

universe

Jet Propulsion Laboratory

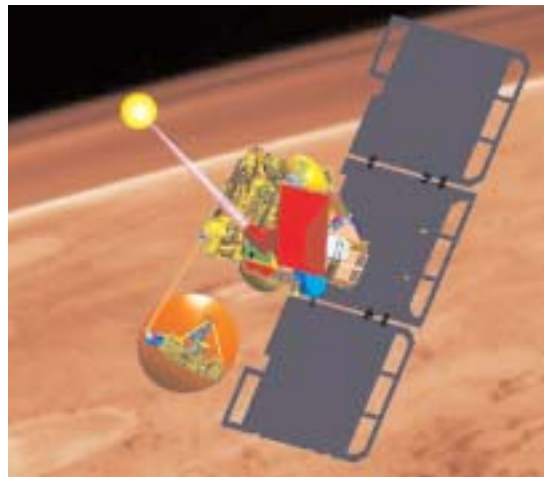
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the SOLAR SYSTEM

NASA HAS SELECTED FOUR PROPOSALS for detailed study as candidates for the 2007 "Scout" mission in the agency's Mars Exploration Program.



More than 20 proposals were considered, and the principal investigator leaders of the four selected by NASA have chosen JPL to be their project management partner. If any of the four proposals were to be selected for development, JPL would provide project systems engineering, mission assurance leadership, mission trajectory design and navigation, and mission operations leadership.

Final selection of one concept for flight development will be made by the NASA associate administrator for space science, Dr. Edward Weiler, by next summer.

The four Mars Scout mission concepts selected, and their principal investigators, are:

- Mars Volcanic Emission and Life Scout (Marvel), led by Dr. Mark Allen of JPL. This mission proposes to conduct a global survey of the Martian atmosphere's photochemistry to search for emissions that could be related to active volcanism or microbial activity, as well as to track the behavior of water in the atmosphere across a full annual cycle.

JPL co-investigators would be Mike Janssen (Section 3262), Geoff Toon (3243) and Marguerite Syvertson (185).

- Sample Collection for Investigation of Mars, led by Professor Laurie Leshin of Arizona State University. This innovative mission would sample atmospheric dust and gas using aerogel and use a "free-return trajectory" to bring samples back to Earth. Such samples could

provide breakthrough understanding of the chemistry of Mars, its surface, atmosphere, interior evolution and potential biological activity.

JPL co-investigators on this mission would be Steven Jones (Section 3538), Amy Jurewicz (3224) and Albert Yen (3223).

- Aerial Regional-scale Environmental Survey, led by Dr. Joel Levine, NASA Langley Research Center, Hampton, Va. This mission offers to provide the first in-situ measurements of the near-surface atmospheric chemistry within the Mars planetary-boundary layer, thereby providing critical clues to the chemical evolution of the planet, climate history, and potential biological activity.

Should this mission be selected, the JPL co-investigator would be Diana Blaney.

- Phoenix, led by Dr. Peter Smith, University of Arizona. This mission proposes to conduct a stationary, in-situ investigation of volatiles (especially water), organic molecules and modern climate. It aims to "follow the water" and measure indicator molecules at high-latitude sites where Mars Odyssey has discovered evidence of large ice concentrations in the Martian soil.

JPL co-investigators on Phoenix would be Blaney, Eric de Jong (3222), Michael Hecht (384) and Leslie Tamppari (314).

Designs for the Marvel mission, the spacecraft and operations draw heavily from the successful 2001 Mars Odyssey mission, now in orbit at Mars.

"One of the most exciting questions people ask is whether life exists elsewhere," Allen said. "A lot of us on this team think that if life ever existed on Mars, there is a good chance life still exists if there is any place warm and wet."

The mission would equip a Mars orbiter with two types of instruments that have proven useful in studying Earth's atmosphere from Earth orbit. One, an infrared solar occultation spectrometer, would look sideways through Mars' atmosphere toward the setting or rising Sun for an extremely sensitive reading of what chemicals are in the thin air that the sunlight passes through before hitting the instrument. The other, a submillimeter spectrometer, would look through any dust in the atmosphere to seek localized atmospheric concentrations of the chemicals of interest.

"By the end of this decade, Marvel could either detect and localize any existing life and active volcanism on Mars or put extremely stringent limits on their existence," Allen said.

Amalthea is rocky, loosely packed

JPL's Galileo spacecraft continues to deliver surprises with the discovery that Jupiter's potato-shaped inner moon, named Amalthea, appears to have a very low density, indicating it is full of holes.

"The density is unexpectedly low," said JPL astronomer Dr. John D. Anderson on Monday at the fall meeting of the American Geophysical Union in San Francisco. "Amalthea is apparently a loosely packed pile of rubble."

The empty gaps between solid chunks likely take up more of the moon's total volume than the solid pieces, and even the chunks are probably material that is not dense enough to fit some theories about the origin of Jupiter's moons. "Amalthea now seems more likely to be mostly rock with maybe a little ice, rather than a denser mix of rock and iron," said Galileo Project Scientist Dr. Torrence Johnson.

This red-tinted moon measures about 270 kilometers (168 miles) in length and half that in width. Anderson and colleagues estimated Amalthea's mass from its gravitational effect on Galileo, when the spacecraft passed within about 160 kilometers (99 miles) of the moon on Nov. 5. Dr. Peter Thomas of Cornell University had calculated Amalthea's volume from earlier Galileo images of the moon.

