Universe

Jet Propulsion Laboratory

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NASA receives $14.5 billion in FY '02 budget proposal

The White House on Wednesday released a "blueprint" describing the broad outlines of its proposed budget for fiscal year 2002, including $14.5 billion for NASA—some $300 million, or 2 percent, over current funding levels.

Details of the $1.98 trillion federal budget are scheduled to be released April 3. The blueprint includes increased funding for the International Space Station, an increase for the Space Launch Initiative, funds for a more robust Mars exploration program, and funds for Earth missions.

According to Dr. Ed Weiler, NASA's Associate Administrator for Space Science, the blueprint will not only assure funding for JPL's Smart Lander mission to Mars in 2007, but will also strengthen chances of conducting a Mars sample return mission early in the next decade.

At the same time, however, the plan calls for cancellation of NASA's Pluto-Kuiper Express and Solar Probe mission proposals, both managed by JPL. "When the priorities were racked up, and given the fact that the new Administration gives Mars a high priority, the result was that the Mars program is getting an increase, but we're losing Pluto and Solar Probe," said Weiler.

In Earth sciences, the blueprint includes support for the second generation of Earth Observing System (EOS) satellites. The blueprint states, "NASA's out-year plan for these satellites has been underfunded in recent years, but the budget will provide a five-percent increase in 2002 for a science-driver EOS follow-on program while discontinuing low-priority remote sensing satellite and environmental application projects to ensure that EOS priorities can go forward."

The entire "blueprint" document is available to the public via a link on NASA's Web site at *http://www.nasa.gov.* After it is finalized in early April, the proposed budget will go to Congress, where it will be taken up by the House of Representatives' Committee on Science and Committee on Appropriations, and the Senate Committee on Commerce, Science and Technology, and Committee on Appropriations. Final approval and ratification is expected sometime next fall. Fiscal year 2002 begins Oct. 1, 2001.

For more information on how the proposed budget is being received by NASA, read the in-depth interview with Weiler on page 3 of this issue.

Lab supports Engineers Week

By Gia Scafidi

Above: Deborah Vane (left), Deborah Jackson and Shonte Wright spoke to students at local schools as part of National Engineers Week. Right: Vane visits with Wilson Middle School students in Glendale.

In celebration of National Engineers Week last week, three JPL engineers stepped out of their usual work routine to stir up children's interests in the engineering field.

Visiting middle schools in Glendale and Los Angeles, the engineers provided young minds with the reality that engineering is a career well within their reach.

"I think visits like this are really important," said Cynthia Gray, seventh-grade math teacher at Woodrow Wilson Middle School in Glendale. "They open up more opportunities for the students to see where they can go. I wish I would have this when I was a kid."

"This is definitely a positive influence," said Diane Scheller, math department chair at Woodrow Wilson. "I can't tell you how many times the students ask 'When are we going to use this math?' These visits show them that they can use it."

This year, the National Engineers Week theme, "Introduce a Girl to Engineering Day," focused on the need for more girls to consider engineering careers. According to the National Society of Professional Engineers, which began the week-long event back in 1951, "research shows that girls and young women lose interest in subjects and the fields of study leading to engineering careers long before they enter college."

"Unless they're individually inspired to go into science, girls may not know that this field isn't only for males," said Deborah Vane, deputy principal investigator on JPL's CloudSat mission. Vane spoke with two groups of seventh- and eighth-grade math students at Woodrow Wilson.

At Hollenbeck Magnet School in East Los Angeles, Shonte Wright, a thermal engineer in JPL's Thermal and Propulsion Engineering Section, felt it was also important to let students know that the engineering field is comprised of people with a variety of different backgrounds. "Quite often I encounter inner-city children who have never considered a career in science and engineering because they've never met engineers and scientists with backgrounds similar to their own."

"Having never had this kind of exposure when I was growing up, it was hard for me to envision myself doing what I now do for a living," noted Deborah Jackson, a member of JPL's Intelligent Instruments and Systems Technology Group. "These students have the advantage of being introduced to the field early on." Jackson visited students at Mark Twain Middle School in West Los Angeles.

"I'm really excited to get feedback from the engineers who went out this week," said Kenneth Berry, K-12 education specialist in JPL's Educational Affairs Office, which organized the engineer visits for the first time this year. "I think providing role models who have succeeded in this field is vital, especially at this grade level when children are deciding what they're interested in."

While the students may not have it all figured out yet, the engineers' visits certainly piqued their curiosities. Aside from their inquiries about the actual field of engineering, students' questions ranged from space missions, NASA's Moon landing and aliens, to college requirements, job salaries and living on Mars.

An annual celebration, National Engineers Week involves numerous Fortune 500 companies, professional companies and government entities. JPL's Educational Affairs Office looks forward to participating with other entities and interested parties on Lab next year as well.

Bob Brown /JPL photos

News Briefs

This small mass spectrometer, the first JPL-developed instrument on the International Space Station, measures about 5 centimeters long.

JPL has instrument on space station

The world's smallest high-performance mass spectrometer, delivered last month to the International Space Station by Space Shuttle Atlantis, may play a critical role in detecting leaks outside the orbiting facility.

The JPL-developed instrument will be available in the airlock for use by astronauts during their spacewalks. The device was specifically designed for use outside the space station. It can detect ammonia, rocket propellant, oxygen, nitrogen and water leaks.

The mass spectrometer, about 5 centimeters long (about 2 inches), is part of a shoebox-sized system with software and visual readout called the trace gas analyzer, developed in collaboration with Johnson Space Center and subcontractor Oceaneering Space Systems. The whole unit weighs about 2.3 kilograms (5 pounds) and can be placed on an astronaut's chest pack, where it can point toward areas under inspection. A small screen displays a graph that shows the detection of specific gases and their amounts, indicating to the astronauts a potential safety risk.

"On missions to Mars and beyond, where commodities will be at a premium, miniaturizing devices while maintaining their performance is crucial to mission success," said principal investigator Dr. Ara Chutjian of JPL. "We feel the device is very versatile and envision it being used in a cabin or airlock both for long-duration human flight missions and for planetary on-site life detection."

Robotics volunteers sought

Volunteers are sought to assist in the For Inspiration and Recognition of Science and Technology (FIRST) robotics competition, a fast-paced and fun event that allows high school students to team up with engineers from businesses, universities and research institution. Students get a hands-on, inside look at the engineering profession as they design and build their own "champion robot."

From technical advisors to referees to crowd control, there are many ways for JPLers to help out. To see a list of positions for which volunteers are needed, log on to *http://www.jpl.nasa.gov/pso/first.*

To get involved with the competition, contact the Public Services Office at ext. 4-0112.

Machine-Aided Indexing available

JPL personnel are invited to take advantage of a NASA-developed tool that assists in the analysis, classification, and management of information.

The Machine-Aided Indexing system is a Web-based interactive tool for analyzing and indexing the subject content of technical documents. At the heart of the application is a natural language processor that can accept any user-supplied text as input, including abstracts, full-text documents or Web pages. Within seconds, text copied to the Web-based input screen is analyzed and a ranked listing of subject terms results.

The 18,000 terms of the NASA Thesaurus serve as the foundation for the extensive knowledge base used by the system. The new tool also incorporates a fully searchable and browsable form of the NASA Thesaurus, hierarchies and definitions included.

To access the system, log on to *http://www.sti.nasa.gov/nasaonly/webmai*.

Property storage audit underway

By Mark Whalen

Take those office supplies out of the ventilation ducts. And don't even think about going to the local hardware store to buy a storage shed.

In concert with the Laboratory's ongoing annual inventory of accountable property is an effort to streamline the way JPL property is stored.

"Annually, all JPL employees are required to perform a property inventory; part of that is putting things in storage," said Bruce Troutman, manager of the Logistics and Materiel Services Section. "This 'housekeeping' is part of protecting government property."

A Lab-wide cleanup effort began in mid-February and will continue through at least May 18. Started in the mesa area, this inspection covers seven distinct areas of the Lab. Each area will take two weeks to cover. All buildings, including basements, ventilation ducts and storage containers, will be looked at to assure that property is stored properly and safely.

Part of the effort is to educate JPL staff about storage of property at the Cheli warehouse, the Lab's current 11,000-square-meter (120,000 square foot) facility in the city of Bell.

Troutman said anything acquired with government funds that is considered excess should go to Cheli. Without authorization from the Facilities Division, employees may not purchase storage containers to use for idle property.

"If a piece of property is used every week or two, we don't challenge it being stored properly on Lab," added John Beedy, supervisor of the Property Accountability Group. "If it's something that's used once a year, then it's a candidate for storage at Cheli."

Records are not to be sent to Cheli; rather, they should be stored at the JPL Archives and Records Management Facility in Pasadena, which is operated by Sherikon Space Systems. Inc.

Cheli is managed by JPL and is leased by Caltech from the General Services Administration. Items stored there are released only to their owners.

"In recent years, the way Cheli is operated has changed," Troutman said. "The fear people have had in the past is, 'I need it tomorrow, but can't get it until next week.' That's not true. The Transportation Group is available to deliver property to and from Cheli every day if needed."

Troutman said that management improvements at the facility include an Oracle-based inventory system.

In addition to encouraging usage of Cheli, Troutman indicated that a study has been undertaken by Property, Facilities and the Engineering and Science Directorate to identify possible sites for on-Lab storage and the possibility of establishing an off-site storage location close to JPL. To support this study, organizations should identify their storage needs to their facility representative.

Staff invited to movie screening

JPL personnel are invited to a free advance screening of a new Warner Bros. film, *The Dish,* on Thursday, March 8 at 7:30 p.m. in Hollywood.

The movie tells the true story of a group of eccentric scientists staffing a satellite dish inauspiciously located on a remote Australian sheep farm. On the eve of the historic first lunar landing on July 19, 1969, NASA finds the Aussie apparatus is the only receiving dish on Earth capable of broadcasting images of humanity's first steps on the Moon. With help from a colorful cast of local officials and townsfolk, the unconventional Australian crew struggles to overcome a series of mishaps and play their crucial part in one of mankind's greatest achievements in a gripping, emotional and truly funny way.

