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**h**igh school students from across Southern California exemplified the true meaning of teamwork and perseverance at JPL's first robotics scrimmage, held May 25 and sponsored by the Laboratory's Robotics and Mars Exploration Technology Program.



Nine student teams, all members of the FIRST (For Inspiration and Recognition of Science and Technology) program, showed off their engineering talents while they piloted their robots to shoot balls into metal hoops. The remotely controlled robots, about 4 feet tall and able to extend up to 10 feet, were designed, constructed and tested entirely by the students, with professional engineers mentoring along the way. Organizers of the scrimmage hoped to

Bell High School. "Colleges recognize this program and we've learned a lot about trial and error."

Every year, four regional competitions are held throughout the United States in early spring, while the nationals take place on a grander scale in April at Disney's EPCOT Center in Orlando, Fla. Last year, more than 15,000 students, forming 300 teams, battled their robots for the national championship title.

To prepare for the competitions, students must collaborate to transform a box of parts (without any directions) into their robotic visions, as well as raise the necessary funds for a team's involvement. "Soliciting a private sponsor is one way to overcome some of the financial responsibilities, which can easily range from \$10,000 to \$50,000," said Robert Steele of JPL's Autonomy and Control Section 345, the scrimmage coordinator and FIRST task manager.

In the end, students come into the no-holds-barred competitions understanding the connection of classroom lessons and real-world applications, as well as the importance of teamwork, organization and deadlines.

"This program allows students to participate in an end-to-end project, which most of them have never done," said Dr. Samad Hayati, manager of JPL's Robotics and Mars Exploration Technology Program. "The fact that they work with students, teachers and professional engineers also gives them a sense of the interaction that takes place in real-world working environments."

This year's scrimmage consisted of five-game matches, each of which had four high schools paired into "alliance" teams. Points were based on the color of a ball that landed in the hoops. "To avoid 100-to-0 matches, the winning team of each match was only awarded three times the points of the defeated team," explained Steele.

Two high schools came away with grand prizes. After semi-final and final matches, the alliance of the Hope Chapel Academy's "Beach Bot 2000" team and Newbridge High School's "Team Funkatron—Starring Super Chimp" team came out on top. They were both presented with plaques from JPL.

"At the beginning of the year, we all thought this was a full-on battle," said Daniel Winston, member of the Granada Hills High School "Robodox" Team. "But the whole alliance team concept helped us realize that we can get ideas from each other because every team has different strengths. It benefits us all if we work together."

Next year, JPL plans to provide seed money for 20 Southern California high school robotics teams to participate in FIRST's competitions. The Laboratory is encouraging JPLers to participate in the program, as a variety of talents is needed for this event, Steele said.

## Scrimmage teaches students good lessons

By Gia Scafidi

*Crowd looks on as student-built robots compete at JPL.*

raise JPLers' excitement and interest in FIRST's robotics competitions.

"I can't begin to tell you what an impact this program has had on [the students] lives," said Tom Campbell, coach of the Bell High School's "Screaming Eagles" team. "Not only have they experienced the trials and thrills of competition, but, most importantly, they've had a chance to experience much wider intellectual and geographical worlds than they had ever dreamed of."

"It's fantastic because everybody involved brings different strengths and talents to the table," said Dave Monteros, department chair of electronics and coach of the Don Bosco Technical Institute's "Critical Mass" team.

Established in 1992 as a non-profit organization, FIRST was created to generate high school students' interest in science and technology. Its robotics competitions serve to "inspire curiosity . . . in today's youth by immersing them in the world of engineering." Teamed up with engineers from businesses and universities, students get a sneak peek into the engineering world during an intense six-week preparation period before the annual competitions.

"This has opened up many opportunities for us," said Michael Pena of

## Electronic nose is nothing to sniff at

Device will aid shuttle, space station crews

By Nancy Lovato

*The E-nose was developed to sniff out a number of toxic compounds to aid space crews in detecting chemical leaks, solvent spills and electrical fires.*

Scientists are expanding the sensitivity of a JPL-developed "electronic nose," while shrinking its size to make it more compact for future space missions following a space shuttle flight that successfully demonstrated the technology.

"The E-Nose was able to determine changes in humidity accurately, which we confirmed using an independent humidity monitor in the shuttle cabin," said Dr. Amy Ryan, principal investigator for E-Nose at JPL. "While we would have liked to monitor any of the 10 common contaminants the E-Nose was trained to smell, fortunately for the crew none was detected. That was confirmed with air samples brought back in canisters from the flight."

The ability to monitor recycled air is very important to the space program, especially in closed environments such as the space shuttle, the international space station and any future space outpost that features a closed human habitat. Early detection of potentially harmful spills or leaks is essential so that crew members can immediately take action to remedy the situation. Even if a human nose could detect every possible odor and identify it, fatigue or a cold would impair the nose's sensing ability.

"Space crews are very, very busy," said Ryan.



"Anything we can do to automate their tasks and keep the space habitat safe is highly desirable. Now we need to further develop E-Nose's capability to detect various odors and differentiate between those that signify danger and those that do not. We are working with people at other NASA centers to optimize this technology."

