

# universe

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I n s i d e

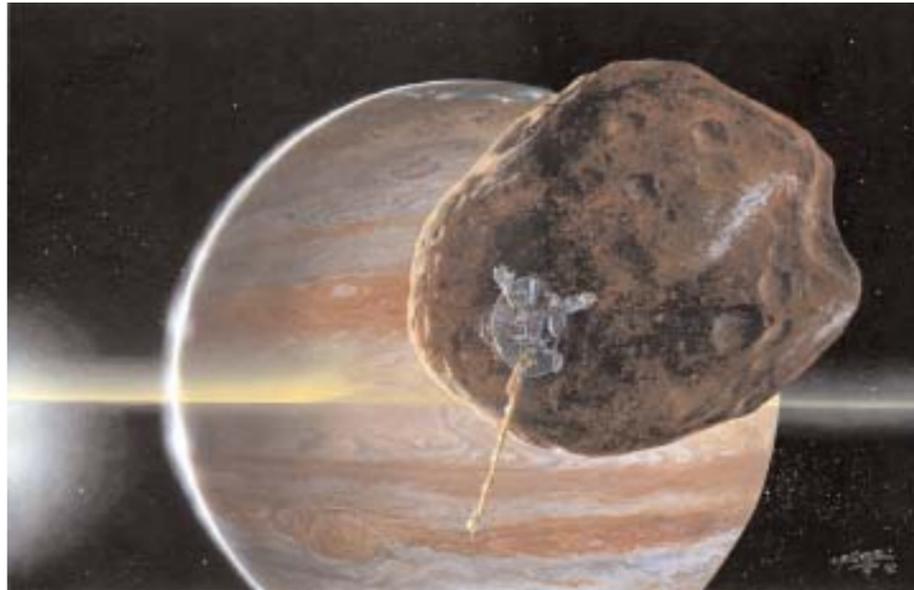
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*l b e m e*  
**S** O L A R S Y S T E M

## Galileo executes its final flyby

By Guy Webster

*Artist's rendering shows Galileo's approach to the Jovian moon Amalthea.*



### JPL'S LONG-LIVED GALILEO SPACECRAFT ACHIEVED PARTIAL SUCCESS IN

A DASH THROUGH JUPITER'S INNER RADIATION BELTS AND PAST THE SMALL MOON AMALTHEA ON TUESDAY, ITS FINAL FLYBY BEFORE A DELIBERATE IMPACT INTO JUPITER NEXT SEPTEMBER.

THIS WAS GALILEO'S LAST FLYBY, AFTER 37 OTHER CLOSE ENCOUNTERS WITH VARIOUS PLANETS, ASTEROIDS AND JUPITER'S FOUR LARGE MOONS SINCE LAUNCH 13 YEARS AGO.

As the orbiter headed closer to Jupiter than it had ever ventured before, it gathered measurements of the energy fields and charged particles in the inner region of Jupiter's magnetic environment. It also examined dust grains that form a "gossamer" ring around the planet.

However, Galileo placed itself in a standby precautionary mode after its closest approach to Amalthea. It flew past Amalthea at a targeted altitude of 160 kilometers (99 miles), then went into "safe" mode about 30 minutes later. In that mode, onboard fault-protection software suspends many operations until

receiving further instructions from the ground.

"We knew this would be a challenging encounter for Galileo, so we are not surprised to have some things go awry," said Project Manager Dr. Eilene Theilig. "Not only was the spacecraft going through a region with more intense radiation than it had ever experienced before, but it was also doing this after it had already survived four times the cumulative radiation dosage it was designed to take and had already operated nearly five years past its original mission."

The flight team at JPL is working on recov-

ery operations, diagnosing what happened and preparing new commands to Galileo that will restore the orbiter to normal and enable the playback of scientific data stored on the spacecraft's tape recorder. Two tape tracks of science data were recorded during the encounter period, out of four tracks planned. Also, the intended type of two-way radio link with Earth for the period closest to the flyby was not achieved.

Now receding again from Jupiter, the spacecraft left the region of radiation danger about 11 hours after passing Amalthea.

Amalthea orbits about halfway between Jupiter and Io, the innermost of the planet's four large moons. Amalthea is an elongated body, about 270 kilometers (168 miles) long.

Galileo has nearly depleted its supply of the propellant needed for pointing its antenna toward Earth and controlling its flight path. While still controllable, it has been put on a course for impact into Jupiter. That's so there will be no risk of it drifting to an unwanted impact with the moon Europa, where Galileo discovered evidence of a subsurface ocean that is of interest as a possible habitat for extraterrestrial life.

Sixty-four minutes after speeding over Amalthea's cratered surface, Galileo passed within about 71,400 kilometers (44,366 miles) of Jupiter's cloud tops. That marked the beginning of Galileo's final orbit, which will end with a plunge into the crushing pressure of Jupiter's atmosphere on Sept. 21, 2003.

Going into a standby mode does not jeopardize Galileo's disposal at Jupiter. No further commanding of the spacecraft is necessary to assure that it is on an impact trajectory, Theilig said.

## Stardust's Annefrank flyby successful

By Guy Webster

*Asteroid Annefrank is seen as irregularly shaped, cratered body in an image taken by Stardust during a Nov. 2 flyby.*

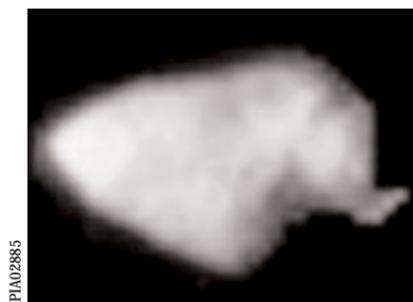
All systems on JPL's Stardust spacecraft performed successfully when tested in a flyby of asteroid Annefrank on Nov. 1, heightening anticipation for Stardust's encounter with its primary target, comet Wild 2, 14 months from now.

As a bonus, Stardust discovered that Annefrank is about twice the size anticipated, but with a dimmer surface. The dimmer surface increased the challenge of sighting the object as the spacecraft approached.

The Annefrank flyby offered a unique opportunity to thoroughly test all the operations planned for the encounter at Wild 2, where Stardust will collect samples from the cloud of dust around the comet for return to Earth. "We performed a full dress rehearsal with the cometary dust collector deployed, the spacecraft poised in its flyby attitude and with all science instruments on," said Stardust's principal investigator, Prof. Donald Brownlee of the University of Washington.

The spacecraft passed within about 3,300 kilometers (2,050 miles) of Annefrank. Engineers at JPL and at Lockheed Martin Space Systems-Astronautics in Denver ran the operation through the hours before and after the closest approach. The approach geometry was more difficult than it will be at Wild 2 because of the angles toward the Sun and Earth relative to the angle toward the asteroid. "The spacecraft performed every command perfectly," said Allan Chevront, Stardust spacecraft systems engineer at Lockheed. "Its performance under these severe conditions was outstanding."

"It was a challenge for the navigation camera to see Annefrank during approach," said JPL's Ray Newburn, lead scientist for the camera. The predicted brightness of Annefrank was near the lower limit of



PIA02885

what the camera can detect. Engineers tried techniques such as taking multiple long exposures and adding them together, said Dr. T.S. Mike Wang, optical navigation specialist at JPL. "Annefrank was not cooperating," Wang said. "It was just too dim."

The encounter images show Annefrank to be irregularly shaped, cratered, and about 8 kilometers (5 miles) in diameter. Stardust's dust instruments were on for the encounter, although no dust was anticipated. Scientists are still checking data to see if, by chance, the instruments may have seen a dust particle. "The dust flux measurement instrument ran for at least 27 minutes and performed all expected functions," said Dr. Tom Economou of the University of Chicago, lead scientist for that instrument. The lead scientist for Stardust's interstellar dust analyzer, Dr. Jochen Kassel of Max Planck Institute, Garching, Germany, said the Annefrank experience will enable him to put the German instrument into an even better configuration at Wild 2.

"Performing such flight testing before the primary encounter is a critical part of reducing risks and significantly increasing the probability of success at the primary target, Wild 2" said Stardust Project Manager Tom Duxbury. "We learned a lot that will improve our operations at Wild 2 based upon the lessons learned at Annefrank, but the bottom line is that if Annefrank had been Wild 2, we would have succeeded."

# News Briefs

## Galileo observes Europa 'lava lamp'

Reddish spots on the icy surface of Jupiter's moon Europa may indicate pockets of warmer ice rising from below. This upwelling could provide an elevator ride to the surface for material in an ocean beneath the ice, say scientists studying data from JPL's Galileo spacecraft.

"Europa acts like a planetary lava lamp, carrying material from near the surface down to the ocean, and, if they exist, potentially transporting organisms up toward the surface," said DR. ROBERT PAPPALARDO, a planetary scientist at the University of Colorado, Boulder.



PIA03878

Reddish spots and shallow pits pepper the enigmatic ridged surface of Europa in this view combining information from images taken by Galileo during two different orbits around Jupiter.

Galileo, orbiting Jupiter since 1995, has produced strong evidence that Europa has a deep ocean of melted saltwater underneath a surface layer of ice. During the recent annual meeting of the Geological Society of America, scientists discussed interpretations of Europa data and proposals for future exploration of that world.

A Galileo color image of the spots, which are called by the Latin term for freckles, "lenticulae," is available online at <http://photojournal.jpl.nasa.gov/catalog/PIA03878>. Information about the mission and its discoveries is online at <http://galileo.jpl.nasa.gov>.

## Cassini captures Saturn image

A successful test of the camera on JPL's Cassini spacecraft has produced images of Saturn 20 months before the spacecraft arrives at that planet. The image shows the shadow of the planet



PIA02884

falling across its famous rings and includes Saturn's largest moon, Titan.

The planet was 285 million kilometers (177 million miles) from the spacecraft when the images were taken in late October, nearly twice the distance between Earth and the Sun.

"This is an emotional event for the mission," said DR. DENNIS MATSON, Cassini project scientist at JPL. "We now have Saturn in our sights."

"Cassini has sighted the ringed planet looking distant, mysterious and serene," said DR. CAROLYN PORCO, a planetary scientist at Southwest Research Institute in Boulder, Colo., and leader of the science team using the Cassini camera. "Our anticipation has been building for years, so it's good to know our destination is in view."

Cassini camera-team member DR. ALFRED MCEWEN at the University of Arizona added, "Seeing the picture makes our science-planning work suddenly seem more real. Now we can see Saturn and we'll watch it get bigger as a visual cue that we're approaching fast. It's good to see the camera is working well."