To RSVP and receive the theatre location, e-mail your full name to *thedish@gsemg.com.*

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.

End of Life Issues and Bereavement—Meets the second Monday of the month at noon in Building 111-117. Call the JPL Employee Assistance Program at 4-3680.

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 the first Tuesday of the month in Building 167-111. For information, call the Employee Assistance Program at ext. 4-3680.

Fri., March 2–Sun., March 4

Othello—This Theater Arts at Caltech production will be presented in Ramo Auditorium at 8 p.m. Friday and Saturday, 2 p.m. Sunday. Tickets are $15. Call (626) 395-4652.

Saturday, March 3

Caltech Theater Auditions—JPL employees, retirees, and family members are invited to audition for the Theater Arts at Caltech production of *Six Characters in Search of an Author*. Auditions will be held in Ramo Auditorium from 2 to 4:30 p.m. The play will be performed during spring term on three consecutive weekends beginning May 25. See *www.its.caltech.edu/~tacit* for related information.

Rainforest Odyssey—In a program designed for children, the David Taylor Dance Theatre explores the magic, mystery and fragility of South America's rain forests and the Amazon's indigenous peoples. To be held at 2 p.m. in Caltech's Beckman Auditorium. Tickets are $10 for adults, $5 for children. Call (626) 395-4652.

Sunday, March 4

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

Tuesday, March 6

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

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

"Power Etiquette: What You Don't Know Can Kill Your Career"—Author Dana May Casperson will discuss her book at noon in von Kármán Auditorium. Sponsored by the Director's Advisory Council for Women in celebration of Women's History Month.

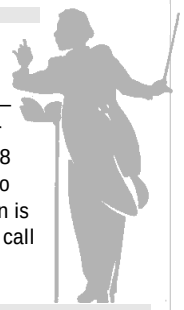
Wednesday, March 7

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

Thursday, March 8

JPL2001 Lecture Series—Principal Investigator Dr. Dave Diner will discuss the Multi-angle Imaging SpectroRadiometer's (MISR) first 15 months in orbit at 11 a.m. in von Kármán Auditorium.

Friday, March 9



Caltech-Occidental Symphony Orchestra—A program to be determined will be held at 8 p.m. in Caltech's Ramo Auditorium. Admission is free. For information, call (626) 395-4652.

Saturday, March 10

Celtic Roots—This program, to be held at 8 p.m.in Caltech's Beckman Auditorium, will explore the roots of Scots-Irish traditional music in a medieval and folk style. Tickets are $25, $21 and $17; youth high school age and under, $10. For information, call (626) 395-4652.

Sunday, March 11

Chamber Music—Susan Greenberg, flute; Belinda Broughton, violin; Simon Oswell, viola; and Ronald Leonard, cello; will perform a free concert at 3:30 p.m. in Caltech's Dabney Lounge. For information, call (626) 395-4652.

Tuesday, March 13

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

Wednesday, March 14

"Chloroflurocarbons, Climate Change and the Future of Stratospheric Ozone" —Caltech associate professor Dr. Paul Wennberg will lecture at 8 p.m. in Beckman Auditorium. Admission is free. Call (626) 395-4652.

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

JPL Toastmasters Club—Meeting at 5:30 p.m. in the Building 167 conference room. Guests welcome. Call Jim Raney at ext. 4-6301.

Friday, March 16

Folk Music—Country-folk singer Katy Moffat will appear at 8 p.m. in Caltech's Dabney Lounge. Tickets are $12 for adults, $4 for children under 12. Call (626) 395-4652.

"Positioning Women For Intrapreneurship In Non-Traditional Roles"—Cristi Cristich, president and chief executive officer of Cristek Interconnects, which manufacturers cutting-edge electronic connectors used in smart weapons, space applications and biomedical devices, will speak at noon in von Kármán Auditorium. Sponsored by the Director's Advisory Council for Women in celebration of Women's History Month.

Travel Film—*Slovenia and Croatia: From the Alps to the Sea* will be presented at 8 p.m. in Caltech's Beckman Auditorium. Tickets are $9 and $7. Call (626) 395-4652.

Corrections

An article in the Feb. 16 issue of Universe on the NEAR Shoemaker spacecraft's landing on asteroid Eros omitted the names of two members of the JPL navigation team: Eric Carranza and John Bordi, both of Section 312.

Also in the Feb. 16 issue, the list of employees who retired in February should have included William Kleinschmidt, who worked at JPL for 20 years and retired from Section 391.

BUDGET BLUEPRINT

By Franklin O'Donnell

The Bush Administration on Wednesday released a "blueprint" outlining the general shape of the NASA budget for the fiscal year 2002, which begins next October. While details will not be released until April 3, the blueprint calls for the cancellation of two NASA mission proposals related to JPL, Pluto Kuiper Express and Solar Probe, while at the same time increasing funding for the Mars program.

Dr. Ed Weiler, NASA's Associate Administrator for Space Science, discussed the budget blueprint following Wednesday's announcement.

QUESTION *The budget statement refers to additional funding for a "more robust" Mars program. What exactly does that mean?*

WEILER As many people know, during the past six months the Mars team at NASA Headquarters and at JPL, along with their partners at universities and in industry, completed a major planning effort looking at what makes a good science-driven Mars exploration program. They ended up with two models. One was a minimal program, while the other was more robust. The last Administration added an extra $300 million in funding, which allowed us to get to the minimal program. The new Administration is looking at funding to get close to the more robust program endorsed by the Mars community. This would allow us to get science done faster, makes resources available to develop new technologies earlier in the program, and so on.

QUESTION *Could you translate that into specific impacts on Mars missions?*

WEILER The details will have to wait until the full NASA budget is released on April 3. But at this point we can say that this will guarantee having a smart lander in 2007. It will also lead to more of a chance of getting a sample return early in the next decade. What is important to me is that it gets us close to being able to do the program that has been endorsed by the Mars community.

QUESTION *What was the rationale for cancellation of the Pluto and Solar Probe missions?*

WEILER There are two factors that drove this decision. First, [NASA's] Office of Space Science has budget problems in 2002. Second, the Mars program is underfunded for what the community has agreed it would like to do. When the priorities were racked up, and given the fact that the new Administration gives Mars a high priority, the result was that the Mars program is getting an increase, but we're losing Pluto and Solar Probe.

QUESTION *NASA had recently announced that it was inviting competitive proposals for ways to do a Pluto mission. What does this budget decision do to that?*

WEILER Essentially it means that we intend to cancel the Pluto announcement of opportunity. We need to notify Congress of our intention to do that, and that is taking place today (Feb. 28).

QUESTION *The budget blueprint talks about "key propulsion technology investments" designed to support a possible "future sprint to the planet Pluto before 2020." What is this about?*

WEILER Here we are asking ourselves, can we develop in-space propulsion techniques that could greatly shorten the trip times for some of these missions? The idea is not to give a vote of no confidence to outer planets research, but rather to rethink how we approach getting there. If you can get there faster, you can really reduce the costs of missions. It may or may not impact the cost of spacecraft development per se, but you may save yourself 10 years of operations costs on a given mission. It also allows you to do science during the same generation as the people who thought the science up. I felt that this was a very positive statement on the part of the Administration in terms of support for science and solar system exploration.

You should also keep in mind that new propulsion technology can open up other possibilities, such as missions to other destinations in the outer solar system. It's not just Pluto. Cassini will be arriving at Saturn and its moon Titan in about three years; if we had new space propulsion, we could get back to Titan for more in-depth study that much sooner. Neptune's moon Triton with its ice geysers is another interesting place. Right now these destinations are hard to get to. Closer to home, it could shorten the trip time to Mars.

QUESTION *How will this be coordinated with existing propulsion research in the rest of NASA?*

WEILER There will be no duplication of effort. I would envision that some of the work would take place in Code R [NASA's Office of Aeronautics] and some in Code S [the Office of Space Science]. There may be some done in-house, but the bulk of the work will be competed to universities and industry.

QUESTION *Do you foresee focusing on any particular propulsion technologies, or ruling any out?*

WEILER All options on the table. I think it would be foolish of us to rule anything out at this point.

If you get the sense I'm excited about this, I am. Building really huge boosters to get great momentum at Earth and then coasting all the way to Pluto isn't the greatest way to get across the solar system. This could affect everything we do in the solar system.

QUESTION *What about other missions and programs?*

WEILER For any mission that isn't specifically called out in this blueprint, things are business as usual. Projects are only vulnerable if their costs get out of control and stay out of control. Basically the message to project managers is, stay on cost or de-scope. We aren't going to do budget contortions to accommodate projects that keep growing in cost.

QUESTION *Do you see space science missions being affected by the budget situation in human spaceflight, such as recently reported space station budget overruns?*

WEILER [NASA Administrator] Dan Goldin has spoken to me personally about this. He is on record as saying that no science money will be used to fund space station overruns. I can guarantee that not only has he talked the talk, but he's walked the walk. My budget hasn't been touched.

In terms of the overall NASA and federal budgets, the new Administration has been very fair to the Office of Space Science, very supportive. I'm really very pleased with where we are going.

"[NASA Administrator] Dan Goldin ... is on record as saying that no science money will be used to fund space station overruns. I can guarantee that not only has he talked the talk, but he's walked the walk. My budget hasn't been touched."

—Dr. Edward Weiler, NASA Associate Administrator, Space Science

Coleman gets the scoop on JPL's Earth studies

theme EARTH

KNBC weatherman Fritz Coleman, second from left, visited JPL last month to discuss the Lab's ocean and climate research programs and media applications of Earth science data. At left is Dr. Timothy Liu of Research Element 3237; to Coleman's right is JPL oceanographer Dr. William Patzert; at right is Marguerite Syvertson, Earth communications and education theme lead.

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 ERC and the Universe office, Bldg. 186-118, or via e-mail to 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

I'd like to thank all of my friends and co-workers who expressed their condolences and support for me and my family during the recent passing of my father.

I'm very grateful for your kind words and wishes. Thank you, ERC, for a beautiful plant.