Since there are limits on size and power requirements in constricted quarters, miniaturization is important. The unit flown in fall 1998 on STS-95 is only about the size of a large paperback, weighs 1.4 kilograms (about 3

pounds)—including the operating computer—and uses an average of 1.5 watts of power. Dimensions are 18.5 by 11.5 by 12 centimeters (7-3/4 by 4-1/2 by 4-3/4 inches).

"Our current efforts are directed towards improving the sensitivity of the E-Nose, expanding the compounds we can detect from 12 to 24, and making the unit even smaller," Ryan said.

"Decreasing the size and weight will be pretty straightforward, since the shuttle's space allocation requirements dictated the special box we used for that flight."

A major application that JPL scientists are pursuing is the detection of a fire before the blaze erupts. Fires can smolder in closed areas, such as insulation in paneling or around wires, for some time before flames actually appear. With early detection, the fire can be extinguished safely before much damage occurs. The many potential commercial uses include "sniffing" for unexploded land mines, for spills in chemical plants that could contaminate workers, for plant ripeness to harvest at the desired point in the agricultural cycle, and for possible diagnosis of disease based on odors from human perspiration and breath.

The JPL E-Nose flown on the shuttle used sensor technology from Caltech.

# News Briefs

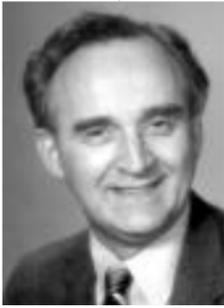
## IEEE honors Lab researchers

Several JPL employees recently received honors from the Institute for Electrical and Electronics Engineers (IEEE).

Awarded IEEE fellowships were DR. SVERRE ENG of the Division 34 staff for his contributions to optical communications, applied laser spectroscopy and low-noise mixer diode technology; DR. ANTHONY FREEMAN (334) for contributions to synthetic

aperture radar data calibration and development of synthetic aperture radar image products; and DR. LUTE MALEKI (335), for contributions to the science and technology of frequency standards.

HARVEY ENDLER (333), JIM WEILER (514) and PAUL WILLIS (900) received IEEE Third Millennium Medals for outstanding contributions to the IEEE and larger technical community.



Dr. Sverre Eng



Harvey Endler



Dr. Anthony Freeman

## NASA partners to use HDTV, digitize images

NASA has established a corporate partnership that includes provisions to provide, for the first time, high-definition television coverage of astronaut activities aboard the international space station and on space shuttle missions.

The agency's agreement with Dreamtime Holdings Inc. will also create a web-searchable, digital archive of imagery from JPL and all other NASA centers.

The agreement will also provide JPL with high-definition television cameras, monitors, editing equipment and other support equipment within the next year.

Dreamtime headquarters will be in leased space located at NASA's Ames Research Center in Moffett Field, Calif.

The NASA-Dreamtime partnership will create a state-of-the-art multimedia portal, [www.Dreamtime.com](http://www.Dreamtime.com), that will provide thousands of images, sounds, documents, blueprints and plans from NASA's currently underused archives. Content will be accessible via web, wireless, TV and interactive TV devices. Rollout of the in-depth portal site will begin within the next several months.

The partnership's first priority

will be to create the *Dreamtime.com* portal, which will combine video, audio, still photographs, high-resolution images, historical documents and three-dimensional views of spacecraft such as JPL's Mars Pathfinder Sojourner rover and the Hubble Space Telescope. The portal will also include space topic-related bulletin boards, educational activities and games, chat rooms and e-cards. Educational content planned in documentaries and TV broadcasts will be linked to modules in the portal.

The U.S. Congress declared commercial utilization to be one of the primary goals of the U.S. space program when it passed the 1998 Commercial Space Act and directed NASA to actively seek commercial users for the space station. NASA publicly solicited offers for commercial collaboration from the public in December 1999, stating its intent to partner with the private sector to create new market opportunities in the multimedia arena. Dreamtime was selected from 12 offers based on criteria published in the announcement. The term of the agreement between NASA and Dreamtime is for seven years with a five-year option.

## Lab conference helps small businesses

By Gia Scafidi

Small-business owners and business representatives brushed up on their success skills last month at JPL's second annual Small Business Roundtable Conference, sponsored by JPL, NASA and the Small Business Administration (SBA).

More than 100 attended the May 11 event, which included a panel of speakers from JPL, the SBA, OAO Corp., Lockheed Martin Aeronautics and TRW, and stressed the importance of SBA certification and strong business relationships. Members of JPL's Technical and Acquisitions divisions also met with attendees.

"We conduct the conference to give small businesses, especially small disadvantaged businesses and women-owned businesses, the opportunity to network and learn how to market NASA and other prime contractors in the space industry," said Mel Roberts, principal for acquisition operations and planning in JPL's Engineering and Science Directorate.

According to Roberts, every year JPL's Acquisition Division contracts \$200 million of small business contracts.

A formal certification of small

disadvantaged businesses, part of the Clinton administration's programs to expand opportunity for socially and economically disadvantaged businesses, allows small business owners to be eligible for preferences under recent federal procurement regulations. Faye Graybeal of Lockheed Martin Aeronautics confirmed that certified business owners are recognized in the industry. "Every contract bid that Lockheed Martin gets must have at least one small disadvantaged business and one woman-owned business on it," she said.