Mars Scout concepts selected

By Guy Webster and Mark Whalen

JPL would lead one mission, partner on three others

Artist's rendering shows the Mars Volcanic Emission and Life Scout spacecraft and instruments.

Wind damage causes flood, closes half of building

By Mark Whalen

No injuries reported in pre-Thanksgiving gusts

Right: Nov. 26 windstorms caused significant damage to Building 198's roof.

The winds that raced through JPL two days before Thanksgiving caused considerable damage to Building 198 that displaced dozens of employees, but the good news is that no one was injured. All staff members in the building were evacuated the morning of Nov. 26, as high winds caused a section of the roof to peel back. The loose piece of roof then sheared a fire-hose connection line on the roof, causing a massive flood.

The majority of the damage was done to the eastern side of the building, where approximately 100 staff members in Division 34 scrambled to find temporary places to do their work. Those in the western half of the building returned to their offices on Monday.

It wasn't long before those who escaped the flooded areas found new homes. People from across the 3X Directorate and elsewhere have offered extra desks and chairs. Vacant offices have been located. Some conference rooms have been converted to office space, and many people have begun to share their offices with others.

"It's amazing how everyone has been absorbed into the system," said Bob Develle, manager of the Facilities Engineering and Construction Section.

"Everyone has been wonderful in trying to help," added Susan Henry, deputy director, Business Operations and Human Resources Directorate. "We were so lucky to come out of this as well as we did."

On Monday, personnel from the Occupational Safety Office toured the building and agreed that residents of the east side of the building (wearing



Photo courtesy of Don Plage

hard hats) could enter the building to pick up personal belongings.

All flight hardware was spared damage, but the flooding caused damage to several computers as well as ceiling tiles, carpeting, wall-board and items that were on top of furniture at the time of the flood.

Develle noted that the roof membrane dislocated by wind was quickly put back in place, and the building sustained no leaks from the rains over the holiday.

The building is now dry, repairs and replacement of damaged items are underway, and Develle expects that all staff can return sometime in January.

News Briefs



Dr. Steven Ostro



Dr. Jeff Plaut

Ostro wins Kuiper Prize

For his years of research demonstrating the power of radar techniques to wrest information from near-Earth asteroids, DR. STEVEN OSTRO will receive the prestigious Gerard P. Kuiper Prize next year from the American Astronomical Society's Division for Planetary Sciences.

Ostro, a JPL senior research scientist, began probing these miniature planets with radar more than 20 years ago, and was essentially the only researcher doing so through the 1980s. The field has grown in the past decade, with increasing recognition of the scientific importance of asteroids.

Ostro and his colleagues have successfully obtained radar echoes from nearly 200 asteroids, mostly ones that cross Earth's orbit but also including many in the main asteroid belt between Mars and Jupiter. "Every single one of them is unique in its own way," Ostro said. "It's been just one remarkable object after another."

"I feel extremely fortunate to be doing this work," Ostro said. "It's like a Star Trek fantasy—seeing a world that no one has ever seen before."

The prize Ostro will receive next September is named for GERARD KUIPER, widely regarded as the father of modern planetary science. The 1,200-member Division for Planetary Sciences awards it to one scientist each year "whose achievements have most advanced our understanding of the planetary system." Ostro will be the 20th recipient. Previous winners have included CARL SAGAN, JAMES VAN ALLEN and EUGENE SHOEMAKER. Ostro will be the first JPL scientist to receive the Kuiper Prize.

Plaut leads Odyssey science

DR. JEFFREY PLAUT has been named project scientist for JPL's 2001 Mars Odyssey mission, succeeding Dr. Steve Saunders, who retired. Plaut had been the deputy project scientist for Odyssey.

Plaut came to JPL in 1991 and has served on the Magellan mission to Venus and three space shuttle radar missions. He is currently the co-principal investigator on the 2003 Mars Express radar sounder and a team member on the 2005 Mars Reconnaissance Orbiter radar team.

He has a bachelor's degree from Brown University and a doctorate in Earth and planetary sciences from Washington University at St. Louis.

Radar to track vehicle speed

In response to concerns regarding speeding vehicles on-Lab, JPL Security will soon implement the use of a new enforcement tool. Beginning Jan. 6, 2003, Security will use radar to deter speeding and will issue traffic citations to any vehicle exceeding the posted 20 mph maximum speed limit on the property, or the 10 mph maximum speed limit in the parking lots.

Several security officers have been trained and certified with the California Highway Patrol in the use of radar.

Personnel are reminded to adhere to the Laboratory speed limits and operate their vehicles in a safe manner at all times.

Toys for Tots campaign underway

JPL is joining with the U.S. Marine Corps Reserves in the effort to help brighten the holiday season for needy children in our community. Donations of new, non-gift-wrapped toys will be accepted through Dec. 18 at the JPL Store, Building 180 lobby, Building 303 lobby and Building 190 cafe.

For more information, call Nancy Kapell, ext. 4-9432.

Cost estimating class offered

"Principles of Cost Estimating," the next class of JPL/UCLA Extension program, begins Thursday, Jan. 9 and will continue every Thursday through March 27. Classes will be held in the 190 Cafe from 5:30 to 8:30 p.m. This course covers the principles, practices and procedures for preparing cost estimates using a step-by-step methodology, which is compliant with government regulations. Students will receive a certificate of completion for JPL Principles of Cost Estimating after successful completion of all eight classes in the program.

The cost of the class is \$380. To enroll, pay on the first night with check or credit card. Tuition reimbursement is available for a portion of the class; see <http://hr/et>. Also, you may apply for a loan through the Caltech Credit Union.