Alexander "Sasha" Mednikov

On behalf of my husband and myself, I would like to thank the ERC for the plant sent on my father's passing.

Emily Murphy

Passings

PHENEATE LEWIS, 85, retired from Section 370, died of pneumonia Jan. 31.

Lewis worked at JPL from 1969–80. She is survived by her husband, Everette, son Everette Junior, daughter Sandra Cox, five grandchildren and 10 great grandchildren.

A memorial service was held Feb. 5 at Valentine Mortuary in Pasadena. Burial was private.

ELIA ARMENIA, 81, a retired senior computer operator from Section 362, died of heart failure Feb. 13.

Armenia joined the Lab in 1960 and retired in 1984. He is survived by sons Daniel and Charles; daughters Diana Bogart and Gloria Robertson; and 14 grandchildren.

Memorial services were held Feb. 17 at Pierce Brothers in North Hollywood.

WILLIAM "BLAKE" WILSON, 73, a retired engineering associate in the Atmospheric Chemistry Element 3232, died of cancer Feb. 17.

Wilson, a JPL employee from 1977–95, is survived by his wife, Rosemarie; daughter Donna; four stepchildren and four grandchildren.

A memorial service is scheduled for Sunday, March 25 at 4 p.m. at First Baptist Church in Temple City. In lieu of flowers, Wilson's family suggests donations to a memorial fund in his honor that is being set up by the church.

Classifieds

For Sale

AIRLINE TICKETS, (3) Southwest, to anywhere they fly. 714/899-9836.

BBQ GRILL, Sunbeam, gas, with stands on both sides for utensils and plates, cover included, $50. 714/903-8888.

BED, queen size, good cond., w/bedding, featherbed & frame, $125/obo; DRESSER, bedroom, Brazilian rosewood veneer, all wood, 8 drawers, good cond., $60. 891-6836, Steve.

BUNKBED, light pine wood, with mattresses, $200. 248-2931.

BUNKBEDS, white iron, vg. condition, $125. 249-4602.

CLAY POTS, round, large (2-ft and 3-ft diameter), each 2' $50/obo, each 3' $60/obo. 626/398-3480.

COMPUTER, 66 MHz 486-DX2, 16 MB RAM, color monitor, 400 MB hard drive, floppy disk, mouse, keyboard, Windows 3.1, Word 6.0, $100. 626/797-3310, evenings & weekends.

COMPUTER ACCESSORIES: Macintosh 15" multiscan monitor, Apple extended keyboard, Macintosh mouse, must sell by 3/8, $50/obo. 790-5012.

COMPUTER DESK, Sauder, $75. 790-2013.

COPY MACHINE, Xerox, perfect condition w/new toner cartridge, $300; COMPUTER, IBM w/monitor, keyboard and laser printer, make offer; PHONE ACCESSORIES, for Motorola flip phone, 3 chargers, leather case and 3 spare batteries, $70. 626/798-0024.

COUCH, beige, 7 ft., with matching chair in steel blue, wide wale corduroy velour, good condition, $200/obo. 768-4436, after 5 p.m.

ENTERTAINMENT CENTER, 60 x 20 x 48", easily fits TV 36" or smaller, glass cabinet for VCR/stereo, speaker compartments on bottom, sliding storage shelves for CDs/VHS, see photo at ERC, seller can help move, $85/obo. 626/794-2196.

GUITAR, classical, Yamaha mod. CG180SA, Indian rosewood back and sides, solid spruce top, ebony fret board, deluxe SKB case, exc. condition, $300. 626/798-5324.

HOUSEHOLD ITEMS: microwave, Panasonic, 3 yrs. old; TV, 20" Panasonic, 2 yrs old; pocket books, war history; toaster. 388-8178.

LAWN FURNITURE, redwood, 8 pieces, $300/obo; UMBRELLA, blue, w/cushions, $80; BIKES, two boys, Sears, Free Spirit, 12 gear, $50/ea.; TOOL KIT, Jensen, $80; DESK, small, teak, $400. 626/355-1109.

MISC: sectional couch, beige, almost new, $300; coffee table, $75; 4 stacked tables, $200; bar cart, $150; child's bike, toys, etc, best offer. 248-8853.

PAINTING, Kinkade's "Beginning of a Perfect Day", framed, $900/obo. 626/289-3373.

PHONE ACCESSORIES, Nokia 6100 series hands-free kit and car charger, used but in excellent condition, paid $50, sell for $25. 714/903-8888.

RUG, oriental, w/pad, 9' x 12', just cleaned, no defects, must sell, $2,500. 626/798-0024.

SNOW BOOTS, women's size 8, tan color, great for ski trips, only used once, $15. 714/903-8888.

SOFA, slip-covered, excellent condition, oatmeal color background with pale pink roses, 2 cushions, 4 pillows, $150. 626/794-8720, Andy or Lisa.

SOFA/LOVESEAT, brown, excellent cond., $200/both; TABLES, coffee & 2 accent tables, oak w/beveled glass insets, $150/all. 661/254-7443.

TABLE, dinette, square glass top 5'x5' w/ metal feet and 4 matching chairs, $800/obo; BAR STOOLS, four matching, metal frame, all in superb condition, $400/obo. 626/398-3480.

WASHER/DRYER, Whirlpool heavy duty set, exc. condition, both for $400. 626/254-1565.

WINDOWS, aluminum slider for home or mobile home, five 3' H x 5' W $35/each, one 3' H x 8' W $55; one 18 1/2" H x 22 1/2" W $16; STORM WINDOWS, alum. style, 5 each 47 1/4" H x 47 1/4" W $65; CAR SEATS, 4 at $25/ea; UMBRELLA STROLLERS, two, $12/ea.; STROLLER, fold up, $16; SNOW SKI RACK, large car, $75, all are obo. 626/303-5595, Paul.

Vehicles / Accessories

'92 ACURA Legend LS, auto, all options, beige/gold, 84K miles, always garaged, excellent condition, all service records available, low Kelly Blue Book $10,500. 236-4869, after 5 p.m., Harold.

'00 BMW 328i, automatic, power leather seats, CD, am/fm stereo, auto rain sensor, moonroof, power everything, premium pkg., 12,000 miles, a/c, like new, $33,000. 909/599-3230.

'95 CHEVROLET Lumina minivan, 36K, 7 passenger, metallic blue, LS package, ac/ps/pb/tilt /pdl, rear air, cruise, AM/FM/CD, ABS, pwr. seat, rack, recent tires, clean, runs good, $8,350/obo. 891-6836, Steve.

'95 CHEVROLET Suburban LT, 4 x 4, exc. cond., pwr. everything, tow package, roof rack, am/fm, CD, cassette, green w/beige leather int., cruise control, theft deterrent, $18,600. 426-4905.

'70 CHEVROLET Chevelle Malibu, 2-dr. hard top, classic muscle car, 1-year-old paint (Chevy medium green), headliner/some interior, window tinting, new chrome on bumpers, tires, motor/trans. mounts, etc. & more, center line rims, 350 engine, automatic, runs great, 159,000 original miles, photos available by e-mail at Pj1mktg@aol.com, $7,600/obo. 626/303-5595, Paul.

'64-66 CHEVROLET El Camino fiberglass bed cover, white, vg. cond, $100; '83-85 MAZDA RX-7 glass moon roof panel, dark tint, with leather cover, vg. cond., $50. 249-5611.

'95 DODGE Neon Highline, 4-dr. sedan, 5 speed, a/c, cruise, power locks, CD stereo upgrade, heated rear window, etc., orig. owner, 68,500 miles, very good condition, $4,600. 626/355-4376, leave message.

'94 DODGE Intrepid sedan, 4 dr., blue, 58K miles, a/c, cruise control, power steering, windows, door locks, new tires, excellent condition, $6,000. 500-0330.

'91 DODGE Grand Caravan, white, 117K miles, 7 passenger, cruise control, power steering, windows, door locks, towing package, new tires, well maintained, $4,500. 500-0330.

'96 FORD F-150, Eddie Bauer long bed, 5-speed stick shift, all power options, a/c, am/fm with Sony CD, nice shell included in price, 71K miles, very clean and well maintained, $8,900. 661/424-9348.

'91 FORD Ranger XLT, long bed w/shell, V6, 5-speed, gd. cond., am/fm/cass., $3,200/obo. 626/296-9073.

'88 FORD Econoline 150 van conversion, V8, 81K orig. miles, 2nd owner, TV, ice chest, new a/c, new tires, very good condition, $3,800/obo. 310/313-2101.

'95 HONDA Accord EX, 5 speed, 4 door, all power options, moon-roof, white, good condition, alloys, tinted windows, cruise control, cass/am/fm, 30 mpg on highway, one owner, $7,900. 626/584-6526, Fred.

'93 HONDA Accord EX, black w/tan int., power windows, doors and sunroof, a/c, CD, automatic, alloy wheels, Blue Book $8,995, sell for $5,500/obo. 626/296-5426.

'83 NOMAD trailer, 25 ft., all systems A-OK, a/c, load levelers and anti-sway bars, $3,300. 882-7914.

'80 PONTIAC Grand Prix, runs well, auto, new battery, 100K+ mi., needs some work, $1,250/obo. 626/398-6564.

'93 SUBARU Impreza L, hatchback, automatic, p/w, p/m, CD, cass., 5 dr., good condition, no mechanical problems whatsoever, 137K miles. 626/222-1725.

TRANSMISSION JACK, 1,000 lb. cap, extends 45" to 71", hydraulic, excellent cond., $100. 249-2944.

'86 YAMAHA F2700 Motorcycle, red and white, sport bike, 15K orig. miles, excellent cond., blue book $2,730, sell $2,200/obo. 626/296-5426.

Wanted

CARPOOLER, for existing carpool, meet at Diamond Bar Park & Ride on Diamond Bar Blvd., work hours M-Th 7:30 a.m.-4:15 p.m., Fridays we leave JPL at 4 p.m. 909/590-2906.

HOME FURNISHINGS: electric pasta maker; wood bookcases; TV set; lamps; cat tree; California king futon, I just moved and need to buy a few things. 626/397-7224, Charlie.