Fourteen camera-team scientists selected by NASA will use the camera to investigate many features of Saturn, its moons and its rings. Cassini will begin a four-year prime mission in orbit around Saturn when it arrives on July 1, 2004. It will release a piggy-backed probe, Huygens, to descend through the thick atmosphere of Titan on Jan. 14, 2005.

A color composite of the Saturn images is available online at <http://photojournal.jpl.nasa.gov/catalog/PIA02884>.

## Students to name 2003 rovers

NASA has announced its participation in a contest that will give Ameri-

can school kids a chance to name the two rovers being launched by JPL next year to explore Mars.

The robotic explorers are part of NASA's upcoming Mars Exploration Rover (MER) mission. The twin rovers will land at two different locations on the mysterious red planet to explore the surface in search of answers about the history of water on Mars.

The "Name the Rovers" contest is a collaborative effort between NASA and the Lego Company. Lego will manage the contest in conjunction with The Planetary Society. The contest provides students with the unique opportunity to suggest a name for each of the two Mars-bound rovers, temporarily known as MER-A and MER-B. The rovers are scheduled to launch in May and June 2003, respectively. The rovers are scheduled to land on Mars in January 2004.

"We are very excited about providing students with an opportunity to actively participate in the next mission to Mars," said DAVE LAVERY, program executive for solar system exploration at NASA Headquarters. "We are eagerly looking for some really creative and innovative ideas from the students as they compete to name the next Mars rovers and become part of history."

The contest is open to students 5 to 18 years of age who attend a U.S. school and are enrolled in the Fall 2002 school season. Submissions must include suggested names for both rovers and a 50- to 500-word essay justifying why the students believe the names should be chosen. The contest has many educational benefits and encourages students to do research for their essays and to learn more about Mars and space exploration.

The contest is open for submissions through Jan. 31, 2003. NASA will announce the contest winners prior to launching the rovers in spring 2003. For more information, visit <http://www.nametherovers.org>.

## Enroll for benefits through Nov. 14

Benefits-eligible JPL employees may review their current insurance coverages and make changes for the year 2003 via the Oracle Web Applications system (the same web site employees use for timekeeping). Log on to <http://nbs>.

Information packages have already been sent to employees. These packages include a summary of benefit changes for 2003, new rates and plan comparison, as well as instructions on how to use the web to verify your current benefit elections and submit changes. Please review this information carefully.

If you haven't already done so, you may want to consider some things before you enroll, such as:

- How well did your choices work for you in 2002?
- Are there dependents you need to enroll or delete from coverages?
- Do you need to increase or decrease your life insurance for yourself or your dependents?
- Did you defer too much or too little into your Health Care and/or Dependent Care Spending Accounts for 2002?

To assist employees in making informed choices about medical and dental coverage options and to answer any other questions, representatives from the Benefits Office and each of JPL's medical and dental insurance carriers will be on Lab on Friday, Nov. 8, 1 to 3:30 p.m., 180-101 conference room, and Wednesday, Nov. 13, 10:30 a.m. to 3 p.m., on the mall.

If you are making no changes to your current benefit selections for 2003, you do not need do anything. Your elections will remain the same in 2003. However, if you currently have a Health or Dependent Care Spending Account and wish to participate in one next year, you must re-enroll.

For more information, check the Benefits Office's home page at <http://eis.jpl.nasa.gov/hr/benefits/benefits.htm> or call ext. 4-3760.

# Special Events Calendar

## Ongoing Support Groups

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

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

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

**Gay, Lesbian and Bisexual Group**—Meets the first 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.

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

## Friday, November 8

**"What's the Color of Funny? Race, Society, and Comic Strips"**—Aaron McGruder, creator of the Boondocks comic strip, will speak at 8 p.m. in Caltech's Beckman Auditorium. Admission is free. For more information, call (626) 395-4652.

## Fri., Nov. 8—Sun., Nov. 10

**Double Infidelity**—The play by Mariavaux will be performed by Theater Arts at Caltech Friday and Saturday at 8 p.m., Sunday at 2 p.m. Tickets are \$15. Call (626) 395-4652.

## Saturday, November 9

**Folk Music**—Singer/songwriter Cosy Sheridan will appear at 8 p.m. in Caltech's Winnett Lounge. Tickets are \$12 for adults and \$4 for children under 12. For more information, call (626) 395-4652 or check the Folk Music Society website at <http://www.folkmusic.caltech.edu>.

## Tuesday, November 12

**Investment Advice**—A Fidelity representative will be available for one-on-one counseling in T1720-131. For an appointment, call Fidelity at (800) 642-7131.

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

## Wednesday, November 13

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

**JPL Toastmasters Club**—Meeting at 5 p.m. in the 167 conference room. Call Roger Carlson at ext. 4-2295.

## Thursday, November 14

**JPL Stories**—Charley Kohlhasse, Mars Program consultant and former Cassini science and mission design manager, will present "Bits of This and That," at 4 p.m. in the customer service area of the Library, Building 111-104. The talk will highlight six special topics: Building Missions, Public Engagement, Virtual Reality, Art and Science, Changes at JPL Since 1959, and Earth's Greatest Problem. If you have questions about the JPL Story series or wish to participate, call Teresa Bailey at ext. 4-9233.

## Fri., Nov. 15—Sun., Nov. 17

**Double Infidelity**—The play by Mariavaux will be performed by Theater Arts at Caltech Friday and Saturday at 8 p.m., Sunday at 2 p.m. Tickets are \$15. Call (626) 395-4652.

## Saturday, November 16

**Caltech-Occidental Symphony Orchestra**—The program for this concert will feature Montsalvage's Cinco Canciones Negras and Dvorak's Symphony No. 6. Call (626) 395-4652.

**Stephen Wolfram**—The creator of *Mathematica* will appear at 8 p.m. in Caltech's Ramo Auditorium to describe ideas and discoveries from his book "A New Kind of Science," their implications for various fields of science, and their personal and historical context. An extended question-and-answer period will be included. Admission is free. For more information, call (626) 395-4652.

## Tues., Nov. 19—Wed., Nov. 20

**Investment Advice**—A TIAA/CREF representative will be available for one-on-one counseling. For an appointment, visit <http://www.TIAA-CREF.com> or call (877) 209-3140, ext. 2614.

## Thursday, November 21

**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. For reservations, call Susan Lee at (626) 395-6327.

**Social Security**—A representative will be available for one-on-one counseling. Call the Benefits Office at 4-3760 for an appointment.

**TIAA/CREF Workshops**—"Planning Retirement Income," from 10 a.m. to noon, will help answer such questions as How much money is enough? What are my retirement income options? When and how can I begin receiving income? An enrollment meeting will be offered at noon to assist employees newly eligible for the Caltech/JPL TIAA/CREF retirement plan with selection of investment options and the completion of enrollment forms. "Getting Organized," to be held from 1 to 3 p.m., will cover setting goals and determining obstacles; overcoming obstacles and closing the saving gap; financial security; replacement ratio and retirement income; and cash flow, income and expense analysis. All will be held in Building 180-101.

**Von Kármán Lecture Series**—Dr. Richard Terrile, JPL Mars Scout program scientist, will present "Rise of the Machines: Intelligent Robots and Space Exploration" at 7 p.m. in von Kármán Auditorium. This presentation will give an overview of the current and future plans for exploring our solar system with robotic spacecraft. For more information, see <http://www.jpl.nasa.gov/events/lectures/nov02.html> or call Public Services at ext. 4-0112.

## Friday, November 22

**Von Kármán Lecture Series**—Dr. Richard Terrile, JPL Mars Scout program scientist, will present "Rise of the Machines: Intelligent Robots and Space Exploration" at 7 p.m. in the Vosloh Forum at Pasadena City College, 1570 E. Colorado Blvd. See above listing for further details.

## Fri., Nov. 22—Sun., Nov. 24

**Double Infidelity**—The play by Mariavaux will be performed by Theater Arts at Caltech Friday and Saturday at 8 p.m., Sunday at 2 p.m. Tickets are \$15. For more information, call (626) 395-4652.

## Saturday, November 23

**Caltech-Occidental College Concert Band**—A free concert will be offered at 8 p.m. in Beckman Auditorium. The featured artist is Jay Easton, who will play one of the largest saxophones ever made. Music by Shostakovich, Sousa, and Alfred Reed will be included. For more information, call (626) 395-4652.

Saturn as imaged by Cassini in October.



## 40 Years Ago

Harper's Bazaar publicity photo with Dr. Pickering, two technicians, and model, October 1962.



Optical  
Interferometry  
Development  
Laboratory

O I D L

NEW INTERFEROMETRY LAB TO AID IN THE SEARCH FOR STARS AND PLANETS

# Getting closer to our neighbors

BY MARK WHALEN

**T**HE SEARCH FOR PLANETS beyond our solar system has received a major boost with the dedication of JPL's Optical Interferometry Development Laboratory.

Located across the street from the Caltech Credit Union, the new Building 318 was christened on Nov. 4. JPL Director Dr. Charles Elachi and the Executive Council welcomed guests that included U.S. Rep. Adam Schiff (D-Pasadena) and Pasadena Mayor Bill Bogaard.

"The Optical Interferometry Development Laboratory will allow us to invent the tools for a new era of discovery," said Michael Devirian, program manager, Origins and Astrophysics Office.

"Imagine if every star had a planet like our planet," said Elachi. "Interferometry is one of the key technologies that will allow this type of discovery, and the new building will be critical for the development of this technology."

The facility was designed with the capability of building the next generation of space instruments that will not only find those far-off planets, but also to take pictures of them and measure the molecules in their atmosphere for the signs of life.

The Optical Interferometry Development Laboratory comprises five buildings linked together so that a movement in any location will not cause vibrations that spoil delicate instruments and experiments in any of the laboratories. Temperatures are held constant and the air is held still.

The new facility meets extremely demanding criteria for control of temperature, humidity, vibration and noise sufficient for development of picometer-class control technology. The building is a 1,346-square-

meter (14,500-square-foot) structure containing a 458-square-meter (4,930-square-foot) high bay with an 11-meter (36-foot) ceiling, a 185-square-meter (1,990-square-foot) ground support equipment room, and three development laboratories, each at 219 square meters (2,360 square feet).

Facilities Manager Bruce Fischer also pointed out that "this is undoubtedly the first building constructed in NASA in which the design emphasized durability in materials in equipment and was designed to minimize maintenance costs."

Indeed, the Laboratory was awarded a rebate check of more than \$48,000 last month by Southern California Edison for the installation of energy-efficient equipment in the building.