The class textbook, "Cost Estimator's Reference Manual," ISBN 0-47-30510-3, is available for new students for \$190 and may be purchased by calling (800) 248-3248.

For more information, call DANA EDLER, ext. 4-5825 or AILEEN BATIN, ext. 4-4281.

Special Events Calendar

Ongoing Support Groups

Alcoholics Anonymous— Call the Employee Assistance Program at ext. 4-3680 for meeting 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—Meets 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, December 13

Von Kármán Lecture Series—Dr. Firouz Naderi, Solar System Exploration Program director and Mars Exploration Program manager, will present "The Robotic Exploration of Mars" at 7 p.m. at the Vosloh Forum at Pasadena City College, 1570 E. Colorado Blvd. For more information, visit <http://www.jpl.nasa.gov/events/lectures/dec02.html>.

Saturday, December 14

Caltech Children's Holiday Party—The campus' Winnett Lounge will host this pot luck from 11 a.m. to 2 p.m. The Caltech Women's Club sponsors. Bring your favorite dish to share; paper products and beverages will be provided. There will be holi-

day crafts for children, storytelling and an appearance by Santa. Contact Homaira Majid at (626) 683-3544 or wahid@caltech.edu.

Thursday, December 19

Social Security—A representative will be available for one-on-one counseling. For an appointment, call the Benefits office at 4-3760.

Friday, December 20

Tax Deferred Account Deadline—Salary Reduction Agreements for 2003 must be submitted by today. Web access will close at midnight. For information, call the Benefits Office at ext. 4-3760.

Saturday, December 21

Folk Music—Celtic group Broceliande will perform a special Christmas show at 8 p.m. in Caltech's Dabney Lounge. Tickets are \$12 for adults, \$4 for children under 12. For more information, call (626) 395-4652 or visit the Folk Music Society website at <http://www.folkmusic.caltech.edu>.

Thursday, December 26

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

Thursday, January 2

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

Sunday, January 5

Chamber Music—Soprano Jessica Tivens will perform works by Haydn Liszt, Chopin and others at 3:30 p.m. in Caltech's Dabney Lounge. Admission is free. For more information, call (626) 395-4652.

Cheli warehouse plans a move

Cheli, JPL's storage warehouse, will move from its current location in the City of Bell next year, but if all goes well, you won't even notice.

The 125,000-square-foot facility, temporary home to furniture, computers, flight hardware and myriad other pieces of JPL property, must find new quarters next year. The building's owner, the General Services Administration, has put the property up for sale.

"We are actively pursuing equivalent space," said Bruce Troutman, manager of the Logistics and Materiel Services Section 272, who noted that JPL will vacate the property by

Sept. 30, 2003. "We want to make the move as seamless as possible."

Troutman said May is the target date for acquiring a new storage site, with the move to take place gradually between June and September. For now, he said, "While we are not discouraging movement of property, we ask those who use Cheli to rethink whether they need all their items in storage. We will get rid of it if there's no longer a need for it."

Cheli manager John Beedy noted that during the transition to a new facility, JPLers will have no need to bring their equipment back to the Lab or find their own storage. And service won't be disrupted. "We will still service the Lab with the normal three- to four-day turnaround, with a one-day turnaround for urgently needed items," he said.

For more information about the move, call Troutman at ext. 4-6452 or Beedy at ext. 4-3518.

Multimedia facility breaks ground



From left: Steve Bridges, Audiovisual Services manager; Dr. Charles Elachi, JPL director; Blaine Baggett, executive manager, Office of Communications and Education.

Ground was broken last week for the construction of an add-on and modification to the existing multimedia facility in von Kármán Auditorium. Two stories covering 64' x 20', about 2,560 square feet, will be built south of the studio in Building 186. The new facility is expected to be completed by May 2003, with electronics installation completed by September 2003.

The facility will provide storage for the complete videotape masters library, which currently counts more than 6,500 tapes; provide new non-linear digital television editing rooms; provide space to facilitate conversion to digital television production, including high-definition TV; enlarge the live, multi-camera production control room to better support complex television shows; and provide additional office space.

During construction, von Kármán Auditorium's control room will be utilized for live television and the TV studio floor for video editing. Personnel are housed in a trailer in the loading dock of von Kármán Auditorium. Following

construction, "We will be ready to work on the special television equipment installation around JPL to support the Mars Exploration Rover landings and Stardust encounter in January 2004," noted Audiovisual Services Manager Steve Bridges.

The effort will "support NASA's requirement to convert to digital television, so we can continue to provide the commercial television media and producers with technically compatible video," Bridges said. "It will also support the increased workload due to JPL's increased amount of concurrent missions and programs."



Team members prepare to shoot jelly beans toward the target in JPL's Invention Challenge. Dec. 6, Gary Gray won the JPL division, while Puzier Mountain High School, one of 17 schools to enter, won the student competition.

Where did the jellybeans go?