Beyond partnering with large prime contractors, the panelists advised of the benefits of joining forces with other bidders for industry contracts. TRW representative Al Boldon said that when the government uses fewer contracts in order to lower administrative costs, as in the present situation, marketing opportunities may improve when a business has teammates.

Representatives from Caltech, USC, the Los Angeles County Department of Water and Power, Aerojet, and Dryden Flight Research Center were also on hand for questions and networking opportunities.

# Special Events Calendar

## Ongoing Support Groups

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

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 in Building 167-111. Call Greg Hickey at ext. 4-0776.

Senior Caregivers Support Group—Meets the first Tuesday of each month in Building 167-111. For information, call the Employee Assistance Program at ext. 4-3680.

## Monday, June 12

Retirement Options—TIAA/CREF representative Jeffery Stone will conduct an enrollment meeting from noon to 1 p.m. in Trailer 1720. This workshop is designed for employees who have recently become or will soon be eligible for retirement plan participation, and for new hires eligible to join the plan. Bring the enrollment material you received either from TIAA/CREF or at new-hire orientation.

## Monday, June 12—Thursday, June 15

American Heritage Week—The annual event will be held in the mall from 11:30 a.m. to 1:30 p.m. Monday through Thursday. Various entertainment and games will be offered each afternoon, and on Thursday evening the International Cuisine Night will be held from 4:30 to 7:30 p.m. For information, call Bobbi Marin at ext. 4-4131.

## Tues, June 13—Wed., June 14

Retirement Options—TIAA/CREF will be available for individual counseling in Trailer 1720. Call (877) 209-3140, ext. 2614, or access scheduling information online at <http://tiaa-cref.org/moc>.

## Employee accomplishments noted with Award for Excellence

Ceremonies were held May 11 to honor recipients of JPL's Award for Excellence. The awards recognize a specific accomplishment or sustained contribution by individuals and teams that is clearly characterized by exceptional technical excellence, business-operations excellence, quality or leadership. The ceremony recognized contributions between Dec. 1, 1998 and Dec. 10, 1999.

A list of award recipients follows.

### Individuals

**Business Operations**  
Penny Carter-Lockert (194), Kenneth Gowey (644), Jennifer Hessar-Amiri (220) Sharon Kyle (252).

## Tuesday, June 13

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

## Wednesday, June 14

JPL Toastmasters Club—Meeting at 5:30 p.m. in the Building 167 conference room. Guests welcome. Call Mary Sue O'Brien at ext. 4-5090.

## Thursday, June 15

JPL Astronomy Club—Meeting at noon in Building 198-109.

Investment Advice—Fidelity representative Jason Rasmussen will speak at noon in the northeast corner of the Building 167 cafeteria. Targeted for employees participating in JPL's 403B tax-deferred annuity program and who are more than 10 years from retirement, the workshop will also cover the importance of reviewing, reevaluating and rebalancing your portfolio on a regular basis. Rasmussen will also be available for one-on-one counseling in Trailer 1720. To schedule an individual appointment, call (800) 642-7131.

Von Kármán Lecture Series—Dr. Tom Farr of Research Element 3235 will present a lecture titled "Imaging Radar at JPL: Past, Present and Future" at 7 p.m. in von Kármán Auditorium. Open to the public.

## Friday, June 16

Von Kármán Lecture Series—Dr. Tom Farr of Research Element 3235 will present a lecture titled "Imaging Radar at JPL: Past, Present and Future" at 7 p.m. in The Forum at Pasadena City College, 1570 E. Colorado Blvd. Open to the public.

## Tuesday, June 20

JPL Hiking Club—Meeting at noon in Building 303-209.

## Wednesday, June 21

Music on the Mall—The Robert Kyle band will combine jazz, blues, Latin & Brazilian jazz during their performance starting at noon.

## Thursday, June 22

JPL Stories—Roger Bourke will present "Seeds of the Grand Tour: How Voyager Began in the Mid-'60s." The story will focus on innovation as one of JPL's greatest assets. To be held from 4 to 5 p.m. in the customer service area of the Library, west end of Building 111.



### Leadership

Richard Brace (500), Artur Chmielowski (350), Izeller Cureton-Snead (220), Jeanne Holm (174), James Lamb (346), Marc Montgomery (220), Kenneth Nealson (3251), Valerie Thomas (344), Philip Varghese (902).

### Quality

Irene Chan (224), Robert Downer (383), Phillip Yates (351).

### Technical

Mark Anderson (3531), Edward Cuddihy (514), Daniel Eldred (341), William Hurd (905), Terry Scharton (352), Thomas Spilker (311).

Continued on page 4

# JPL WELCOMES 40,000 VISITORS

About 40,000 people visited JPL's

annual open house June 3 and 4,

enjoying the wide variety of

displays and attractions.

Clockwise from left: A prototype

rover at the Mars Yard; a

"fisheye" view of the space

simulator in Building 150; viewing

the sun through a special solar

telescope; checking out rocks and

other Earth materials through

magnifying glasses; and kids hard

at work building model spacecraft.



