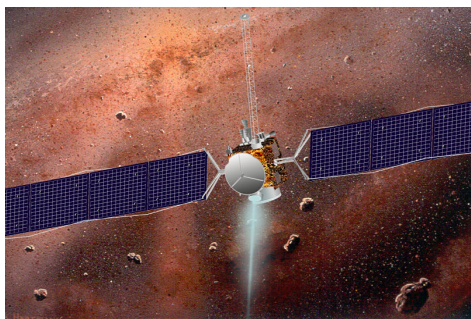


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Dawn of a new mission begins '02

The Dawn spacecraft with images of asteroids Vesta and Ceres are shown against the background of a painting by William K. Hartmann titled "A cocoon nebula, perhaps the primordial solar nebula."



JPLERS ENDED 2001 saying goodbye to Deep Space 1 and looking forward to a new Dawn—a mission that will orbit the two largest asteroids in the solar system. The Dawn mission builds on the ion-propulsion technology pioneered by Deep Space 1, the little ion engine that could, which continued to astound us throughout 2001.

Dawn was approved shortly before the end of the year, and is one of a pair of missions chosen by NASA for the agency's Discovery Program. JPL's Sarah Gavit is the project manager, and Dr. Christopher T. Russell of UCLA is the principal investigator. The mission will launch in 2006.

NASA selected Dawn and Kepler—a spaceborne telescope, also scheduled for launch in 2006—from 26 proposals made in early 2001. The Discovery Program emphasizes lower-cost, highly focused scientific missions that must stay within a development cost cap of about \$299 million.

"Kepler and Dawn are exactly the kind of missions NASA should be launching, missions that tackle some of the most important questions in science yet do it for a very modest cost," said Dr. Edward Weiler, associate administrator for space science at NASA Headquarters. "It's an indicator of how far we've come in our capability to explore space when missions with such ambitious goals are proposed for the Discovery Program of lower-cost missions rather than as major projects costing 10 times as much."

The Dawn mission will make a nine-year journey to orbit the two most massive asteroids known, Vesta and Ceres, two "baby planets" very different from each other yet both containing tantalizing clues

about the formation of the solar system. Using the same set of instruments to observe these two bodies, both located in the main asteroid belt between Mars and Jupiter, Dawn will improve our understanding of how planets formed during the earliest epoch of the solar system.

Ceres has quite a primitive surface, water-bearing minerals, and possibly a very weak atmosphere and frost. Vesta is a dry body that has been resurfaced by basaltic lava flows, and may have an early magma ocean like Earth's moon. Like the moon, it has been hit many times by smaller space rocks, and these impacts have sent out meteorites at least five times in the last 50 million years.

The mission will determine these pre-planets' physical attributes, such as shape, size, mass, craters and internal structure, and study more complex properties such as composition, density and magnetism.

The mission will determine these pre-planets' physical attributes, such as shape, size, mass, craters and internal structure, and study more complex properties such as composition, density and magnetism.

During its nine-year journey through the asteroid belt, Dawn will rendezvous with Vesta and Ceres, orbiting from as high as 800 kilometers (500 miles) to as low as 100 kilometers (about 62 miles) above the surface.

"I'm ecstatic that we'll have such a great opportunity to show what ion propulsion can do," Gavit said. "Ceres and Vesta are two of the largest unexplored worlds in our solar system. We'll learn about early planet formation in ways that wouldn't have been possible before this mission." She said she looks forward to working with Orbital Sciences, a new industry partner for NASA's interplanetary spacecraft. Orbital Sciences Corporation, Dulles, Va., will develop the Dawn spacecraft.



"We'll learn about early planet formation in ways that wouldn't have been possible before this mission."

— Sarah Gavit, Dawn project manager

The Dawn mission builds on the highly successful ion-propulsion technology pioneered by Deep Space 1. Launched on Oct. 24, 1998, Deep Space 1 was designed and built in just three years, the shortest development time for any interplanetary spacecraft NASA has flown in the modern age. It was the first mission in NASA's New Millennium program. In addition to its technical achievements, Deep Space 1 is an ambassador of Earthlings' goodwill, carrying with it a compact disc of children's drawings and engineers' thoughts.

JPLers have big hearts

"Chanson," below, entertained at a United Way campaigners' thank-you luncheon.



JPLers donated \$450,570 for the United Way of America during the Lab's recent "Neighbor to Neighbor, Heart to Heart" campaign.

The campaign results were announced at a Dec. 18 luncheon in von Karman Auditorium. The luncheon was organized to thank the volunteers for the time and effort they contributed to the JPL United Way campaign.

The Food Drive campaign was especially successful in 2001. A record 81 boxes of canned food was collected, a 43 percent increase over last year's quantities.

The food will be distributed to hundreds of needy families by five local agencies.

"We demonstrated, as we do every year, that JPLers are good and caring neighbors," said Blaine Baggett, executive manager of JPL's Office of Communication and Education, who served as this year campaign manager. "Our food drive will help hundreds of needy families during the holiday season, and we hope the nearly half million dollars raised will have a positive impact on our area throughout the year."

The \$450,570 raised is equivalent to a donation of almost \$100 per JPL employee.

Fifty-six employees made contributions of \$1,000 or more. These "Leadership Givers" contributed a total of \$84,692. This is a 21 percent increase in participation over last year, and a 23 percent increase in contributions for this category of donations.

Here's how the rest of the numbers shake



Peter Poon (left) presents Blaine Baggett a certificate of appreciation for leading the United Way campaign.

out: Organization 9X had the highest percentage participation, at 79 percent, while 3X had the highest number of participants, at 1,431. Organization 6X had the highest per-capita dollar amount at \$171, while 3X had the highest dollar amount donated, at \$288,340.

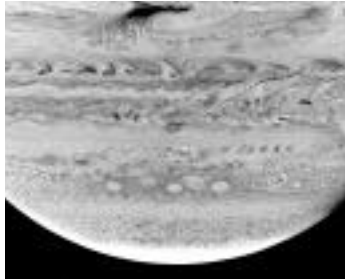
JPL's Space Odyssey

A Year in Review

2001 truly was a year of great space adventures for the Lab. Throughout the year JPLers enjoyed one success after another — ranging from spectacular launches to unprecedented discoveries about comets, asteroids and planets — including our own.

JANUARY

On New Year's Day, on the way to its Saturn destination, the Cassini spacecraft's radio and plasma wave science instrument detected low-frequency radio waves at a distance of 10 million kilometers (6.2 million miles) from Jupiter (*below*), which University of Iowa scientists converted to sound waves to make the patterns audible. ... The 2001 Mars Odyssey spacecraft (*above*) arrived at Kennedy Space Center to prepare for its April launch. ... JPL-led proposals to look deep inside Jupiter's atmosphere and magnetosphere, and to orbit two of the largest asteroids in the solar system, were selected by NASA for study as candidates for the next mission in the agency's Discovery Program of lower cost, highly focused, rapid-development scientific spacecraft. JPL was also named to participate in a proposed French-led Net-Lander Mission, scheduled for launch in 2007. ... Dr. Charles Elachi was named to succeed Dr. Edward Stone as JPL director. ... The Mars Global Surveyor spacecraft, which had been in orbit since 1997, ended its primary mission Jan. 31 and immediately began an extended mission through April 2002.



FEBRUARY



A JPL navigation team guided the NEAR Shoemaker spacecraft to a controlled landing on asteroid Eros (*above*), the first time such a maneuver had been attempted. ... A JPL-developed high-performance mass spectrometer (*below*) was delivered to the International Space Station to detect leaks outside the orbiting facility. The device can be placed on an astronaut's chest pack, where it can easily point toward the areas under inspection. ... JPL scientists were part of a team that worked on the Canadian Space Agency's Radarsat-1 satellite to track movement in the Antarctic ice sheet.



MARCH

JPL developed a mathematical model of the surface of Venus that filters out recurring radar noise, showing a cracking pattern that indicates that the surface has heated and cooled by almost 200 degrees C (390 F).



APRIL

The 2001 Mars Odyssey spacecraft launched from Kennedy Space Center April 7 (*mission operations team below*). ... The Lab held a retirement ceremony for Dr. Edward Stone, and announced the establishment of the new Dr. Edward C. Stone Award for Outstanding Research Publication. ... JPL acquired one of the world's finest electron beam lithography systems, which will allow researchers in the Microdevices Laboratory to work on the sub-molecular scale.



MAY

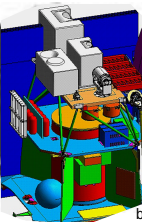
Dr. Charles Elachi took the helm as the eighth director in JPL's history. Elachi announced a reorganization and restructuring of the Laboratory that included new positions on the Executive Council. ... The city of Monrovia successfully tested an emergency vehicle early warning system that was designed by a private company with the assistance of JPL's Technology Affiliates Program. ... NASA selected a builder to add an advanced 34-meter dish antenna at the Madrid, Spain, Deep Space Network facility, part of a plan to increase the DSN's capabilities by late 2003. ... Lt. Gen. Eugene Tattini was selected to become JPL's deputy director upon the retirement of Larry Dumas later in the year. ... A record 62,500 people attended JPL's annual open house (*below*) May 19 and 20. ... On May 25, Galileo successfully completed a flyby of Jupiter's moon Callisto. The pass was designed



to use Callisto's gravity to alter the shape of Galileo's orbit to achieve a flyby of Io in August. ... Daily global maps created with images from Mars Global Surveyor provided a moving picture of Martian weather during 1999-2000 similar to familiar satellite weather maps we see of Earth. ... JPL's Deep Impact mission, the first to ever attempt to impact a comet nucleus, successfully completed its preliminary design phase and has been approved by NASA to begin full-scale development for launch in January 2004.

