: alloy wheels, full power seats, moon roof, fold-down rear seats w/ski bag, BMW roof rack; pictures at <http://web.mac.com/dwc791/iWeb/Site/BMW.html>; \$25,250. 626/318-4999.

CANOE, 17-foot Grumman, aluminum, comes w/2 oars, 2 life preservers & PVC storage stand; buyer to pick up in South Pas.; \$500. southpasadena@mac.com, 626/390-5996.

'98 DODGE Dakota, V6, 3.9 L, automatic transmission, 2 WD, 78,000 miles, a/c, CD, pickup shell, new tires, all maintenance records, runs great. 310/795-8949.

'02 FORD Escape XLS, 5-speed manual, a/c, roof rack, 55K mi., white, tires/brakes replaced last year, vg cond., 100% dealer servicing, \$8,350 (below Blue Book value). 626/836-6729, Tim, eves/weekends.

'91 FORD Escort wagon, 170K miles, silver, 5 speed, cruise control, power steering, good condition, reliable, \$1,000. 626/356-4958, eves/weekends.

'85 FORD Tioga, Class C motorhome with Thousand Trails charter membership, \$6,000. 661/947-9638.

'05 HARLEY DAVIDSON Sportster (883 cc), near new, won in a raffle, under 300 miles into careful break-in by a skilled rider, never down. \$7,000. 626/577-6638, Suzanne or suzanneb91101@yahoo.com.

'01 HONDA CBR 929RR, 5K mi., exc. cond., bought new in '03, \$5,800/obo. 626/639-0352 or 818/653-2439, cell.

'97 HONDA CR-V, extremely well (garage) kept, 1 owner, super clean, super dependable, no problems, recently installed new timing belt as part of routine maintenance, 150K mi., \$7,200. sunwarmd@netzero.net or 626/622-4141.

JEEP CHEROKEE (classic style) bra, like new, \$50. 626/350-7666.

'95 LAND ROVER Range Rover SE V8, 4.0 L, auto, 4WD, 138K, tan, leather seats, cd, ps, pw, dual airbags, moon roof, runs great, good condition, \$5,500/obo. 626/296-9073 or 818/515-2461.

'03 TOYOTA Highlander Ltd., only 30K mi., leather, all auto/power, a/c, multi-disk CD, front & side airbags, sliding sunroof, towing package, black with tan interior, excellent condition, really like a new car, \$23,104 (Blue Book price). 626/296-3441.

'98 TOYOTA Sienna minivan, V6 LE, 194 HP, 87K miles, light blue, exc. cond., dual a/c, 12-disc CD changer, dual sliding doors, 1 owner, \$6,999. 909/592-2279.

'71 VW Superbeetle, eng. 2 yrs. old, needs int./ext. TLC, ylw w/sunroof, great proj. car for teen or young adult, \$1,500/firm. 626/533-9251 or tzarcandia@aol.com.

'94 YAMAHA 750 Virago, 19K miles, vg cond., many extras, custom seat, after-market pipes, rear view mirrors, handle bars, steel-braided cables, crash-bars w/highway pegs, custom air cleaner and new tires, runs great, \$2,700. 429-2841.

Wanted

APARTMENT or rm. for rent; Los Feliz, Silverlake, Echo Park, Highland Park or near 2 fwy; for April or May. 323/668-9756, leave msg.

DAYBED, if you have one you wish to get rid of. 626/296-3441.

HOME TO RENT, Glendale vicinity: 3 bd., for missionary family, no pets. 719/651-9793.

MUSICIAN, bass or keyboard player for rock/blues/jam band, way low-key vibe but we do like to jam, practice near JPL. reverb2020@yahoo.com.

MUSICIANS, bluegrass, young and old; banjo, lead guitar, keyboard, fiddle, mandolin. 248-6062, Elizabeth.

RENTAL, JPL engineer and wife (no kids, no pets), convenient to JPL, month to month OK. 626/797-2676, Paul.

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

TUTORS, jr. & sr. high school level classes (geometry, pre-algebra, algebra I & II, SAT math, etc.), eves and/or weekends; also English tutors. 888/784-1639, David.

VANPOOL RIDERS, Valencia to JPL, leaves K-Mart 6:30 a.m., leaves JPL 4 p.m., \$110/month or \$5.50/day. 653-9134, Chris.

Free

CAT, loving female; spayed, shiny short-haired black coat, green eyes; 2 years old, healthy and happy; gets along well with other animals and enjoys being indoors. 262-2962.

For Rent

ALTADENA, quiet backyard cottage with private yard, walk to JPL, bus stop, and hiking/biking trails; 1 bd. w/built-in closets, full bath, kitchen, pantry & living area, central air/heat; 500+ sq. ft., private deck with gorgeous views of the San Gabriel Mtns.; very cute; \$1,000; on-site parking/laundry negotiable for right tenant. 626/794-7930.

ARCADIA apt., 2 bd. + 2 ba., garage, a/c, stove; new paint, clean; convenient location, walking distance to shops and food court, near JPL/Caltech, Santa Anita mall and 10/210 fwy.; no pets, \$1,599. 626/576-7333.

MONROVIA, small but clean and tastefully decorated guest house, plus bonus bldg., very private; ideal for 1 person; incl. refrig and stove, washer & dryer; trash and water provided; great for would-be gardeners; \$800 + \$600 sec dep. 626/357-6955.

PASADENA, easygoing, non-smoker housemate wanted, small bedrm. in a 4-bd. house, walking distance from JPL (2 blocks), central air/heat, fireplace, patio + backyard; laundry/kitchen privileges, wireless network, satellite TV, no pets, off-street parking; \$650 + \$400 deposit, utilities incl. 626/807-0699.

PASADENA condo, large 900 sq. ft., 1 bd. & 1 ba., top-floor corner unit on E. Del Mar Blvd., 2 miles from Caltech & PCC, 7 miles from JPL, parking included, \$1,500. 626/755-4923, Michelle.

PASADENA, nicely furnished and maintained second-floor 1,050 sq.-ft. condo on a beautiful, quiet street near the Paseo; open, bright layout with view from large balcony; very large master bedroom, small second room; large kitchen with all appliances; full bath plus half-bath; nice pool, no pets, no smoking; \$1,900. 734/846-9699, Rob.

TUJUNGA house, 2 bd., 1 ba., in the hills on 3/4 acre, 15 min. to JPL, \$659,000. 951-8067.

Real Estate

COVINA, 2 bd. 2 full ba., great single-family home, in a quiet cul-de-sac, close to shopping and schools; new hardwood floors, patio, recessed lighting, central air, enclosed yard; Homeseekers.com, MLS# 494440. 626/589-6560 or 626/966-3677.