JPL in the  
21st Century

# Open House

# 2000



Photo credits, clockwise from top left:  
Dutch Slager, Richard Hasegawa, Richard  
Hasegawa, Tom Wynne, Richard Hasegawa.

View this and  
previous issues of  
Universe online

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

## AWARDS *continued from page 2*

### Teams

#### Business Operations

RTOP Tiger Team: Jennifer Berlien, Thomas Davall, Elizabeth Emmons, Linda Graham, Annette Green, Catherine Yee, Gail Yopez, Lincoln Yeung.

### Quality

CloudSat Proposal Team: Alaudin Bhanji, Ronald Boain, Moustafa Chahine, Col. Robert Cox (A), CMP Machine Shop (A), David Crisp, Pat Crowley (A), Stephen Durden, Valerie Duval, Wendy Edelstein, Diane Evans, Inam Haque, Gary Hendel (A), Eastwood Im, Virendra Jha (A), Edward Jorgensen, Mary Kodis, Hiroshi Kumagai (A), La Pole, Mark (A), Nancy Leon, Fuk Li, Thomas Livermore, Harunobu Masuko (A), Pauline Mathieson (A), Richard Mattingly, Cynthia McClure (A), Robert Menzies, Chris Nilsen (A), Alfred Paiz, Raul Perez, Karen Piggee, Iain Rannachan (A), Fernand Rheault (A), Albert Roitman (A), Mark Rokey, Ernie Schultz (A), Arnold Silva, Elena Myers Sims (A), Alan Smerling, Ed Sokol (A), Suzanne Spitz, Brian Steer (A), Graeme Stephens (A), Dan Sweeney (A), John Theon (A), Shelby Tilford (A), Barry Titlebaum, Steven Walter, Dale White (A), Mike Wroblewski (A), Alfred Zieger.

JPL Graphics Design Services Team: David Hinkle (A), Adriane Jach (A), Elsa King (A), Marilyn Morgan, Audrey Riethle.

SRTM Assembly and Integration Team (mechanical integration): Victor Barnes (A), Kirk Barrow, Larry Broms, Gary Bruner, Carl Buck, Mark Duran, Howard Eisen, Charles Foehlinger, Dennis Maciej, Kamesh Mantha, Sarah Marshall, Johnny Melendez, Patrick Murphy, George Nakatsukasa, Alex Perez, Richard Rainen, Mary Reaves, Bernd Richter, Kendra Short, John Shuping, Peter Sorci, Beverly St. Ange, Jim Stultz, Kim Sun, Michael Tickner, Jeffrey Umland, Kirby Willis; (electronic test): Bruce Carrico, Samuel Chan, Riley Duren, David Escoto, Gary Esparza, Arthur Gussner, Gary Hamilton, Carl Liebe, Edward Litty, Dalia McWatters, Gregory Neumann, Alan Nicholson, Mimi Paller, Kenneth Peters, Anthon Rasmussen, Paul Renick, Scott Shaffer, Thomas Shain, Yuhshen Shen, Philip Smith, Samuel Tauch, Joseph Vacchione, Louise Veilleux, Terry Wysocky,

### Technical

Atomic and Molecular Collisions Team: Ara Chutjian, Murray Darrach, Shannon Jackson, Troy Molsberry, Otto Orient, Dean Aalami (A), Vachik Garkanian, Dan Karmon.

Deep Impact Proposal Team: William Blume, Mary

Bothwell, Alice Cobbin, Grace Hallowell, Michael Jones, Kent Kellogg, Donald Rapp, Paul Reichley, Troy Schmidt, Anna Tavormina, Janis Taylor, Carroll Winn.

MOMED (monolithic membrane device) Team: Peter Bruneau, Suzanne Martin, Peter Siegel.

Muses CN Mechanical Team: Aeroflex Motion Control (A), Kobie Boykins, Anthony Ganino, Michael Johnson, C. Eric Kurzweil, Greg Levanas, Kenneth Powell (A).

Spacecraft & Sequence Team: David Acevedo, Olen Adams, Alicia Allbaugh (A), Shadan Ardan (A), David Bates, Jan Berkeley, Dennis Bluhm (A), N.T. Brady, Eileen Clark, Cynthia Compton, Zainab Cox, William Cunningham, Paul Fieseler, Ana Grigoryan-Martinez, Friedrich Krug (A), Jose Mancera, Wade Mayo, Bruce McLaughlin, Ben Miller, Bill Nelson (A), Carol Polansky, Charles Porter, Klaus-Peter Renner (A), Gerald Snyder, F. H. Jim Taylor, Nancy Vandermer.

Tactical Mobile Robotics Team: Charles Bergh, Steve Goldberg (A), Martial Herbert (A), Robert Hogg, Brett Kennedy, Robert MacLachlan (A), Mike McHenry (A), Richard Musgrove, Arturo Rankin, Gauray Sukhatme (A), Yalin Xiong, David Zhu.

(A) = Affiliate team members

For more information about the Award for Excellence, go online to <http://eis.jpl.nasa.gov/sec614/reward>.