JUNE

Ground was broken (*below*) for JPL's new Optical Interferometry Development Laboratory. The facility, designed to meet extremely demanding criteria for control of temperature, humidity, vibration and other factors, is scheduled to be completed in July 2002. ... The 10 most promising mission concepts of 43 proposed to NASA for possible launch to Mars in 2007 were selected to receive funding for six months of continued studies. Of those 10, two would be led by principal investigators from JPL: the Mars Environmental Observer (*below*), an orbiter that would explore the role of water, dust, ice and other materials within the Martian atmosphere; and CryoScout, (*above*) designed to use heated water jets to descend through Martian polar ice caps, to measure composition and search for organic compounds. ... Managers for the Cassini mission to Saturn announced a revised plan to work around a telecommunications problem and avoid loss of scientific data after the spacecraft drops the Huygens probe (*right*) to descend to the surface of Titan, Saturn's biggest moon, in January 2005. The new plan will change the originally planned date and geometry for the part of the mission in which the Huygens probe will parachute into the thick atmosphere of Titan.



JULY

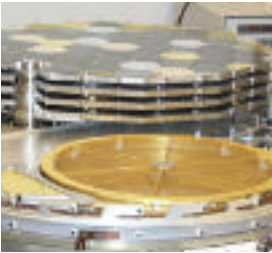
Earthquake scientists unveiled a new network of ground-motion monitors (*below*) in Southern California that use satellite technology to precisely record millimeter-level motions of the Earth's crust. JPL is one of the major partners and leaders in the development of the network. ... Daily observations by Mars Global Surveyor's thermal emission spectrometer produced images of the largest dust storm to be seen on Mars since the spacecraft's arrival in 1997. ... For the first time ever, a star spinning so fast its mid-section is stretched out was directly measured by an ultra-high-



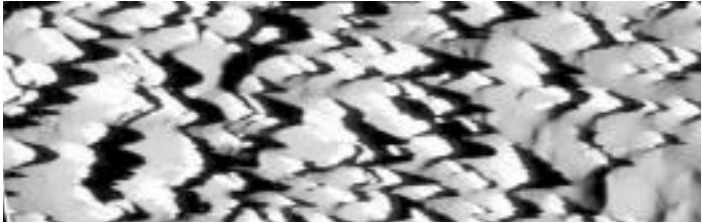
resolution NASA telescope system on Palomar Mountain near San Diego. Measuring the shape of this star, Altair, was as difficult as standing in Los Angeles, looking at a hen's egg in New York, and trying to prove that it's oval-shaped and not circular. ... Jason 1, the follow-on mission to the Topex/Poseidon ocean surface topography mission, arrived at Vandenberg Air Force Base for its launch in the fall.

AUGUST

Genesis (*right*), the JPL-managed mission to collect samples of the solar wind and return them to Earth, launched from Kennedy Space Center Aug. 8. ... Galileo released images of Jupiter's moon Callisto showing a spiky landscape (*above right*) of bright ice and dark dust. The pictures give the highest resolution view ever seen of any of Jupiter's moons. ... The Wide Field and Planetary Camera 2, designed and built by JPL for NASA's Hubble Space Telescope, provided a new, detailed image of violent gas collisions that produced supersonic shock fronts in a dying star. For the first time, scientists can see phenomena



leading to the formation of planetary nebulae. Previously, this had only been predicted by theory, but had never been seen directly. ... Eugene Tattini took over as the Laboratory's new deputy director. ... Physicists predicted gusty winds at the Sun's north pole for the few months following Ulysses' Aug. 31 flyby over that area.

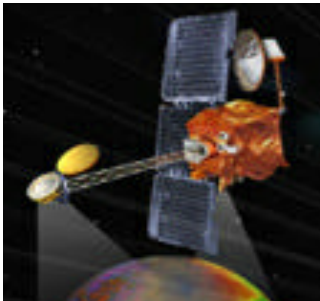


SEPTEMBER

JPL's Airborne Visible/Infrared Imaging Spectrometer provided assistance to disaster officials following the terrorist attacks on Sept. 11. *Avis* was flown aboard a Twin Otter airplane at different altitudes to identify residual hot



spots from fires, and also allayed concerns about the dispersion of asbestos into the environment as dust. ... Having already completed its prime mission of flight-testing advanced technologies, including an ion engine, Deep Space 1 successfully completed a risky flyby of comet Borrelly Sept. 22, flying within 2,200 kilometers (1,400 miles) of the comet's icy nucleus, giving researchers the best look ever inside the glowing core if icy dust and gas. ... Deputy Director Larry Dumas bid farewell to his JPL colleagues in Sept. 26 ceremonies.



(187 miles) above Mars and hit that point within 1 kilometer (6 miles). ... Caltech dedicated the Space Infrared Telescope Facility (SIRTF) Science Center on campus. JPL manages SIRTF, scheduled for launch in July 2002.

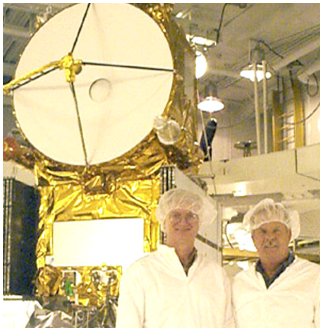
OCTOBER

Galileo revealed the discovery of the tallest volcanic plume ever seen—500 kilometers (more than 300 miles), which arose from a previously unknown volcano on the moon Io. ... 2001 Mars Odyssey (*left*) successfully entered orbit around Mars Oct. 23. Navigators were aiming for a point 300 kilometers



NOVEMBER

Utilizing upgraded ground facilities (*left*) at the Deep Space Network, Cassini began a 40-day search for the first direct detection of gravitational waves, a basic feature of how the universe behaves. ... Genesis entered its 30-month science collection orbit around the balanced-gravity point Lagrange 1. ... The Microwave Instrument for the Rosetta Orbiter arrived in Europe for testing. The mission is scheduled for launch in January 2003.



DECEMBER

Jason 1 (*left*) successfully rode a Delta II rocket into Earth orbit from Vandenberg Air Force Base Dec. 7. ... New observations made during a full Martian year (687 Earth days) by Mars Global Surveyor are expanding our understanding of the Martian climate and may indicate the climate is changing significantly even today. ... Deep Space 1 completed its mission Dec. 18.

Special Events Calendar

Ongoing Support Groups

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

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

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

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

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

Saturday, January 5

An Evening With Ken Burns—The renowned historian and filmmaker will lecture at 8 p.m. in Caltech's Beckman Auditorium. Free admission. Call (626) 395-4652.

Tuesday, January 8

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

Wednesday, January 9

"Cosmic Background Imager: Reading the Universe's Early History"—Caltech astronomy professor Dr. Anthony Readhead will lecture at 8 p.m. in

Beckman Auditorium. Free admission. Call (626) 395-4652.

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

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

Sunday, January 13

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

Tuesday, January 15

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

Thursday, January 17

Social Security—A representative is available from 9:30 to 11:30 a.m. in the 167 cafeteria.

Friday, January 18

Mark Twain Tonight!—Hal Holbrook portrays the legendary author in a one-man show at 8 p.m. in Caltech's Beckman Auditorium. Tickets are \$35, \$31 and \$27 for adults; high school age and under, \$10. Call (626) 395-4652.

Saturday, January 19

Winter Concert—The Caltech Jazz Bands will appear at 8 p.m. in Beckman Auditorium. Free admission. Call (626) 395-4652.

Letters

Many thanks to my friends and coworkers for their support and expressions of sympathy following the recent passing of my mother. Also, thanks to the ERC for the plant sent to my home.

Ron Gillette

I would like to express my sincere gratitude to my friends and co-workers for the sympathy cards and expressions of condolence given to me following the death of my mother. I would also like to thank the ERC for the beautiful plant sent to my home.

Burt Sigal

I would like to thank the "JPL Wheels Camping Club" for the "Life-time Membership" they bestowed upon me at their annual Christmas party at the home of the Jacksons in Murrieta Springs, Calif. on Dec. 1. I was the

To all, present and past, thanks for working with me, and for the send-off upon my retirement. Good luck to the Laboratory. With best wishes,

Winston Gin

We would like to wholeheartedly thank our extended JPL family for your support and comfort during the recent passing of our beloved Grandmother. Your kind thoughts and wishes have lifted our spirits during the past few weeks. Also, a special thank you to ERC for the plants that have brightened our home.

Linda & Cindy Nguyen

Huyen Duong

Classifieds

For Sale

ARMCHAIRS, 2 matching, wicker, w/cushions, different patterns; + sm. table, very pale mauve, exc. cond., \$100/set. 364-9726.

BABY ITEMS: portable 3-in-1 pack & play pen, \$50; super saucer/active center, \$35; infant swing, battery operated, w/music, \$60; baby clothes, 3-12 mo.; Infant bouncy chair w/activity bar, \$10; infant front carrier \$10; \$91-3929, after 7 p.m.

BANANA PLANT, red, in 5-gal plastic pot, \$15/obo. BOWL, g/r, ceramic, 2-ft dia., 10" deep, \$25/obo. 626/791-6101.

BEDROOM SET, beautiful, cream color, incl. queen bed, headstand, desk, bookshelves and drawers, headstand features gold trimming w/mirror, cabinets & night light, gd. cond., exc. price. 790-4417, Patricia.

BIKE, '94 Trek 2120 Touring, 54" frame, ice violet, 14" carbon/Alloy Al stays/frame, w/Shimano SPD pedals, Shimano RX100T (triple-21 gear) crankset, Shimano Deore LX derailleurs w/SIS bar end shifters, 22.8 lbs., exc. cond., < 300 miles on bike, orig. \$1,000, now \$660. 790-2123.

BODY BOARD, Moege Boogie, sky blue, whard silver bottom and leash, \$23/obo. 626/564-1225.

COMPUTER, laptop, Sony VAIO, Pent. III 700MHz, 64MB SDRAM, 10GB HD, 13.3" XGA screen, all-in-one design w/laptopy drive & DVD-ROM (8x max), 2-yr. service plan w/CompUSA, bought Mar. 2001for \$1,700, sell \$1,200/obo. 949/370-8827.

COMPUTER, Pentium 3, 733 MHz, 128 mb

FITNESS MACHINE, Fitness Flyer no-impact walk/er w/4-function monitor: scan-ner, calorie counter, response time, elapsed time; aerobic workout (upper and lower major muscle groups; vg cond., orig. \$200, sell \$99/obo. 249-8079.

GUITAR EFFECTS PEDAL, DOD Tech 8, all effects, bought used for \$120, sell for \$33/obo. 626/564-1225.