1 ONE YEAR

By Mary Hardin

TO GO

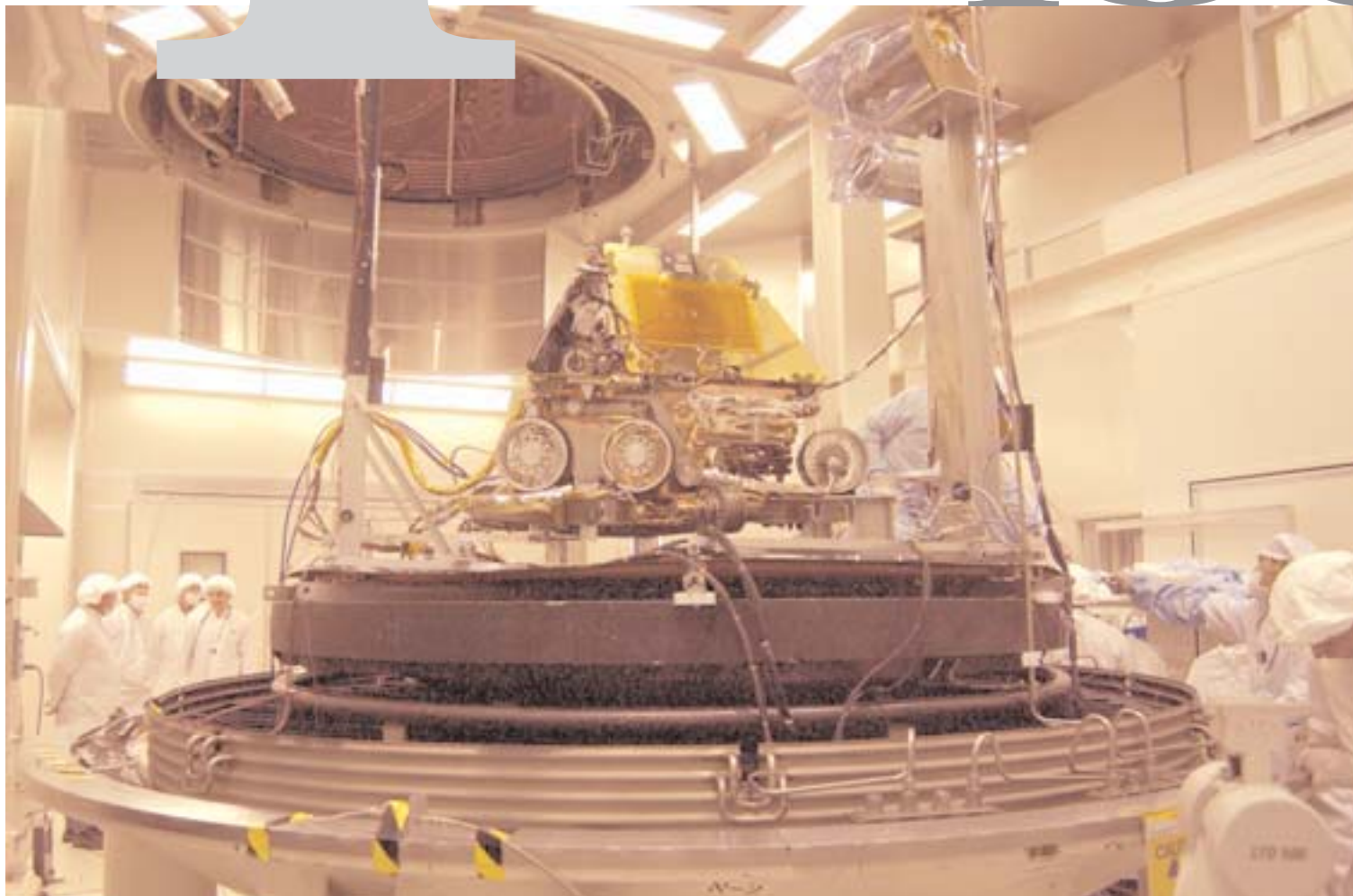


Photo by Bob Brown / JPL Photolab

The Mars Rover 2 undergoes testing Dec. 10 in the Building 248 Space Simulator. The testing chamber is the circular area shown above and to the left of the rover.

MARS ROVERS SCIENCE TEAM

PREPARING FOR JANUARY 2004 LANDING

W

ith just over a year to go before JPL's twin Mars Exploration Rovers land on the red planet, members of the science team previewed the mission's goals and candidate landing sites at a special session of the American Geophysical Union meeting in San Francisco earlier this month.

"The twin rovers will be able to travel the distance of several football fields during their missions. They will carry sophisticated instruments that effectively make them robotic geologists, acting as the eyes and hands of the science team on Earth," said Mission Manager Dr. Mark Adler.

"We are very busy at JPL building and testing the two rovers and the spacecraft that will land them safely on Mars."

Remote sensing instruments will be mounted on a rover mast, including high-resolution color stereo panoramic cameras and an infrared spectrometer for determining the mineralogy of rocks and soils. When interesting scientific targets are identified, the rovers will drive over to them and perform detailed investigations with instruments mounted on a robotic arm.

Rover instruments include a microscopic imager, to see micron-size particles and textures; an alpha-particle/X-ray spectrometer, for measuring elemental composition; and a Moessbauer spectrometer for determining the mineralogy of iron-bearing rocks. Each rover will carry a rock abrasion tool, the equivalent of a geologist's rock hammer, to remove the weathered surfaces from rocks and analyze their interior.

"All the instruments on the payload are undergoing intensive calibration and test activities in preparation for flight," said Dr. Steve Squyres, principal investigator for the science payload at Cornell University, Ithaca, N.Y.

"Once at Mars, the instruments will be used, together with the rover's ability to traverse long distances, to study the geologic history of the two landing sites," Squyres explained. "The scientific focus of the mission is to investigate what role water played there, and to determine how suitable the conditions would have been for life."