HOUSE / CONDO / APT., 2 bd.,for long-term rent or lease, close to Caltech; must allow aquarium (have renter's insurance). 626/583-4717.

SOCCER PLAYERS, adult females to form a new Glendale Parks and Recs. league. 249-2990 Tracey, eve.

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

WOOD/METAL WORKERS, experienced, with a few hours per week to spare, to help complete flying replica of Wright 1903 'Flyer', a project of the L.A. AIAA; have built 1 replica, tested in the Ames Full Scale tunnel in March '99, want to complete second aircraft by the summer '02 for public demos in '03. 626/794-2141, Fred Culick.

VOLLEYBALL PLAYERS, coed, all levels of play, every Tues. night 8-10 at Eagle Rock High School, $3/night. 956-1744, Barbara.

Free

DOGS: looking for loving home for mini-Dachshunds, 1 black female, 1 brown male, both 8 years old. 626/797-1664.

Lost & Found

Found: BRACELET, gold with brown topez gems, near Bldg. 300. Ext. 4-5870.

For Rent

EAGLE ROCK, 2 bd., 2 ba., + office, hilltop home, laundry, appliances, wood floors, remodeled, view, gated, 5849 Buena Vista Terrace, $1,400. 790-1893.

LA CANADA, room in lovely private home, private bath, garage, kitchen privileges, $450. 952-3382.

LA CANADA/FLINTRIDGE, room, private ba., kitchen privileges, BBQ, pool, off-street parking. 790-1280.

LA CRESCENTA, cozy 2-bd. house w/pool, private, high above Foothill, $1,450. 952-6007.

MONROVIA, room in a house, private bath, full privileges, 12 miles from JPL, no pets, $475. 626/358-7728, after 7 p.m.

PASADENA apt. to share, 4 bd., 2 ba., fully furn., just remodeled, 1/2 mile to Caltech, utilities included, $495. 626/351-9641.

PASADENA, 1 bd., 1 ba., furnished apt., newly renovated, 1/2 mile to Caltech, utilities included, $750. 626/351-9641.

SIERRA MADRE, 2 bd., 1 ba., quiet 6-unit bldg., walk to village, upper unit, $800. 626/355-7318.

SOUTH PASADENA apt. to share, 2 bd., 1.5 ba., secure parking, large bd., near Fair Oaks and 110, $500. 626/799-5512, Mr. Monico.

W. TOLUCA LAKE, charming cottage for 1 or 2 people, enormous bd. w/vaulted ceiling opens into garden; stove, ref., washer, dryer, dishwasher, disposal, enclosed garage; util. incl.; easy fwy. access; cat(s) OK; $1,650. 980-1638, hkline2@msn.com.

Real Estate

HAWAII, Kailua-Kona, Big Island, awesome views from Kahaluu to Kailua Bay, desirable loc.,, 3 bd., 2 ba. on main level, guest suite or office on lower level w/priv. entr.,, Royal Pacific Realty, $340,000. 888/424-7902 (toll free), fax 808/322-6659, e-mail gour@kona.net.

PASADENA condo, 2 master bd., 1.75 ba., fireplace, c/a, updated kitchen, secured 2-car parking, view of trees, great location in Madison Heights, close to Old Town, South Lake shopping district and Caltech, prof. landscaping and amenities include pool, Jacz., rec. room w/kitchen, gym, sauna and barbeques, $159,900. 626/405-2348.

Vacation Rentals

BIG BEAR LAKEFRONT lux. townhome, 2 decks, tennis, pool/spa, nr. skiing, beaut. master bdrm. suite, sleeps 6. 949/786-6548.

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

HAWAII, Maui condo, NW coast on beach w/ocean view, 25 ft. fr. surf, 1 bd. w/loft, compl. furn., phone, color TV, VCR, mcrowv., d/w, pool, priv. lanai, slps. 4, 4/15-12/14 $105/nt./2, 12/15-4/14 $120/nt./2, $10/nt. add'l person. 949/348-8047.

LAKE ARROWHEAD house, 4 bd., 2 1/2 ba., sleeps 10, quiet, secluded, relaxing, snowy, woodsy area of Cedar Glen, http://www.highcountryrents.com/cedar_run.html for pictures/rates, JPLers that book directly with owner get 2 weekends for 1 + cleaning fees, $370/weekend. 626/403-0446, owner.

MAMMOTH, Chamonix condo, at lifts 7, 8, 16, 17, walk to Warming Hut, 2 bd., 2 full ba., sleeps 6, fully equipped elec. kitchen, incl. microwave and extras, f/p and wood, color TV, VCR, cable fm stereo, o/d Jacz., sauna, game & rec. rms., conv. to lifts, shops, events, special midweek rates. 249-8524.

MAMMOTH, Courchevel, walking distance to Canyon Lodge and lifts, 2 bd., 2 ba., sleeps 6, fully equipped unit. 661/255-7958.

MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, slps 6-8, fully equip'd kitch. incl. mcrwv., d/w, cable, VCR, phone, balcony w/mtn. vw, Jacz., sauna, streams, fishponds, close to Mammoth Creek. 626/798-9222 or 626/794-0455.

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

PACIFIC GROVE hse, 3 bd., 2 ba., f/p, cable TV/VCR, stereo/CD, well-eqpd kitch. w/ microwv, beaut. furn, close to golf, bches., 17 Mile Dr. Aquarium, Cannery Row, JPL discnt. 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.

SAN FRANCISCO, Nob Hill honeymoon suite sleeps 2 max, full kitchen, maid service, concierge, reserve early, $125/nite, $750/wk. 626/254-1550.

Universe

Jet Propulsion Laboratory

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Lab warms up to energy crisis

Conservation efforts help hold down consumption

By Mark Whalen

Bob Brown / JPL Photo Lab

Vaji Nasoordeen, manager of the Facilities Maintenance and Operations Section, says turning off chillers in 28 JPL buildings early in the day has helped significantly in the Lab's effort to conserve energy.

THANKS TO CONSERVATION EFFORTS IN PLACE THROUGHOUT THE LABORATORY, JPL IS FARING RELATIVELY WELL DURING THE STATE'S CURRENT ENERGY CRISIS.

Electrical consumption, based on kilowatt-hours, has decreased steadily in the past few months. Between early November and the end of January, the Lab's consumption fell almost 1 million kilowatt-hours, or about 10 percent. "Our initial review indicates that we've reduced the demand measurably from our normal demand at this time of year," said Facilities Division Manager Bruce Fischer.

The energy savings, however, don't translate into dollar savings. Although electrical consumption at the Lab is at its lowest point in several winters, the cost of energy has risen considerably since the onset of the energy crisis. The Lab's bill for January to power provider Edison stood at about $450,000, higher than at any time in the past three years.

In the current deregulated energy market, "There no such thing as cost savings, because we'll be paying a lot more this year—and probably next year—for the energy that we buy," Fischer said. "What we are looking for in our conservation efforts is avoiding even higher bills." Part of the reason for the price hike is a recent decision by the California Public Utilities Commission to raise costs by 1 cent per kilowatt-hour for the 90-day period that began on Jan. 6.

In the case of natural gas, prices have skyrocketed since last fall, most dramatically for the November–December period. The Lab paid about $75,000 for gas in November, but more than $170,000 for December. Still, JPL did its part by lowering consumption by 6.6 percent over that time period.

"We have asked the Associate Director to create a substantial reserve in the Allocated Direct budget to cover our utility costs this year, because we feel the most critical time for energy costs is going to be over the next six months," Fischer said. "When fall comes, we feel there will be more stable rates."

So while the Lab can't control what it pays for energy, it can have a big say in how much energy it uses.

Vaji Nasoordeen, manager of the Facilities Maintenance and Operations Section, said in 28 buildings, chillers—air conditioning units that provide chilled water for building cooling—are being shut down early—about 3:30 p.m.—with minimal, if any, adverse impact to employees in those buildings. "We're also trying to identify buildings that can shut down chillers as early as 3 o'clock," he said.

An energy-saving measure under consideration for the summer months concerns alternate shifts for some workers in energy-intensive buildings—including 144, 150, 170, 248, 277 and 301. Instead of a traditional work-day staff would work a swing or graveyard shift, saving energy usage during peak usage times, which are from noon to 6 p.m. in the summer. Electricity costs are dramatically higher in the summer due to the demand for air conditioning throughout Southern California.

Also helping the cause is that all JPL staff have been asked to turn off lights, computers and peripheral equipment when not in use. In addition, many office buildings have sensors that shut off lights automatically when motion is not detected in a particular area. "Facilities is looking to reprogram some special-projects money to install additional occupancy sensors before the summer," Fischer said.

The Lab is also enforcing the policy calling for heating at 68 degrees, cooling at 78 degrees. "By maintaining this, we can do a lot to manage the air conditioning demand," Fischer said.

In addition, JPL is looking into buying its power from different sources, but no decision has been made as yet.

For the last several years, JPL has purchased natural gas from the Defense Energy Support Center in Virginia, Fischer said. "They could also provide us with electricity; in fact, we looked at buying electricity from them a year ago, but there wasn't enough of a savings for us to justify leaving Edison as a supplier.

"We have put together a set of metrics to show our current consumption and demand, and compare those to previous periods to show the progress we've made. Employees can visit the Facilities Web page (*http://jpl-facilities/660/index.htm*) to access the data," Fischer said. "We will look at all alternatives to find a stable source of power for the Laboratory, for what we consider as reasonable a cost as we can get."

theme SOLAR SYSTEM

Math model cracks the cause of Venus climate change

By Martha Heil

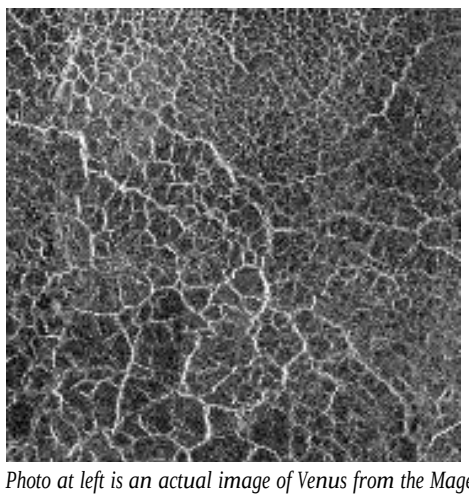
Dr. Sue Smrekar and intern Pierre Moreels have shown how Venus' hot, dry surface has reacted to temperature changes.