## Passings

**CLIFFORD CASABIANCA**, 86, a retired test engineer in Section 364, died of cardiac arrest May 9 at his home in Tujunga.

Casabianca joined JPL in 1946 and retired in 1988. He is survived by daughter Roseanne Morrison and two granddaughters.

Services were held May 12 at Forest Lawn Memorial Park in Hollywood Hills.

## Classifieds

### For Sale

AMPLIFIER for guitar, Fender Blues deluxe, Tweed series, \$375/obo. 249-2357.  
BABY ITEMS, Jogger II-16, dark blue w/sunshade & net basket, \$100; CHILD CARRIER for bicycle, holds up to 40-lb. child, mounts over rear tire, \$30; DIAPER GENIE, \$10; TRIKE, Fisher-Price Push 'n Pedal, \$15; MISC. baby toys & books, \$1-\$10. 790-8442.  
BEDS, twin, 2, maple headboards, spreads, frames, extra-firm matt., exc. cond., \$150 ea./obo. 790-5024.  
BIKES, 2, girls, 20", \$50, 12", \$40; boys, 20", 18 spd., \$75; HELMETS, 2, \$10 ea., all brand new. 626/969-7377.  
CAMERA, Ricoh RDC4300, 1.3 megapixel digital, Mac or Wins., optional infrared remote, all orig. software/manuals/cables, does extreme closeups, also works as a color video camera, see at <http://www.richocpg.com/product/digital/rdc4300.html>, \$225. 353-2103, Bill.  
CHANDELIER, Kichler 22" dia., glass w/white trim, \$50; SKI RACK, BarreCrafters trunk-mount, holds up to 4 pr., \$50; SPRINKLER TIMER, WaterMaster programmable 6-sta., \$20. 790-8442.  
CLAY POTS, lg., round, 2' & 3' dia., 2', \$50 ea./obo, 3', \$60 ea./obo. 626/791-6101.  
COMPUTER MONITOR, 14", flat screen, \$25. 661/274-7954.  
CRYPTS, A&B companion, Live Oak Memorial Park, 200 E. Duarte Rd., Monrovia, \$2,000/obo. 281/399-0013, Bob King, TX.  
DESK, 2-pedestal, oak finish, exc. cond., w/swivel chair, \$235; ENTERTAINMENT CTR/bookshelf, sm. (for sm. TV), oak finish, \$35. 548-9151.  
DINING SET, formal, beaut. solid oak oval table, 6'x4", dark finish, 6 captain's chairs w/cush. & tablecloth, exc. cond., \$650/obo. 626/303-2808.  
DRESSER, 9 drawer, natural dark wood finish, 68"Lx30"Hx18"D, \$125; DRESSER, child's, \$25; MATTRESS & box spring, \$25; DESK, \$50. 353-9367.  
ENTERTAINMENT CTR, cherry wood, glass drs., CD & stereo storage, 35" Sony TV, VCR, & DirecTV mini dish sys., exc. cond., 1 1/2 yrs. old, \$700 for all. 626/966-3677.  
EXERCISE MACHINE, NordicTrack \$100; CRIB w/matt., Simmons, dark wood, \$150; TOY BARN, Little Tykes, \$20; PLAYGROUND w/slide, Little Tykes, for bkyd., \$35; HIGH CHAIR, adj., \$20. jhook@pacbell.net.  
FAN, floor, hvy. duty, 3 spd., reversible, thermostatic ctrl., VG cond., \$15; COFFEE PERCOLATOR, Regal, 40 cup, stainless steel, \$19; TOASTER OVEN, GE, \$15. 626/793-1895, Albert.  
LIFE JACKETS, 4, "Americas Cup", 2 youth med., 2 adult med., \$60/obo. 994-6588.  
LUGGAGE, hard-sided, women's American Tourister, red, VG cond., 27", \$40, 24", \$30; Bel-Aire, lt. brown, vg cond., 22", \$20; men's Samsonite, drk. brown, fair cond., 27", \$10; 21", \$5. 626/577-8107.  
METAL DETECTOR, Bounty Hunter, top of the line, hardly used, \$350. 248-6062.  
ORGAN, Yamaha 415 elect. console, 13 pedals, 3 keyb'ds, 144 rhythm patterns, pd. \$7,500, sacrifc. \$3,000; DIET TAPES, Jenny Craig, set of 14, \$50; POWER CONTROL CTR, computer, 5 pwr. + 1 master switch, 5 surge-protected outlets + 2 modem/fax/phone jacks, new, \$20; ADAPTERS, sprinkler valve, Lawn Genie, model 756LG 3/4, new, \$10 ea. 790-3899.  
MOVING SALE, everything must go: Maytag refrig., washer & dryer, bdrm set, sofa-sleeper, love seat-sleeper, coffee & end tables,