NASA scientists are in the process of picking the landing site for each rover. Four sites look the most promising. "Three of the sites, Terra Meridiani, known as the Hematite site; Gusev; and Isidis show evidence for surface processes involving water," said Dr. Matt Golombek, landing site scientist at JPL. "These sites appear capable of addressing the science objectives of the rover missions: to determine if water was present on Mars and whether there are conditions favorable to the



Members of the Mars Exploration Rovers Assembly, Test and Launch Operations team gather around Rover 2 and its predecessor, a flight spare of the Pathfinder mission's Sojourner rover, named Marie Curie.

preservation of evidence for ancient life." The fourth site, Elysium, appears to contain ancient terrain, which may hold clues to Mars' early climate when conditions may have been wetter.

The launch period for the first rover opens May 30, 2003, and the second rover's launch period opens June 25, 2003. The first rover will reach Mars January 4, 2004, and the second arrives January 25, 2004. Each rover will have a primary mission lasting at least three months on the martian surface.

Pictures of the rovers at JPL can be viewed at <http://www.jpl.nasa.gov/mer>. More information about the mission is online at <http://mars.jpl.nasa.gov/mer>.

SEASON'S GREETINGS

Letters

We want to thank Project Galileo for the beautiful flower arrangement at our son Greg's memorial service and thank all who sent cards and memorials and comforted us in our great sorrow.

Bill and Diane O'Neil

We would like to thank our friends and the ERC for the cards and lovely plants they sent. The good wishes and prayers during the recent passing of Judy's father meant a lot to us. Thank you all for the kindness and concern you have all expressed.

Judy and Lloyd Keith

Sincere thanks to all my friends and colleagues at JPL for their support upon the death of my father. The plant is beautiful and will remind me daily of why I'm proud to be part of the JPL family.

Henry Kline

I would like to thank my friends and coworkers at JPL for their expressions of sympathy and support on the recent death of my father. I would especially like to thank the IND community for their support during this emotional time. Your words of comfort, cards, and prayers made this difficult period more bearable. I would also like to thank the Employee Services & Recognition Office for the lovely plant they sent to my home.

Wayne Sible

I would like to express my deepest appreciation to all my friends at JPL for your kind thoughts and cards you sent me during my recent absence.

Thank you Div. 35 for the lovely plant and cards and to Section 387 for your support and cards. Thanks to Marge Marquez, Andre Yavrouian, Dave Bame and Paul Cate for all your help and support. It is nice to know that I have so many friends at JPL who were concerned about me. I miss you all and hope to see you in January if not sooner.

William Neiderheiser

Retirees

The following JPL employees retired in December: Jay Bondi, 50 years, Section 351; Anthony Pearson, 42 years, Section 950; Arthur Franzon, 35 years, Section 350; John Ekelund, 32 years, Section 312; Michael H. Hill, 28 years, Section 313; Robert Holt, 23 years, Section 336; Bill Varga, 20 years; Miles Miller, 16 years, Section 314.

Passings

ROBERT LOWRY, 69, retired Architectural Design Group leader of the Facilities Engineering and Construction Section, died Nov. 22 of liver cancer.

He worked at JPL from 1978-98 and is survived by his wife, Pat; his mother; son Craig; and brother Bill.

Memorial services were held Dec. 7 at New Wine Christian Center in Santa Clarita.

NICKOLAS CLIMES, 67, a retired senior quality assurance engineer in Section 512, died of a heart attack Nov. 23 in northern California.

Climes worked at the the Lab from 1961-2002. He is survived by former spouse Maureen, son Scott, daughter Christy, and three grandchildren.

Classifieds

For Sale

BASS AMP, acoustic, 350 watts, built in graphics equalizer, four 15" woofers, \$425; CAR BED, Little Tykes, like new, \$50; CONCRETE CORING CYLINDERS, great for landscaping, \$.10/each, 626/358-1786, Dave.

CAMERA flash, Minolta auto 280 PX, 35 mm, 3 pin flash attachment with auto setting, exc. cond., \$30. 323/258-7037.

CAT CARRIER, for airplane trips, used only one time, like new, strong and made of light metal/plastics, can carry a fairly large cat, original cost, \$75; sell for \$25. 248-8967, lv. msg.

CEMETERY PLOT, Rose Hills Memorial Park & Mortuary, Lot 277, grave 3 located on Alpine Terrace next to new chapel (gate 1), value \$3,200, sell \$1,800. 626/442-9940, Chris.

CEMETERY PLOTS, 5 Rose Hills, Garden of Autumn, will sell each plot separately if necessary, plots are valued at \$2,100 each, sell for \$1,800 each. 562/404-3464 x230 between 7-4 or 909/986-4611, after 6:00, Janelle.

CHRISTMAS TREE, artificial, 7 ft. tall, beautiful, \$50. 956-1755.

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

COMPUTER DESK/CHAIR, birch finish, \$45; COMPUTER TABLE, rosewood, finish, \$40; ARTIST EASEL, large, \$45; LADDER, wooden; PET CARRIER, small. 626/355-5662.

COUCH, gray/blues/pinks, muted colors, very versatile, with Oak and Brass trim, \$250/obo; DESK, white, 3 drawers, fitted glass top, oval shape, \$75/obo. 626/294-1927, Cheryl.

DINETTE TABLE, 30" x 47", oak, with 2 cushioned oak chairs and 1 oak cushioned bench that seats 2, vg cond., \$250; INTELLIVISION CARTRIDGES, 8 original, \$25/all. 626/359-7666.

DRESSER, good cond. \$150. 434-6507, Evelyn. DVD PLAYER, Philips, \$100; BRIEFCASE, aluminum, Zero-Halliburton, \$150; SURFBOARD, Rusty, 7' 1", minigun, \$100. 626/844-9228.