JACKET, men's, brown leather, Members Only sz. 38, ribbed waist & sleeve cuff, never worn, \$50/obo. COAT, women's belted trench, black leather, sz. 12/14, zip-out insulated lining, worn very few times, \$75/obo. RAINCOAT, women's, powder blue cotton-polyester, belted sz. 12, zip-out insulated lining, seldom worn, \$35/obo. 780-0470.

MISC: car cover, custom weather proof, for 1984-96 Corvettes, California Car Cover Co., orig. \$400, now \$99; metal tray, pack of 10, extra deluxe, multi colored for Visor or Palm, \$9.99; extra USB cradle for Visor, \$14.99; phone, deluxe Nokia 6100 series, for AT&T network, free case, \$99; batteries, for Nokia 5000 and 6000 phones, \$15; Eveready battery for older type camcorder, never used, \$5, 366-6134.

MISC: SyQuest cartridge drive, 44MB, \$15; cartridges 3.1/60; CD jewel cases, 50, \$10; Jenny Craig diet tapes, set of 14, \$50; computer pwr. contr., 3 pwr. switches + 1 master sw, 5 surge-protected outlets + 2 modem/faxphone jacks, new, \$20; organ, Yamaha 45 electronic console w/13 pedals, 3 keyboards, 144 rhythm patterns, gd. \$7,500, sacrifice for \$3,000. 790-3899.

MODEMS, efficient networks speedstream 5260 Ethernet ADSL and Alcatel 1000 AD-SL 661/254-6134.

ORGAN, electronic, Wurliitzer, 2 manuals, 88 keys, 1 octave foot pedals, rhythms, mahogany, with bench, \$150. RECEIVER, Sony STR-6055 RCR, acc enclosure, Sony TC-K15, 1 cassette deck, nd. new belt, w/2 Advent 10" speakers, \$220. 248-9418.

REFRIGERATORS, G.E., 1 is beige, 17 yrs. old, side by side, \$100; other is white, 15 yrs. old, \$100. DINING ROOM table, w/oak, cherry wood top, black legs, gd. cond., \$150. SOFA/SLEEPER, makes into qn.-sz. bed, abstract black, blue & mauve design, gd. cond., \$300. 626/357-8210.

SOFTWARE, Radius Firewall PCI card, w/complete DVD editing kit, (IEEE 1394 compatible), digital video editing software, and 6 to 4 pin DV cable, compatible w/PC or Mac, perfect for making movies from digital video camcorder, never used, \$80. 626/333-3212.

TELEVISION, Hitachi, Ultravision, 46", projection, exc. cond., 4 yrs old, \$700. 395-9631.

TEST EQUIPMENT: suitcase vacuum tube tester & all adapters including TV picture tube: EICO 950B resistance-capacitance comparator bridge; EICO 385 color bar/pattern generator; EICO 955 capacitor checker; Knight Flyback Checker; Knight KG-650 vacuum tube voltmeter; Heathkit V-7A vacuum tube voltmeter which voltage probe: instruction manuals incl. for most, negotiable, can bring to JPL for seriously interested. 352-7892.

TRIMMER, string, w/retroer attachment, Homelite gas powered, used very little, \$50/obo. 249-8079.

TRIP TO MALAYSIA, round trip economy airfare, 4 nts. hotel in Kuala Lumpur, all transfers to/from hotel, tour of city, gd. thr. Oct. 29, 92, open ticket, 6 wks. notice needed for booking; retail value \$1,000 seeking \$500, I won't be put can't use it. 323/935-3432.

VIDEO, Disney's Sleeping Beauty, VHS, new, sealed, limited edition masterpiece, fully restored with THX sound, \$25. 562/240-2313.

WALL UNIT, 6' x 6' x 1', open shelving w/wood cabinet on bottom, solid wood, \$30. 243-8255.

WOODWORKING MACHINE, Woodmaster 6 in 1, variable power 1.5 to 3 HP, 900-5200 rpm., like Shopsmith MarkV. 10" Table Saw, 34" Lathe, 16 1/2" Drill Press, horizontal boring, radial sanders, overhead pin router, plus 18" jig saw, + 100 many accessories to list, in top shape, all manuals included, \$799/obo. 909/621-9722.

Vehicles/Accessories

'99 AUDI Quattro, 1.8 turbo, automatic with tiptronic, white w/grey interior, sunroof, sports pkg., trip computer, keyless entry, alloy wheels, all records, \$19,900. 626/358-3730, Randy.

CATALINA Capri sailboat, 14 ft., boat and trailer, good cond., reg. under through 2003, \$800/obo. 661/263-2037.

'83 BMW 633CSi, black, orig. paint, cosmetically good inside/out, well maint., gd. records, \$5K/obo over retail Blue Book. 626/836-3931.

'98 DODGE Stratus, 59K mi., new tires, vg cond., clean, am/fm, cassette, auto, a/c, \$8,800. 626/303-5174. Joe.

'94 FLEETWOOD Prom. trailer, model 24 M, a/c, heater, am/fm case, microwave, fridge, 19' awning, dual propane tanks, 2 doors, full bath, outside shower, mirrored cabinets, hitch included, vg cond., \$9,900/obo. 951-1257.

'95 FORD Windstar Van LX, loaded w/lots of extras, quad captain's chairs, 81K mi., runs great, \$9,500. 626/447-6423.

'92 FORD F150 truck, 67,000 mi, vg. owner, longbed, camper shell, a/c, radio/cass. V-8, 5-s-p, manual, heavy duty, geared for towing, white, gray interior, \$6,995. 626/798-1765.

'90 FORD F150 Lariat pickup, supercab, 5.8 L, V8, 4 wd, alt. many extras, low mi., orig. ownr., very clean, exc. cond., \$6,900. 626/363-3704.

'93 GMC Suburban 1500, 4x4, tow pkg, 3rd seat, new tires and bath., phone, roof rack, full pwr, tint, am/fm/cass, exc. maint rec. and cond., \$8,000. 626/799-3587.

'90 HONDA Civic EX Sedan 4 dr., auto trans, air, pwr. steering, power windows, tilt wheel, cruise contr., dual airbags and ABS, keyless entry, moonroof, 16,000 mi., \$17,000. 626/355-9707.

'93 HONDA VFR 750 Motorcycle, exc. cond., new chain, new front tire, pearl white, 25K mi., \$3,500. 661/275-2098.

'92 HONDA Accord EX Sedan 4 dr., 106K mi., gd. cond., white w/blue int., auto., 4 cyl. 2.2 L, front whl dr., a/c, p/s, p/w, p/dl, cruise cont., ABS, tilt whl, sun/moon roof, am/fm stereo/cassette (anti-theft), gd. tires, \$6,000. 626/296-9073, Patti.

'90 HONDA Accord LX, manual 4-dr sedan, 15,000 mi., low miles, power windows, a/c, all works, all perfect, maroon exterior, beige interior, \$5,300/obo. 952-1456, griffith@uow.edu.au.

'99 JEEP Wrangler, exc., like new cond., black, soft top, 23K mi., E, 4 wheel drive, \$11,000/firm. 957-7742, eves.

'96 LINCOLN Continental, 21K mi, V8, auto, ABS, traction control, moonroof, CD changer, Lo Jack installed, red/tan leather, exc. cond., \$12,800/obo. 626/351-0891.

'00 NISSAN Pathfinder LS, 2 wd, champagne, alt, a/c, p/s, tow. co. Bose audio, am/fm/stereo, CD, sunroof, custom seat covers, 15,000 mi. \$25,000/obo. 200-0012.

'00 NISSAN Maxima, champagne color, alloy wheels, AT, PS, a/c, AM/FM CD-cass., color-coordinated Maxima floor mats, immac. shape, loaded, low miles 29,500, \$17,000. 800/318-6888, ext 203, Clive.

'90 NISSAN 240SX SE Fastback, red, 5-speed, tip-tilt/removable sunroof, pwr. steering, tilt wheel, cruise, am/fm stereo, single owner, all records, 100K mi., alt. gd. cond., \$3,000/obo. 323/467-4742.

'87 NISSAN, truck, 4 x 4, 5-spd. stick w/overdrive, cruise contr., AM/FM, CD, power windows/locks/brakes, VG 30, V6, new trans and 4 x 4, new battery, sunroof and shade, shell w/lock ext. cab and long bed, open window, cool running, \$5,500/obo. 626/446-1054 or 626/201-1895, Mike.

'98 PONTIAC convertible, beautiful, white, loaded, ~19,000 miles, exc. cond., 25 mpg, factory warranted, \$11,000/obo. 790-2133.

'73 PONTIAC LeMans, must sell fast, 30K on road, no rust, private setting, no interior, gd. cond., orig. owner, exc. transp. car, \$1,000. 626/966-2904 after 6 p.m., weekdays.

'85 SUNRADER motor home, 21', Toyota powered, 36K mi., dual rear wheels, 4-burner gas stove/oven & sink, restroom w/toilet, shower & sink, overhead cab, sleeps 2 adults, dining area converts for additional sleeping area and refrig. + more. 642-5091.

'93 TOYOTA Tercel, 2 door, 37,000 mi., a/c, exc. cond., w/airbags, \$6,000/obo. 626/794-4921 or 323/393-2831, Bert.

'92 TOYOTA Camry LE, 4 cyl., 4 dr., all pow-er, auto, 140K mi., \$3,400/obo. 541-1408, David, weekend.

'87 TOYOTA Camry silver, 4 dr., 5-spd., cruise control, am/fm/CD, 162K mi., needs a few repairs, Blue Book \$1,700, sell \$1,200/obo. 626/943-2840.

'97 TRAILER LITE, Forest River Sierra, 17-ft. fully self-contained weekendner, orig. owner, exc. cond., kept under carport, sleeps 4 adults, microwave, 2 sinks, 2 toilets & speakers, forced air furnace, a/c, Domestic refrig. 3-burner stove, oven, dual kitchen, sinks, dual propane tanks, awning, battery, spare tire, \$6,995. 626/798-1765.

'89 VOLVO 740GLE, 4-dr. sedan, 150K mi., auto, a/c, p/w, wincl/mkrms, am/fm, cruise ctr, runs great, \$2,500/obo. 248-8682.