pine secretary, much more. 790-5312.  
PALMORDER, Sony 24X w/Steady Shot, incl. 2 batt., used less than 10 hrs., \$279; SHARING DEVICE, Belkin, 4 to 1 peripheral, never used, w/gold IEEE cable, orig. \$99, sell \$39; BATTERIES for camcorder, new, long life, orig. \$79, sell \$30; for Nokia 6000 series cell phone, long lasting, metal hydride, \$15; for Sony Mavica, orig., \$65, sell \$30. 366-6134.  
PLAYHOUSE, outdoor, toddler, octagonal, appx. 4.5' tall, gd. cond., slide, door, fold-down table, shuttered windows. \$75. 626/355-9733.  
PRINTER, HP Deskwriter, inkjet, Mac, \$25; MICROWAVE, Litton, lg., \$25. 790-6185, Tim Scheck.  
SOFA & loveseat, brown, exc. cond., \$200; CHAIR, swivel, brown, exc. cond., \$75; COFFEE TABLE, octagonal, beveled glass top w/matching end tables, 3 pc., \$150. 661/254-7443.  
SOFA, slip-covered, exc. cond., oatmeal background w/pale pink roses, 2 cush., 4 pillows, \$200. 626/794-8720, Andy or Lisa.  
SOFA, light brown, leather, \$120; CHAIRS, 2 light brown, leather w/foot stools, \$60 ea.; BOOKSHELVES, floor to ceiling, adjust., wood w/2 encl. cabinets, about 6' wide, \$100. 353-9367.  
SPEAKERS, JBL Signature Series, vintage, 12", model D131, 1 recone, 1 orig., \$180/pr. 249-2357.  
STAR DIAGONAL, for a telescope, Meade, 2.0 inch, exc. cond., \$75. 790-2123.  
STROLLER, Right Start, Sit'n'Stand, clean, great shape, \$75. 661/263-2760.  
TABLE, sewing/craft, portable, 4x2, \$25; BIRD-CAGE & acces., \$30. 362-3358.  
TELEVISION, 27", exc. cond., 1 yr. old w/remote & manuals, \$175. 626/744-9277.  
TV & VCR, JVC, new 27" screen, 1 mo. old, TV has S-video & component inputs, DVD player compatible, VCR is a stereo, 4-head player, audiovisual cables incl., value over \$600, sell \$450. 626/792-7578.  
VACUUM, Hoover, upright, older but works fine, \$30. 626/798-0921.  
WASHER/DRYER combo, Kenmore heavy duty, perfect for sm. spaces, \$600. 626/289-3717.  
WATER SKIS, 1 pr. Taperflex by Puritan, \$150/obo. 995-6588.

### Vehicles / Accessories

'95 ACURA Legend LS coupe, 2 dr., black, auto, 105K mi. mostly fwy., mint cond., black leather, s/r, heated seats, alloy wheels, CD changer, remote keyless entry, \$16,000/obo. 626/584-3204 day, 626/791-6101, eve/weekend.  
BOAT, 10', inflatable, wood motor mount & optional flr., 2 oars, 1 removable bench seat, foot-pump, good on/ocean/lake/river, gd. cond., \$600/obo. 909/599-2598, Andy.  
'95 BUICK Le Sabre, dark blue, exc. cond., very well maint., orig. owner needs mini-van, auto, a/c, stereo/cass., p/l/w, 59K mi., \$7,800/obo. 626/449-4850.  
'84 DODGE D-500 pickup truck, VG cond, auto, 2.6 L, bedliner, shell, new batt./carburetor, very clean, well maint., all service records, 138K mi., orig. owner, \$2,800. 626/332-2682, Steve.  
'98 FORD Explorer Sport, 2 wd, 2 dr., white/gray int., 28.5K mi., 4.0 L V6, 5 spd., manual, pwr. s/w/l, a/c, factory CD player, exc. cond., \$15,500. 626/296-1298.  
'96 FORD Escort LX, exc. cond., 5 spd., 2 dr., 57K mi., a/c, am/fm/cass., \$6,900/obo. 909/323-3640.  
'94 FORD Explorer XLT wagon, 4 dr., exc. cond., loaded, leather seats, 122K mi., \$9,200/obo. 790-2123.  
'93 FORD Explorer EXL, beige, auto, air, cass., records, like new, lic.# SMPLY E, \$10,000/obo. 500-9219.  
'81 FORD Econoline 150 van conversion, new tires/brakes, \$2,000/obo. 790-5312.  
'66 FORD Mustang, classic, orig. owner/ invoice & most repair/service receipts, yellow w/parchment int., 289 V8, exc. mech. cond., new rear brakes & front Michelins, driven nearly every day, very clean inside/ out, no dents, see & drive to appreciate, \$5,900. 626/794-7007, Margialden@aol.com.  
'64 FORD Mustang parts: grill, ctr. bars, 13" hubcap, cigar lighter, misc. 626/448-4383.  
'85 HONDA Civic 4-door, automatic, records, needs work, \$700. 626/345-0969.  
HONDA stock stereo, digital am/fm receiver, memory presets, cass., CD player compatible, \$15. 248-8103, Mike.  
'88 HYUNDAI, 4 dr., white body, blue hardtop, auto, am/fm, runs good, \$800. 626/797-4149; 310/223-8794, pager.  
'97 JEEP Wrangler SE, red, 4WD, p/s/b, air