The new facility was needed because previous development-laboratory space on Lab was inadequate and personnel overflowed facilities that are scattered across the Laboratory. The location of the new building, in the vicinity of buildings 171, 301 and 306, was needed to cluster it in proximity with existing vibration-isolated and clean environments used for interferometry development. Building 306 is capable of nearly comparable vibration isolation, but its space is fully occupied by preliminary interferometry technology development, as well as hardware dedicated to other flight missions.

The building will begin occupation later this month.

"It will be nice to have the interferometry team co-located together," said Astronomy and Physics Director Larry Simmons.

The facility will support the following missions, among others:



PHOTOS BY DUTCH SLAGER / JPL PHOTOLAB

**THE KECK INTERFEROMETER** in Hawaii, which links two 10-meter (33-foot) telescopes to form the world's most powerful optical telescope system. They will be used to search for planets around nearby stars.

**THE SPACE INTERFEROMETRY MISSION**, which will detect planets in size from a few Earth masses to Jupiter-mass. It will analyze the wobbling motion the planets induce in their parent stars to detect planets. The mission will determine the positions and distances to stars several hundred times more accurately than is possible today with the best telescopes. Launch is proposed for 2009.

**THE JAMES WEBB SPACE TELESCOPE**, which will carry a near-infrared camera, a multi-object spectrometer and a mid-infrared camera/spectrometer. The mission will help astronomers understand how galaxies first emerged out of the darkness that followed the rapid expansion and cooling of the universe just a few hundred million years after the Big Bang. The mission is scheduled for launch in 2010.

**THE TERRESTRIAL PLANET FINDER**, which will feature formation-flying interferometers and will be capable

of detecting and characterizing Earthlike planets around as many as 200 stars up to 45 light-years away. The mission's proposed launch is in 2014.

The JPL project team included Carl Simon, project manager; Scott Susoeff, construction manager; Alden Jenkins, electrical construction manager; Vince Bethel, mechanical construction manager; Mike Salsman, contract negotiations; Brad Walker, safety; and Alison Weisbin, environmental. Architecture and engineering was handled by the firm of Widom, Wein, Cohen, O'Leary, Terasawa, and the building contractor was OC America Construction, Inc.

Michael Shao, leader of JPL's Interferometry Center of Excellence, noted that the interferometry program has grown from just four or five people to about 150 today. "The technological progress being made in interferometry over the last few months is outstanding," he said. "This new facility will be very valuable for the future of our research."

To commemorate the event, Schiff presented JPL with a certificate of recognition from the U.S. Congress. "Thank you for the extraordinary work you do every day," he told the gathering.



Left to right: Dr. Anne Kinney, director of the Astronomy and Physics Division in NASA's Office of Space Science; Congressman Adam Schiff; JPL Director Dr. Charles Elachi; Pasadena Mayor Bill Bogaard; Dr. Michael Shao, leader of JPL's Interferometry Center of Excellence; and Michael Devirian, program manager, Origins and Astrophysics Office.

## Halloween fun



Photo by Bob Brown / JPL Photolab



Bob Brown



Bob Brown



Photo by Bob Brown / JPL Photolab



Photo by Richard Hasegawa / JPL Photolab

DailyPlanet  
ONLINE AT THE JPL STORE

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

<http://dailyplanet>

JPL's online news source

View this and previous issues of Universe online

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

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## Notice to Advertisers

Advertising is available for JPL and Caltech employees, contractors and retirees and their families. No more than two ads of up to 60 words each will be published for each advertiser. Items may be combined within one submission. Ads must be submitted on ad cards, available at the JPL Store and the Universe office, Bldg. 111-B29C, or via e-mail to [universe@jpl.nasa.gov](mailto:universe@jpl.nasa.gov).

Ads 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.

## Letters

To my JPL friends, past and present co-workers of Section 311, I would like you to know how much I appreciated your presence at my retirement party on Wednesday, October 23. It was a wonderful get together and one that I shall always remember. I have had many happy years at the Lab and will miss you all and the exciting space successes. Many thanks and best wishes to all of you.

Fran Mulvehill

We would like to thank all of our wonderful friends, colleagues, and Section 354 for the cleverly planned surprise to celebrate our marriage. The party, cake, kind words, and advice made for the perfect send-off and the generous cash gift will be put to good use. A special thanks to Lori for putting everything together and to Jeff and Marie for getting us there. We had a great time.

Matt and Brenda (McDonald) Dudik

My family and I would like to thank the colleagues and friends of Charles for their prayers, cards and gifts that were received after his passing.

Amelia Crawford and four daughters

## Passings

**DOROTHY SANDERS**, 78, a retired secretary, died from complications of cancer Oct. 19.

Sanders worked at JPL for 26 years, retiring in 1986. She is survived by her husband, Densmore. Services were private.

## Classifieds

## For Sale

**BIKES**, boy's, Huff, \$45, girl's, \$15, both very good cond.; **PLATES**, 20-25, collectible porcelain, \$30. 626/359-7666.

**COFFEE MAKERS**, Krups 10-cup, white/black, like new, \$40/obo; Braun 10-cup, white/black, like new, \$30/obo. 626/791-6101.

**COMPUTER MONITOR**, 21", Nokia 445Xi, 19.7" viewable; **DINING TABLE**, 60" x 30", solid maple, not veneer, butcher block type, satin urethane varnish, \$100/ea. 626/798-4740.

**COPIER**, Canon PC 420, has new toner cartridge, \$60. 626/791-8161.

**COUCH**, shades of gray/blues, with Oak Trim, \$200/obo; **DESK**, white, \$50/obo. 626/294-1927.

**DRYER**, electric, heavy-duty large capacity, good cond., \$115. 648-4846, Mike.

**FAX MACHINE**, Sharp UX-510, w/manual, \$30. 626/791-8161.

**FURNITURE**: desk, Spanish oak, and 2 matching bookcases, \$700; mission sideboard w/mirror, \$1,200; mission library desk, \$400; office furn., Techline, white, 6 pcs, \$500; hall table, drop leaf, \$250; butcher block utility table, unf., \$200; several mirrors, Span. hand-made rug, bright colors, \$250; Nordic-Track, orig., \$50. 626/584-0860, Donna.

**FURNITURE**: recliner, teal, \$49; peacock chair, wicker, \$29; coffee table, oak, \$19; 3-shelf bookcase, white, \$19; baby crib, maple \$29; stroller, pink and gray, \$19; microwave cart, solid oak, \$39; matching oak side table, \$19; water dispenser (hot and cold), stand-alone model, \$29. 626/798-4510.

**GUITAR**, Takamine acoustic, 6 string, with case, \$300/firm. 626/294-1927.

**MACHINIST ROLLER CABINET**, Kennedy, 6 drawer, 27", wrinkle brown, exc. cond., \$300/obo; **GPS DEVICE**, Garmin etrek, \$60; **CLIMBING GEAR**, set of small and large black diamond nuts racked on 2 carabiners, \$55; **SLUNG HEXES**, set, \$50; **ASSORTED SLINGS**, \$10; **HOME SPEAKERS**, Pioneer, CS-E350 \$20. 500-1543.

**MISC**: quilting frame, \$29; SuperDisk external disk drive for Mac, \$49; spare tire/wheel T105 80D-13, donut, used once, \$39; Shiatsu massager, fits in chair, \$39; mini-blinds 72" w x 50", 2 for \$29; wireless doorbell/intercom \$39; golf ball retriever, telescoping alum. 12", \$19; rolling duffel bag, kids, multicolor, never used, \$19; 3-pc. luggage set, P. Cardin, \$19. 626/798-4510.

**MINI-DISC PLAYER**, with record capability, Sony, remote, 10 blank discs, great sound, tiny, mint cond., \$145/obo. 687-8627, Alberto.

**MOUNTAIN BIKES**, 2, Raleigh, 14.5in frame, good cond., \$40/ea. 248-0638, after 6pm, Paul.

**RANGE**, GE dual oven electric, 42", beige, exc. cond. 601-0089, day, 952-3008, eve., Joseph.

**REFRIGERATOR**, 1998 Kenmore, 20.5 cu. ft., bottom freezer, auto defrost, white, humidity control, vg cond., in Altadena, orig. cost over \$800, sell for \$375. 626-355-4447.

**SCREEN**, wicker, 3-panel, natural rattan, 72" high x 54" wide, \$60; **TYPEWRITER**, Smith-Corona electric, with memory \$50; **PLANT STAND**, indoor/outdoor, white coated metal, 29" high x 14" wide x 12" deep, still in box, \$10. 352-3112.

**SURFBOARD**, 7'11", Rusty, \$95; **DVD**, Philips, \$100; **BRIEFCASE**, alum. Zero-Halliburton, \$195; **CALCULATOR**, TI-83 Plus, \$50. 626/844-9228.

**TELEVISION**, 16" screen, Hitachi, exc. cond., w/remote, wood frame, \$100. 626/794-4921.

**TREES**: fish tail, 6' tall, \$80/obo; **Ficus**, braided, in 30" plastic pot >10" tall, \$50; **Ceramic bowl**, gray, 2' diameter with painted geraniums, \$40 obo. 626/791-6101.

**VACATION CLUB MEMBERSHIP**, Silverlakes, Calif., resort, golfer's dream, 4 weeks free golf anytime each year, 2 bd. condo for up to 6 people, two lakes, many amenities, private PGA rated course with driving range and putting greens, less than 2 hours from Pasadena, exchange rights with 3,000 resorts, reduced to sell due to illness, \$15,000. 805/967-7725.

**WASHER/DRYER**, stacked, Maytag, gas dryer, white, used less than 3-years, \$500/obo; **BABY CRIB**, custom, and changing table, blue with Noah's Ark theme, \$250/obo. 626/564-1196.

## Vehicles / Accessories

'92 ACURA Integra LS, hatchback, red/automatic, 120K mi., orig. owner, well-maintained, new tires, all service records, pwr. windows, cruise control, am/fm/tape, tilt wheel, int. trunk and gas release, \$5,800. 562/420-2313.

'89 BUICK Century, 108K mi., air, cruise, pwr. acces., very clean, good running, reliable transportation, \$1,600. 790-1739.

**CABLE CHAINS** for 255 70R16 tires, all steel construction, extra heavy duty side cables and carbon steel spring rollers, chain tensioners included, easy installation, exc. cond., used twice, \$45/obo. 353-6369.

**CARGO LINER**, for Ford Explorer '98-2000, 4 dr. models, gray Dupont cordura "Line-a-Trunk" by Rear Gear protects cargo area floor, side walls, wheel wells, rear seat backs and tailgate; see [www.urbanjunglesuv.com/rear\\_gear\\_urban\\_jungle.htm](http://www.urbanjunglesuv.com/rear_gear_urban_jungle.htm), exc. cond., \$65/obo. 353-6369.