ENTERTAINMENT CENTER CABINET, gd cond., 2 ft. x 2 ft. x 5 ft. high, light wood w/ smoke glass, on wheels, 4 shelves w/bottom drawer for CDs/DVDs, \$100. 626/445-6677, after 6 p.m.

EXERCISE BIKE, AMF Whiteley, ergometer, exc. cond., used only 280 mi., was \$300 new, sacrifice \$150/obo. 248-1793.

FIREPLACE SCREEN, brass, stand alone w/and-irons and tree fireplace tools, \$80/obo. 790-5012.

FIREWOOD, seasoned hard & soft 12" to 20" logs and kindling, you pick and load, in La Crescenta, \$220/cord or \$2/cu. ft. 248-8030.

FURNITURE: dining table, solid maple, oval w/drop leaves, 72" x 41", 2 add'l leaves 12" ea., + table pads, 6 matching chairs & matching hutch, \$550; double bed, matt. & box springs, headboard, 2 night stands and dresser all in blond flame wood, \$100; microwave, Montgomery Ward, \$20; encyclopedia, Collins, publ. 1961, \$20; slide or movie screen, Lenticular, \$10; canning jars, quarts and pints. 626/286-7982.

FURNITURE: recliner, teal, \$49; chair, wicker, peacock, \$29; coffee table, oak, \$19; baby crib, maple, \$29; stroller, pink & gray, \$19; microwave cart, solid oak, \$39; matching oak side table \$19; bookcase, blue, metal, sliding glass doors, 4' w x 3' t, \$89; dispenser for hot and cold water, stand alone model, \$29. 626/798-4510.

FURNITURE: contemporary; couches, 2, 6 foot, \$230; coffee tables: rect. \$35, circular, \$30; stereo cabinet, \$275; table, dining room, with 6 chairs, 2 leaves, \$275. 323/257-7668.

EDUCATIONAL GAME, Geo Safari, with 7 card packs of approx. 18 interactive games each, incl.: basics (animals, insects, nature, ...), geog., math, reading, English, getting ready for school, ages 4-7, vg cond., \$45. 626/303-1927.

GUITAR, Takamine, F-360, acoustic, case, kapo, tuning fork, elec. tuner included, \$300/firm. 626/294-1927, Cheryl.

GUITAR, acoustic, Fender DG-7, 6 string, high gloss natural finish, Meranti back & sides, chrome tuner, exc. cond. \$150/obo. 207-0110.

LASER DISC PLAYER, Pioneer CLD-1070, plays CD, LD, CDV but not DVD, purchased in 1990 for \$400, see for \$100/obo. 248-1549.

LAWN EDGER, electric, \$10. 626/836-4767.

MISC.: quilting frame, \$29; doctor's scale, tall w/ balancing lever, \$49; donut spare tire/wheel T105 80D-13, 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 aluminum 12', \$19; kids rolling duffel bag, multicolor, never used \$19; 3-piece luggage set, Pierre Cardin, \$19. 626/798-4510.

PHONICS GAME / TRAINING, contains videos, cassettes, manuals, a comprehensive course for children through adult, exc. cond., paid \$200, sell for \$100. 626/303-1927.

PIANO, upright, antique, solid wood, \$500/obo. 731-0470.

PICNIC TABLE w/benches, redwood, 70" x 32", gd cond. but needs paint or stain, \$75. 626/445-5214, Bob.

PLOTTER, HP Design Jet 600, 20 MB memory, will take up to a 36" roll, has a roll sheet cutter, \$500/obo. 626/586-0860, Donna.

POOL COVER, solar-warming 'bubble' material, 40' X 20', on roller on wheels, you transport it, \$100/obo. 626/794-9874

PRINTERS for parts: HP Deskjet 912C and 940C, mechanically sound but I/O boards are dead; ink cartridges for 912C (or equiv.); HP Inkjet tri-color print cartridge (hp 51649a), new and partially used B/W and color cartridges; best offer. 951-5952, Dave, after 5 p.m.

REFRIGERATOR, white, '00, \$250. 626/577-7766 or jdone91101@yahoo.com.

ROOSTER, med. size, hatched spring '02, white, unknown breed, pics avail., \$5. 626/794-8737.

SCANNER, brand new Memorex 48u, 48-bit true color flat bed scanner, 600 x 1200 dpi, compatible w/Windows 98/2000/ME/XP, hot plug and play, \$29. 956-3745, Steve.

SEWING MACHINE, Kenmore, \$25. 248-6062

SKI MACHINE, VitaMaster, ski machine with electronic console, \$35. 626/836-4767.

SLEEPER COUCH, off-white pattern, vg cond., mattress in exc. cond., \$200/obo. 626/577-7363.

SNOWBOARD BOOTS, Burton, sz. 5, exc. cond., \$40; BINDINGS, Burton, older but OK, \$20. 952-8455.

SPA, fiberglass w/wood frame, above ground, 7' x 7', accom. 5+ people, 11 jets, electric, w/bar, gazebo, hard (vinyl and foam) cover, \$875. josub1@socal.rr.com

STAMP COLLECTION, from 1950s and 1960 and earlier, approx. 200 U.S. and foreign mounted in album plus approx. 3,000 U.S. and foreign in bulk, \$20. 790-5012.

STROLLER, Graco, gd. cond., \$20; BED FRAME, toddler, + matt., \$20; BACKPACK CARRIER, baby/toddler, \$20; TRICYCLE, booster seat, toys, + much more baby and toddler stuff, all under \$10. 626/836-4767.