bags, Kenwood stereo/cass., sound bar, Lo-Jack, ignition cut-off, 31"x10.5" tires, alloy rims, 25K mi., still under transf. warr., exc. cond., \$13,500. 248-8103, Mike.  
'84 LAZY DAZE motor home, 22 ft., poptop, \$5,575. 626/445-6320.  
'90 MAZDA 929S, great full size sedan, loaded, sunroof, fabric seats, looks/runs good, orig. owner, 200K mi., \$2,995/obo. 626/355-2473.  
MILLER equipment trailer, completely refurbished, tilt, new deck/tires/brakes/elec., will support 21,000 lbs., exc. cond., \$4,500/obo. 626/798-6249.  
'93 PACE ARROW motorhome, 30 ft., exc. cond., 23K mi., basement model, levelers, safety-lux steering, TV, microw., a/c, much more, \$39K/obo. 249-0939.  
'98 PONTIAC convertible, white, loaded, 11,700 mi., exc. cond., 25 mpg, \$14,300/obo. 790-2123.  
'69 PORSCHE 912, exc. cond., \$4,500/obo. 249-2235.  
'98 SATURN SW-2 wagon, white, mint/spotless cond., extended bumper-bumper warr., 6 yr./75K mi., dual airbags, CD, tinted win., center console, 17K mi., all papers, proof of oil changes every 3-4K mi., \$14,000. 661/294-0712, Brad.  
'87 TOYOTA Celica, 2 dr., 5 spd., 94K mi., a/c, gd. cond., \$2,500. 323/662-7376.  
'91 TOYOTA pickup, xtra cab, deluxe, auto, 4-spd., camper shell, a/c, red, single owner, under 71K mi., exc. cond., \$6,900/obo. 626/449-4326, Gaj.  
'97 VOLKSWAGEN Jetta GL, black, gray int., 5 spd., exc. cond., 6 CD changer, s/r, a/c, pwr. drs., tinted win., new tires, alloy wheels, well maint., 51K mi., \$11,200. 626/355-2499, Gary or Nichole.  
'86 VOLVO 240 DL, blue, orig. owner, clean cond., 158K mi., \$1,000/obo. 790-5965.

### Wanted

BED, twin, w/matt./box spring/frame. 548-9151.  
FIRST-TIME MOM (soon-to-be) and member of tech. staff seeks same for confidential study-buddy, note-comparing, mutual gripe/worry exchanges & reality checks. nancypg@juno.com.  
GERMAN SPEAKERS/parents to form play group for toddlers to foster native language development. 249-9093, Petra.  
JPL WIDOW seeks pleasant 2-bd. apt., condo or guest house; prefer Crescenta Valley or other nearby areas. 661/718-2528, marjwins@aol.com.  
SPACE INFORMATION/memorabilia from U.S. & other countries, past & present. 790-8523, Marc Rayman.  
TO RENT, responsible tenant who takes pride in home seeking 2-bd. apt. or house in SG or SF Valley, prefer So. Pas./Pas., something with farm, trees, courtyard garden, etc. 626/289-2795, Debbie.  
TO RENT, apt. or house in JPL area starting July 15, up to \$1,000/mo., want light, pets OK. 626/446-6500, ext. 311 or mjheil@yahoo.com.  
VOLLEYBALL PLAYERS, coed, all levels of play, Tues. nights, 8-10, Eagle Rock H.S., \$3/nt. 956-1744, Barbara.

### Lost & Found

Found: Woman's bracelet, gold, in west parking lot on 5/11. Ext. 4-7793.

### For Rent

ALTADENA, charming 2 bd., 1 ba. house near Christmas Tree Lane, hrdwd. flrs., f/p, appliances, fenced backyard, fruit trees/roses, \$1,500, incl. water/gardener/trash, negotiable, see at [www.alumni.caltech.edu/~chrisc](http://www.alumni.caltech.edu/~chrisc). 626/794-9579.  
ALTADENA condo lease, mins./JPL, 2 bd., 1 3/4 ba., nice closets w/organizers, f/p, c/a, comm. pool, storage rm., 2 car gar., carport, tile countertop & marble floor in kitch., lg. patio, landscaped, planters/oriental garden/waterfall/spa, end unit w/wins. on 3 sides, rent by owner, \$1,200. 626/398-1988, Beverly Drane.  
ALTADENA, lg. furn. rm., cable TV, share 3 bd., 3 ba., hilltop house, pool, patios, view (incl. JPL), c/a/h, all amen., laundry, kitch., d/w, priv. off-street pkg., 11 min./JPL, smoke OK, owner smokes, \$500, incl. all util. + dep., avail. 6/10. 626/794-1050, after 5 p.m., Harry.  
ARCADIA furn. rm., cozy, Indry. & kitch. privileges, pool, non-smoker, \$350. 626/448-8809, Harry.  
LA CANADA guest house, fully furn., short-term, close to JPL, no smoke/pets. 790-7727.  
MONTROSE, 2-bd. house, unfurn., hrdwd. flr.,