'92 CHEVROLET Cavalier RS, 135,000 mi., good cond., brand new breaks and battery, \$1,200. 626/396-1945.

'00 COACHMAN Futura travel trailer, 28 ft, model 2790TB, all welded aluminum frame, very light for its length at 4,366 lbs, sleeps 6, 2 bunks, queen bed, used less than 10 times, covered at all times, \$16,500. 661/255-7958, eves.

'99 FORD Taurus, like new, silver, 75,000 mi., new tires, \$5,200. 626/379-3503.

'99 FORD Taurus Wagon, metallic silver, great spacious family car, 12 valve V6 3.0 L engine, 79K mi., exc. cond., \$8,300/obo. 626/584-1164.

'68 FORD Mustang Classic Calif. Special GT/CS, hi-perf. 302 cid, 75K orig. miles, auto, fac. a/c, PS, AM radio, metallic gold paint, black interior, GT hood, trunk, fogs and wheels, no rust, turns heads, \$13,250/obo. 626/963-5727.

'99 HONDA Accord LX, exc. cond., tan interior, champagne color, radio/cassette, a/c, 51,000 miles, \$12,995/obo. 626/584-7668 or 818/956-0014, Marilyn.

'94 HONDA Nighthawk 250cc, 2,500 miles, exc. cond. kept in garage, \$1,500. 562/693-1136.

'91 HONDA Prelude SI, black, drives well, a great car, 235K miles, Kelley Blue Book estimates \$2,925, sell \$2,500/obo. 310/822-

8068, leave message.

'85 HONDA Accord sedan, good cond., well maintained. 4 dr., automatic, white w/blue interior, 167K mi., \$1,850. 626/914-7853.

'85 KOUNTRY Lite 5th wheel trailer, 30 ft., orig. owner, alum. frame, 13.5K mi., a/c, side bath, microwave, TV/VCP avail, new tires & water pump, sleeps 6, exc. cond., renewed lic.-Mar. \$6,500/obo. 626/963-5727.

'94 MAZDA MPV V6, auto, air, pwr., 85K, exc. cond., \$4,700. 541-1408, David, weekends.

'90 MAZDA Protege SE, 5 spd. man., 4 dr. sedan, 198K mi., a/c, gd tires, smogged, 2nd owner, grt around-town car, \$800. 626/864-6365.

**PICKUP TRUCK COVER**, for S10 or Sonoma, Tonneau, white, dual locks, clamp-on installation and carpeted, \$600. 991-7245.

'94 SATURN SL2, 5 spd. manual, alarm, upgraded sound system, Alpine detachable faceplate, AM/FM/cassette, 6 CD changer, 16" wheels, sunroof, great cond., \$3,200/obo, 714/445-3456 or 714/327-4671.

'01 TOYOTA Rav 4, 2 WD-power, silver, windows, door locks, CD player, air, 5 speed, 10,300 mi., \$15,800. 260-0651.

'01 TOYOTA Corolla, price reduced, sport trim, exc. cond., only 22K mi, 5 spd., silver, alloy wheels, CD player, a/c, pwr. everything, all dealer service, still under orig. manuf. comprehensive & powertrain warranties, fun to drive, ready to look/run great for many years, moving, must sell, \$11,850. 626/396-1945, lv msg.

'01 VOLKSWAGEN Beetle GLS, silver/black leatherette, 5 spd., pwr. locks/windows/mirrors, cruise, alloys, AM/FM cass., CD changer, fog lights, ABS, remote keyless entry, 11K mi., \$16K. 626/449-0997.

'78 VOLKSWAGEN Beetle, convertible, white w/black top and interior, exc. cond., car has spent entire life in L.A. area, second owner has all receipts from orig. owner, \$7,800. 661/313-6144.

## Wanted

**BASKETBALL HOOPS**, portable w/stand, for Loma Alta elem. students in Pas. district, any size, donations tax-deductible. 626/791-2574.

**MUSIC STAND**, non-folding type. 805/338-3064 or donandellen1@earthlink.net.

**ROOF BOX**, any sz., gd. cond. 626/584-1164.

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

**VIOLINS** for Loma Alta students in Pas. district; full, 3/4, and half-sizes needed, any cond., donations are tax-deductible. 626/791-2574.

**VOLLEYBALL PLAYERS**, coed, no beginners please, Tues. nts., 8-10 at Eagle Rock High School, S/nt. 956-1744, Barbara.

## Free

**CAT**, gray Tabby kitten, med length hair, litter trained, healthy, very playful, friendly; mother cat also needs a home, 1 yr old. 626/287-9433.

**CAT**, inquisitive, affectionate, neutered, dark, short-haired tabby male with good disposition, wonderful purr, 2-3 yrs old, found injured in road in August, now completely healed, healthy and grateful, can't stay here, would like loving home. 626/798-3235, Lori.

**DOG**, 1 year old, male, black Labrador, neutered, needs lots of love and attention, great athletic dog, loves water, running, playing and all around exercise. 626/290-6199, Edgar.

## Lost &amp; Found

Lost: **HAIR BARRETTE** with marcasites, sentimental value. Ext. 4-9385.

## For Rent

**ALTADENA**, room, kitchen priv., washer/dryer, pool, share ba., \$400. 626/345-0892.

**ARCADIA**, 1 bd., 1 ba. apt, 3-unit bldg., a/c, washer/dryer in unit, garage, remodeled kitch., walking distance to shops, supermarkets, bus stop; nice, residential neighborhood, \$875. 626/576-7333.

**BURBANK**, 2 bd., 2 ba. apt., upper unit in small quiet bldg., C/A, stove, dishwasher, \$900. 848-7515, Elaine, after 5 p.m.

**LA CANADA**, private rm. in home, private bath, off-street parking, BBQ, pool, full kitchen priv., wash/dry in unit, fireplace. two exer. rms., entert. rm., woodshop, 2 plng. spots in secure garage, avail. early Nov., \$1,275. 790-4097.

**MONTROSE**, 1 bd., 1 ba. condo to lease in Stancress, nr. Montrose shops, Vons, theater, hiking trails, grnd. flr. by pool/spa, great shaded patio, wash/dry in unit, fireplace. two exer. rms., entert. rm., woodshop, 2 plng. spots in secure garage, avail. early Nov., \$1,275. 790-4097.

**PASADENA**, back house, 2 bd., 10 mins from

JPL, no pets, one person, stove, fridge, micro incl., very clean, \$1,000. 626/795-3608.

**PASADENA**, 2 bd., 2 ba., cent. heat/air, 2 parking spaces, close/JPL, \$1,000. 626/304-0065.

**PASADENA**, 3 bd., 1 ba., garage, stove and fridge provided, no smoking, no pets, 1754 Corson St., drive by, pick up brochure, then call for appointment, \$1,495. 626/798-4510.

**PASADENA** studio, great location, walking dist. to Paseo Colorado, Lake Ave. shops, 2 blocks south of Colo.; built-in refrig., tabletop stove, built-in desk and shelves, closet organizer, full bath; under-ground, gated parking; washer/dryer on site, quiet bldg; must undergo credit check w/property mgmt. company; water, trash incl.; \$660. 626/354-3647, Sheri Kang or Ben Yau, or sherikang@aol.com.

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

**SIERRA MADRE**, house w/2 apartments; ground floor has huge living room, 2 bd., one ba., and a garden, \$1,250; second floor has mountain views, 3 bd., 1 ba., \$1,450. 626/798-7755.

**SIERRA MADRE**, townhouse-style apt. to share, 1,000 sq. ft., lg. patio, 2 bd., 1.5 ba., quiet st., garage parking, washer and dryer for this unit, \$615 plus 1/2 utilities. 626/355-4838, Heather.

**SLYMAR**, rent to own, new, 5 bd., 3 ba., \$10,000 credit after one year, home under construction, 2,000 sq. ft. 626/584-6526.

**SUNLAND**, fully furn. room in condo, share

kitch., bath & laundry, garage parking, a/c, fireplace, pool, Jacz., tennis court, 10 miles to JPL, prefer male, non-smoking, no pets, \$450 + half utilities, security deposit; references. 352-3112.

## Real Estate

**LA CAÑADA** home, attractive, well-maint., 3 bd., 1.75 ba., 1855 sq. ft. on approx. 1/4 acre level lot, living & dining area, family room, 2 fireplaces, newer cent. heat & a/c, newer floor, copper plumbing, updated appliances, beautifully landscaped, auto-sprinklers, on sewer, detached 2-car garage & separate workshop/storage, walk to schools & JPL, \$719K. 952-0421.

**NE PASADENA**, Lower Hastings, 3 bd., 2ba., well-maint. family home with large, grassy backyard on 10,800 sq ft lot, central heat and a/c, ceiling fans, recently remodeled baths, fully permitted 260 sq. ft. workshop could be converted to an office, curb appeal, great neighborhood, convenient to shopping, schools, and Gold Line station, \$529K. 626/355-5060 or 626/695-0535.

**SYLMAR**, spacious 3 bd., 2 ba. house in quiet residential area, a/c, outdoor Jacuzzi, fireplace, 1,400 sq ft. + 2-car garage, must see, must sell, \$269,950/obo. 833-8490, Mike.

## Vacation Rentals

**CANCUN**, 5 star resort, 7 days, next to Ritz Carlton beachfront, full kitchen, sleeps 7, avail. 11/23-30/02. 601-0089 day, 952-3008, eve., Joseph.

**COSTA RICA**, Pueblo Real, Quepos, 2 bd., 2 ba., condo, fully equipped kitchen, TV, VCR, sleeps 6, air, newly remodeled, large pool, tennis, tropical restaurant, nr Manuel Antonio, next to river w/ mangroves and monkeys, close to beach, JPL rates. [luisalfaro@earthlink.net](mailto:luisalfaro@earthlink.net) or 760/723-8522.

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

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

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

**PUERTO VALLARTA**, Villa del Mar, lg. studio slps 4, rooms have microwave, kitchen, phones, cable TV, private patio, 3 pools, 3 restaur., spa, priv. beach, charming town, top-rated resort, avail. only 12/28/02 - 1/4/03, on-site New Years Eve Fiesta, see at [http://www.myuvc.com/puerto\\_vallarta.shtm](http://www.myuvc.com/puerto_vallarta.shtm). 541-1340.