A mathematical model of the surface of Venus could show how the hot, dry surface has reacted to changes in temperature throughout the planet's history.Patterns of cracks were found on Venus' 500-degree surface by JPL's Magellan spacecraft in the early 1990s. Using an analysis technique by Pierre Moreels, a French intern at JPL, the patterns proved to be roughly hexagonal. This kind of cracking pattern shows that the surface has heated and cooled by almost 200 degrees Celsius (392 degrees Fahrenheit) over long periods of time.

Moreels adopted a modeling technique that was originally developed for medical imaging to discern individual blood cells, ensuring an accurate count. The technique is called the watershed transformation and has also been used in Earth-observing satellite images of fields.

"The program uses an analogy to the Earth's watershed process to filter out the noise from the radar imaging system on Magellan," Moreels said. "It finds the regions in the surface covered with patterns of multi-sided shapes. The more of these areas of multi-sided shapes we find, the better we can understand the history of climactic change on Venus."

Moreels and his mentor, Dr. Sue Smrekar, a research scientist in JPL's Geophysics and Planetary Geology section, reported their results March 12 at the Lunar and Planetary Science Conference in Houston.



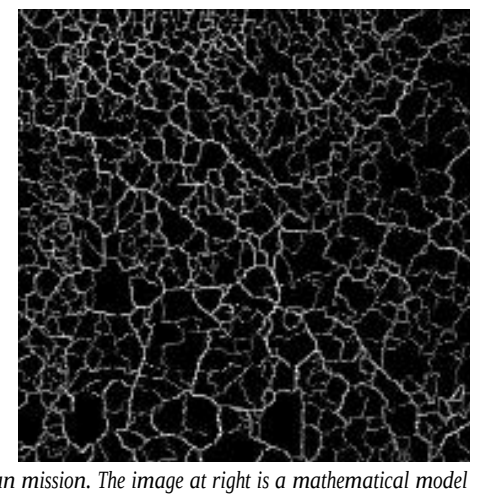


Photo at left is an actual image of Venus from the Magellan mission. The image at right is a mathematical model that filters out recurring radar noise by mapping the cracks into a graph simulating a field of mountains.

The Magellan spacecraft took pictures of large areas of fissures, analogous to cooling basalt fractures on Earth, but on a much larger scale. The mathematical program filters out recurring radar noise by mapping the cracks into a graph simulating a field of mountains—the rougher the surface, the higher the peak. The program fills in the valleys of the simulated landscape, much as rain fills in a lake. This way, small peaks of radar noise are covered over, and only the dramatic changes in the surface's roughness remain.

The program then evens out the edges and connects them. The result is a map of the surface cracks that can easily sort out the number and orientation of the cracks and the area between them. The shapes generally have six sides of different lengths and cover an area more than 100 square kilometers (39 square miles).

Slow heating and cooling globally could have formed large areas of cracks on Venus' surface. A major episode of resurfacing occurred on Venus roughly 700 million years ago, in which water and sulfur levels in the atmosphere rose. Mapping the size and distribution of the cracks will help determine whether they are the result of local or global heating. Other models, in which volcanoes heat the surface or flows erupt on the surface and cool, have difficulties in explaining the size of these polygons.

More information on the Magellan mission is available online at *http://www.jpl.nasa.gov/magellan.*

News Briefs

Siegel elected IEEE Fellow

DR. PETER SIEGEL, supervisor of the Submillimeter-Wave Advanced Technology Group, Section 386, has been elected a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) for his contributions to the field of millimeter and submillimeter-wave radiometry, technology, and spaceborne instruments.

Siegel and his group are contributing to the Earth Observing System Microwave Limb Sounder, an instrument slated to be launched on the EOS Aura satellite in 2003; the Microwave Instrument for the Rosetta Orbiter, for a European Space Agency comet exploration mission; and the NASA heterodyne spectrometer instrument for ESA's Herschel/Planck astrophysics mission, which will be used for a variety of studies including studies of galactic structures and galactic life cycles.

Siegel joined JPL in 1987. The number of IEEE Fellows elected in a year is no more than one-tenth of 1 percent of the total IEEE voting membership of more than 10,000.

Science Advisory Group seeks input

The Space and Earth Science Programs Directorate's (SESPD) Science Advisory Group, which provides advice to the directorate on research-related issues, advocates for JPL research and researchers, and compiles and distributes information of general interest to the research community, seeks comments or suggestions from the Lab's science community.

The group is chaired by Space Infrared Telescope Facility Project Scientist DR. MICHAEL WERNER. Among the group's achievements, he said, is the formulation of a policy recommending that JPL scientists have a substantial role in all small missions managed by JPL, including Small Explorer (SMEX), Medium-Class Explorers (MIDEX), Discovery, and Earth Space Science Pathfinder (ESSP). This policy has been adopted by SESPD.

The advisory group's meeting results are available online at *http://sespd-lib*. Go to "Work Area," then the SESPD Science Advisory Group folder. Recent additions to the site—in the "What's New" folder—highlight programs that bring students and postdoctoral fellows to JPL, a white paper providing guidelines for the generation of press releases based on research results, and instructions for apply for SESPD Bid and Proposal and JPL Technical Infrastructure Funds.

The group's folder includes a membership list. Input may be provided to the group through your division representative or directly to Werner.

The group's next meeting is scheduled for June 5.

Signups underway for summer camp

Registration is now underway for the JPL/Caltech Child Educational Center's summer camp, "Exploring Our Natural World."

Offered for children from 5 through 12 years of age, the camp will be held from June 25 through Aug. 24 at three locations: the CEC site in La Cañada, next to La Cañada High School; Paradise Canyon Elementary School in La Cañada; and the CEC site in Pasadena, near Caltech.

Families may apply for the full summer or for weekly sessions; however, enrollment is limited at each location, so it is important to call early to ensure placement.

The camp will feature daily activities, long-term projects, field trips and science exploration.

For information, call the CEC at ext. 4-3418.

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.

End of Life Issues and Bereavement—Meets the second Monday of the month at noon in Building 111-117. Call the JPL Employee Assistance Program at 4-3680.

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 the first Tuesday of the month in Building 167-111. For information, call the Employee Assistance Program at ext. 4-3680.

Friday, March 16

Folk Music—Country-folk singer Katy Moffat will appear at 8 p.m. in Caltech's Dabney Lounge. Tickets are $12 for adults, $4 for children under 12. Call (626) 395-4652.

"Positioning Women For Intrapreneurship In Non-Traditional Roles"—Cristi Cristich, president and chief executive officer of Cristek Interconnects, a manufacturer of cutting-edge electronic connectors used in smart weapons, space applications and biomedical devices, will speak at noon in von Kármán Auditorium. Sponsored by the Director's Advisory Council for Women in celebration of Women's History Month.

Travel Film—*Slovenia and Croatia: From the Alps to the Sea* will be presented at 8 p.m. in Caltech's Beckman Auditorium. Tickets are $9 and $7. Call (626) 395-4652.

Tuesday, March 20

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

Using Your Home Computer To Do JPL Work—Dr. Laif Swanson, manager of the ICIS Planning & Liaison Office, will discuss how to fill out your timecard, read and send e-mail, and access JPL information from home, including how to get a JPL remote access account, configure your home computer and get the software you need. Held at noon in von Kármán Auditorium. Web slides will be available from the "ICIS Noontime Talks & Events" link in the "News & Events" section of the ICIS home page at *http://icis.jpl.nasa.gov*.

Wednesday, March 21

"To Test or Not to Test: The Comprehensive Test Ban Treaty"—Theoretical physics professor Dr. Sidney Drell will speak at 8 p.m. in Caltech's Beckman Auditorium. Free admission. For information, call (626) 395-4652.

Thursday, March 22

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

JPL Stories—Rosaly Lopes, research scientist and member of the Galileo Near Infrared Mapping Spectrometer team, will speak at 4 p.m. in the customer services area of the Library, Building 111-104. If you have questions about the JPL Story series, call Teresa Bailey at ext. 4-9233.

Von Kármán Lecture Series—Dr. Duane Bindschadler, Galileo's science planning and operations manager, will discuss the mission's latest results at 7 p.m. in von Kármán Auditorium. Open to the public.

Friday, March 23

JPL 2001 Lecture Series—Dr. Ed Smith, senior research scientist in the Earth and Space Sciences Division, will discuss "The Heliosphere: Ulysses Observations at the Ongoing Solar Maximum" at 11 a.m. in von Kármán Auditorium.

Von Kármán Lecture Series—Dr. Duane Bindschadler, Galileo's science planning and operations manager, will discuss the mission's latest results at 7 p.m. in The Forum at Pasadena City College, 1570 E. Colorado Blvd. Open to the public.

Wednesday, March 28

JPL Toastmasters Club—Meeting at 5:30 p.m. in the Building 167 conference room. Guests welcome. Call Jim Raney at ext. 4-6301.

Women's History Month Luncheon—To be held at noon at Brookside Country Club in Pasadena. Author Dava Sobel (right) will discuss her best-selling book *Galileo's Daughter*, which chronicles the life of the astronomer by examining his relationship with his eldest daughter. Tickets are $16; seats are limited. For more information, log on to *http://ood-lib.jpl.nasa.gov/ood-lib/dscgi/ds.py/Get/File-191/Women.doc*. Sponsored by the Director's Advisory Council for Women in celebration of Women's History Month.

Thursday, March 29

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

Bonus awards

Recently, 25 JPL employees were named as Level A Bonus Award recipients. Level A recognizes Lab-wide accomplishments that impact JPL as a whole and achieve one of JPL's significant goals or objectives; enhance JPL's reputation; or advance a field of knowledge.