TEDDY BEARS, collectors, various Bialoskys from 1985-90, ltd. edition Humphrey Furskin by Xavier Roberts, \$50-\$125. 626/398-3649.

TRAMPOLINE, mini, \$25. 248-6062

TREES: red banana plant, 5' tall, \$60/obo; fish tail, 6' tall, \$80/obo; ficus, braided, in 30" plastic pot, > 10' tall, \$250/obo; ceramic bowl, gray, 2' diam.

w/planted geraniums, \$40/obo. 626/791-6101.

WASHER, by Whirlpool, 2.5 cu. ft., 1 year old, like new, barely used, exc. cond., shipped by buyer, \$215. 323/899-1688.

Vehicles / Accessories

CABLE CHAINS for 255 70R16 tires + similar sz., all-steel construction, extra heavy duty side cables and carbon steel spring rollers, chain tensioners included, easy installation, exc. cond, used twice, \$30/obo. 353-6369.

'02 CHEVROLET Monte Carlo SS, red, 35K mi., must sell, \$20K left on loan, pwr. everything, 75K warranty, 523-6384.

'00 COACHMAN Futura travel trailer, 28 ft., model 2790TB, all welded alum. 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 Expedition XLT, V8 5.6L, silver, exc. cond. in/out, 22K mi., pwr. everything, tow pkg., must sell, \$25K/obo. 487-9654.

'99 FORD Taurus Wagon, metallic silver, great spacious family car, 12 valve V6 3.0L engine, 79K mi., exc. cond., \$7,900/obo. 626/584-1164.

'99 FORD Taurus SE, loaded, power windows and seats, exc. cond., \$4,900. 626/379-3503, Erik.

'98 FORD Taurus SE, DOHC 24-valve V6, 90K miles, white, loaded, leather, CD changer, factory spoiler, \$6,495/obo. 661/424-9441, after 5 p.m.

'97 FORD Thunderbird, V8, 70K mi., beige, auto, all pwr., dealer maintained, exc. cond., \$6,100. 626/793-7937.

'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.

'68 FORD Mustang, hardtop, 289 V8, auto, fac. a/c, p/s, am radio, orig. owner, orig. candy apple red paint, mint cond., runs great, owner manual, fac. invoice, fac. window sticker, fac. sales brochure, gets attention. 248-6489.

'91 HARLEY-DAVIDSON Sportster 883, 19K mi., black, oil cooler, belt drive, good cond., \$4,600/obo. 661/254-8012.

'97 HONDA Civic CX hatchback, orig. owner, clean title, 31K mi., manual 5-spd., a/c, tilt wheel, new tires, Alpine radio/cd, eggplant purple, vg cond., unable to drive due to illness, \$4,500. 952-2852.

'97 HONDA Valkyrie motorcycle, exc. cond., extra chrome, garage kept, purple/white, studded seats, leather bags, many accessories, 23K mi., \$8,100. 957-2852.

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

'93 HONDA Accord LX, 4 dr., looks good, runs good, well maintained, all records available, black, tinted windows, 150K mi., \$4,000/obo. 366-2974.

'91 HONDA Civic DX, manual trans., 5 spd., air, AM/FM stereo/cass., orig. paint/interior, new tires, reduced to \$3,500/obo. 213/229-2980, Ned.

'91 HONDA Prelude SI, black, 5-spd, drives well, orig. owner, well maint., a great car at 235K miles, Blue Book estimate \$2,925, sell \$2,500/ obo. 310/822-8068, lv. msg.

'02 KAWASAKI KX-100 motorcycle, compl. stock, exc. cond., only ridden 5 hrs., orig. paperwork & manual, will throw in FMF TC2 pipe w/spark arrestor, registr. current through June 2003, \$3,000. 626/447-0408 or TeamPnut@earthlink.net.

'99 KAWASAKI Vulcan motorcycle, 1500 classic, 17,000 mi., lots of extras, \$6,600. 626/441-2150.

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

'89 LINCOLN Mark VII LSC, near mint cond., gold w/beige luxury leather interior, JBL sound, alum. wheels, same owner from 12,900 miles, current mileage 125,800, mechanically exc., \$3,200/obo. 323/465-0881, Darryl or beachwoodca@aol.com

'95 MAZDA MPV, 95,000 mi., new timing belt and tires, runs well, \$3,800/obo. 626/447-4028.

'00 MERCURY Cougar, auto., 6-cyl., exc. cond., silver/black, loaded, cloth seats, pop up sunroof, CD player, alloy whls, only 24K mi., great commuter car, \$13,000. 909/952-2540 or 909/980-1702, eve.

'01 TOYOTA Corolla, Sport trim, exc. cond., only 22K mi., 5 spd., silver, alloy wheels, CD player, a/c, pwr. everything, all dealer srvc., still under orig. manuf. comprehensive and powertrain warr., fun to drive, ready to look and run great for many yrs., moving, must sell, reduced to \$11,450. 626/396-1945, lv. msg.

'95 TOYOTA Camry, beautiful cond., 153,000 mi., \$5,000. 626/379-3503.

'83 TOYOTA Supra, 25K mi. on rebuilt eng., 5 spd, manual, am/fm/cass., very reliable, clean inside and out, shiny orig. paint preserved. 957-2852.

'01 VW 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., \$15,850. 626/449-0997.

'96 VOLVO 960 wagon, exc. cond., loaded, auto, moon roof, all power, 6 disc CD/cassette, heated leather seats, white/gray interior, 97K mi., well maint., no accidents, \$12,000. 626/296-3441.