**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.

# universe

Jet Propulsion Laboratory

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*h e m e*  
EARTH

## SeaWinds prepares for launch

By Mark Whalen

*JPL is preparing for the Dec. 14 launch of SeaWinds, an ocean-observing scatterometer that will fly aboard Japan's Advanced Earth Observing Satellite II (ADEOS-II). The mission, which also includes a partnership with the National Oceanic and Atmospheric Administration (NOAA), will measure surface wind speed and direction over 90 percent of the ice-free oceans daily. Project Manager Moshe Pniel provides an update on the mission and its goals.*

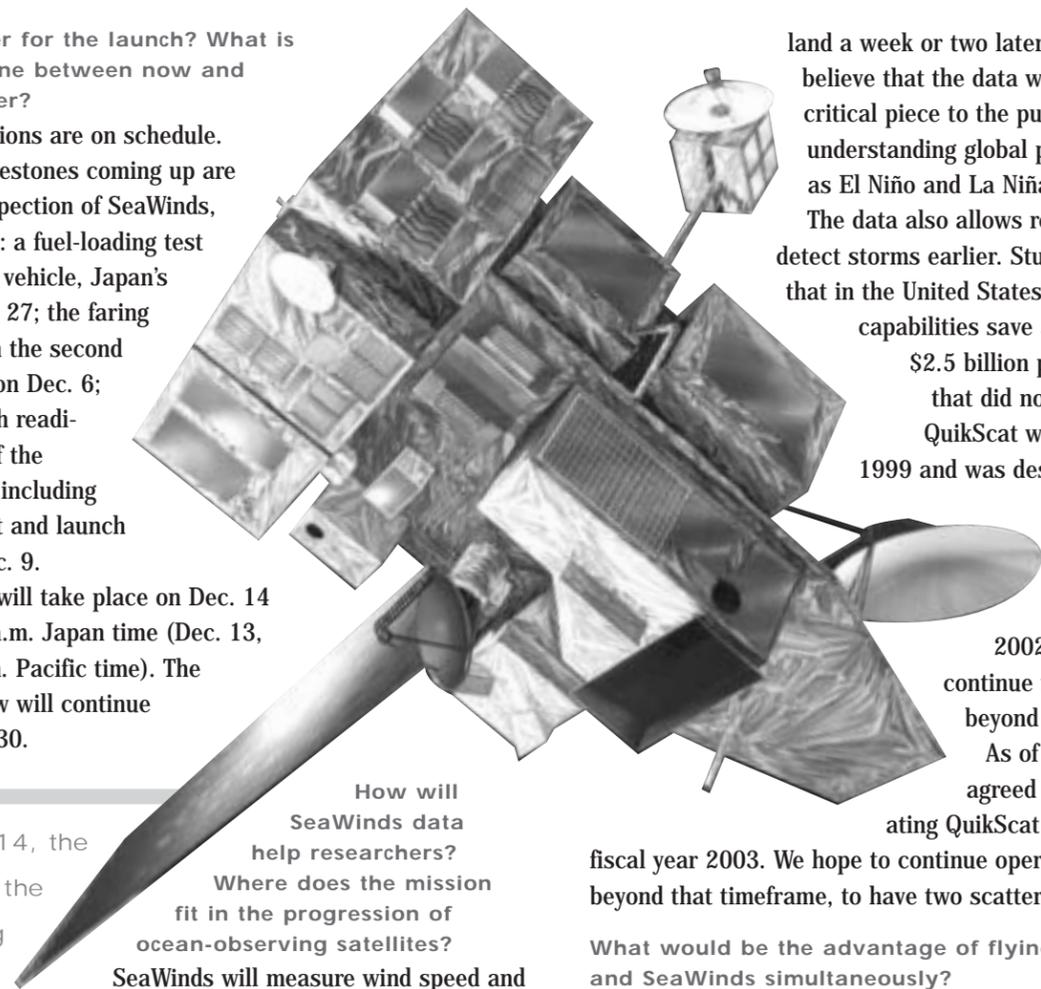
Is all in order for the launch? What is left to be done between now and mid-December?

All preparations are on schedule. The major milestones coming up are JPL's final inspection of SeaWinds, on Nov. 25-26; a fuel-loading test on the launch vehicle, Japan's H-IIA, on Nov. 27; the faring assembly with the second launch stage on Dec. 6; and the launch readiness review of the entire system including the spacecraft and launch vehicle on Dec. 9.

The launch will take place on Dec. 14 10:31-10:47 a.m. Japan time (Dec. 13, 5:31-5:47 p.m. Pacific time). The launch window will continue through Dec. 30.



Set to launch Dec. 14, the mission will continue the quest for better weather forecasting



How will SeaWinds data help researchers? Where does the mission fit in the progression of ocean-observing satellites?

SeaWinds will measure wind speed and direction over the global oceans. The measurements started with the NASA Scatterometer (NScat) in 1996, and are currently being performed by QuikScat.

Understanding the winds over the ocean—both the speed and direction—helps improve our understanding of the global climate and improve global weather prediction. It is this understanding that fits in with the portion of NASA's core mission that is to understand and protect our home planet. Winds affect the weather over the oceans, which in turn affect the weather over

land a week or two later. Our scientists believe that the data will contribute a critical piece to the puzzle of understanding global phenomena's such as El Niño and La Niña.

The data also allows researchers to detect storms earlier. Studies have shown that in the United States early warning capabilities save approximately \$2.5 billion per year in damage that did not occur.

QuikScat was launched in 1999 and was designed to operate for two years, but we crossed the three-year boundary in June 2002. SeaWinds will continue the measurements beyond the QuikScat era. As of now NASA has agreed to continue operating QuikScat through the end of

fiscal year 2003. We hope to continue operating QuikScat beyond that timeframe, to have two scatterometers up there.

What would be the advantage of flying both QuikScat and SeaWinds simultaneously?

Our scientists tell us that if we do have both operating, we will be able to look at phenomena that occur in a timeframe that is shorter than our current observation capability. One example that comes to mind is the ability to identify the formation of hurricanes and typhoons and track their paths.

NASA has currently agreed to allow this overlap for validation and calibration, similar to Jason 1's overlap with Topex/Poseidon.

*Continued on page 3*

## On-Lab parking access to change in January

JPLers are reminded that new criteria for having on-Lab parking access will be effective Monday, Jan. 6, 2003.

The current system of blue background badges and vehicle decals will no longer be used for access to on-Lab parking. New parking hanging tags will supercede the blue stripes on the JPL picture badges and also take the place of window and bumper decals. Employees will continue to use their current badges for identification purposes at JPL and will not need to remove colored parking decals from their vehicle bumpers or windows.

Individuals eligible for on-Lab parking will be issued a "hang-tag" for their rearview mirror. These hang-tags will be color-coded to coincide with JPL's colored decal lots:



green, blue, silver, red and white. Personnel with unassigned on-Lab parking will be issued a tan colored hang-tag.

Hang-tags will also be provided to individuals who have been selected for performance-based on-Lab parking, parking lottery winners and carpool participants.

The parking lottery has been completed and the 500 individual winners will be notified by e-mail in early December. Each winner will receive an orange parking hang-tag that will permit them to park on-Lab in an unassigned parking space for one specific day each week.

In conjunction with the issuance of the hang-tags, the Lab's parking policy is being revised to require all vehicles parked on-Lab (within the gated perimeter) to display a hang-tag or parking pass at all times.

The new parking hang-tags will be distributed by the Parking Office to eligible personnel beginning the second week of December. A variety of hang-tag distribution locations and dates will be published shortly.

# News Briefs

## Elachi receives Takeda Award

JPL Director DR. CHARLES ELACHI was in Tokyo Nov. 20 to receive a Takeda Award for his work in developing spaceborne radar instruments to monitor the global environment.

The awards, established last year by the Takeda Foundation of Japan, honor individuals who demonstrate outstanding achievements in the creation and application of new engineering knowledge to benefit human needs.

Elachi shared his prize for work benefiting the environment with two Japanese researchers. He received half of a monetary award of 100 million yen (about U.S. \$833,000); the other half will be shared by his Japanese co-honorees.



Dr. Charles Elachi at Nov. 20 ceremony in Tokyo.

The Takeda Foundation was established in 2001 by IKUO TAKEDA, founder of instrument manufacturer Advantest Corp.

## Massey honored by Tuskegee

ED MASSEY, manager of the Voyager Interstellar mission and the NASA portion of the Ulysses mission to the Sun, has received the 2002 Outstanding Alumni Award from the Los Angeles chapter of Tuskegee University's alumni association.

Massey, a retired lieutenant colonel in the U.S. Air Force, joined JPL in 1987. He has served as the Voyager/Ulysses manager since 1998. He graduated from Tuskegee in 1966 with a bachelor's degree in electrical engineering and later earned a master's degree in systems management from USC.

## Lab workshop at women's conference

Women at Work will sponsor the Young African-American Women's Conference on Saturday, Nov. 23, at Pasadena City College, and JPL will participate with a workshop, Galaxy Quest: Career Opportunities in the Earth and Space Science Programs.

The interactive workshop will be held from 8:30 a.m. to 3:30 p.m., and will also focus on NASA/JPL education programs as well as student career opportunities.

Galaxy Quest will be hosted by the JPL Minority Education Initiatives Office. RHONDA JONES, diversity specialist for the Navigator Program, and TOBY SOLORZANO, deputy manager of the Equal Opportunities Program Office, will be on hand.

The conference, which is open to young women ages 12 to 21, will include additional workshops on women in traditional and non-traditional career fields. There will be sessions on how to apply, interview and maintain jobs, and how to advance in the workplace. Exhibitors from educational and employment organizations will also be on site.

For more information on the conference, visit the Women at Work website at [www.womenatwork1.org](http://www.womenatwork1.org).

JPLers interested in contributing in the Galaxy Quest workshop can contact Jones at ext. 4-1562 or via e-mail. To volunteer time in the JPL interactive booth, contact Solorzano at ext. 4-5789 or via e-mail.

## Popular Science honors missions

NASA's unprecedented work in Space Science and Earth Science captured three of Popular Science's "Best of What's New Awards" for 2002.

The Mars Odyssey mission and the twin satellites of the Gravity Recovery

and Climate Experiment (Grace), managed by JPL; and the Aqua spacecraft mission, managed by NASA's Goddard Space Flight Center, were chosen in the Aviation/Space category. Aqua includes the JPL-managed Atmospheric Infrared Sounder experiment system.

Popular Science will feature the 100 winners, chosen in 10 categories, in its December 2002 issue. Popular Science annually reviews thousands of new products and innovations. To win, a product or technology must represent a significant step forward in its category.