DEL MAR timeshare condo, 2 bd., 2 ba., living room, fully equipped kitchen, pool, Jacuzzi, BBQ area, game room, walk to beach; high season, 1 week; \$4,000. 626/507-8083, David or 626/215-3323, Kitty.

PASADENA townhouse, 2 story, quiet end unit, move-in cond., private 2-car attached garage w/washer and dryer hookups, ample wooden storage cabinets in garage, 2 bd., 2.5 ba., walk-in closets, Pergo hardwood flooring downstairs, dining room with wet bar, formal living room w/fireplace and secluded balcony, \$450K. 626/284-4080.

PERRIS, Calif., 5-bd., 2.5-ba. home, family room, laundry room, above-ground pool, dog run, alarm and camera security (view completely around house), 2-car garage, close to schools and shopping, built in '91, \$390,900. 951/940-5677 or 909/913-2966.

TUJUNGA hills house, 2 bd., 1 ba., on 3/4 acre, 15 min. to JPL, \$659,000. 951-8067.

Vacation Rentals

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

FLORIDA condo, beautifully furn. 2 bd., 2 ba., 2nd floor, on the surf of New Smyrna Beach, half-hour to Cape Canaveral, 90 min. to Disney World; enjoy all the comforts of home, quiet, relaxing, overlooks beach, BBQ/pool/game rm., easy walk to stores & restaurants. 760/439-7821, Darlene, dthauge@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., \$145/nite/2, \$20/nite/add'l person. 949/348-8047, jackandrandy@cox.net.

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

MAMMOTH, Meadow Ridge, 2 bd., 2 ba., + loft; sleeps 8, great family unit and location, walking distance to Eagle Lodge; fully equipped kitchen; microwave, new dishwasher, new oven; cable TVs, VCR, DVD, CD/cassette stereo, free wireless internet access; close to pool, Jacuzzi, spa; JPL discount. 240-8763 or anahid@KazEng.com.

OCEANSIDE condo, on the sand, charming 1 bd., panoramic view, walk to pier or harbor, pool, spa, game rm., sleeps 4. 949/786-6548. ROSARIO BEACH condo, 2 bd., 2 ba., ocean view, pool, tennis, short walk to beach on priv. rd., 18-hole golf course 6 mo. away, priv. secure parking. 626/794-3906.

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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.

JPL'S ONLINE NEWS SOURCE

<http://dailyplanet>

E-mail us at

universe@jpl.nasa.gov

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Rovers prepare for winter

By Guy Webster

Right: An image taken in February shows Spirit's view of intricately layered exposures of rock at the feature known as "Home Plate."

Below: Dr. John Callas

JPL'S LONG-LIVED MARS ROVERS DEMAND LOTS OF CARE as they age and the martian winter approaches.

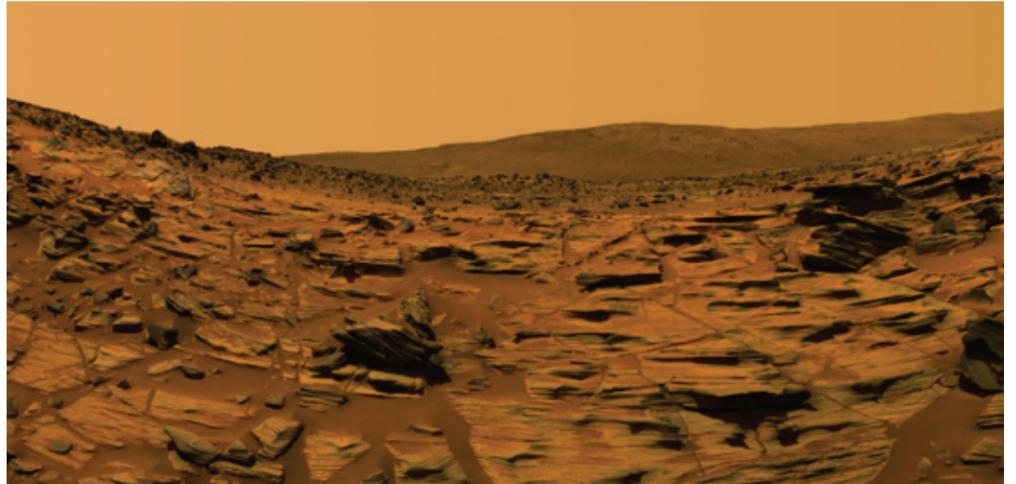
Dr. John Callas, newly named project manager for the Mars Exploration Rover mission, is coordinating the work to meet these challenges. He is a JPL scientist and was named project manager after earlier roles as science manager and deputy project manager for the Spirit and Opportunity rovers.

"It continues to be an exciting adventure with each day like a whole new mission," Callas said. "Even though the rovers are well past their original design life, they still have plenty of capability to conduct outstanding science on Mars. The JPL operations team and the remote science team working on the project are the best in the solar system at what they do. It is a pleasure and a privilege to lead such an outstanding team and great mission."

One of Spirit's six wheels has stopped working. Dragging that wheel, the solar-powered rover must reach a slope where it can catch enough sunshine to continue operating during the martian winter. The period of minimum sunshine is more than 100 days away, but Spirit gets only enough power for about one hour per day of driving on flat ground. And the supply is dropping fast.

Spirit's right-front wheel became a concern once before, when it began drawing unusually high current five months after the January 2004 landing on Mars. Driving Spirit backwards redistributed lubricant and returned the wheel to normal operation. This week, during the 779th martian day of what was originally planned as a 90-martian-day mission, the motor that rotates that wheel stopped working.

"It is not drawing any current at all," said JPL's Jacob Matijevic, rover engineering team chief. One possibility engineers are considering is that the motor's brushes, contacts that deliver power to the rotating part of the motor, have lost contact. The motors that rotate Spirit's wheels have revolved more than 13 million times, far more than called for in the rovers' design.



Spirit's solar panels have been generating about 350 watt-hours of electricity daily for the past week. That is down about 15 percent since February and less than one-half of their output during the martian summer.

The best spot for Spirit is the north-facing side of "McCool Hill," where it could spend the southern-hemisphere winter tilted toward the sun. Spirit finished studying a bright feature called "Home Plate" last week and is driving from there toward the hill. It has approximately 120 meters (about 390 feet) to go. Driving backwards with the right-front wheel dragging, the rover needs to stop and check frequently that the problem wheel has not snagged on anything and caused other wheels to slip excessively. Expected progress is around 12 meters (40 feet) per day under current conditions.