The $3,500 awards were bestowed for accomplishments that occurred since October 1999. The three-tiered Bonus Award Program was designed to incent and reward accomplishments and behaviors that will ensure future success of the Laboratory: reward outstanding individuals who contribute to achieving JPL's goals and objectives; and increase JPL competitive advantage through strategic pay practices that differentiate high performance.

For more information on the program, log on to *http://eis.jpl.nasa.gov/hr/compensation/bonusawards.html*.

The Bonus Award winners for February:

Section 197: Richard Roessler, Mary Wong.
Section 212: James Prikosovits.
Section 224: Stephen Canell.
Section 260: Jean Walker.
Section 264: Thomas May.
Section 311: Henry Harris.
Section 313: Guy Beutelschies, Curt Henry.
Element 3231: Dr. Michael Werner.
Section 334: Simon Yueh.
Section 335: Richard Gross, Jeffrey Srinivasan.
Section 341: W.K. Reinholtz.
Section 346: Subbarao Surampudi.
Section 351: Wilbur Marner.
Section 352: Donald Moore.
Section 353: James Polk.
Section 383: Jeffrey Oseas.
Section 440: James Graf.
Section 450: William Irace.
Section 506: Burton Sigal.
Section 760: Thomas Livermore.
Section 770: Said Kak.
Section 775: Ronald Zenone.

NOVA awards

The following employees received JPL's Notable Organizational Value Added (NOVA) awards in January:

Section 330: Mae Hawk.
Section 387: Henry Conley, Charles Davis, Arsham Dingizian, John Genofsky, Eric Hochberg, Gregory Lievense, Scott Nolte, David Randall, Lee Wigglesworth.

The following employees received NOVAs in February:

Section 314: Ning Liu, Ray Morris, Dennis Page, Carol Polanskey, Sonserey Rubia, Steven Scott, Recaredo Torres, Vicken Voskanian, Randii Wessen.
Section 368: Carol Scott.

Service awards

The following JPL employees were recently honored for 20 or more years of service:

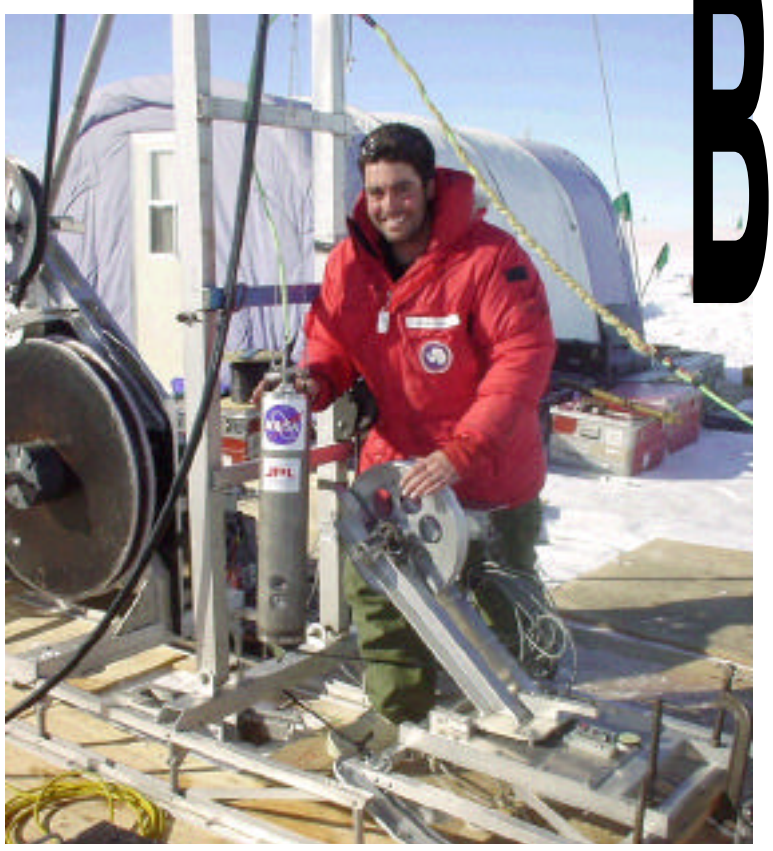
40 years: Herbert Blackhall, Michael Carney, James Conel, Kathleen Myers.
35 years: Olen Adams, Ralph Bartera, Thomas Duxbury, William Kloezeman, M.L. MacMedan.
30 years: James Alexander, Margery Fea, Raymond Frauenholz, Donna Hoffman, Laura Hollis, William Irace, Gerhard Klose, Paul Koskela, Barry Levitt, Francis Mathur, Sharon Pasos, Elena Pestano, David Quinn, Moktar Salama.
25 years: Sandra Bedrossian, Richard Benson, Jeffery Cornish, Michael Girard, Charles Greenhall, Ming-Taun Leu, Eleanor Manning, Merle McKenzie, Ronald Schlaifer, Joseph Toczylowski, Donald Yeomans.
20 years: James Border, Margaret Borzage, Robert Brooks, Lamont Burgess, Kumar Chandra, Stephen Dawson, David Diner, Richard Doyle, Mark Gatti, Susan Gilbert-Hagood, Johanna Gunn, Charles Keith, Gail Klein, Jack Mallory, Jacob Matijevic, Iain McDermid, Ronald Morillo, Patrick Murphy, David Nichols, Hope Norton, Hassan K.P. Shankar, Alfred Pappano, Thomas Runge, Jennifer Schlickbernd, Linda Scott, Roy Scrivner, George Shultz, Steven Wells.

Antarctica *continued from page 3*

changing. By measuring the extent and velocity of the moving ice and estimating its thickness, we can estimate how much ice may be lost into the ocean from Earth's largest storehouse of freshwater. "These calculations are important for understanding Antarctica's contribution to the present rate of sea-level rise of about two millimeters, or the thickness of a dime, a year."

Mission scientists are now developing velocity maps showing the direction and speed of the ice. They have already created the first-ever complete velocity maps of the spectacular Lambert Glacier, a sinuous ice stream more than 500 kilometers (311 miles) long, which reaches speeds of more than one kilometer (about two-thirds mile) a year once the ice spreads onto the Amery Ice Shelf.

They are also beginning to create a new map of Antarctica to compare with the one made in 1997. The process of turning the radar images into map-quality mosaics will take about a year to complete.



BREAKING the ICE

Eight hundred kilometers from the south pole, where the summer temperatures dipped to minus 25 Celsius and the Sun beamed 24 hours a day, JPL's Dr. Alberto Behar and his field colleagues captured the first-ever still and video images deep within Antarctic ice streams.

By Gia Scafidi

THE ANTARCTIC ICE BOREHOLE PROBE MISSION, a collaborative effort of JPL and Caltech, supported by NASA and the National Science Foundation, looked at the dynamics and stability of the West Antarctic ice sheet and served as a stepping stone in the development of technology capable of withstanding extreme ice and liquid environments.

The Antarctic ice sheet, the size of the United States and Mexico combined, holds a potential gold mine of information related to the geological history of Antarctica and the mechanisms by which ice flows from this area to the oceans. Studies show that significant changes in glacier melting and flow rates could considerably impact sea levels and global warming.

"One way to study the dynamics of the West Antarctic ice sheet is to study the fast-moving ice streams and understand their dynamics," explained Behar, JPL's chief engineer on the glaciological investigation. "What sets their speeds, causes them to flow, makes them stop? It's not very well understood yet." He explained that ice streams are essentially like glaciers within the ice sheet.

The three-month investigation took place at Ice Stream C, an area where 150 years ago the ice suddenly stopped flowing, and attention has been drawn to one area in the middle of the stream. This "sticky spot," moving at a rate of 0.02 centimeters (0.008 inches) per day, greatly differs from its neighboring streams, which flow at approximately one meter per day.

Sharing three eight-hour shifts every day, the 11 researchers utilized the ice probe, equipped with lights and two cameras. By way of hot-water jet drilling and reaming, the team made 17-centimeter-wide (6.7-inch) holes in the ice, each hole taking approximately 36 to 48 hours to make. The probe was then lowered more than 1,200 meters (3,900 feet) deep into the water-filled holes via a fiber-optic cable. The team had to finish measurement sequences within four to five hours or the middle of the deep hole would refreeze to a diameter smaller than the probe, causing great problems retrieving the instruments.

By means of snowmobiles, the science team members traveled between their campsite and four different drill sites. They found that the further south they drilled the faster the stream flowed.

"The investigation was a drama unto itself," said Behar. "We were exploring areas never seen before and finding things out never before known in a place that keeps its secrets very tightly."

Over the course of the investigation, the researchers observed what appeared to be a basal water system, or series of water channels under the ice sheet. It's believed that these channels aid in the flow of ice streams. The team calculated that, if these channels existed, the depth of the water basal cavity would be in the millimeter range. On the contrary, at the third drill site, the probe plunged through an "astounding" 1.4 meters (4.6 feet) of water at the base of the stream.

To the researchers' surprise, the study also revealed debris embedded in the ice much higher from the base of the ice stream than expected. Researchers thought they'd find debris no higher than two meters (six feet) off the base. In fact, the visual data showed debris at 26 meters (85 feet) off the base, which Behar said could not yet be explained. The probe's visual images also uncovered a layering effect in the ice, thought to be previously melted and frozen horizons.

"The layered information will turn out to be very interesting," said Dr. Frank Carsey, JPL's principal investigator on the project. "These layers could serve as a calendar or a unit of deformation." Ice sheets move slower than ice streams, explained Carsey, the top moving somewhat faster than the bottom.

All of the team's findings open up the doors to further glaciological research. "As Hermann Engelhardt [Caltech's principal investigator on the project] put it 'With the probe, we've now left the dark ages,'" said Behar.

"This project fits into the bigger picture of planetary ice studies," noted Carsey. "It provides us with some understanding of what goes on deep in ice caps—Earth's ice caps, Martian ice caps and ice caps on Jupiter's moon Europa."

"If we are going to spend $500 million on a space mission to the Mars polar cap or to Europa, we really have to be as certain as possible that the hardware and system will work as planned," said Dr. Arthur Lane, JPL's co-investigator on the project. "These glaciological environments provide us with most of that stressful envelope that allows us to be far more certain we can make the system work properly."