## Lab-developed technology honored

An instrument developed for industry as an outgrowth of JPL innovation and work in imaging spectroscopy has been honored by R&D magazine.

The magazine's R&D Innovation 100 award went to Carl Zeiss Inc. for its laser scanning fluorescence microscope, which provides significant advancement in fluorescence analysis, one of the most important techniques in life science research. The microscope provides a new perspective into cell processes at the molecular level in neuroscience, cancer research, and all subdisciplines of cell biology, since it is the first laser scanning microscope that clearly separates and analyzes combinations of fluorescent markers with overlapping characteristics.

The instrument was developed in collaboration with JPL's GREG BEARMAN, chief biological scientist, Biomolecular Systems Research Program, and Caltech colleagues RUSTY LANSFORD and SCOTT FRASER. The trio combined the technologies of two-photon laser scanning microscopy and imaging spectroscopy to unambiguously identify different color signatures as well as conventional dyes. This approach offers the needed ability to concurrently image multiple colored, spectrally overlapping marker proteins within living cells.

Successful entries for the magazine's awards are submitted by an international range of organizations, including universities, private corporations and government labs. During the past few decades, the research community's growing emphasis on technology transfer has boosted the number of joint public-private submissions.

The sole criterion for making the grade is demonstrable "technological significance" compared with competing products and technologies. Issues such as smaller size, faster speed, greater efficiency, and higher environmental consciousness have continued to gain importance in successful award submissions.

## Papers sought for conference

A call for papers has been issued for the International Conference on Space Mission Challenges for Information Technology, to be hosted by JPL next July. One-page abstracts are due Dec. 16.

Novel space information technology papers are solicited from all sectors of the space community, including Earth-orbiting systems, deep-space missions, ground support systems, instruments, science, landers, rovers, and probes. The conference will address all space end-application areas, including civilian, military, and commercial.

All submitted papers will be peer reviewed, and if accepted, require a four- to eight-page manuscript that will be published in a conference proceedings.

The conference will include panel and poster sessions, tutorials, and an exhibition of the latest commercial products and technologies (industry, research labs, and universities).

The conference will be held July 13-16, 2003, at the Pasadena Convention Center. For topic areas, schedule, author information, and general logistics, see the conference website at <http://smc-it.jpl.nasa.gov>.

# Special Events Calendar

## Ongoing Support Groups

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

**Caregivers Support Group**—Meets the first Thursday of the month at noon in Building 167-111 (The Wellness Place). Call the Employee Assistance Program at ext. 4-3680.

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

**Gay, Lesbian and Bisexual Group**—Meets the first 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.

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

## Friday, November 22

**Von Kármán Lecture Series**—Dr. Richard Terrile, JPL Mars Scout program scientist, will present "Rise of the Machines: Intelligent Robots and Space Exploration" at 7 p.m. in the Vosloh Forum at Pasadena City College, 1570 E. Colorado Blvd. See above listing for further details. This presentation will give an overview of the current and future plans for exploring our solar system with robotic spacecraft. For more information, see <http://www.jpl.nasa.gov/events/lectures/nov02.html> or call Public Services at ext. 4-0112.

## Fri., Nov. 22—Sun., Nov. 24

**Double Infidelity**—The play by Mariavau will be performed by Theater Arts at Caltech Friday and Saturday at 8 p.m., Sunday at 2 p.m. Tickets are \$15. For more information, call (626) 395-4652.

## Saturday, November 23

**Caltech-Occidental College Concert Band**—A free concert will be offered at 8 p.m. in Beckman Auditorium. The featured artist is Jay Easton, who will play one of the largest saxophones ever made, and music by



Shostakovich, Sousa, and Alfred Reed will be included. For more information, call (626) 395-4652.

## Wednesday, November 27

**JPL Toastmasters Club**—Meeting at 5 p.m. in the 167 conference room. Call Roger Carlson at ext. 4-2295 for information.

## Tuesday, December 3

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

## For the record: "Name the Rovers" contest

An article in the Nov. 8 issue of Universe about a contest to name the 2003 Mars Exploration Rovers should have included the following information.

Employees of JPL, Caltech, NASA, Lego or The Planetary Society; their affiliates, organizations, subsidiaries, advertising and promotion agencies and their immediate families; and/or those living in the same household of each, are not eligible for the contest.

For more information, log on to [http://www.lego.com/rovers/contest\\_rules.asp](http://www.lego.com/rovers/contest_rules.asp).

## Wednesday, December 4

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

## Thursday, December 5

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

**JPL Stories**—Louis Friedman, executive director of the Planetary Society and former JPL Advanced Programs manager, will present "The Political, Astrodynamic, and Sailing Pursuit of Halley's Comet" at 4 p.m. in the customer service area of the Library, Building 111-104. The United States was the only major space-faring nation that did not send a spacecraft to Halley's Comet. Come hear about the various ideas that were proposed and the political and technical considerations of the time, and why they all failed. For more information about the series, call Teresa Bailey at ext. 4-9233.

## Friday, December 6

**Lionheart**—This all-male a capella ensemble, known for its interpretation of medieval and Renaissance music, will perform at 8 p.m. in Caltech's Beckman Mall. Tickets are \$15 for adults, \$5 for youth school age and under. For more information, call (626) 395-4652.

## Sunday, December 8

**Chamber Music**—Caltech students will perform the Kitty MacDonnell memorial concert at 3:30 p.m. in Dabney Lounge. Admission is free. For more information, call (626) 395-4652.

## Tuesday, December 10

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

**Mariner II Anniversary**—The 1962 film "Clouds of Venus," the story of the first spacecraft to fly by and report on Earth's neighbor, will be shown at noon in von Kármán Auditorium.

## Wednesday, December 11

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

## Friday, December 13

**Mariner II Anniversary**—The 1962 film "Clouds of Venus," the story of the first spacecraft to fly by and report on Earth's neighbor, will be shown at 2 p.m. in von Kármán Auditorium.

## Friday, December 13

**JPL Toastmasters Club**—Meeting at 5 p.m. in the 167 conference room. Call Roger Carlson at ext. 4-2295 for information.

## Friday, December 13

**Mariner II Anniversary**—The 1962 film "Clouds of Venus," the story of the first spacecraft to fly by and report on Earth's neighbor, will be shown at 2 p.m. in von Kármán Auditorium.

*Continued from page 1*

Speaking of that, how will the SeaWinds measurements be used in concert with those of Jason 1, which studies the ties between the oceans and atmosphere by measuring sea-surface heights? And what about the data provided by the Atmospheric Infrared Sounder (AIRS), which provides a three-dimensional look at the weather?

The data from each of these missions provides a critical piece to understanding the complex puzzle of the global climate.

How long has the instrument been in Japan?

Actually, it was delivered to Japan in March 1999. It was integrated on the ADEOS-II spacecraft in April 1999. Problems with the Japanese H-II launch vehicle and the development of the H-IIA launch vehicle have caused the launch to be delayed a number of times.

# SeaWinds

Have all these delays been hard to deal with for you and the project team?

Yes, for several reasons. First of all, we wanted to make sure we didn't lose our technical people, that they were engaged and felt that they were continuously contributing. We also wanted to keep the morale up and keep the team focused. In some cases, the project was able to share some of our personnel with other projects. However, the bottom line is that dealing with a moving launch date, which you are not controlling, is difficult.

The way Japan approached the launch slips was to have several short-term storage periods, and to make use of the extra time available to conduct additional spacecraft tests.

Fortunately, since we delivered SeaWinds, no major changes have been made. To deal with the launch delays, we needed to make sure the instrument was maintained properly.

JPL built the SeaWinds instrument; what other parts of the mission have been or will be done at JPL?

Various groups have supported and/or will support the mission in the following ways:

- Integration and testing of the instrument with the spacecraft in Japan
- Activating and operating SeaWinds after launch
- Development and operation of the ground system
- Distribution and archiving of data through the Physical Oceanography Distributed Active Archive Center at JPL
- Calibration and validation of the instrument
- Science by JPL scientists from the Ocean Vector Winds Science Team

How does the partnership with NOAA work? Who else is involved in the mission, and who will receive the data?

NASA scientists use the data for research purposes, while NOAA distributes the data to operational organizations.

The NASA ground network, which is managed by the Goddard Space Flight Center, will support the mission with stations in Alaska and Wallops Island in Virginia.

The science team includes investigators at JPL, Goddard and various universities, and there are co-investigators in Europe and Japan. It's really an international team.

NOAA provides an interface with the operational agencies. They receive the data in about 2 1/2 hours, and distribute it to operational users, who to this point have been using QuikScat data for their various applications such as weather models, iceberg tracking and monitoring of hurricanes.

In the U.S., the SeaWinds data will go to the NOAA's

National Environmental Satellite and Information Service. They in turn will deliver the data to a broad range of users and partners. One of those is the National Centers for Environmental Prediction in Maryland for use in their weather forecasting models.

SeaWinds data will also be used at the European Center for Medium-Range Weather Forecasting and other international sites.

Will SeaWinds be able to provide reliable data on severe weather conditions?

Yes. Among others, our data will be used by the U.S. Navy's Joint Typhoon Warning Center and the National Hurricane Center in Miami. Also, more than half of the commercial ships in the world take advantage of weather based vessel routing services, which use QuikScat data, to avoid storms, rough seas and icebergs. It is estimated this information saves about \$300 million per year in shipping operation costs.

SeaWinds is a three-year mission that is projected to last as long as five years. Are any plans in the works for similar missions to follow?

Yes. We are working with NASA on a follow-on to SeaWinds, called the Ocean Vector Winds Mission, which would continue the systematic measurements of ocean winds. We are currently in a risk-reduction phase.

The mission would build an industrial base, so that we would be able to purchase scatterometers from industry at a later date. In the 2011-12 timeframe, there is a potential to launch three scatterometers over a 15-year period. The goal is to make the instrument smaller, lighter and cheaper to manufacture. The measurements will be at least as good as SeaWinds.



Photo by Bob Brown / JPL Photolab

Our scientists believe that the data will contribute a critical piece to the puzzle of understanding global phenomena's such as El Niño and La Niña.

*Moshe Priel,  
SeaWinds project  
manager*

What excites you most about the SeaWinds mission? How will the public notice it?

Well, of course, it's not like a Mars landing mission, which has a lot of public visibility and pizzazz to it. However, I feel that the benefits from the mission will have a direct impact on people's everyday lives.