Opportunity is closer to the equator, so does not need to winter on a slope like Spirit. Opportunity spent most of the past four months at "Erebus Crater." It examined layered outcrops, while the rover team determined and tested a strategy for dealing with degraded performance by a motor in the shoulder of its robotic arm. Opportunity left Erebus this week and is on a 2-kilometer (1.2-mile) journey to a giant crater called "Victoria."

Callas has worked on the Mars rovers' mission since 2000 and five other Mars missions since joining JPL in 1987. He succeeds Jim Erickson, who switched to a leadership role with JPL's Mars Reconnaissance Orbiter.

MOVE OVER, SUPERMAN, WITH YOUR X-RAY VISION.

Marine scientists have figured out a way to see through the ocean's surface and detect what's below, with the help of satellites.

Using sensor data from several U.S. and European satellites, researchers from JPL, the University of Delaware and Ocean University of China, Qingdao, have developed a method to detect salty, submerged eddies called "Meddies" that occur in the Atlantic Ocean off Spain and Portugal at depths of more than 1,000 meters (one-half mile).

These warm, deep-water whirlpools, part of the ocean's complex circulatory system, help drive the ocean currents that moderate Earth's climate. The research marks the first time scientists have detected this phenomenon from space, and the first use of a new multi-sensor technique that can track changes in ocean salinity. Results are reported in the April issue of the American Meteorological Society's Journal of Physical Oceanography.

"Since Meddies play a significant role in carrying salty water from the Mediterranean into the Atlantic, new knowledge about their trajectories, transport and life histories is important to understanding their mixing and interaction with North Atlantic water," said Professor Xiao-Hai Yan of the University of Delaware, lead author of the study and co-director of the university's Center for Remote Sensing. "Ultimately, we hope this will lead to a better understanding of their impact on global ocean circulation and global climate change."

First identified in 1978, Meddies are so named because they flow out of the Mediterranean Sea. A typical Meddy averages about 600 meters (2,000 feet) deep and 100 kilometers (60 miles) in diameter, and contains more than 900 billion kilograms (1 billion tons) of salt.

While warm water ordinarily resides at the ocean's surface, the warm water flowing out of the Mediterranean Sea has such a high salt concentration that when it enters the Atlantic Ocean at the Strait of Gibraltar, it sinks to depths of more than 1,000 meters (one-half mile) along the continental shelf. This underwater river then separates into clockwise-flowing Meddies that may continue to spin westward for more than two years, often coalescing with other Meddies to form giant, salty whirlpools that may stretch for hundreds of miles.

"Since the Mediterranean Sea is much saltier than the Atlantic Ocean, the Meddies constantly add salt to the Atlantic," Yan said. Without this

steady salt-shaker effect, he notes, the conveyor belt of ocean currents that help distribute heat from the tropics toward the North Pole might be diminished, resulting in colder temperatures in regions such as New England and northwestern Europe that currently experience more temperate climates.

"There is concern about global climate change shutting down the ocean currents that warm the Atlantic Ocean," Yan said. "The melting of sea ice at the North Pole could add enormous amounts of fresh water to the Atlantic, reducing its salinity enough to slow the sinking of cooler water, which would shut down the conveyor belt of ocean currents that help warm major regions of the planet."

Yan and his team drew on data from several satellite sensors that can read an important signal of a Meddy's presence. Altimeters flying aboard JPL's Topex/Poseidon and Jason satellites and the European Space Agency's European Remote Sensing and Environment (Envisat) satellites measured the height of the sea surface compared to average sea level, revealing the difference in altitude where a Meddy entered the Atlantic.

Specialized microwave radars called scatterometers, including the former NASA Scatterometer on Japan's Midori-1 spacecraft and the current SeaWinds instrument on NASA's QuikScat spacecraft, measured the surface wind over the ocean, providing data needed to remove the surface variability "noise" caused by the wind blowing over the ocean's surface.

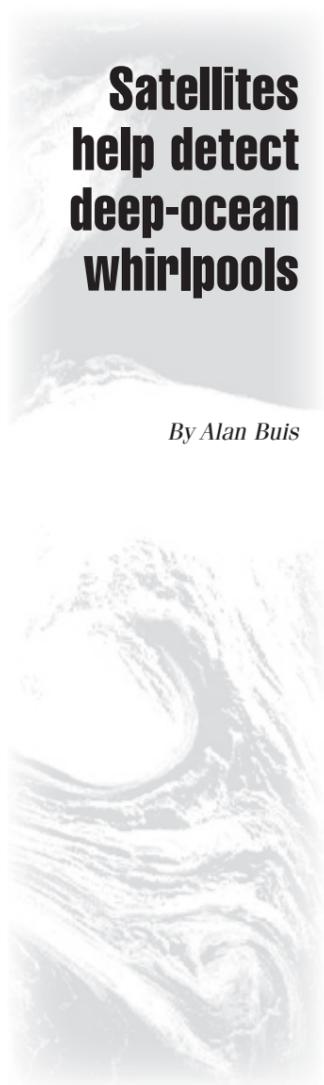
"By carefully removing the stronger surface signatures of upper ocean processes, we were able to unveil the surface signatures of deeper ocean processes, such as the Meddies, to these space-based sensors," said Dr. W. Timothy Liu, QuikScat project scientist at JPL.

The scientists also analyzed data provided by an infrared spectrometer known as the Advanced Very High Resolution Radiometer, which flies aboard National Oceanic and Atmospheric Administration satellites. This instrument maps heat emitted by the ocean's top layer and showed the increase in temperature from a warm Meddy before it began sinking.

While the technique is not yet 100 percent accurate, Yan and his colleagues are continuing to refine it, and are exploring its application to other coastal regions of the world.

Satellites help detect deep-ocean whirlpools

By Alan Buis



News Briefs



National Air and Space Museum, Smithsonian Institution

From left: museum director Gen. J.R. "Jack" Dailey, Steve Squyres, Jim Erickson, awards master of ceremonies David Hartman.

Rover team wins museum award

The National Air and Space Museum Trophy, the museum's highest honor, has been awarded to the team responsible for the ongoing Mars Exploration Rover missions, and pioneer space scientist DR. JAMES VAN ALLEN. The rover team is honored in the category of Current Achievement and Van Allen in the category of Lifetime Achievement. The awards were presented at a private ceremony at the Smithsonian's National Air and Space Museum in Washington on March 9. Established in 1985, the award recognizes outstanding achievement in scientific or technological endeavors relating to air and space technology

Rover mission and the Mars Science Laboratory mission. CYN DY CHINN and ANDREA VANACORE, the JPL One NASA liaisons, made the presentation. The JPL winners are TARA ESTLIN, DAN GAINES, RICHARD MADISON, MICHAEL MCHENRY, HARI DAS NAYAR, ISSA NESNAS, MIHAIL PIVTORAIKO, GREGG RABIDEAU, BABAK SAPIR and I-HSIANG SHU. Other awardees on the team are CLAYTON KUNZ (NASA Ames), DAVID APFELBAUM and REID SIMMONS (Carnegie Mellon University) and STERGIOS ROUMELIOTIS (University of Minnesota).