JPL hopes to advance the probe's technology in the next year or two, adding sensors capable of detecting biology in the Antarctic ice sheet, and eventually on other planets. It's known that microbes live under glaciers, where it's warmer and there are nutrients from impurities found between water crystals.

"These locations are very old places, some are hundreds of millions of years old," said Carsey. "The base of an ice sheet in a planetary program is a matter of history and biology."

Until the next challenge, Behar is grateful to have been part of such a successful team effort. "It has been an incredible experience, considering the number of people it takes to pull off one of these projects," he said. "It was challenging, but it was also a great feeling to see a project bear fruit in the field. To see different projects come together and bring back eye-opening data was wonderful."

Above left: Dr. Alberto Behar operates Caltech's hot water drill set. The equipment and tent in background are set on sleds and can be moved to different locations by tractor or snowmobile. Above: A drill hose being deployed into a freshly drilled bore hole.

JPL studies show Antarctica isn't sitting still

By Rosemary Sullivant

Antarctica may appear to be a land frozen in time, but it certainly is not still. Glaciers plow down the continent's center to the sea, icebergs snap off and crash into the ocean, and great rivers of ice snake through the ice sheet, evidence of a dynamic relationship between this remote continent and global climate.

A joint NASA and Canadian Space Agency mission now provides a more comprehensive view of how the Antarctic ice sheet moves and changes, and may help answer some fundamental questions about this mysterious place at the end of the world, including whether the ice sheet is advancing or retreating.

The initial mapping campaign, the 1997 Antarctic Mapping Mission, resulted in the first high-resolution radar satellite map of the continent. The second phase, the Modified Antarctic Mapping Mission, completed last November, once again charted Antarctica with space-based imaging radar. This second mission gives scientists a way to see how the continent has changed over the past three years as well as a wealth of new information on the movement of the most active region,the outer half of the ice sheet.

For the new mission, the Canadian Space Agency's RADARSAT-1 satellite trained its imaging radar on the outer half of the continent twice during each of three consecutive 24-day periods, ending last Nov. 14.

Precise navigation and data from the six passes make it possible to create detailed topographic maps and to measure the speed of the moving glaciers. "Most of the Antarctic ice sheet moves imperceptibly slowly but nevertheless surely," said science team member Dr. Frank Carsey of JPL. "This mission gives us an overall snapshot of how the ice moves and how it is

continued on page 2

Ocean Envoys take education online

By Gabrielle Birchak-Birkman

Classrooms have now become larger thanks to the Internet. JPL is providing online workshops for educators involved in the Ocean Envoys Program. With a click and scroll, interested participants can meet, visit seminars like they would at a conference and have a one-on-one conversation with keynote speakers.

The Ocean Envoys Program consists of volunteer educators who give presentations on JPL oceanography to classrooms, museums, national parks, Girl Scouts, Boy Scouts, service organizations, ham radio operators and other groups. The three-part educational program started in February. JPL and its partner in the venture, College of Exploration, will present the two following series in April and August. "These volunteers really help spread the word about the cool things that NASA and JPL are doing, said Tom Nolan, who works in educational outreach for the TOPEX/Poseidon Project.

College of Exploration is a nonprofit educational organization that designs courses for students of all ages with different kinds of computer capabilities.

College of Exploration's program is global and addresses people from several different countries. That way people can participate when it is convenient for them. It's customer driven," said Nolan.

Peter Tuddenham, the college's executive director, explained that the virtual campus is not just a message board where academia and students meet. "We like to focus on community building," he said. "Learning comes from good conversation and sharing. We are always looking for new ways to transcend learning barriers. We can make an environment where people feel like they belong."

JPL also worked with College of Exploration on the Project Ocean Steward Online Expedition and Teacher Workshop. National Geographic conducted the project with support from JPL and the National Oceanic and Atmospheric Administration Sea Grant program.

"This is the most convenient online conference program I have used," said Nolan. "I would like to invite the rest of the Lab to try College of Exploration for their outreach and training activities."

Those interested in taking part in the Ocean Envoys online workshop can contact Annie Richardson at JPL via e-mail.

View this and previous issues of Universe online

http://universe.jpl.nasa.gov

Universe

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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 ERC and the Universe office, Bldg. 186-118, or via e-mail to 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

I would like to express my warmest thanks to my friends and co-workers for your sympathy and support at the pas-sing of my grandmother. Also, thanks to ERC for the very beautiful plant.

Dee Darrow

We would like to thank our JPL friends for their support and kind thoughts following the sudden passing of Pete's dad. It has meant so much to know friends and family are standing right behind our shoulders, ensuring our ability to move forward. Thanks also to the ERC for sending a lovely potted plant to remind us of his life and love.

Pam and Pete Distaso

I would like to thank everyone at JPL and Acro who supported and prayed and gave a hug during the illness of my father, Benny De La O. Our family greatly appreciated your donations, helping us where needed at the time of his death. Thank you also to the ERC for the beautiful plant sent in his memory.

Roberta Davis and family

I would like to thank my friends and colleagues for their compassion and support over the death of my father, Samuel Laidig. My family and I especially thank both the ICIS and 501 organizations for their donations to the Pasadena Sister Cities Student Exchange Scholarship Fund and the University of California, Berkeley Alumni Scholarship Fund in his honor. Your generosity is deeply appreciated and your kindness a great comfort. Thanks also to the ERC for the beautiful spathiphyllum.

Vicki Laidig

Retirees

The following employees retired in March:

Nathan Burow, 39 years, Section 330; Theodore Moyer, 38 years, Section 312; Jurrie van der Woude, 37 years, Section 181; Richard Messersmith, 34 years, Section 341; Kerry Nock, 31 years, Section 380; Robert Galletly, 18 years, Section 352.

Classifieds

For Sale

AIR CONDITIONER, Kenmore, window mounted, cools liv. rm or bdrm, used 1 summer, bought new for $600, sell $475/obo; COUCH, futon style, queen size, good for starting out, green cover, maple wood color, $70/ obo; TV TABLE TRAYS, $5 each/obo. 626/792-8272.

BABY ITEMS: carrier, Baby Bjorn, blue pinstripe print, only a year old, exc. cond., $50; high chair, Graco, clean, gd cond. but needs seat cushion, $15; stroller, Century 4-in-1, vg cond., pd $175, sell $75; baby exer-saucer, Graco, exc. cond., $50. 626/351-9223.

BEDROOM SET, 3 pc. king, dark wood, $125; DINING SET, 9 pc., cane back, pecan $600; BAR STOOLS, 2, oak, swivel, $125/both; COMPUTER DESK, oak, 47" x 24" x 67", all exc. cond, $175. 626/447-5353.

CLAY POTS, round, large (2-ft and 3-ft diameter), each 2" $50/obo, each 3" $60/obo. 626/398-3480.

COFFEE, top of the line 100% pure sun-dried Kona, hand picked from top-qual. trees, 100% rich, dark roast, ltd supply, discounted 45% at intro price of $21/lb. 626/584-9632.

CRIB, Child Craft, converts to bed w/side dresser, 2 large drawers under bed, includes mattress, exc. condition, $250. 957-3130.

DESK/CHAIR, antique mahogany, rolltop, $1,500; TABLES, 2 custom rod iron indoor/ outdoor, w/heavy glass top, $2,500. 248-8853.

DRAFTING MACHINES, Bruning, model 4000, 31" arm, $75; model 2700, 24" arm, $55; good condition, work well. 249-1112.

FERTILITY TESTS, Clear Plan Easy fertility test sticks, brand new sealed box of 30, expires 5/2002, paid $55, sell for $40. 714/903-8888.

FURNITURE: oak ent. center, $150; sofa and matching chair, $300; sofa table, $50; oak dining table w/6 chairs, $150; and oak dining hutch, $200, all in exc. condition. 248-7097.

GOLF BALLS, used, $.25/ball or donation, money goes to pet rescue organization. 626/792-8272.

LAMPS, 3 big antique wagon wheel hubs, approx 14" tall; light comes through vertical slats for spokes; 2 are old, weathered; one is hand carved; $50 ea. La Verne: 909/593-4046; vivdavies@starquest.net.

LAWN MOWER, reel type, 2.75 HP chain drive, front throw, $75/obo. 626/963-1364.

MISC: sectional couch, beige, almost new, $300; coffee table, $75; 4 stacked tables, $200; bar cart, $150; child's bike, toys, etc., best offer. 248-8853.

REFRIGERATOR/FREEZER, Hotpoint model CSX20EF, side-by-side, 19.6 cu. ft., icemaker, very good cond., $151. 957-3675.

SKI BOOTS, Salomon SX-71, men's size 11, worn only a few times, in original box, $22/obo. 236-4869, eve.

SOFA, brown, velvet, 7 ft., good condition, $175. 626/793-8783.

SOFA/LOVESEAT, brown, exc. cond., $200; CHAIR, swivel, brown, exc. cond., $75. 661/254-7443.

STAMP ALBUMS, Scotts series, U.S. commemoratives, 2 vol. binder, singles & blocks of 4; Scotts The National stamps, 25 vol., binder; Scotts '90 std. stamp catalogue, 4 vol.; Scotts Minuteman U.S. 2 vol. binder; 2 Scotts green binders, new cond.; stamp stock sheets (90) by Vario, made in Germany, new; Scotts border blank sheets (60) for albums, new, 3 x 20; all for $200. 249-1112.

TABLE, coffee, octagonal, beveled glass top with matching end tables, 3 pieces/$150. 661/254-7443.

TABLE, dinette, square glass top, 5'x5' w/ metal feet and 4 matching chairs, $800/obo; BAR STOOLS, 4 matching, metal frame, all in superb cond., $400/obo. 626/398-3480.

TRICYCLE, girl's, fully assembled, exc. cond., w/basket, used for 2 months, $20; EXERSAUSER, $20; ACTIVITY BOARD and table, infant/toddler, $10; CLOTHES & SHOES, reasonably priced, designer, infant/toddler girls. 626/798-6248.