Wanted

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

APARTMENT OR CONDO for rent at Lake Arrowhead next summer that will sleep 8 adults and 4 children, children can use sleeping bags on the floor, preferably with close proximity to the lake. 626/796-8925.

BATTERY, inexpensive, for IBM 755CX laptop. 626/777-0157, pgr.

BOY SCOUT PATCHES and such for collection. 909/948-9595.

CARPOOL PARTNER, part-time, from Laguna Niguel, 92677. 949/363-7418.

CHILD CARE, after school, homework help for 3rd and 4th grader, + light house-keeping, La Crescenta, some local driving also needed. 249-1583, Terri.

DRUM SET, trap, prefer major brand, will pay to \$300. 626/797-1673.

RIDERS for vanpool from Littleterrac/ Palmdale to JPL. 661/944-2448 or 3-3790.

ROOM, temporary, female visitor to Pasadena needs single rm. for several months, mostly as a base of operations as she will be extensively traveling. 626/397-7224, Charlie.

ROOM needed 1-2 nights per week in La Canada area. 949/363-7418.

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

TUTOR for upper division statistics, Jan./Feb. only 962/345-0681.

VOLLEYBALL PLAYER, coord, no beginners please, Tuesdays nt. 8-10 at Eagle Rock High School, \$3/nt. 956-1744, Barbara.

Free

CAT, stray, to good home, gold and white, friendly and playful, approx. 2-3 yrs. old. 626/632-6567.

Lost & Found

Lost: CELL PHONE, J505x, in a gray pouch with an orange card in it, found on Dec. 20 at 11:30 am in a parking lot going towards East lot; if not there, might have been dropped in East lot parking area. Ext. 3-1715, Della or 626/797-6814.

Found: BRACELET, silver-colored, at Woodbury, Bldg. 601 on 12/13. Ext. 4-9550, Barbara.

For Rent

ALTADENA, culst., 2 bd., 1.5 ba., private house w/attached, den, garage, laundry facility. 704-4376.

BURBANK HILLS, 3 bd., 1 ba., home on quiet tree-lined st., laundry HU, C/A, hrdwd flrs,

fireplace, fenced backyard, remodeled kitchen, w/DW, stove, fridge, \$1,800. 952-1538.

LA CANADA apt., 1 bd., 1 ba., 10 min. to JPL, groups floor unit in 4-plex, acc, enclosed garage, \$790. 790-7444.

MONROVIA HILLS, 2 large bd., with 2 full ba., in a private family home, share kitchen & laundry, electricity, gas, water and cable incl., 12 miles from JPL, no smoking! pets: \$475 each bd. with its ba. 626/358-7728.

MONTROSE, studio apt, cblk, cabin-like, 4 mi. to JPL, single occup, 2312 E. 15th St., Ave. near Ocean View, \$550. 248-0568.

PASADENA, furn. condo studio, 1115 E. Corvado, #223; gated, pool, carport, laundry, BBQ area, non-smoker, no pets, 2 blocks N. Caltech @ Wilson & Cordova, you pay electric. \$875. 626/792-9053, Ray and Marilyn.

PASADENA, cottage for one, 1 bd., living kitchen, full bath, 15 min. to JPL, close to house in estate area, 3 miles/Off Town and JPL, unfurn., no smoking, no dogs, \$1,100 including utility, cable, for long-term rental. 626/796-2662.

PASADENA, room in a 4 bd., 2 ba. apt, furn., acc, parking, laundry in 4-plex, 5 mi. to Caltech, co-ops welcome, \$495 + util. 626/351-9641.

PASADENA, 1 bd., 1 ba. apt, furn., laundry rm., a/c, parking, close to Caltech, PCC, great for co-ops. \$925 + util. 626/351-9641.

PASADENA, spacious 2-story condo, 3 bd., 2.5 ba., prestigious community, beaut. inter., bright kitchen, prof. landscaped, 626/402-9775, close to shop, cozy lvr w/ lip with incl. unit, frl, h/dwd flrs., immac. cond., close to schools, \$1,750. 626/396-9024.

PASADENA townhome, 2 bd., 1.5 ba., a/c, fireplace, washer/dryer, near Caltech/PCC, new carpet, ceramic tile, \$1,300. 626/402-9775 or 626/379-3505.

PASADENA, condo, spacious 1,500 sq. ft., 2 bd., 2 ba., w/2-car gar., 25 miles to Caltech, \$1,680. 626/233-9496 or http://members.aol.com/PasCondo/.

PASADENA townhome, 2 bd., 1 1/2 ba., inside washer dry, new carpet, nr. PCC/Caltech, \$1,300. 323/256-0535 or 626/402-9775.

SOUTH PASADENA, studio apt., 1718 Huntington Dr. betw. Marengo and Milan Sts, fully furn., util. pd., car space, laundry, no pets, non-smoker, \$750; managers unit: deluxe 1 + bd., fully furn., you pay electric/phone \$1,000 (\$100 incl. 1st person). 626/792-9053 Marilyn or Ray.

SYLMAR, new home, 4 bd., 2.5 ba., spacious, gated, view, pool, buy option, near mountains and golf, \$1,995. 626/584-6526.

TEMPLE CITY, single-family house, 3 bd., 2 ba., fam. rm, office, wood-burning fireplace in liv. rm. 3 car detached garage, acc, dishwasher, ex. gas BBQ in backyard, on 2 acres of forested land w/many flat areas for barns and corrals, \$312,000. 653-9283, Carolyn.

PASADENA, exc. condo next to Caltech, totally remod. 2 bd + 1 3/4 ba., 1,200 sq. ft., newly refin. hrdwd flrs. in din. rm, newer appliances, carpet & paint, lg. balcony, just off central air, \$535K. 957-8813.

OREGON, secure & quiet country estate nr. historic Jacksonville, 2,430 sqft, custom living space, 2 bd., office/hdr bedrm., 3 ba., 810 sqft garage/workshop space, 2,000 sq. ft. custom redwood deck surrounds house, gorgeous view, on 20 acres of forested land w/many flat areas for barns and corrals, \$312,000. 653-9283, Carolyn.

PASADENA, exc. condo next to Caltech, totally remod. 2 bd + 1 3/4 ba., 1,200 sq. ft., newly refin. hrdwd flrs. in din. rm, newer appliances, carpet & paint, lg. balcony, just off central air, \$535K. 957-8813.

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OREGON, secure & quiet country estate nr. historic Jacksonville

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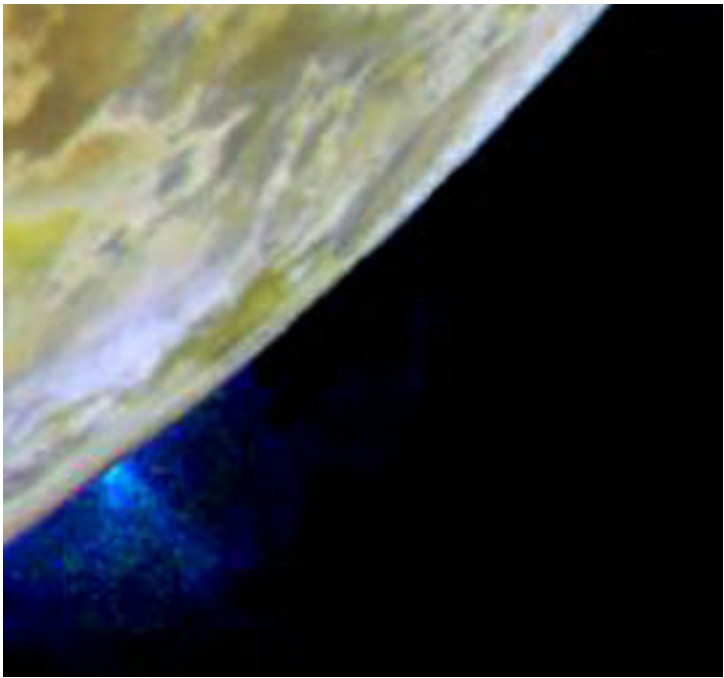
Galileo pays its last visit to Io

By Guy Webster

A plume of gas and particles
is ejected some 100 kilometers
(about 60 miles) above the
surface of Jupiter's volcanic
moon Io in a 1999 image
taken by Galileo.

i b e m e

SOLAR SYSTEM



JPL'S GALILEO ORBITER *darted past Jupiter's moon Io on Thursday, Jan. 17 in the veteran spacecraft's last and closest flyby of any of the giant planet's four major moons.*

Io's volcanoes have presented many surprises since they were first seen in 1979 by JPL's Voyager spacecraft and especially during the six years that Galileo has been orbiting Jupiter. Scientists hope this week's encounter will reveal how several regions of Io have changed over the years.

"Galileo's days are numbered now, so it's especially exciting to visit Io one last time," said JPL's Dr. Eilene Theilig, Galileo project manager. "An orbital mission like Galileo gives you the advantage of getting to examine interesting places repeatedly over a period of time. That's been great for studying Io, since it keeps changing so much."

The Galileo flight team at JPL aimed the orbiter to skim just 100

kilometers (62 miles) above Io's multicolored surface at 6:09 a.m. Pacific time on Jan. 17. "The reason we're going so close is to put Galileo on a ballistic trajectory for impact into Jupiter in September 2003," Theilig said.

Galileo has operated in orbit more than three times longer than its originally planned mission. The resilient spacecraft has survived about three and a half times as much exposure to radiation from Jupiter's radiation belts as it was designed to withstand. In its 33 loops around Jupiter, it has flown near Io six times previously and near the other three of Jupiter's planet-sized moons—Europa, Ganymede and Callisto—a total of 27 times.

The tour has relied on expert navigators to calculate several moves in advance, using each moon's gravity to help adjust the spacecraft's trajectory toward its various encounters.

However, the propellant supply needed for steering the spacecraft and keeping its antenna pointed toward Earth is now nearly exhausted. To avoid even a slim chance that Galileo could crash into Europa after its mission ends, NASA has decided to send it to a controlled demise in the crushing pressure of Jupiter's dense atmosphere. Galileo had earlier found evidence that Europa has a deep ocean of melted saltwater under its frozen surface, heightening interest in keeping Europa pristine for later studies of its potential for harboring extraterrestrial life.