The One NASA Peer Award program gives awards to individuals and teams whose achievements support NASA's strategic goals and utilize an approach consistent with the concept of One NASA. Candidates must be nominated by their peers rather than by their supervisors. Employees may not nominate their supervisor. In addition to winning this award, individual and team awardees are eligible to be considered for the Center Best Award. The JPL Center Best Award winner is then eligible for the NASA Agency Best Award. To nominate someone or for more information about this award, see <http://hr.jpl.nasa.gov/esr/OneNASA/Index.html>.

Cassini studies Titan

The Cassini spacecraft focused on the atmosphere of Saturn's moon Titan during a March 18 flyby. This was the first time Cassini sent radio waves through Titan's atmosphere to antennas on Earth. The radio waves revealed characteristics about the atmosphere's temperature, structure and winds. Cassini has never done this before, though JPL's Voyager 1 did a similar experiment in 1980. For more information, visit <http://saturn.jpl.nasa.gov/home/index.cfm>.

Technology prizes to be awarded

JPL's Office of the Chief Technologist and Office of the Chief Scientist note that the prestigious Economist weekly magazine (<http://www.economist.com/index.html>) is soliciting nominations for its annual technology prizes. Much of the work that JPL does fits in the competition's "No Boundaries" category. Nominations are due by 5 p.m., Friday, April 7 to Loren Lemmerman (Loren.A.Lemmerman@jpl.nasa.gov), and should include the nominee's name, current affiliation and contact information, and a 100-word summary explaining why the nominee deserves to win the award in a category. Self-nominations are allowed. Please do not submit your nominations to the Economist directly. The Office of the Chief Scientist and Chief Technologist will reply to all and select up to three nominations to forward to the Economist from JPL.

and exploration. As in past years, trophy winners received a miniature version of "The Web of Space," a sculpture by artist JOHN SAFER. In its citation, the museum said the rovers' "continuing exploration is a clear testament to the robust nature of the engineering behind the vehicles and the rigorous mission operations activities required to guide each vehicle."

Team earns One NASA Peer Award

A One NASA Peer Award was presented on March 9 to the JPL-led Coupled Layer Architecture for Robotic Autonomy (CLARATy) Team, which was recognized by their peers for their efforts to foster NASA-wide collaboration.

The team was honored for the accomplishment of creating and applying a software framework for integrating innovations in robotics into rapid insertion into NASA's flight missions. The team promotes reuse of robotic software by providing a flexible framework to support the development and integration of robotic technologies across centers, the benefits of which have been felt by the Mars Exploration



Photo courtesy of Andrea Vanacore

From left: JPLers Gregg Rabideau, Tara Estlin, Babak Sapir, Issa Nesnas, Michael McHenry, Mibail Pivtoraiko, I-Hsiang Shu, Hari Das Nayar.

Santa Monica wins ocean quiz

Front row, from left: Ingo Gaida, Ben Lucas, Dimitry Petrenko, Bennett Rankin and ZeNan Chang. Back row: JPL Public Services Office Manager Kim Lievense; Anthony Michaels, director of USC's Wrigley Institute for Environmental Studies; Ann Close, associate director.



Photo courtesy of Jocy Williams

A team from Santa Monica High School won a regional competition for the National Ocean Sciences Bowl on March 4. JPL co-hosted regional competitions for the national event with host USC. Coordinated by the Consortium for Oceanographic Research and Education, the event saw student teams answer questions about biology, chemistry, geology and physics of the oceans, as well as navigation, geography and related history and literature. The National Ocean Sciences Bowl invites winning teams from regional competitions to go head-to-head at the finals in Pacific Grove, Calif., May 13-15. Some winning teams will have the opportunity to work beside experienced marine scientists through field trips and other hands-on marine experiences. Other students will win cruises on research vessels, scholarships and scientific equipment. For more information about the National Ocean Sciences Bowl, visit <http://www.nosb.org>.

Special Events Calendar

Ongoing Support Groups

Alcoholics Anonymous—Meets Wednesdays at 11:30 a.m.

Caregivers Support Group—Meets the first Thursday of the month at noon in Building 167-111 (the Wellness Place).

Codependents Anonymous—Meets at noon every Wednesday.

Lambda (Gay, Lesbian, Bisexual and Transgender Networking Group)—Meets the first Friday and third Thursday of the month at noon in Building 111-117. For more information, call Randy Herrera, 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).

For more information on any of the support groups, call the Employee Assistance Program at ext. 4-3680.

Saturday, March 25

Space: Are We Alone?—This high-definition film, part of the "Science Saturdays at 2:00" series of family events, will be shown at 2 p.m. in Caltech's Beckman Auditorium. Laura Baker, from Caltech's division of geological and planetary sciences, will introduce the film and lead a post-screening discussion. Tickets are \$5. For more information, call (626) 395-4652 or visit www.events.caltech.edu.

Tuesday, March 28

Caltech Women's Club Preschool Playgroup—Meets in Tournament Park (off Wilson Avenue south of California Street in Pasadena) for children's crafts, songs, stories and play while adults socialize. Group also meets April 4. For more information, e-mail smiller@caltech.edu.

Wednesday, March 29

Banff Mountain Film Festival—Presented by the Caltech Alpine Club, Patagonia Pasadena and the Altadena Mountain Rescue Team at 7:30 p.m. in Caltech's Ramo Auditorium. Tickets are \$12 in advance, \$15 at the door. For more information, call (626) 395-4652 or visit www.events.caltech.edu.

Caltech Women's Club "Wednesday in the Park"—Meets in Tournament Park for playtime for the children and socializing for adults. Rain location is Brown Gym. Group also meets April 5. For more information, e-mail smiller@caltech.edu.

JPL Chorus—Meets at noon in Building 233-303. For more information, call Shary DeVore at ext. 4-1024.

JPL Library Orientation—Stop by Building 111-104 at 11:30 a.m. for an overview of the Library's products and services, and learn how to access numerous electronic resources from your desktop. For more information, call the reference desk, ext. 4-4200.

Thursday, March 30

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

"The Remarkable Life of Neil Armstrong"—James Hansen, Auburn University history professor and author of "First Man: The Life of Neil A. Armstrong," will appear from 4:30 to 6 p.m. in von Kármán Auditorium. Sponsored by the Caltech Management Association and Caltech Flying Club.