For example, if we are able to more accurately predict weather three or five days out, it would have an immediate impact on all travelers. If we provide ice maps to fishermen in Alaska and they know where to fish and where not to fish, there is an impact there. If the hurricane center in Miami is able to forecast hurricanes more accurately and earlier, if people have more warning and smaller areas need to be evacuated, then there is an impact.

The same thing applies to shipping lanes. Understanding the climate and the world's weather is not just a problem for the United States. Having an international, multi-agency collaboration really uses all the resources of the world to understand something that is really global in nature.

For more on the SeaWinds mission, log on to <http://winds.jpl.nasa.gov/missions/seawinds/seaindex.html>

## Six employees garner Space Flight Awareness honors



Six JPL employees recently received NASA's Space Flight Awareness award, earning a trip to Kennedy Space Center for the scheduled October launch of Space Shuttle Atlantis.

Honorees, in photo at left, left to right: Jesse Olvera (Section 380), Steve Benskin (274), Jeff Boyer (314), Donna Campbell (100), Becky Klages (215) and Marilyn Morgan (274), along with guest John Beckman, Engineering and Science director, received a VIP tour of KSC as part of the award. Unfortunately, weather conditions delayed the launch of the shuttle.

At JPL, the Space Flight Awareness Program is administered by the Employee Services and Recognition Group. For information, visit <http://eis/sec614/reward/#sfa>.

### Next Universe delayed

Due to the Thanksgiving holiday, the next issue of Universe will be delayed to Friday, Dec. 13. This issue will also be the last of 2002. Universe will resume its normal schedule on Friday, Jan. 3.

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

### Editor

Mark Whalen

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### Chief Photographer

Bob Brown/Photo Lab

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Susan Braunheim-Kalogerakos

Universe is published every other Friday by the Office of Communications and Education of the Jet Propulsion Laboratory, 4800 Oak Grove Drive, Pasadena, CA 91109.

### 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 on ad cards, available at the JPL Store and the Universe office, Bldg. 111-B29C, or via e-mail to [universe@jpl.nasa.gov](mailto:universe@jpl.nasa.gov).

Ads 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.

## Letters

My family and I would like express our gratitude to the Aquarius Project team, Project Formulation Support Team, all our friends at JPL, and the ERC for the kind words and the beautiful plants that were sent following the passing of my brother.

David Durham, Mary Beth Murrill and our two boys

## Retirees

The following JPL employees retired in November:

John Biles, 46 years, Section 352; Donald Lord, 41 years, Section 360; Ronald Saunders, 33 years, Section 630; Donald Boyd, 32 years, Section 344; Quy Nguyen, 27 years, Section 381; Francis Mulvehill, 24 years, Section 311; John P. Walsh, 23 years, Section 183; Rodney Rohla, 21 years, Section 910; Gyan Ahluwalia, 17 years, Section 368; Cerini Bess, 16 years, Section 231; Lawrence Avril, 15 years, Section 344; LaDonne Brewer, 15 years, Section 512; Paul Maker, 15 years, Section 384; Rocco Sacramantra; 15 years, Section 336.

## Passings

**PHYLLIS MITTLESTEDT IRVING, 91**, retired former chief operator of the Laboratory's PBX group, died of leukemia Sept. 26. She worked at JPL from 1951-78, and is survived by her husband, Alex Irving.

## Classifieds

### For Sale

BBQ, Weber Genesis Silver A propane gas grill, spec. ordered cobalt blue top, 2 yrs. old, perfect cond., cast iron grates, \$275. 213/700-6288, Matt.

BEDROOM SET, qn. sz., 2 side tables, dresser w/mirror, \$300; TABLE LAMP, white, \$20; CHAIR, rough fabric, walnut trim, \$15; TABLE, lamp sz., walnut, \$20; TV, 19" color; FILE CABINET, 2 drawer, brown metal, \$10. 626/355-6923.

BUNK BEDS, This End Up, solid wood, w/rails, under-bed drawers, converts to two singles, vg cond., \$200. 352-5688.

CHER CONCERT TICKETS, farewell Tour 2002, Dec. 2, Staples Center, section floor risers, row K, seats 3-6 & 1 at \$167.50 section 111, aisle M14, seat 14, 4 tickets at \$95.75. 909/941-2897 or [Pj1mktg@aol.com](mailto:Pj1mktg@aol.com), Paul.

CLOTHES, West African, 2-piece female outfit (skirt and gown), \$100, 3-piece male outfit (gown, pants and top), \$125. 626/969-7377.

CLARINET Yamaha YCL-20, good cond., list price \$600, sell for \$300/obo. 952-8455.

COATS: large men's, wool, with zip-in lining, like new. \$40; sports, large, \$10; SLACKS, 42 waist, \$8-10; SHIRTS, L and XL, short sleeve, \$5-8; new XL, long sleeve, \$8; lost weight. 790-6060.

COFFEE MAKERS, Krups 10-cup, white/gray, like new, \$40 obo; Braun 10-cup, white/black, like new, \$30/obo. 626/791-6101.

COFFEE TABLE, 36", round, solid maple, on rotating pedestal, exc. cond., \$200. 661/252-9378, Rose.

COFFEE TABLE, blk. onyx top with bronze frame, 52" w x 24" d, \$30. 790-6060.

COMPUTER, Intel P4, 1.6 GHz, 256 MB RAM, 40 GB HD, 32 MB Nvidia TNT4 video card, ESS Audio Sound, 22" flat screen monitor (19.7" viewable), software includes Microsoft Windows XP Professional, Microsoft Office XP, Norton Internet Security/Personal Firewall, and Microsoft Visual Studio.net Enterprise Architect Edition (worth over \$800 alone), Logitech infrared mouse, standard keyboard incl., \$2,000/obo.

323/344-9503, Chris.

COMPUTER DESK/CABINET, enclosed, rustic finish, 3 yrs old, perfect cond., holds files, computer system, plenty of storage, \$1,000/obo. 626/287-9433.

DINING ROOM TABLE, formal, 6' x 9' w/2 leaves + 6 chairs, seats gold padded, 2 of chairs have side arms, sturdy oak wood, color medium, mint cond., matching hutch, practically new, \$2,500/both, \$1,500 for each/obo. 626/794-7402.

FILE CABINET, 2 drawer, oak, \$75; TREADMILL, exc. cond., \$150; both exc. cond. 661/252-1873.

HOT TUB, Softub, maroon, older model, runs well, \$550. 248-2931.

MISC: living rm. set, 3-pc., leather \$1,750; steam-trunk w/48 x 30 glass top, \$150; DSL modem & home router, Earthlink, \$50. 626/818-3460.

MOWER, rotary push, Craftsman, \$120/obo. 957-4770.

PHONE, Nokia 8290, charger and car charger, works on Cingular network, \$80; MONITOR, Samsung 900NF flat tube, 19", \$250. 213/700-6288, Matt.

REFRIGERATOR, GE, 21 cu. ft., side-by-side, ice maker, almond color, exc. cond., \$275; DINETTE, set with 4 chairs and Formica top, \$100. 248-9561.

REFRIGERATOR, Whirlpool, 18.2 cu. ft., top freezer, white, auto ice maker, EZ-vue crispers, adjustable glass shelves, 2 yrs old, sacrifice, \$350. 790-4028.

SOFA/SLEEPER, 7 foot, Ethan Allan, very comfortable, good cond. \$100/obo; ARM CHAIR/ottoman \$25, DISHWASHER, under counter, GE, good cond., \$50/obo. 661/296-7789, Linda.

SPA, by Cal Spa, 8 seat, outdoor, 48 jets, complete w/cover, brand new, must sell. 909/948-2340, eves.

STEREO EQUIPMENT, Yamaha; amp, AV-66, 100 X 2 watts; tuner, T-60, 16 AM/FM presets; dual cassette deck, KX-W362; CD changer, CDC-765, (5) disk, speakers, AST S1, bookshelf, full range, Bass Response to 28 Hertz (2); pictures avail., e-mail [seth1834@earthlink.com](mailto:seth1834@earthlink.com), incl. orig. manuals, all in exc. cond., \$1,000/obo. 626/795-1902, Seth.

TABLE AND CHAIR SET, from Pier One, modern, chrome and glass, one blue chair, one green chair, good cond., \$220/obo. 626/795-5590.

TREES: fish tail, 6' tall, \$80/obo; Ficus, braided in 30" plastic pot >10" tall, \$250 obo; Ceramic bowl, gray, 2' diameter with planted geraniums, \$40 obo. 626/791-6101.

VIDEO GAMES, 8 Intellivision orig. cartridges, \$30/all; PLATES, porcelain, 20 collectible, in original boxes, \$15. 626/359-7666.

### Vehicles / Accessories

'01 ACURA CL Type S, exc. cond, w/nav system, 31K mi., orig. owner, white/tan, 5yrs./70K mi left in extended warranty, \$23,500. 661/297-2988, Wayne.

'96 BMW 318 ti hatchback, 1 owner, 53K mi., complete dealer maint. record, manual 5-spd. transmission, 1.9L DOHC, 16-valve, 4-cylinder engine, Calif. edition oversize ragtop sunroof and special alloy wheels, custom Saris bike rack included, power everything, 5 function computer, cruise control split fold down rear seats, \$11,800/obo. 626/791-9768.

'93 CHRYSLER Town & Country, white, 7-pass, auto, leather seats, new shocks & ABS, roof rack, chains, great family car, 117K mi., must sell, \$4,500. 549-1594, Pascal.

'00 COACHMAN Futura, travel trailer, 28 ft, model 2790TB, all welded aluminum frame, very light for its length at 4,366 lbs, sleeps 6, 2 bunks, queen bed, used less than 10 times, covered at all times, \$16,500. 661/255-7958, eves.

'01 FORD Escape XLT, 4 x 4, 3.0L V6, loaded, mocha int/ext, 2 new tires & alignment, svc contract, 29K mi., VG cond., \$18,500/obo. 626/818-3460.

'99 FORD Taurus, like new, low mi., light blue, \$5,200. 626/379-3503.

'99 FORD truck rims, very clean, must see, 5-spoke alum, make offer. 661/297-1185, Ray.

'98 FORD Windstar minivan, 6 cyl., 3.8L, gold/tan, all power, alarm, 10-disc CD, 46K mi., clean, runs well, \$9,000. 661/254-3147.

'95 FORD Aerostar van, v6, 3.0, extend van, red, great cond., \$3,750. 626/379-3503.

'95 FORD Explorer XLT, 4 WD, 4 dr., green/tan, 127K mi., AT, cloth sport seats, CD changer, keyless entry, alloy wheels, plus more, good cond., one owner, \$6,900. 790-5538.