Before its final plunge, Galileo will make the first close flyby of Amalthea, a small, inner moon of Jupiter, in November 2002.

This week, Galileo will make direct measurements of the charged particles and magnetic environment around Io. Also, its camera and instruments for infrared and thermal imaging have been programmed to make observations during the flyby. As much of the data as possible will be transmitted to Earth from the spacecraft's tape recorder in coming months, Theilig said.

Io, like Earth's moon, always keeps the same side facing inward toward its planet. On Jan. 17, Galileo was set to be in position for its best-ever look at the Jupiter-facing side of Io. "We're hoping to see areas we haven't seen well since Voyager imaged them back in 1979," said JPL's Dr. Torrence Johnson, Galileo project scientist. "We'd like to know more about rates of change for volcanic features on Io." New observations are also planned for a previously inactive volcano that unexpectedly lofted a tall plume last summer.

Lab women share their experience, advise students

By Carolina Martinez
and Mark Whalen

Only 22 percent of all American scientists and engineers are female, and women make up only 9 percent of engineers. Studies show that the interest girls have in math and science equals that of boys in elementary school but declines sharply by the time girls leave middle school.

A panel of six female scientists and engineers from JPL tried to narrow this gap Jan. 13 during a live broadcast and webcast. The women discussed the paths they pursued and the challenges they faced to achieve science-related careers. Approximately 100 middle school and high school-aged girls took part in the discussion, and others nationwide joined in remotely.

This talk-show-formatted session began as a way to connect JPL scientists and engineers with girls in the Techbridge program at the Chabot Space and Science Center in Oakland, Calif. The webcast evolved into a far-reaching effort to include local students and the public.

"We realize that this science gap exists all over the country and for that matter, the world," said Stephenie Lievense of JPL's Mars Public Outreach team. "We want girls to see all

the opportunities that are available to them. One way to do that is to provide them with access to these role models. Girls are sincerely interested in technology, but often have little or no access to female scientists and engineers."

On the webcast, thermal systems engineer Shonte Wright noted the importance of staying focused on college studies. As a student, she participated in math and engineering clubs, where "we held each other accountable," she said. Other friends were athletes, but "during school hours I kept close with people whose goals were in line with my own."

Geophysicist Dr. Andrea Donnellan advised students to seek out teachers as role models. "Teachers are always looking for help," she said. "It's a great way to get experience. Don't be discouraged and drop out, because there are so many people who will help you."

In response to a question by student Anna Bertiger of Westridge School in Pasadena about whether panelists had ever encountered the "glass ceiling," a situation where women have a hard time advancing in their careers, systems engineer Tracy Williams found "no evidence of a glass ceiling at all. All of my supervisors and

others I work with have encouraged me to be the best I can be."

Jennifer Mindock, a systems engineer who works on the Mars Exploration Rover's avionics subsystem, agreed with Williams.

"In my experience, if you show commitment, you'll get rewarded for it," she said. "As long as I've put the effort into something, I've always been able to go in the direction I want to go."

"This event gives me an opportunity to show these girls that engineers are more than the pocket-protector, calculator-carrying individuals depicted on screen; that nerd is a good term, and that science, though challenging, is fulfilling," said robotics research engineer Dr. Ayanna Howard.

The archived webcast is available at <http://www.jpl.nasa.gov/webcast/womeninscience.html>.

The issue of encouraging more young women to enter the science and engineering fields is getting wider attention. The current issue of the Girl Scouts of America's "Leader" magazine is devoted entirely to girls and technology. In that issue, three JPL women speak about what influenced them to pursue a career with NASA.

From left: Webcast host
Stephenie Lievense joins panelists
Jo Anne Alano, Tracy Williams,
Jennifer Mindock, Shonte
Wright, Dr. Andrea Donnellan
and Dr. Ayanna Howard.



Photo by Derek Blackway

News Briefs



Dr. Lee-Leung Fu



Dr. Jonathan Dowling

Jason 1 reaches operational orbit

The joint NASA/French Space Agency oceanography satellite Jason 1 has reached its operational orbit and begun six months of instrument calibrations with its sister spacecraft, Topex/Poseidon.

On Jan. 10, mission flight controllers at JPL and at the Centre National d'Etudes Spatiales' Satellite Control Center in France commanded Jason 1 to fire its thrusters and lower itself into its operational orbit of 1,337 kilometers (830 miles). As of Jan. 11, Jason 1 was approximately one minute (approximately 370 kilometers or 230 miles) ahead of the Topex/Poseidon satellite, on an identical ground track.

Launched Dec. 7, 2001 from Vandenberg Air Force Base, Jason 1 was initially inserted into a 1,327-kilometer (823-mile) orbit 10 kilometers (6 miles) below Topex/Poseidon. A series of thruster maneuvers over the past five weeks gradually placed Jason 1 into its current orbit.

Checkout of the spacecraft and its instrument payload is now complete. All instrument and spacecraft functions and the operations systems at the French space agency and JPL are functioning nominally.

Following completion of the calibration phase, plans are for Topex/Poseidon to be placed in a parallel ground track orbit midway between two adjacent Jason 1 ground tracks. The paired spacecraft operations are expected to produce observations with higher resolution than either satellite could attain alone. This enhanced resolution will improve the detection of ocean eddies, coastal tides and currents and will have both scientific and practical applications.

Jason 1 will continue Topex/Poseidon's observations of ocean surface topography for monitoring world ocean circulation, studying interactions of the oceans and atmosphere, improving climate predictions and observing events like El Niño.

Odyssey completes aerobraking

Flight controllers for JPL's Mars Odyssey spacecraft have sent commands to raise the spacecraft up out of the atmosphere and conclude the aerobraking phase of the mission.

At 12:18 a.m. Pacific time Jan. 11, Odyssey fired its small thrusters for 244 seconds, changing its speed by 20 meters per second (45 mph) and raising its orbit by 85 kilometers (53 miles). As of Jan. 11, the closest point

in Odyssey's orbit, called the periapsis, was 201 kilometers (125 miles) above the surface of Mars. The farthest point in the orbit, called the apoapsis, was at an altitude of 500 kilometers (311 miles). During the next few weeks, flight controllers will refine the orbit until the spacecraft reaches its final mapping altitude, a 400-kilometer (249-mile) circular orbit.

"The successful completion of the aerobraking phase is a major milestone for the project," said DAVID A. SPENCER, Odyssey's mission manager at JPL. "Aerobraking is the most complex phase of the entire mission and the team came through it without a hitch. During the next month, we will be reconfiguring the spacecraft to begin the science mapping mission." The science mission is expected to begin in late February.

Fu honored by AMS

JPL senior research scientist DR. LEE-LUENG FU has won the 2002 Verner E. Suomi Award from the American Meteorological Society, the nation's leading professional society for scientists in the atmospheric and related sciences.

Fu was recognized "for simultaneously maintaining the science focus of the Topex/Poseidon mission and producing data sets of great importance across the Earth sciences." The Suomi Award is granted to individuals in recognition of highly significant technological achievement in atmospheric or related oceanic and hydrologic sciences. The award was presented on Jan. 16 in Orlando, Fla.

Fu joined JPL in 1980. He is the lead scientist for JPL's Ocean Science Research Element, has served as the U.S. project scientist for Topex/Poseidon, and is project scientist for Jason 1, Topex/Poseidon's follow-on mission.

JPLer honored for quantum work

DR. JONATHAN DOWLING, principal scientist and supervisor in the Quantum Computing Technologies Group, Section 367, has won the 2002 Willis E. Lamb Medal for achievement in quantum optics and laser sciences. The citation is for his work in "quantum enhancement of spatial resolution" (quantum lithography).

The Willis Lamb Medal, named after the 1955 Nobel laureate and quantum physics pioneer, is one of the most prestigious awards in the field of quantum optics and laser science.

The NBS team achieved several significant milestones during the system upgrade, the most important of which affects all employees in the pocketbook: getting the first payroll out successfully. Also, JPL's financial books for December were closed by Jan. 7. "If we had missed that by just a few days, it would have had a major impact on JPL projects," Montgomery said.

The NBS team was better prepared than Montgomery realized. "Going into our November dress rehearsal, we thought it would take 13 days, working 24 hours a day, seven days a week, to achieve all we needed to. After the rehearsal, we were prepared to do it in 9 days. But when we got to the actual upgrade, it took 6 days, 1 hour and 30 minutes.

"That was such a relief," he said. "I can't applaud the team enough."

While the nuts and bolts of the upgrade have been completed, Montgomery said a number of additional business system enhancements are on the way. For example, in February an automated time allocation system will be available to help supervisors prorate their time across the projects and tasks charged by their employees. In addition, Montgomery is expecting the release of more employee-based self-service enhancements, including an online summary of benefits.

Special Events Calendar

Ongoing Support Groups

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

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

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

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

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

Friday, January 18

Mark Twain Tonight!—Hal Holbrook portrays the legendary author in a one-man show at 8 p.m. in Caltech's Beckman Auditorium. Tickets are \$35, \$31 and \$27 for adults; youth high school age and under, \$10. For information, call (626) 395-4652.

Saturday, January 19

Caltech Jazz Bands—A free concert that includes favorites from the Swing era will be offered at 8 p.m. in Beckman Auditorium. Call (626) 395-4652.

Taiji Demonstration—The Caltech Chen Taiji Club will give a free demonstration of taiji movement forms, sword forms and self-defense applications at noon in Winnett Center. Visit <http://www.astro.caltech.edu/~rsb/taiji> or contact Helen at (626) 617-7108 or hzh_u_89@hotmail.com.

Sunday, January 20

Chamber Music—The Jefferson Chamber Players will perform works from Thomas Jefferson's music library at 3:30 p.m. in Caltech's Dabney Lounge. Admission is free. For information, call (626) 395-4652.

Monday, January 21

Caltech Ballroom Dance Club—A Viennese waltz class will be offered by a professional instructor at 7:30 p.m. in Winnett Lounge, followed by a half-hour practice session. Cost is \$8 per lesson. Contact Megan Knight at knight@its.caltech.edu.