Friday, March 31

Cesar Chavez Day Celebration—"Legacy of Latin American Art: Past and Present" will be presented by JPL's Amigos Unidos from 11:30 a.m. to 1:30 p.m. in von Kármán Auditorium. Guest speakers will be Dr. Richard Zapanta and Rebecca Zapanta, whose family collection will be displayed.



Sunday, April 2

Chamber Music—Canada's Trio Mosaïque will perform at 3:30 p.m. in Caltech's Beckman Auditorium. Tickets are \$32, 27, 22 and \$18. For more information, call (626) 395-4652 or visit www.events.caltech.edu.

Tuesday, April 4

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

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

"The Origins of the Universe"—Dr. Stephen Hawking, author of the international best-selling book *A Brief History of Time*, will speak at 8 p.m. in Caltech's Beckman Auditorium. Free admission, but tickets are required. General admission tickets will be distributed on the morning of the lecture only. Please carefully review the complete ticketing procedures, located at www.snipurl.com/hawking06.



Wednesday, April 5

Associated Retirees of JPL/Caltech—Meeting at 10 a.m. at La Cañada United Methodist Church, 104 Berkshire Place, La Cañada. Call (626) 794-1698 to leave a message for an ARC board member.

JPL Chorus—Meets Wednesdays at noon in Building 233-303. For more information, call Shary DeVore at ext. 4-1024.

JPL Library Orientation—Stop by Building 111-104 at 11:30 a.m. for an overview of the Library's products and services, and learn how to access numerous electronic resources from your desktop. For more information, call the reference desk, ext. 4-4200.

Thursday, April 6

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

"Using Wind to Build the Megaliths of Ancient Egypt"—Dr. Maureen Clemmons will speak from 4:45 to 6 p.m. in von Kármán Auditorium in this Caltech Management Association-sponsored event. For more information, e-mail cma.announce@jpl.nasa.gov or call Randii Wessen, ext. 4-7580.

Friday, April 7

Caltech Dance Show—At 8 p.m. in Ramo Auditorium. Features include pieces from traditional hula to innovative salsa, from captivating belly dance to contemporary jazz, representing almost every segment of the Caltech community in the cast of more than 50 dancers. Tickets are \$5 (unreserved seating). For more information, call (626) 395-4652 or visit www.events.caltech.edu.

Ladysmith Black Mambazo—Offering native South African musical traditions to the sounds of Christian gospel music, the a capella group will perform at 8 p.m. in Caltech's Beckman Auditorium. Tickets are \$32, \$28 and \$24; \$10 for high school age and younger. For more information, call (626) 395-4652 or visit www.events.caltech.edu.

Sunday, April 9

Caltech Dance Show—At 2 p.m. in Ramo Auditorium. Features include pieces from traditional hula to innovative salsa, from captivating belly dance to contemporary jazz, representing almost every segment of the Caltech community in the cast of more than 50 dancers. Tickets are \$5 (unreserved seating). For more information, call (626) 395-4652 or visit www.events.caltech.edu.

IT WAS WELL BEFORE STAR WARS, EVEN BEFORE STAR TREK, WHEN SCIENCE

FICTION FANS WERE “LOST IN SPACE.” THAT MID-1960s

Lassie’s mom no longer ‘Lost in Space’

ADVENTURE SHOW HAD TV VIEWERS FOLLOWING THE WEEKLY
SPACED-OUT EXPLOITS OF THE ROBINSON FAMILY.



By Mark Whalen

Many JPLers will remember veteran actress June Lockhart, one of the stars of *Lost In Space*, from her way-out spaceship uniform. Now 80, Lockhart has continued her busy career and also has maintained her keen interest in spaceflight. In fact, she has become a space fan, and a good friend to NASA and JPL.

Lockhart, who enjoys coming out to JPL from time to time to cheer on flight teams during some of the Lab’s significant mission events and milestones, played Dr. Maureen Robinson on “*Lost in Space*,” which ran from 1965–68. Of course, she is also well remembered for her role as Ruth Martin, the mom in the series “*Lassie*,” in which she had a six-year run (1958–64).

She got her start in acting in 1938 at age 12, working with her parents, Gene and Kathleen, in the film version of Dickens’ “*A Christmas Carol*.” In the 1940s she worked with the former Western Airlines as a spokesperson, handling radio interviews and tours. This led to a solid movie career before most American homes had televisions.

Lockhart is still going strong, with movies and guest spots on TV series and game shows. Her most recent TV stint was an appearance on the ABC drama “*Grey’s Anatomy*” earlier this year.

She spoke with Universe about her interests in space, both Hollywood- and NASA-style.

Were you a space fan before *Lost in Space*? For example, did you know that JPL was working on pre-Apollo missions to the moon?

Yes, I did keep up with that, but I wasn’t actively involved. Like everyone else, of course, I followed John Glenn’s Earth-orbiting mission, the Mercury 6, in 1962. He was the first American in orbit. At that time, I was working on *Lassie*. When the flight took place, I was in the studio, sitting with Jon Provost (who played Timmy) when Glenn was making his reentry. There was a period of about 15 minutes of silence during his descent. We all held our breaths until we learned he had safely landed.

How did *Lost in Space* come about?

When *Lassie* ended for me in 1964 I did an episode of “*Voyage to the Bottom of the Sea*,” which was a very popular science fiction series about a submarine crew and their adventures. It was produced by Irwin Allen.

Soon after that, CBS hired Irwin to do this new series about a space family and I was one of the first actors he signed. It was originally called “*Space Family Robinson*”—playing off of “*Swiss Family Robinson*”—then changed to “*Lost in Space*.” I loved the script, so I joined in.

What do you think appealed to fans of the show?

It was well cast, and had something for everybody. It was about a family, but the props, special effects and the scientific, futuristic setting made it popular as well. By the way, the interest in the show still exists today. It’s still very popular in syndication and through DVD sales.

What are your best memories of coming to JPL?

I’ve been there four or five times in the last few years—for many of the Mars missions, as well as some of the Cassini flybys and others.



For Mars Pathfinder, in 1997, it was beyond excitement. I brought my granddaughter Christianna to JPL with me, and she got to play in the Mars “sandbox.” Since then, she’s been with me on several other visits there.

For the Mars Exploration Rovers’ landing a couple of years ago, it was marvelous to sit in that room, which felt like it simply lifted off the ground with energy and excitement.

I was invited to come out to celebrate the Mars Reconnaissance Orbiter arrival at Mars earlier this month, but I was working and couldn’t make it.