'90 FORD Mustang GT convertible, white, new heads, cooling system, CD player, must see, \$4,000. 626/798-7755.

'89 FORD Econoline 150 van, 85K mi., modified with bubble top, captain's chairs, queen pull out bed, icebox, porta-potty and other features, exc. cond., \$3,900/obo. 790-0566.

'68 FORD Mustang Classic Calif. Special, GT/CS, Hi-Per 302 cid, 75K orig. mi., auto, fac. a/c, PS, AM radio, metallic gold paint, black interior, GT hood, trunk, fogs and wheels, no rust, manuals, turns heads, \$13,250/obo. 626/963-5727.

'97 HONDA Valkyrie motorcycle, exc. cond., extra chrome, garage kept, purple/white, studded seats, leather bags, many accessories, 23K mi., \$8,200. 957-2852.

'94 HONDA Nighthawk, 250cc, 2,500 mi., exc. cond., kept in garage, \$1,500. 562/693-1136.

'91 HONDA Prelude SI, black, drives well, a great car, 235K miles, Kelly Blue Book estimates \$2,925, sell \$2,500/obo. 310/822-8068, leave message.

'90 HONDA AC DX, 5 speed, white, vg cond., am/fm, clean inside, \$2,700. 626/665-3571.

'88 HONDA CRX HF, roof leaks, interior needs TLC, 175K, runs well, \$900. 626/345-0681.

'85 KOUNTRY Lite 5th wheel trailer, 30 ft., orig. owner, alum. frame, 13.5K A/C, side bath, microwave, TV/VCP avail, new tires & water pump, sleeps 6, exc. cond., renewed lic.-Mar. \$6,500/obo. 626/963-5727.

'92 LINCOLN Town Car, Signature Series, exc. cond., \$3,500/obo. 661/288-7953.

'89 LINCOLN Mark VII LSC, beautifully maintained, near mint cond., gold with beige luxury leather interior, same owner from 12,900 miles, current mileage 125,800, mechanically excellent, \$4,750/obo. 323/465-0881, Darryl.

'87 MITSUBISHI van, 7 passengers, captain's chairs, silver, new exhaust, brakes, runs well, 103,000 mi., \$2,500. 248-2931.

'98 NISSAN Frontier XE King cab, clean, perfect maintenance record, new Pirelli tires, battery, and brakes, blue 5-speed, model with power steering, a/c, alloy wheels, bed liner, 73K miles, \$7,500. 687-7673.

'90 PLYMOUTH Grand Voyager, 123K mi., auto trans., power seats, tilt steering wheel, am/fm/cassette, new brakes (front/rear), thermometer/compass ceiling console, power door locks, roof rack, charcoal paint, good cond., \$2,150. 790-5938.

'99 TOYOTA Solara SLE, V6, automatic, 2 dr., black interior/exterior, sunroof, spoiler, leather power bucket seats, a/c, am/fm/cass., CD, power windows/locks/mirrors, cruise control, tilt wheel, driver/pass. airbag, anti-lock brakes, 87,000 mi., immaculate cond., \$10,000. 626/967-3200.

'91 TOYOTA Camry, silver, 4 dr., stick shift, a/c, 4 cyl., runs well, 124K mi., \$2,450. 790-4984.

'88 TOYOTA Camry LE, vg cond., loaded, 134K mi., \$2,500/obo. 731-0470.

'88 TOYOTA Corolla SR-5 Sports Coupe 2 dr., 5-spd., white w/maroon, clean title, 176,000 mi., runs great, AC, AM/FM cassette, cruise, sun roof, brand new alt, 6-mo. old brakes/batt/water pump, BB=\$1,200, sell for \$1,000/firm. 626/355-3657, Jason.

'83 TOYOTA Supra, 25K mi. on rebuilt engine, 5 spd., red, new tires, very battery, am/fm/cass., clean inside and out, very reliable, \$2,100. 957-2852.

'01 VOLKSWAGEN Beetle GLS, silver/black leatherette, 5 spd., pwr locks, windows, & mirrors, cruise, alloys, AM/FM cass, CD changer, fog lights, ABS, remote keyless entry, 11.8K mi., \$15,85K. 626/449-0997.

'00 VOLKSWAGEN Cabrio, garaged, super clean, silver, C/PS/PW/PL/alarms/5spd/CD changer, 75K mi., ext warranty to 85K, \$15K/obo. 805/907-0715.

### Wanted

BEDROOM SET, white, for girl's room, dresser with shelves or cabinets preferred; BABY STROLLER, sturdy. 626/303-2633.

CHESS CLUB volunteers, two afternoons per week 11/18/02 - 2/14/03, for Loma Alta elementary students in Pasadena district, Tue. & Thur. or Wed. & Fri., 3:30 - 5:30 p.m. 626/791-2574.

HOUSING, single or 1 bd., close to JPL, can pay \$550-\$600, move in by Jan. 2003. 323/957-9660.

MOTORCYCLE, adult, off-road, must be running and in gd. shape, pay \$500 max. 626/357-7347.

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

TRADE HOUSE, temporarily, in Virginia for house in La Canada or Pasadena for 12 mo., Va. house is 2 floors, 4 bd., colonial on wooded 0.5 acre lot, prime neighborhood near Vienna Metro Station for Washington DC easy access. 636-6843 or 202/863-2248, Jim Breckinridge.

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

### Free

CLEAN FILL DIRT, 35 cu. yds. avail., haul as little or as much as you like, near Los Robles/Jackson, Pasadena. 626/791-3103 or [dtrask6@its.caltech.edu](mailto:dtrask6@its.caltech.edu)

COMPUTER MANUALS, SunOS, exc. cond., loose leaf stored in six 3-ring binders, installation, system admin., commands reference, network-ing, etc. all dated 1985 or '86, most recently used for a Sun 3/60 running BSD 4.1 and OpenWindows, pick them up for free, or for \$10 I will deliver them to JPL for you. 626/296-8623.

KITTEN, gray Tabby, rescued, med length hair, litter trained, healthy, very playful, friendly, mother cat also needs a home, 1 year old. 626/287-9433.

PRINTER, Epson LQ-800 printer w/extra ribbons, perfect working order. 790-8523.

### Lost & Found

Found: WEDDING BAND, gold, found Nov. 4, Bldg. 300-227, describe inscription to claim. Ext. 4-8328.

Found: GLASSES, prescription, small, metal frame, in a blue soft-case "Stussy" brand, found them in west parking lot. Ext. 3-3704.

### For Rent

GLENDALE, 1 bd., 1 ba. back house, walk to Galleria/Brand/Central, 10-15 min from JPL, lots of closet/drawer space, living room w/ fireplace, kitchen w/stove/oven, service area w/washer/dryer, shared patio, no pets, avail. Dec. 2, \$950, incl. water/gas. 545-0455.

LA CANADA, private rm. in home, with private bath, off-street parking, BBQ, pool, full kitchen priv., wash/dry, etc. \$450 +utilities. 952-5430.

LA CRESCENTA house above Foothill, 3 bd., 2 ba., 2 1/2 p, new carpeting, stove, freshly painted inside and outside, newly landscaped, fenced backyard, 2 1/2 car garage, quiet cul-de-sac, no pets, \$2,150. 249-4146, Bob.

LAS VEGAS house in The Lakes, 2 bd., 2 ba., den, 1,250 sq. ft., new carpet in bedrooms, new tile elsewhere, 2-car garage, gardener pd., includes appliances, avail. 12/15, no pets, \$1,050 + \$1,000 sec. deposit. 661/254-6134.

MONROSE, large 1 bd., 1 ba. condo to lease in Stancrest, near Montrose shops, Vons, theater, hiking trails, grnd. flr. by pool/spa, great shaded patio, wash/dry in unit; fireplace, two gyms, entert. rm., woodshop, 2 pkgng. spots in secure garage, \$1,275. 790-4097.

PASADENA, apt. to share 2 + 2 + loft in luxury security complex near Colorado and Lake, living room, loft and kitchen fully furnished, DSL, balcony, pool, Jacuzzi, gym, \$750. 626/644-5431.

PASADENA, fully furn. 2 bd., 1.5 ba., townhome-style apt. with patio, laundry facilities, parking, near Caltech & JPL, \$1,295; PASADENA, furnished 2 bd., 1.5 ba. apt. to share in same building, avail. in Dec., \$625. 626/351-9641.

PASADENA, nice home for lease, close to Caltech, 2 bd. (one a master suite), 2 ba., large living room, nice kitchen, laundry area, enclosed back yard, 2-car garage, no pets, now smoking, gardener included, \$1,300 + \$1,300 sec. dep. 626/794-0455, call for appt.

PASADENA, back house, 1 bd., 10 min. from JPL, no pets, one person, stove, fridge, micro incl, very clean, \$1,000. 626/795-3608.

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

SUNLAND, roommate to share a 3 bd. house in Sevenhills, 10 miles west of JPL, great views, across the street from Mt Lukens, lots of hiking trails and very quiet, will consider couple, child, small pet, share utilities, avail. Dec. 1. 544-2119, day or 425-8550, eve.

### Vacation Rentals

BALBOA ISLAND, fully furnished 2 bd., 1 ba., patio, washer/dryer, parking, steps to bay, \$150/night or \$875/week. 626/351-9641.

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

BRAZIL, beach house in Florianopolis, south of Brazil, 2 bd., 3 ba., fully furnished, cozy, for up to 6 people, gorgeous beaches, great hikes, nature, \$50/day for this summer. 626/644-4795 or check <http://geocities.yahoo.com.br/dri88>.

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

COSTA RICA, Pueblo Real, Quepos, 2 bd., 2ba., condo, fully equipped kitchen, TV, VCR, sleeps 6, air, newly remodeled, large swimming pool, tennis, typical restaurant, near Manuel Antonio, next to river with mangroves and monkeys, close to beach, JPL rates. [luisalfaro@earthlink.net](mailto:luisalfaro@earthlink.net) or 760/723-8522.

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., 4/15-12/14 \$105/nite/2, 12/15-4/14 \$120/nite/2, \$15/nite/add'l person. 949/348-8047, [jackandrandy@cox.net](mailto:jackandrandy@cox.net).

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

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

OCEANSIDE condo, fully furnished, 2 bd., 2 ba., fireplace, full kitchen, quiet, relaxing, in beautiful setting, located at beachside, with barbeque, pool, spa, game room, and great ocean view, easy walk to pier and restaurants, sleeps 8, available weekly or monthly. 909/981-7492 or [dfhaug@yahoo.com](mailto:dfhaug@yahoo.com), Darlene.