extra rms., f/p, quiet, park-like, redwood deck, washer/dryer, 5 min./JPL, 4421 Rosemont Ave. (below Fthl.), \$1,750. 248-5068.  
EAST PASADENA house, 1 bd., 1 ba., 1 car gar. & street pkg., incl. water/trash, no smoke/pets, carpet, blinds, stove, fans, patio, avail. 7/1, 1 yr. lease, \$750 + \$750 sec. dep. 949/643-9439.  
SW PASADENA, mature lady seeks clean, non-smoking roommate to share modern condo, female pref., furn., twin bed, 2 nightstands, dresser, desk, sm. refrig., microw., 13" color TV, private bath, a/c, indoor Indry., secure pkg/bldg, pool, spa, Jacuzzi, exercise & rec. rm., \$480, exc. phone & cable + \$480 sec. dep., references req., no pets. 626/793-3019.  
PASADENA, unique, artistic 1 bd. apt. in old Victoria home, \$675. 790-1209.  
SIERRA MADRE apt., 2 bd., 1 ba., 2nd fl., stove, laundry rm., carport, no pets, walk to Village, quiet 6-unit bldg., \$780. 626/355-7318.

### Real Estate

LA CANADA-FLINTRIDGE view home, 4 bd., 2.5 ba., c/a, 2,778 sq. ft., 2-car gar., lg. driveway, 15' swim spa, LC schools, very quiet street & neighborhood, 53,954 sq. ft. on 2 lots, oak forest & creek, 2.5 mi. to JPL, see [www.realtor.com](http://www.realtor.com), "La Canada", "Ca", MLS ID=G202353, \$849,500. 952-9654.  
LA CRESCENTA, 2 story, 5 bd., 2.75 ba., Glendale schools, mtn./city view, hrdwd. flr., marble f/p, 2,196 sq. ft. liv. space, 500 sq. ft. encl. patio for den/family rm., 7,800 sq. ft. lot, front & backyd. w/grass, 8 fruit trees, gardens & sprinklers, c/a/h, newer d/w & roof, 2-car attach. gar., \$429K. 249-2889.  
PASADENA, delightful 4 bd., 3 ba., Spanish style home in Caltech/So. Lake area, over 2,600 sq. ft., lg. rms., lots of light, f/p, newer kitch., best price in area, offered by former JPL/Caltech emp., sec. 336, 10+ years. 615 S. Mentor, Pas., \$475,000. 626/229-0909, Lowell Hamburg, DBL Realtors.

### Vacation Rentals

BIG BEAR cabin, quiet area near village, 2 bd., slps. 8, compl. furn., f/p, TV/VCR, \$75/nt. 760/246-7754.  
BIG BEAR LAKE cabin, near lake, shops, village, forest trails, 2 bd., slps. up to 6, f/p, TV, VCR, phone, microw., BBQ, more, JPL disc. from \$65/nt. 909/210-9182.  
BIG BEAR LAKEFRONT, lux. townhome, 2 decks, tennis, pool/spa, beaut. master bd., suite, sleeps 6. 949/786-6548.  
CAMBRIA ocean front house, sleeps up to 4, exc. view. 248-8853.  
HAWAII, Kona, on 166 ft. of ocean front on Keauhou Bay, priv. house & guest house, comfortably sleep 6, 3 bd., 2 ba., rustic, relaxing & beaut., swim, snorkel, fish, spectac. views, near restaur., golf courses, other attractions. 626/584-9632.  
HAWAII, Maui condo, NW coast, on beach w/ocean view, 25 ft. cr. surf, 1 bd. w/loft, compl. furn., phone, color TV, VCR, microw., d/w, pool, priv. lanai, slps. 4, 4/15-12/14, \$100/nite/2, 12/15-4/14, \$115/nite/2, \$10/nite add'l. person. 949/348-8047.  
LAKE TAHOE, N. shore, 2 bd., 2-1/2 ba. condo, slps 6-7, priv. sandy beach, pool, great loc., all amen., hike/golf/fish, 2 mi./casinos, JPL disc. summer wkly. rate, \$650. 626/355-3886, Rosemary or Ed.  
LAKE TAHOE, Incline Village condo, pool, Jacuzzi, tennis/raquetball, sleeps 6+, avail. Sept 3-10, \$650/wk. 323/662-4089.  
MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, sleeps 6-8, fully equip. kitch. incl. microw., d/w, cable TV, VCR, phone, balcony w/view to mtns., Jacuzzi, sauna, streams, fishponds, close to Mammoth Creek, JPL disc. 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.  
PACIFIC GROVE house, 3 bd., 2 ba., f/p, cable TV/VCR, stereo/CD, well-eqpd. kitch. w/microw, beaut. furn., close to golf, beaches., 17 Mile Dr, Aquarium, Cannery Row, JPL disc. 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.  
SOUTH LAKE TAHOE KEYS waterfront, 4 bd., 3 ba., 1 bd. & liv. rm. upstairs, hcrp, access fair, slps. 12+, f/p/s, decks, gourmet kitch., boats, TVs, VCR, stereo, assn. in o/d pools, bch., tennis, 10 min./ski/casinos/golf: wine co., 3-day min., \$1,195/wk. [1 June-15 Sept; 22 Nov-1 April], \$595/wk. low seas., + \$90 clean fee. 949/515-5812.

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### Notice to Advertisers

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 ERC and the Universe office, Bldg. 186-118, 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.