You are friends with astronaut Bill McArthur, the current commander of Expedition 12, the International Space Station. In fact, he’s a fan of yours. How has that developed?

We had initially met when NASA invited me to the launch of the Discovery mission in 1994. Bill was working in mission control at Johnson Space Center. He remembered me from *Lost in Space*, so we struck up a conversation. We have kept in touch ever since.

In December of last year, I came to JPL to talk to Bill via videoconference. So we chatted for about 20 minutes, about astronomy, what the astronauts eat, their exercise, their daily chores. He was quite a genuine, warm and affectionate person. It was like a conversation you’d have with a pal.

He wanted to show me something on the wall behind him. And there was this big picture of me in my spacesuit from *Lost in Space*. He called me the “poster girl of the International Space Station.” I was just blown away!

And Bill asked for a couple of episodes of *Lost in Space* and a copy of *A Christmas Carol*, so those went up to him in the latest supply ship.

Also, years ago, NASA invited me to Houston for the Space Shuttle Columbia mission in October 1992. So early one morning they sent the crew a wakeup call with “*The World is Waiting for the Sunrise*,” a song written by my father, who in addition to acting was a songwriter and performer. That was thrilling too.

Will you be coming to JPL again soon?

Yes, I hope so. I love coming to JPL; they treat us so beautifully. To be invited to these historic moments is a dream. What JPL and NASA do is a wonderful thing to expose the young mind to. I am dedicated to this program and spreading the word about how important the space program is.

Passings

Retired engineer **EUGENE RED-DEMAN**, 82, died Dec. 9.

Reddeman worked at the Lab from 1960 to 1988. During his career he contributed to JPL's Echo, Mariner and Ranger missions.

He is survived by his wife, Ann; daughters Barbara, Kerry, Wendy and Aura; son Mark; 12 grandchildren and 10 great grandchildren.

Services were held at First Baptist Church in Hesperia.

AARON ANDERSON JR., 75, retired from Section 357, died Feb. 13.

Anderson joined JPL in 1959 and retired in 1995. He is survived by sons Aaron III, Donald, Glen and Bruce; daughter Debbie Campbell; four grandchildren, and one great grandchild.

Funeral services were held at Forest Lawn in Covina Hills.

LINWOOD DOUGLASS, 89, retired from Section 381, died Feb. 18.

Douglass worked at JPL from 1944 to 1981. He is survived by his wife, Barbara; son Arthur; daughter Lynn; stepchildren Cherrie, Cindy and David; 23 grandchildren; and seven great grandchildren.

Funeral services were held at Village Covenant Church in Azusa.

ROBERT FRENCH, 72, a retired mechanical engineer, died Feb. 24.

French joined the Lab in 1969 and retired in 1990, having worked on missions that included Mariner and Viking. He is survived by his wife, Celeste; sons Christopher and Timothy; and daughter Mary Celeste Eugster.

The family requests that donations in his memory can be made to the American Leukemia and Lymphoma Society.

Retiree **CARL BODE**, 77, died March 3.

Bode worked at JPL from 1959 to 1993. He is survived by his son, Martin; daughter, Susan Crowe; granddaughter, Elizabeth Bode; and brothers, Gerald and Dennis.

Memorial services are scheduled for March 26 at 2 p.m. at the Glendale Elks. In lieu of flowers, donations can be made to the American Heart Association.

RICHARD ZANTESON, 71, a retired test engineer from the former Science and Technology Development Section (354), died March 7.

Zanteson joined the Lab in 1956 and retired in 1999. His work included contributions to all three Deep Space Network antenna facilities as well as Voyager, Cassini, Stardust, Pathfinder and the Mars Exploration Rovers.

He is survived by his wife, Aileen, daughter Kate, son Eric and three grandchildren. His body was donated to science.

Letters

I want to thank my friends and colleagues in 9x (and 2x) for the flowers and cards that I received after my father passed away. Your kind thoughts and consideration made a difficult time much easier.

Mark Romejko and family

I wish to thank my friends and colleagues at JPL for the plant, flowers, cards and notes of encouragement during the recent illness and passing of my father. Your thoughtfulness and kindness have been a source of comfort during this difficult time.

Zabel Beneyan

My family and I would like to thank my friends and co-workers for all the support, kind words, plants, and prayers in the passing of my father, Carl Bode. Thank you to JPL Benefits for being so kind and supportive, and thank you to JPL for the beautiful plant.

Susan Crowe

My family and I want to thank my co-workers for their sympathy and kind thoughts on the passing of my dad, John. Thanks also for the beautiful plant that was much appreciated by my family.

Gary Savona and family

My family and I would like to thank my colleagues and friends in the Acquisition Division for their expressions of sympathy on the recent passing of my mother. Your generous donation to the Alzheimer's Foundation of America on behalf of my mother is sincerely appreciated.

Kirk Bilby

I would like to thank everyone in the JPL community who helped make my retirement luncheon at Brookside Country Club a truly memorable event. The JPL plaque, gifts, cards, well wishes and testimonies are all appreciated very much. After nearly 26 years, I am leaving the Laboratory with many pleasant memories and the honor and privilege of having had the opportunity to work with some very special people.

Webb Marner

Retirees

The following JPL employees retired in March:

Jerry Person, 51 years, Section 374; Richard Parker, 44 years, Section 269; Edward Ng, 39 years, Section 372; Gerald Hintz, 37 years, Section 343K; Richard Stanton, 36 years, Section 888; James Collier, 29 years; Mitoji Iwanga, 28 years, Section 3815.

Classifieds

For Sale

AIR COMPRESSOR, Campbell Hausfeld, 3/4 HP on 4-gallon pancake tank, exc. cond., \$60. 626/793-7879.

BIKE, 18 speed, Magna Mt, in excellent condition, blue/yellow and black, adjustable seat and handle bars, \$100. 626/710-2410, Braden Cox.

COFFEE TABLE, pine antique, 29 x 40 x 19 H, needs a little TLC, \$75 or ?; DESK, white laminate, 47 x 23, with door & shelf at 1 end, great for kids, \$20. 626/296-3782.

COFFEE TABLES (2), oval, one cherry wood, one oak drop-leaf, both vg cond., \$50 ea. 626/254-1550.

COMPUTER, iMac, 350 MHz PowerPC G3, 128 MB SDRAM, 6 GB Ultra ATA drive, 24x CD-ROM drive, 56K modem, Ethernet, 15" color display, hard drive may need to be replaced, \$100; TREADMILL, EZWalkII manual, excellent condition, like new, \$75. 626/292-1751.