Tuesday, January 22

Investment Advice—One-on-one counseling appointments are available in Trailer 1720 with Fidelity Investments. For an appointment, call (800) 642-7131.

"Software That Thinks: Onboard Autonomy for the Three Corner Sat Mission"—Dr. Steve Chien, supervisor of the JPL's Artificial Intelligence Group, will discuss the mission, JPL's role in it, and how autonomy can enable future missions. To be held at noon in conference room 167.

Wednesday, January 23

Caltech Ballroom Dance Club—A rumba class for beginners will be held at 7:30 p.m. in Winnett Lounge, followed by a half-hour practice session. Cost for the volunteer-taught class is \$1 per lesson. Contact Megan Knight at knight@its.caltech.edu.

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

"Robotics: Moving Beyond the Factory Floor"—Dr. Joel Burdick, professor of mechanical engineering at Caltech, will lecture at 8 p.m. in Beckman Auditorium. Free admission. Call (626) 395-4652.

Thursday, January 24

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

Martin Luther King Celebration—"One Nation, One Dream" is the theme for the Lab's annual commemoration of the civil rights leader's birthday, to be held from 11:30 a.m. to 1 p.m. in von Kármán Auditorium. For more information, call Xaviant Ford at ext. 3-4484.

Von Kármán Lecture Series—Mike Spencer of the Radar Science and Engineering Section will present "The Winds and Beyond: The Radar Scatterometer as a Global Climate Monitoring Device" at 7 p.m. in von Kármán Auditorium. Open to the public. For more information, see <http://www.jpl.nasa.gov/events/lectures/jan02.html> or call Public Services at ext. 4-0112.

Friday, January 25

Exploring Costa Rica: Colors, Creatures and Curiosities—This travel film will be offered at 8 p.m. in Caltech's Beckman Auditorium. Tickets are \$9 and \$7. Call (626) 395-4652.

New Tax Law Information—This year's tax legislation contained many provisions that make retirement savings even more attractive. This workshop, to be held from 10 a.m. to noon in Trailer 1720, room 137, will cover pension portability, increased limits, and improvements to tuition savings and Individual Retirement Account programs.

TIAA/CREF Enrollment Meeting—This monthly meeting, to be held at noon in Building 180-101, is designed to assist employees newly eligible for Caltech/JPL Retirement Plan participation in selecting investment options and completing enrollment forms.

Von Kármán Lecture Series—Mike Spencer of the Radar Science and Engineering Section will present "The Winds and Beyond: The Radar Scatterometer as a Global Climate Monitoring Device" at 7 p.m. in the Forum at Pasadena City College, 1570 E. Colorado Blvd. Open to the public. For more information, see <http://www.jpl.nasa.gov/events/lectures/jan02.html> or call Public Services at ext. 4-0112.

Saturday, January 26

Folk Music—Richie Havens and Livingston Taylor will perform at 8 p.m. in Caltech's Beckman Auditorium. Tickets are \$29, \$25 and \$21 for adults; \$10 for high school age and under. For information, call (626) 395-4652.

Monday, January 28

Caltech Ballroom Dance Club—A Viennese waltz class will be offered by a professional instructor at 7:30 p.m. in Winnett Lounge, followed by a half-hour practice session. Cost is \$8 per lesson. Contact Megan Knight at knight@its.caltech.edu.

Wednesday, January 30

Caltech Ballroom Dance Club—A rumba class for beginners will be held at 7:30 p.m. in Winnett Lounge, followed by a half-hour practice session. Cost for the volunteer-taught class is \$1 per lesson. Contact Megan Knight at knight@its.caltech.edu.

Thursday, January 31

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

JPL Stories—Former Lab Director Dr. Bruce Murray will present "JPL and the Exploration of Mars" at 4 p.m. in the Library, Building 111-104. For a copy of the flyer, see <http://beacon.jpl.nasa.gov/WhatsNew/Stories/Murray.pdf>.

Oracle upgrade successfully completed

By Mark Whalen

Thanks to the diligent work of JPL's New Business Systems team, the Lab is successfully up and running on its upgraded suite of Oracle business applications.

JPL Director Dr. Charles Elachi and fellow Executive Council members Eugene Tattini, Fred McNutt and Susan Henry dropped by the NBS offices Jan. 7 to thank those responsible for the achievement. "The project team was grateful for that acknowledgement," said Marc Montgomery, manager of the Institutional Business Systems Division. He also noted that a large part of the successful upgrade was due to the patience of JPL users.

JPL consultants told Montgomery that the effort was one of the most complex Oracle system upgrades ever completed, in terms of the total amount of data and the number of business applications involved—about 60. Thirty-eight of the applications are customized for JPL.

Some Oracle features are still being tuned up, Montgomery said. "The biggest issue is system performance. We are still focused on identifying and improving the speed of applications and reports—for example, the status of funds on a task order or the actual costs expended on a project—to speed them up significantly so they take minutes instead of hours to run."

and thinking that you would never be able to translate all the bizarre acronyms or find your way around the huge campus? The Lab can be intimidating to visitors and even overwhelming to new employees. Stepping onto its 177-acre site, the history of JPL is almost palpable. As a newbie at the Lab, one might wonder where they fit into and how they can contribute to such a legacy. When Bob Develle, manager of the Facilities Engineering and Construction Section, arrived at JPL in the summer of 2001, its established traditions and operating procedures were daunting. When he was approached to participate in the mentoring program, he jumped at the chance.

“I saw this program as an opportunity for me to get up to speed, to a level of proficiency in the job,” Develle said. “Learning the culture here is everything; to operate around here you have to know the culture, you have to know who’s who, what the issues are and how to get things done. I figured the program was a good thing: anything to figure my way through this maze—flashlights, cheese, breadcrumbs.”

Develle, who served as a contractor at JPL prior to his permanent hiring, already knew the manager of Security, Joe Charles. He and Charles were paired for the six-month one-on-one program called Mentoring in Action.

The program pairs individuals from a variety of backgrounds to, ideally, form a symbiotic relationship that will help each person develop their career, impact the future of the Lab and share their point of view. Participants in the program are guided by a mentoring consultant. They are given a binder of guidelines and suggestions at orientation. Throughout the six-month duration of the official partnership, mentors and protégés must submit an action plan, answer surveys and report on their progress. There are established ground rules that emphasize the level of commitment both parties must display and common-sense mandatory rules, such as discretion. However, the program recognizes and respects each participant’s individuality and encourages the pairs to work out a game plan that suits them both.

“The guidelines are a loose confederation that you can manipulate to meet your goals—you’re not locked into a rigid process and that really helps,” Charles said. “The ground rules that we established were openness and honesty with each other. Personal goals we set were to see the Lab through each other’s eyes and to learn to take those perceptions and use them toward our common growth.”

It’s quite obvious that Charles and Develle feel that their bi-weekly meetings are more fun than obligation. One of the tenets of the program is “Friendship Beyond Mentoring,” and they have clearly embraced that notion. They joke easily with one another and are openly respectful of each other’s perspectives. They both agreed that they are probably having more fun than any of the other mentors and protégés.

“The true knowledge you need to navigate the Lab, you can’t read in a book, you can’t look up on the Internet,” Develle said. “It has to be in a one-on-one situation in a very open atmosphere. And, boy, if you want a book of knowledge [pointing at Charles], well there it is! It’s very seldom that I ask a question and he says, ‘I don’t know.’”

Charles, who came to JPL after serving 25 years as a Department of Treasury agent, finds the open relationship refreshing. Surrounded by photos of himself with the likes of former President Ronald Reagan, it is clear that his former career required extreme discretion. Charles welcomed the opportunity to see life from another angle.

“This experience is really good for me because from my background—time in the military and as a Treasury agent—I’m not prone to be very open because you get exposed to a lot of different things and secrets, and you have a tendency to be very introspective,” Charles said. “However, in this atmosphere [the mentoring program], and within the relationship that we’ve developed, it’s easy to sit and be open.”

In addition to the Mentoring in Action program, Human Resources’ Leadership and Organizational Development Group also oversees the Office Professionals Mentoring Group (OPMG) and the Office Professionals Resource Group (OPRG). Instead of a one-on-one relationship, both of these groups offer settings for mentoring. Typically, two mentors are paired with four protégés. When protégés “graduate,” they can become members of the OPRG.

Like the Mentoring in Action program, participants go through an orientation and then meet on a bi-weekly basis. Meetings are often enhanced by guest



Photos by Bob Brown / JPL Photo Lab

speakers facilitated by members of OPRG. They also serve as a time for members to share shortcuts and valuable JPL knowledge with one another.

Mentor Christine Preheim, a former stay-at-home mom, has been at the Lab for five years. After her children graduated from high school, she decided she wanted a career that offered excitement and challenge. Now a senior secretary for the Mars Exploration Rover project, she feels her dream came true. She was inspired to join OPMG (and, ultimately, OPRG) after a co-worker went through the first phase of the program. Preheim saw that her friend was truly benefiting from the group dynamic and the networking. As a mentor, she feels that she is able to pass on knowledge that helped her find her way at the Lab as well as gain insight from other participants.

“It’s not just the mentors helping the protégés,” Preheim said. “It’s more the mentors and protégés as a team, sharing their experience, their insight and what has worked for

Clockwise:
Joe Charles,
Bob Deville, Lisa
Maginnis and
Christine Preheim.

Mentoring programs
help new employees learn
JPL’s unique culture

A LITTLE HELP FROM THEIR FRIENDS

By Colleen Sharkey



Photos by Colleen Sharkey

them to help solve problems. We’re a problem-solving group.”

Protégé Lisa Maginnis, also a senior secretary in Section 314, came to JPL from a retail background. Although she has been at the Lab for eight months, she has just recently transitioned from contractor to JPL employee. A friend who worked at the Lab convinced her to apply for the job and then encouraged her to join OPMG.

“It’s such a great opportunity to get resources and to be with people who are in the same boat,” Maginnis said. “There’s so much to learn here. This program gives you a good circle of influence that you can use.”

Both Preheim and Maginnis have found the program invaluable in terms of networking and becoming skilled in the ways of JPL. An added bonus that all of the mentors and protégés seem to agree on is the friendship that has blossomed as a result of their professional union.