Free

CATS, 2, friendly, fiancé is allergic, 1 long hair and one short hair, affectionate. 661/313-7751.

STEREO EQUIP., 2 big speakers (-15 x 30 x 40"), amazing bass response, great for outside or the aspiring rock band, too big for my apt. 458-0524.

Lost & Found

Lost: GLASSES, gold colored frame. Ext. 4-1133. Found: SCARF, black and red plaid, near 230, on 11/25. Ext. 3-1050.

Wanted

BOY SCOUT MEMORABILIA, buy or trade. 909/948-9595.

HOUSING, temporarily trade house 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 Wash., DC easy access. 703/758-2256.

LAPTOP COMPUTER that can run Powerpoint. 790-5643.

LAPTOP COMPUTER, low cost, to run DOS program. k6sn@arrl.net, Scott.

ROOF BOX, any size, good cond. 626/584-1164.

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

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

WHEELCHAIR, adult size, easily maneuverable for homebound octogenarian. 249-6786.

For Rent

ALTADENA, 3 bd. home, fully remodeled inside/out, carpets, hardwood floors, fireplace, fenced yd. 2-car gar., backyd, covered patio, located in historic Janes cottage area, \$1,700. 213/236-4201.

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

ATWATER VILLAGE, close to 5 and 2 fwys, 2 bd., 1 ba., spacious, parking and laundry, in 6-unit building, no pets, \$850+. 323/660-4223.

GLENDALE, 2 rms. avail., furn., ctrl courtyard w/running fountain, sun deck and gazebo, ba. w/2 sinks & garden view, house priv., util. incl., no drinking/smoking, \$650-\$850. 246-4750.

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

MONTROSE, large 1 bd., 1 ba. condo to lease in Stancrest, near Montrose shops, Vons, theater, hiking trails, grd. flr. by pool/spa, great shaded patio, wash/dry in unit, fireplace, two gyms, entert. rm., woodshop, 2 plng. spots in secure garage, \$1,225. 790-4097.

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

PASADENA, Caltech area, 3 bd., 1 ba., fireplace in liv. rm, kitchen has breakfast nook, bonus room, gardener included, nice neighborhood, \$1,300 + \$1,300 deposit. 805/496-0755.

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 lr w/FP, end unit, frml. d/r, hdwd. flrs., immac. cond., close to schls, \$1,750. 626/396-9024.

PASADENA, 1 bd., unfurn. apt., 105 S. El Molino Ave., hardwood floors, w/ range & refrigerator, uncovered prking in rear, laundry facil., \$900. 626/793-8001 or jaywatkins@earthlink.net.

SIERRA MADRE, room in 1,100 sq. ft., 3 bd. house w/lg. yard/deck, full house priv. including wash/dryer, M/F, non-smoker, no pets prf., \$500 plus shared utilities. 626/355-5265, Sonja.

SIERRA MADRE, townhome-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, \$605 plus 1/2 utilities. 626/355-4838, Heather.

TEMPLE CITY, 1928 English Tudor, remodeled 2 years ago, 2 bd., 1 ba., loft/studio/office, 2-car garage, lg yard, alarm, auto sprinkler, fridge, stainless stove, hdwood/travertine floor, Bachelor Tile fireplace, \$2,000. 626/287-9433.

TEMPLE CITY, 1 bd., 1 ba., lg patio, new carpet & tile, full remodel, \$1,000. 626/287-9433.

Real Estate

ENSENADA, Mexico beach house, 2 bd., 2 ba., fireplace, spectacular view of Ensenada and islands, large store room, living room, custom kitchen with lots of storage, carport, glassed in patio, all furniture and furnishings go with house, \$37,500. 011 52 646 1 77 74 75.

LAKE TAHOE, view of lake fr. beautiful 2 story, 2 bd., 2 ba., timeshare in Incline, sleeps 6, unit 36 week 37, great time of year for annual Reno Air Races, \$3,000. 562/404-3464 x230 betw. 7-4 or 909/986-4611 after 6:00 p.m., Janelle.

SOUTH PAS. townhouse/condo, 2 level, 2 bd., 2.5 ba., living rm., kitchen, fireplace, laun-dry rm., balcony, 2-car attached gar., pool, 1,302 sq. ft., 7 mi./JPL, \$289,900. 949-4120 or 590-6686.

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

CAMPO SAN LUCAS, on the beach, 2 pools, gym, tennis, volleyball, beach grill, short walk to town, 1 bd. + sleeper couch, sleeps 4, full kitchen, a/c, \$750/week. tcfs@aprelx.com.

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

COSTA RICA, Pueblo Real, Quepos, 2 bd., 2 ba., condo, fully eq'p'd kitch., tv, vcr, sleeps 6, air, newly remodeled, large pool, tennis, typical restaurant, nr. Manuel Antonio, next to river w/ mangroves and monkeys, close to beach, JPL rates. luisalfaro@earthlink.net or 760/723-8522.

HAWAII, Kona, ocean front on Keauhou Bay, house + guest house comfortably sleep 6, 3 bd., 2 ba.; rustic, relaxing, beautiful; swimming, snorkeling, fishing; spectacular vw.; nr. rest-aunts, golf, 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, slps. 6-8, fully equipped kitch., incl. microwave, D/W, cable TV, VCR, phone, balcony w/mtn. vw., Jacz., sauna, streams, fishponds, close to Mammoth Creek, JPL disc. 626/798-9222, 626/794-0455.

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

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