CONCERT TICKETS (2), Beethoven's 9th; CalPhil, Friday, April 28, 8 p.m. at the Ambassador Auditorium in Pasadena; <http://www.calphil.org> for concert info; great seats, 5th row, center; \$180 value, sell \$110 for the pair. 626/688-1648.

DJ GEAR, 2 Pioneer CDJ-700 players, \$350 each; Pioneer DJM-300 mixer, \$250; also coffin and a pair of Mackie studio monitors. sspacemans@yahoo.com or 626/797-4226, Shaun.

ENTERTAINMENT CENTER, solid wood, 55" W x 47" H x 16.5" D, room for TV, shelf for VCR/cable box, large drawer below, inlaid glass doors open to shelves, slight defect, \$100/obo. 626/351-0348.

EXERCISE MACHINE, Concept 2 Rower, model C; rowing works nearly all of the body's muscle groups and is considered to be one of the top forms of exercise; Concept 2 is equally well-considered; 9 years old, excellent condition, been upgraded with the latest PM3 rowing computer and "handle"; can be used with a heart rate monitor; \$350. 626/446-6751.

EXERCISE MACHINE, Star Trac treadmill; features readouts: elapsed time, total calories, distance, speed, laps & pace, incline 0-15%; \$375/obo. 626/755-1958, Cec-Cec.

GPS, Garmin GPS V personal navigator, includes map source CD and extras, used twice, excellent condition, new \$400, sell for \$175. 626/793-7879.

HEADSET for cell phone, Motorola Blue-tooth, like new, \$19. 687-8627, Alberto.

MISC.: diamond ring, David Yurman "X" sterling silver with pave diamonds, size 6, new, paid \$900, sell for \$700/obo; RING, pearl and diamond 14K white gold, size 6, \$140; handbag, new in box, Dooney & Bourke, black with brown accents, all-weather leather 2 collection mini skinny case, H 4" L 6" W .75," detachable dog-hook in brown, lined, paid \$65, sell for \$50. 653-9037.

MISC.: Cuisinart 2 to Go coffeemaker, new, \$25; MaxiGlide hair straightener, with extra ceramic flat plate, \$60; Barton's Creek Snuggles doll, 13.25" tall, new in box, \$25; picture, Paradise Waterfall, 46" x 29," moving water & bird sounds (volume control), creates the illusion of moving water, paid \$250, sell for \$100. 653-9037.

MISC.: HP Deskjet printer cartridges, brand new, not 3rd party or remanufactured, black #45 (\$10), color #78 (\$15); fax cartridge (model pc-102rf) for Brother machines, brand new, \$20; Jenny Craig diet tapes, set of 14, \$25; computer power control center, 5 power switches + 1 master switch, 5 surge-protected outlets + 2 modem/fax/phone jacks, new, \$20. 790-3899.

MISC.: home gym, \$50; baseball glove (left-hand), size small, \$5; crimp hair iron, \$5; women's "cowboy" boots, gray, size 7-1/2, good condition, \$50; fishing reels (freshwater), \$10/ea.; electrolysis machine, \$20; camping chairs (4), camouflage, \$10 ea. 626/357-8210.

MOVING SALE: kitchen table (w/leaves) & 6 chairs, \$100; king size bed, \$75; living room couch and loveseat set (dark blue w/ hunter green in pattern), \$300; sewing desk w/drawers, misc. chairs and more. 909/946-3443.

ORGAN, Yamaha 415 electronic console w/13 pedals, 3 keyboards, 144 rhythm patterns, pd. \$7,500, sacrifice for \$2,000. 790-3899.

PIANO, Kawai grand, 6'1", polished ebony, excellent condition and tone, piano bench and lined piano cover included, pick up in Altadena, \$10,300, home.earthlink.net/~bri-azzen/piano, 626/398-6564.

PIANO, Korg electronic recording keyboard in beautiful cherry-wood concert piano console, many tones and functions, including MIDI, \$1,500. 626/254-1550.

PRINTER, HP Desk Jet 6486. 790-3543.

PRINTER, Lexmark Z715 Photo Jetprinter, unopened box, \$30. 687-8627, Alberto.

SCANNER, Visioneer OneTouch 8920; scan, copy, fax, OCR, e-mail; 1200 x 4800 dpi optical resolution, true 48-bit color, USB interface; scan letter and A4 sized documents, photographs up to 8 x 10, 35mm slides, 35mm negatives; Win98/2000/ME/XP, includes installation software and user manual; \$15. 626/241-7084, Steve.

SKIS, 170 centimeter Rossignol Equipe straight cut w/Salomon 626 bindings, good cond., \$40/obo. 626/304-0737.

SWING SET, indoor, ~ 3 years old but barely used; support bar for std. doorway 29" to 36" wide, catalog price \$79.95 new; strap swing, catalog \$32.95 new; trapeze bar, catalog \$22.95 new; net swing, catalog \$89.95 new; support bar/strap swing used for about 1 mo., trapeze bar and net swing never used; bought for condo but we moved to a house; www.playawaytoy.com for info/pictures; \$90 for all four/obo. 626/446-2989.

WHEELCHAIR, Shoprite, battery operated, motorized, \$750/obo. 760/439-7821, Darlene or dfhaug@yahoo.com.

Vehicles / Accessories

'02 BMW 325i 4-dr. sedan, 2.5 inline-6, 5 sp. manual, power locks/mirrors/windows, CD, iPod adapter, keyless entry & alarm, white on sand leatherette, exc. condition, only 25K miles, free maintenance until 49K miles, \$21K. 626/449-0997.

'02 BMW 330i, 3.0 L, 4 dr., Sea Foam Green metallic, beautiful, low mileage (28,700 mi.), still under full factory warranty, 5-spd. manual transmission; with sport package: alloy wheels, full power seats, moon roof, fold-down rear seats w/ski bag, BMW roof rack; pictures at <http://web.mac.com/dwc791/iWeb/Site/BMW.html>; \$25,250. 626/318-4999.

'68 CHEVY Camaro SS, 350 hp, 49,000 mi., clean int., engine runs great; is a restoration/ street rod project I am unable to complete; front right replacement fender is in primer color, add new paint and you have a fantastic car; \$16,000/obo. www.sassybee.com/camaro or 310/445-6625, Steve.

'98 DODGE Dakota, V6 3.9 L, automatic transmission, 2 WD, 78,000 miles, a/c, CD, pickup shell, new tires, all maintenance records, runs great, \$5,200. 310/795-8949.

'00 FORD Ranger, green, new tires, stick shift. 951-8067.

JEEP Cherokee bra (classic style), like new, \$50. 626/359-7666.