“One of the best benefits, for me, has been the safe haven of camaraderie,” Maginnis said. “It’s a true bonding experience when you’re in this sea of some 5,000 people and you are able to find a couple of people who you are able to trust right off the bat.”

Mary Ellen Derro, a career and mentoring consultant, oversees the two programs. She knows firsthand that mentoring works. After being on Lab for one month she had a mentor, and continues to value the experience. She also points out that many Fortune 500 Chief Executive Officers name mentors as the number one key to their success.

“Everyone could use a trusted advisor, and these programs are one way to do it,” Derro said. I wouldn’t promote it unless I believed in it.”

The Mentoring In Action program start dates for 2002 are Feb. 25, April 23, June 25, Sept 25 and Dec 19. The next session for the OPMG group will be announced on their website (<http://hr/officepros>) in February.

For further information, call Derro at ext. 4-9833, or visit <http://hr/development/careers/mentor.htm>.

Passings

MICHAEL ZYDOWICZ, 65, a retired systems safety engineer in Section 516, died of a heart attack Nov. 13 at his home in Fountain Valley.

Zydowicz worked at JPL from 1980–99. He is survived by his wife, Pat, five daughters and 11 grandchildren. Services were private.

JAMES NEWTON, 50, who had worked in the Shipping and Receiving Group (Section 2726) since 1985, passed away unexpectedly on Nov. 24 at his home in Altadena.

He is survived by his wife, Bernetta; son James, 22 and daughter Sophia, 14.

In lieu of flowers, the family has requested donations to the James Newton Memorial Account at the Caltech Credit Union for his daughter's college fund.

DONALD BROWN, 73, a retired group supervisor in Section 335, died of stroke Nov. 26 at his home in Utah. Brown joined the Lab in 1962 and retired in 1993. He is survived by his wife, Evelyn; daughters Gerry, Susie and Millie; and six grandchildren.

Donations may be made in his memory to the Spechai Children's League. care of Mary Achterman, 535 Knight Way, La Canada, 91011.

HAROLD HOMAN, 85, a retired technical writer from the former Section 648, died of lung and heart complications Nov. 30 at his home in Alhambra.

Homan worked at JPL from 1952–82. He is survived by his wife, Dorothy, three daughters and seven grandchildren.

Burial was at Resurrection Cemetery in Montebello.

BARBARA NAKAMURA, 42, a staff engineer in Section 386, died of cancer Dec. 1 at her home in San Marino.

Nakamura had worked at the Lab since 1985. She received a NASA Group Achievement Award for her work on the Alkalai

Metal Thermal to Electric Converter development effort, and also earned an Award for Excellence for her efforts on the high frequency multiplier devices that will be used on the Her-



Barbara Nakamura

schel Space Observatory.

Nakamura is survived by her husband, Larry, and daughter Kathleen, 7.

Services were held Dec. 8 at Rose Hills Memorial Park in Whittier. With permission of the family, a college fund for Kathleen has been established for those who wish to donate in Barbara's name to the family. Contributions can be sent to Kathleen Nakamura, care of Larry Nakamura, 1420 Mirasol Dr., San Marino, 91108.

JUSTINE WEIHER, 68, retired group lead in Document Review Services, died of cancer Jan. 1.

Weiher joined the Lab in 1967 and retired in 1998. She is survived by her sister, Joan Shea.

Burial was at San Fernando Mission Cemetery in San Fernando.

Retirees

The following JPL employees retired in January: Melvin Guenat, 46 years, Section 642; Winston Gin, 44 years, Section 200; Ray Wall, 40 years, Section 380; Albert Brejcha, 37 years, Section 500; Arlene Calvert, 23 years, Section 135; Grace Hallowell, 21 years, Section 183.

Letters

I would like everyone at JPL, current and retired, for the wonderful help that they have been to me and my family during the time of Michael's death. I really appreciate it, you were all so marvelous.

Pat Zydowicz

My heartfelt thanks to my friends and coworkers for the positive thoughts and wishes in support of my son's application and acceptance to Caltech for undergraduate studies, which I am very happy to announce.

Margareth Olm

My husband and I are very grateful for the kind words and condolences from our JPL friends following the death of my husband's brother and father. The white poinsettia sent by the ERC was very uplifting.

Katherine A. Dumas

Congratulations to Myriam Ruiz, who has announced her engagement to Edouard Schmidtlin. Their wedding is planned for July 2002.

DJ Byrne

Classifieds

For Sale

ARMCHAIRS, 2, matching wicker, w/cushions and small table, light beige-mauve, exc. cond., \$100/set. 364-9726.

BABY ITEMS: Graco swing, 3-spd, like new, \$45; baby monitor, new, \$10; crib mattress, like new, \$30; Aprica stroller, \$30; numerous infant toys. 626/850-4378.

BEDS, queen, Ikea, like new, 1 tubular, gunmetal gray, frame, mattress and bedside table, \$175/set; 1 blond wood frame, mattress and bedside table, \$275/set. 310/246-0146.

CAMERA, Canon AE1, 3 lenses, Vivatar 70-210, wide angle, 35-70, flash Vivatar hoods and accessory bag, polarizing lenses and cable, \$300/obo. 957-4770.

CANOE, Grumman aluminum, 17 ft., unpainted, aluminum seats, two ores and two life jackets, \$300. 626/796-8709, John.

CARTRIDGE DRIVE, Syquest, 44MB, \$15; Syquest cartridge, 44 MB, \$1/ea; CD JEWEL CASES, 50, \$10; DIET TAPES, Jenny Craig, set of 14, \$50; COMPUTER POWER CONTROL CENTER, 5 power switches + 1 master switch, 5 surge-protected outlets + 2 modem/fax/phone jacks, new, \$20. 790-3899. COMPUTER DESK, simulated slate top, wrap around corner unit, no hutch, 1 yr. old, \$350 new, sell for \$150. 909/398-1854.

COMPUTER EQUIPMENT, Harman Kardon powered sub woofer isub for iMac, plug-n-play USB connection, new in original box w/all accessories, exc. cond., \$50. 542-6953. COMPUTER TABLE, oak colored, exc. cond., \$75/obo. 368-7861.

COUCH, large sectional, sofa bed, 2 recliners, and table with phone hookup inside, great cond., light brown pattern, \$400/obo. 626/398-7811.

CRIB AND DRESSER, Bellini, light gray Milano crib and matching Avanti 3-drawer dressing chest, crib convertible to junior bed, chest includes changing table, exc. cond., \$300/set. 952-7472.

DESK, beautiful, solid oak desk, 39 1/2" wide x 59" long, exc. cond., \$375/obo. 368-7861.

FIREPLACE SCREEN/ACCESSORIES, black, \$50/all; COOLERS, Coleman, two, 25" x 36", good cond., \$15/ea.; SHOVELS, six, compact, square point, \$5/ea., CARPET SHAMPOOER, manual brush and handle, never used, \$5; BICYCLES, four, children's, \$15/ea. 626/357-8210.

GARDEN HOSE HOLDERS, new, black ironwork, holds up to 100-ft hose, \$60/obo; aluminum, new, holds up to 75-ft hose, \$50/obo. 626/791-6101.

HOME THEATER SYSTEM, AudioFile, allows upgrade of any existing stereo system to true home theater, includes Dolby Surround decoder w/remote, center speaker and surround speakers in original box, exc. cond., \$100. 542-6953.

OLYMPICS TICKETS, Salt Lake City Winter Games pack: 8 events including figure skating, hockey, ski jump and freestyle arials; face value \$1,285, sell for \$1,000/obo. georgecancro@netscape.net.

ORGAN, Yamaha 415 electronic console w/13 pedals, 3 keyboards, 144 rhythm patterns, pd. \$7,500, sacrifice for \$3,000; STAR WARS Stormtrooper cardboard figure, 6 ft., free standing, \$15; MOPED, Motobecane model 50, very low mileage, doubles as bicycle when engine is disengaged, needs a little work, \$100. 790-3899.

PLANT AND CERAMIC BOWL, one red banana plant in 5-gal plastic pot, \$15/obo; CERAMIC BOWL, gray, 2-ft dia, 10" deep, \$25/obo. 626/791-6101.

PROM DRESSES, 2, designer evening/prom, very elegant, size 10-12, one by ABS, price tag \$329, sell for \$215; other by Sache, price tag \$268, sell for \$195. 241-8208, eve, Irena.

REFRIGERATOR, 16 cu. ft., top-freezer, 7 years old, exc. cond., white, \$200/obo. 626/446-2989.

REFRIGERATOR, side-by-side, beige, good working cond., \$150/obo. 626/462-9776.

REFRIGERATORS, G.E., one is beige, 17 yrs. old, side by side, \$100, other is white, 15 yrs. old, freezer on top, \$100; DINING ROOM TABLE, with leaf, cherry wood tops, black legs, 4 chairs, good cond., \$150; SOFA/ SLEEPER, makes into queen size bed, abstract black, blue and mauve design, good cond., \$300. 626/357-8210.

SATELLITE DISH, new, never used, 18", \$19; CELL BATTERY, metal hydride, for Nokia 5000 and 6000 series phones, \$15; PHONE CASE, for Nokia 8000 series cell, never used, \$5; CAR COVER, weatherproof, custom, for 1984-96 Corvettes from California Car Cover Co., orig. \$400, now \$99; USB CRADLE, for Visor, \$9.99; BED FRAME, metal, for queen size bed, never used, \$15. 366-6134.

SATELLITE SYSTEM, complete, big backyard dish, General Instrument 2650 R receiver, video cipher II, digital audio plus remote control and G.I. 2000 PS antenna positioner power supply, \$650/obo. 626/794-0577.

TELESCOPE, Meade, DS 114 EC, exc. cond., 114 mm aperture on Newtonian reflector, 25 mm MA eyepiece, includes carrying case, \$200/obo. bunncee@yahoo.com.

VCRs, Beta HiFi, Toshiba, 1 works, 1 needs belts, both for \$75; TAPE DECKS, reel-to-reel, Sony TC-355, 1 works, 1 needs record head but good for parts, both for \$100; RECORDING TAPE on 7.5-inch reels, in boxes, 12 new Sony PR-150, 3 new Scotch 200, 12 used misc. Scotch, \$30/all. 790-5461.