'95 LAND ROVER Range Rover SE, V8, 4.0 L, auto, 4WD, 138K, tan, leather seats, cd, ps, pw, dual airbags, moon roof, runs great, good condition, \$5,400/obo. 626/296-9073 or 818/515-2461.

'00 MERCEDES-BENZ CLK 430 Cabriolet, silver 2-door with gray top/int., AMG package, many extras, heated seats, custom wood/ leather steering wheel, custom rear bumper with dual exhaust, 70K miles, extended warranty up to 100K, excellent condition, must see, \$29K/obo. 634-4332.

'95 MERCEDES-BENZ C-280, white with gray leather interior, low mileage (90,000), moon roof, multi CD, premium wheels, impressive, in excellent condition, \$7,390. 262-2962.

'00 MITSUBISHI Eclipse GT, 2-dr. coupe, V6, silver, auto, CD/cassette/AM/FM, spoiler, exec. condition, alarm, pwr. door/windows/mirrors/sunroof/moonroof, foglights, garaged, 80K mi., new front tires and timing belt, regular timely servicing; KBB value \$8,700-\$8,150; sell \$8,100/obo. 415-3348.

TIRE SNOW CHAINS, Shur Grip-Z by SCC, size SZ 335, S-class, fair condition, \$20. 626/304-0737.

'03 TOYOTA Highlander Ltd., only 30K mi., top of the line, leather, all auto/power, a/c, multi-disk CD, front & side airbags, sliding sunroof, towing package, black with tan

interior, excellent condition, like a new car, \$23,100 (Blue Book price). 626/296-3441.

'93 TOYOTA Camry, 4 door, dark blue, auto, a/c, am/fm/cassette, pwr. windows/locks, 161K mi., clean, great condition, \$3,300. home.earthlink.net/~briazen/93camry, 626/398-6564.

'01 VOLVO V-70 wagon, 50K miles, sunroof/ leather/CD, excellent condition, \$15,300/obo. 626/797-8929, Don Helmsberger.

'96 WINNEBAGO Adventurer 32' Class A motorhome; Ford 460; 35K miles; services recent and up to date; 6 Kw generator, ducted dual a/c, driver door, hydraulic leveler, queen bed, oak interior, 2 TVs and much more; NADA valuation \$25K (low) to \$30K (avg.); make offer, must sell. 805/584-6766.

Free

CLEAN FILL DIRT, 10 cu. yds, avail., haul as much as you like, near Los Robles/Jackson, Pasadena. 626/791-3103, dtrak6@its.caltech.edu.

HOME THEATER SYSTEM, Onkyo DRS 2.0, excellent sound, except subwoofer stopped working; now CD/DVD drive failed; fix sub, add external drive and go; CD/DVD/AM/FM receiver, five speakers plus sub; \$1,000 in 2001, now free. 951-9570, Don.

Wanted

APT. OR BACK HOUSE for rent, a nice couple, in North Arcadia, within Highland Oaks school district. 626/318-6370.

DAYBED, if you have one you wish to get rid of. 626/296-3441.

FREEZER, large, good condition. 626/345-0681.

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

VANPOOL RIDERS, West Covina-Irwindale-JPL; leaves WC Mall at 6:10 a.m. and Caltech at 6:20; leaves JPL at 4:00; \$105/mo. or \$5/day. Ext. 4-4334, Denise.

Real Estate

DEL MAR timeshare condo, 2 bd., 2 ba., living room, fully equipped kitchen, pool, Jacuzzi, BBQ area, game room, walk to beach; high season, 1 week; \$4,000. 626/507-8083, David or 626/215-3323, Kitty.

For Rent

ARCADIA apt., 2 bd. + 2 ba., garage, a/c, stove, new paint/carpet/flooring, clean, convenient location, walking distance to shops and food court, near JPL/Caltech, Santa Anita mall and 10/210 fwys., no pets, \$1,499. 626/576-7333.

LA CRESCENTA, 1-bd. apt., occupy on May 1, option to continue for 1 year starting Aug. 1, \$1,100; no security deposit required for first 3 months; afterwards, security deposit is \$1,100. 323/251-8708, Dan.

LA CRESCENTA house, 3155 Orange Ave., 2 bd./den, 1 ba., FA/CA, frplc., yard FR/RR, dbl. garage, move-in cond., \$1,800. 248-4708.

LA PUENTE, 1 bd. + 1 ba., in a 3 bd., 2 ba. home, newly remodeled; full privileges, female preferred, no smoking/pets; available May 1; \$900, utilities included. 626/379-3269.

OXNARD condo, Channel Island Harbor, 2 bd., 2 ba., loft, 3 balconies, walk to beach/marina, views of ocean/harbor, pool, spa, tennis, \$1,600. 626/710-0653.

PASADENA studio apt., 3 miles to JPL, \$750 + utilities. 559/994-0834.

PASADENA condo, large 900 sq. ft., 1 bd & 1 ba., top-floor corner unit on Del Mar Blvd., 2 miles from Caltech & PCC and 7 miles from JPL, parking included, \$1,500. 626/755-4923 Michelle.

SOUTH PASADENA, 1 bd. + office apt. with garage, includes water/trash/sewer, hardwood floors, W/D hookups, \$1,500. 323/344-7163.

TEMPLE CITY, beautiful Spanish-style home, great location, close to everything, 20 min. to JPL, close to 210/10/605 freeways, quiet, private, 2 bd. + 1 ba., garage, central a/c and heater, stove, \$2,200. 626/568-3264, Frantz.

Vacation Rentals

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

CORONADO ISLAND resort timeshare condo; Easter wk. 4/9-16; 2 bd., 2 ba., delux, ocean view, short walk to sparkling beach, across street from Del Coronado Hotel; fully equip'd kitchen, Jacuzzi; day use of Lowe's resort, pools, grounds & 30% disc. Restaurants: JPL disc. 437-5223.

FLORIDA condo, beautifully furn. 2 bd., 2 ba., 2nd floor, on the surf of New Smyrna Beach, half-hour to Cape Canaveral, 90 min. to Disney World; enjoy all the comforts of home, quiet, relaxing, overlooks beach, BBQ/pool/ game room, easy walk to stores & restaur-ants. 760/439-7821, Darlene, 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/w, pool, priv. lanai, slps. 4, laundry fac., \$145/nite/2, \$20/nite/add'l person. 949/348-8047, jackandrandy@cox.net.

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

OCEANSIDE condo, on the sand, charming 1 bd., panoramic view, walk to pier or harbor, pool, spa, game rm., sleeps 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 mo. away, priv. secure parking. 626/794-3906.

JPL'S ONLINE NEWS SOURCE

<http://dailyplanet>

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