WASHING MACHINE, 2 yrs. old, \$75. 956-1744.

WEDDING GOWN, designer Mori Lee, beautiful, w/capped sleeves, scalloped neckline, satin bodice, overlaid w/lace, re-embroidered appliques, sequins, pearls, illusion pyramid pick-up on front of skirt flows in a wide lace edge to back of dress, deep V-back meets satin bow at waist, no train, size 12, fits 5' 8", can be altered, picture at <http://www.morileeinc.com/catalog/C2001S5pix1.html>, \$150/obo. 241-3779.

Vehicles/Accessories

'91 ACURA Integra LS, white, 152,000 mi., sunroof, CD player, power windows, a/c, runs and looks great, \$4,500. 213/448-0663.

'83 BMW 633 CSI, black, orig. paint, cosmetically clean inside/out, well maintained, good records, \$5K/obo over retail Bluebook. 626/836-3931.

'98 FORD Explorer, Eddie Bauer, 4 dr., loaded with all extras, 5-yr. warranty, exc. cond., \$14,000. 626/798-8163.

'86 FORD Bronco XLT, automatic, 4 X 4, 5.0L engine, class 4 towing package, wide 31" tires, 172K mi., blue, runs well, \$3,000. 626/796-8709, John.

'97 HONDA Accord LX Sedan, 4 dr., 95K mi., gd. cond., black w/gray int., 5 spd., 4 cyl., 2.2 L, front whl dr., a/c, p/s, cruise cont., tilt whl., am/fm/cd player, anti-theft, gd. tires, \$8,000/obo. 626/378-8395.

'95 HONDA CBR 600 F3 motorcycle, beautiful purple/black/yellow, gd. cond., 24K mi., new tires, extras, \$3,400. 805/403-9864.

'92 HONDA Accord EX sedan, 4 dr., 106K mi., gd. cond., white w/blue int., auto., 4-cyl. 2.2L, front whl dr., a/c, p/s, p/w, p/dl, cruise cont., ABS, tilt whl., sun/moon roof, am/fm stereo/ cassette, anti-theft, gd. tires, \$6,000. 626/296-9073, Patti.

'88 HONDA Accord coupe, 2 door, 5 spd., 220,000 mi., gold, good engine, transmission needs work, \$800/obo. 909/556-0878, Chris.

'99 JEEP Wrangler, exc., like-new condition, black, soft top, 23K mi., SE, 4-wheel drive, \$11,000/firm. 957-7742.

'97 JEEP Grand Cherokee Ltd., black, exc. cond., 68K, all options + ext. warr. to 75K/ 2003, Lojack, leather, 4 x 4, V8, for pictures e-mail dak.91@yahoo.com, \$15,800. 626/441-7663.

'96 JEEP Cherokee, 98K mi., 1 owner, a/c, pwr alarm/locks/windows/steering, cruise cont., new brakes/tires, www.begrific.com/ jeep for photos, \$7,000/obo. 805/234.0323, cell.

'85 MERCEDES MBZ 300D, turbo, diesel, silver-blue, automatic, 200K mi., runs great, needs body work, \$4,100. 626/355-9733, Joe.

'89 MERCURY Sable LS sedan, lt. blue w/dark blue leather, 3.8L, V6, 99K mi., orig. owner, always garaged, a/c, pwr. steering/ windows/ door locks/antenna, tilt whl., AM/FM stereo cassette, dual pwr. seats, alloy whls., keyless entry, rebuilt auto trans, newer tires, all records, \$2,400. 790-5461.

'85 TOYOTA Tercel Deluxe Wagon, light brown, 5 spd., AM/FM stereo, well maintained, records, original owner, 117K mi., \$1,150. 626/351-0129.

'95 TOYOTA Avalon XLS, 89K mi., leather, power bench seat, original owner, a/c, power windows/door locks, ABS, \$9,000. 661/297-8533.

'93 TOYOTA Corolla, white ext., blue int., 91K mi., good cond., automatic, power steering and locks, a/c, sunroof, cassette, new tires, \$4,400/obo. 248-1205.

'93 TOYOTA Tercel, 2 door, with 37,000 only, a/c, exc. cond., w/airbags, \$6,000/obo. 626/794-4921 or 323-393-2831, Bert.

Wanted

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

BOY SCOUT PATCHES and memorabilia for collection, buy or trade. 909/948-9595.

ROOM needed 3-4 nights/week, for Santa Barbara commuter during week. 805/403-9864.

SEWING MACHINE, 1960s model or later in good working condition, straight stitch and zigzag for learner, up to \$60. 790-4719, Ann.

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

TUTOR for upper division statistics, Jan./Feb. only. 626/345-0681.

VOLLEYBALL PLAYERS, coed, no beginners please, Tues. nights from 8 to 10:00 at Eagle Rock High School, \$3/night. 956-1744, Barbara.

Free

CHRISTMAS CARDS, used, anyone collecting for art projects? 200-300 available. 661/722-6129.

DESK, 40 x 18, 4 drawer, good cond. 626/355-3886, Rosemary and Ed.

FILL DIRT, clean, haul as much or little as you want of the 4 cu. yards, near Los Robles/Jackson, Pasadena. 626/791-3103.

For Rent

ALTADENA house, 1 mile from JPL, 2 bd., beautiful hardwd. flrs, wood-burning fireplace, French doors, remodeled kitch. & bathroom, dishwasher, a/c, washer/dryer, detached 2-car gar., gated backyard w/patio, \$1,400. 626/791-7081.

ALTADENA, 3 bd., 2 ba., private family home, fireplace, remodeled kitch. & ba., 2-car gar., laundry, spacious backyard, great view, gardener included, \$1,500. 909/392-7554.

ARCADIA, fully furn. bedrm. in house, incl. 1 parking space, utilities, phone line ready, prefer Caltech student, \$550. 626/462-9776.

BURBANK HILLS, room in house; quiet, immaculate; female prof. nonsmoker preferred; large yard, pool, spa; will consider dog; hsekpr, gardener & water paid; \$700 neg. + 1/2 util. 848-4541, Mary.

LA CANADA/FLINTRIDGE, separate small rm. w/ba., walk to JPL, gated separate entrance, a/c microwave, fridge, partially furn., temp ok, very private, all utilities paid, \$650. 790-1893.

MADISON HEIGHTS condo, 2 bd., 2 ba., fully secured building and parking, cent. air and heat, large balcony, walking distance to S. Lake and Old Town, \$1,300. 626/826-9868.

MONTROSE, 2-bd. house with 2-car detached garage, laundry, quiet, parking, looking for quiet tenant(s), 2332 Montrose Ave., close to JPL, \$1,350. 248-5068.

PASADENA, fully furnished room, sep. entrance, share kitchen and ba., close to PCC and Caltech, \$495 plus util. 626/351-9641.

PASADENA apt., fully furn., 1 bd., 1 ba., laundry room, close to PCC & Caltech, \$895 + util. 626/351-9641.

PASADENA home, near Hill and Orange Grove, rustic, Craftsman, 3 bd. plus den, in nice neighborhood, knotty pine kitchen, wall-to-wall carpeting, fenced yard, \$1,595. 956-1744.

PASADENA, spacious 2-story condo, 3 bd., 2.5 ba., prestigious community, beaut. inter., bright ktch., prof. landscape, ctrl. air & heat, close to shopping, cozy LR w/FP, end unit, frml d/r, hdwd. flrs., immac. cond., close to schls., \$1,750. 626/396-9024.

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

SOUTH PAS., manager's unit apt., 1718 Huntington Dr. betw. Marengo and Milan, nice neighborhood, deluxe 1 + bd., fully furn. unit, dbl. carport, non-smoker, no pets, you pay electric/phone, \$1,000, \$100 for each add' person. 626/792-9053, Ray or Marilyn.

STUDIO CITY townhome, on Coldwater near 101 fwy, 2 bd., 2 ba., central air, 2 f/p, 2 parking spaces in gated area, pool, Jacuzzi, BBQ, \$1,245. 956-1744.

TEMPLE CITY, single-family house, 3 bd., 2 ba., family room, office, wood-burning fireplace in living rm., 2-car detached garage, a/c, dishwasher, gas BBQ in backyard and more, exc. cond., \$1,700. 952-7192.

Real Estate

MAMMOTH LAKES condo unit, 1 bd./loft, 2 ba., exc. cond., newly redecorated / refurn., floor-to-ceiling fireplace in liv. rm., balcony offers superb view of Mammoth Mtn., all-electric kitch., desirable location in complex, close to Canyon Lodge, \$189,500. 249-8524.

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

PASADENA, spacious 2-story townhome, 1,513 sq. ft., across from Caltech, Catalina & San Pasqual, 3 bd., 2.5 ba, liv. rm. w/ fireplace, formal step-up dining room, 2 patios and 2 balconies, newer appliances, in-unit washer/dryer, dishwasher, brand new central air/heat unit, secure underground parking, pool, spa, sauna operational all year long, \$329K or lease \$2,050/mo. 626/585-9048.

Vacation Rentals

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

HAWAII, Maui condo, NW coast, on beach w/ocean view, 25 ft. fr. surf, 1 bd. w/loft, compl. furn., phone, color TV, VCR, microwave, d/w, pool, priv. lanai, slps.

4, 4/15-12/14 \$105/nite/2, 12/15-4/14 \$120/nite/2, \$15/nite/add'l person. 949/348-8047.

MAMMOTH, Chamonix condo, 2 bd., 2 full ba., sleeps 6, fully equipped elec. kitchen, w/microwave & extras, f/p and wood, color TV, cable, FM stereo, VCR, o/d Jacuzzis, game, rec. & Indry rms., conv. to Canyon Lodge, lifts 7, 8, 16, 17, shops, lifts, special events, daily/weekly rates, special midweek rates. 249-8524.

MAMMOTH, Snowcreek, 2 bd., 2 ba. + loft, sleeps 6-8, fully equipped kitchen incl. microwave, D/W, cable TV, VCR, microwave, d/w, pool, priv. lanai, slps.

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

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

View this and previous issues of Universe online

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

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No more than two ads of

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