VACUUM, Hoover SteamVac Ultra, 5 brush agitator, in super condition, like new, cost $200, sell for $130. 362-2003, Derek.

WASHER/DRYER combo, Whirlpool Thin Twin, gas dryer, exc. condition, $400/obo. 626/358-7055.

WASHING MACHINE, Maytag lg capacity, vg cond., $100; AREA RUG, Pottery Barn, appr, 5 X 8 ft., ivory w/blue trim lg floral pattern, exc. cond., paid $450, sell for $100. 626/351-9223.

WORKBENCH with vice, $40; LAWNMOWER, $15; COMPUTER DESK, rosewood finish, $50; SOFA, dark green, sm. print, vg. cond., $50. 626/355-5662.

Vehicles/Accessories

'92 ACURA Legend LS, 4-dr. sedan, beige/ gold, auto trans., always garaged, exc. cond, 84K miles, new timing belt &brakes, all service records, Acura/Bose music system, theft deterrent, auto climate control, leather interior, moonroof, $11,300. 236-4869, after 5 p.m.

'00 BMW 328i, automatic, power leather seats, CD, am/fm stereo, auto rain sensor, moon roof, loaded, premium pkg., 12,000 mi., a/c, like new, $32,995. 909/599-3230.

'98 CADILLAC Sedan DeVille, orig. owner, like new, black with gold package, CD, chrome wheels, only 33K miles, priced below Bluebook, $25,000. 248-4647.

'85 CADILLAC Coupe DeVille, runs, current tags and smog, $600/obo. 661/285-9159.

'72 DATSUN 240Z, w/Chevrolet 350, V8, automatic trans., roll bar, 70K, fun car, needs tuning, $2,000/obo. 323/341-4739, jwall@oxy.edu.

'94 DODGE Stealth R/T, white, all pwr., exc. cond., 72,600 mi., $11,000. 505/496-5101.

EQUIPMENT TRAILER, Miller Tiltbed, compl. refurbished, new tires, deck, electrical, brakes, 21,000 lbs. gross vehicle weight, $3,500/obo. 626/798-6249.

'97 FORD Escort LX, auto, air, exc. cond., 76K miles, $5,500/obo. 626/351-9880.

'97 FORD Explorer XLT, only 27,000 miles, exec. cond., new tires, all dealer servicing, $16,000. 626/355-5631, after 5 p.m.

'96 FORD SVT Cobra Mustang, conv., 5 speed, all black, leather interior, stereo w/CD changer, security alarm w/LoJack, clean, well-maintained, exc. cond., no modifications to body or engine, garage kept w/cover, less than 27K miles, $21,000/obo. 626/379-1540.

'91 FORD Ranger XLT, long bed w/shell, V6, 5 spd., gd. cond., AM/FM/cass, $3,000/obo. 626/296-9073.

'91 FORD T-Bird, V8, 32,000 original miles, interior and exterior in exc. cond., new tires and brakes, a must see and drive. 951-3467.

'95 HONDA Civic DX, red, 2 dr., 5 speed, 103,000 miles, $10,000/obo. 362-3358.

'94 HONDA Accord EX wagon, green, 5 spd., a/c, pwr. windows, doors, sunroof, etc.

VTEC engine, 76K miles, $9,500. 626/564-1471, Babar.

'87 HONDA Civic, 2-door hatchback; '83 HONDA Accord, 2-door LX, hatchback, both running, good basic transp. 626/403-0446.

'89 MERCURY Sable, 95K miles, light blue, good cond., 3.8L, V6, power everything, $1,800/obo. 909/902-5664.

'91 MITSUBISHI Eclipse GLX, red/black, 5 spd., turbo, AWD, am/fm/cass., prem. sound, pwr. windows/doors, new clutch, runs great, 1 owner, needs new antenna, 112K mi., $3,000. 626/798-8065.

'95 PONTIAC Firebird, blue/green, T-tops, leather, alloy rims, all power, 135,000 miles, $7,300. 505/496-5101.

'79 TERRY Trailer, sleeps 6, refrigerator/ stove, electric/butane powered, good cond., $1,000/obo. 626/797-6406.

'89 TOYOTA Supra, turbo, V6, 5 speed, 120K miles, new clutch/brakes, sport roof, a/c, p/s, p/w, p/dl, alarm, tilt wheel, cruise, am/fm/CD, ABS, gd. cond., $4,400/obo. 626/449-2007.

'79 VOLVO, brick red, new tires, eng. in great shape, 198K mi., $1,000/obo. 626/791-5376.

Wanted

CRIB and other baby accessories. 626/462-9427, Irina or Dmitry, Irina_Strekalova@hotmail.com.

HOST FAMILY, for a French 16 y/o male high-school student for 1 month this summer, the student likes guitar/surf/tennis, French family could host American student in exchange. Christophe Dumas at 626/564-8483 or Mrs. Colette Larre (larre@nantes.inra.fr).

HOUSING, returning graduate researcher couple, non-smokers, seek 1 bd. from end of May to end of Dec, must allow pets. 720/890-1310 or 303/492-8274, jahm@colorado.edu or jahm@mail1.jpl.nasa.gov, Moriba Jah.

TO RENT: small cottage or guest house. 1 or 2 bd., near Caltech, for a long-term Caltech staffer. 626/286-3705, Mrs. B.

For Rent

ALTADENA, large house on private lot, new kitchen, carpet & paint, 3 bd., 2 ba., den, lg. liv. rm with f/p and formal din. rm, gardener and water paid, close to JPL, 1-yr. lease required, $1,550. 249-8840, Garth Franklin.

ALTADENA, large room, 10 min. from JPL, private bathroom, kitchen and laundry facilities, $475 furnished, $425 unfurnished + utilities. 626/712-3451, Azita.

EAGLE ROCK, furn. room in single family hse, nice area, 10 min/JPL, private entrance & bath, share kitchen & laundry privileges, $350, utilities included. 323/256-1785.

EAST PASADENA, 2-bd. house, 1-car garage, 1 carport, incl. water/trash, no smoking/pets, carpet, blinds, stove, large kitchen, gardener takes care of lawn, avail. 3/25, 1 yr. lease, $1,200 + $1,200 sec. dep. 714/846-6202.

GLENDALE, resident to share exclusive house & location, furnished, central courtyard w/ fountain, deck w/gazebo, bathrm w/garden vw., compl. house privileges and utilities, no smoking or drinking, 15-20 min. to JPL. 246-4750.

LA CRESCENTA, cozy 2-bd. house w/pool, private, high above Foothill, $1,450. 952-6007.

PASADENA home, 2 bd., 1 ba., 1,100 sq. feet, on Hill Avenue with large yard, five minutes from downtown Pasadena, pets negotiable, clean credit and references required, $1,500. 909/941-8159, Scott.

PASADENA apt., 1 bd., 1 ba., furnished close to PCC/Caltech, $825. 626/351-9641.

PASADENA apt., 2 bd., 1.5 ba., townhome style, laundry parking, fully furnished, $1,150. 626/351-9641.

W. TOLUCA LAKE, charming cottage for 1 or 2 people, enormous bd. w/vaulted ceiling opens into garden; stove, ref., washer, dryer, dish-washer, disposal, enclosed garage; util. incl.; easy fwy. access; cat(s) OK; $1,650. 980-1638, hkline2@msn.com.

Real Estate

NORTH GLENDALE house, 4 bd., 2.5 ba., in prime Emerald Isle area, 5 mi. from JPL, attractive front view, spacious back yard, master bd. suite, formal living and dining areas, comfortable family room with wet bar, exc. cond., $568,000. 244-3060.

SUNLAND/TUJUNGA, why pay twice the price for half the house? 15 minutes to JPL, never any smog, seldom even fog at the 1,650-foot elevation of this 3-bd., 2-ba., 2,900 sq. ft. home with loads of extras on a 10,000 sq. ft. level lot, details at http://www.its.caltech.edu/~sharonb/, $349,000. 352-7321.

Vacation Rentals

BIG BEAR cabin, quiet wooded area near village, close to snow play areas, 2 bd., sleeps 8, completely furnished, f/p, TV/VCP, $75/night. 249-8515.

BIG BEAR LAKEFRONT lux. townhome, 2 decks, tennis, pool/spa, nr. skiing, beaut. master bdrm. suite, sleeps 6. 949/786-6548.

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

HAWAII, Kona, on 166 feet of ocean front on Keauhou Bay, priv.house and guest house comfortably sleep 6, 3 bd., 2 ba., rustic, relaxing and beautiful, swimming, snorkeling, fishing, spectacular views, near restaurants, golf courses and other attractions. 626/584-9632.

HAWAII, Maui condo, NW coast on beach w/ocean view, 25 ft. fr. surf, 1 bd. w/loft, compl. furn., phone, color TV, VCR, mcrowv., d/w, pool, priv. lanai, slps. 4, 4/15-12/14 $105/nt./ 2, 12/15-4/14 $120/nt./2, $10/nt. add'l person. 949/348-8047.

LAKE ARROWHEAD house, small 4 bd., 2 1/2 ba., sleeps 10, quiet, secluded, relaxing, snowy, woodsy area of Cedar Glen http://www.highcountryrents.com/cedar_run.html for pictures/rates, JPLers who book directly with owner for 2 weekends get 1 + cleaning fees. $370/weekend. 626/403-0446, owner.

MAMMOTH, Chamonix condo, at lifts 7, 8, 16, 17, walk to Warming Hut, 2 bd., 2 full ba., sleeps 6, fully equipd elec. kit., incl. microwave & extras, f/p and wood, color TV, VCR, cable, FM stereo, o/d Jacz, sauna, game, rec. & laundry rms., covn. to shops, lifts, special events, special midweek rates. 249-8524.

MAMMOTH, Courchevel, walking distance to Canyon Lodge and lifts, 2 bd., 2 ba., sleeps 6, fully equipped unit. 661/255-7958.

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, jacuzzi, sauna, streams, fishponds, close to Mammoth Creek, JPL discount. 626/798-9222 or 626/794-0455.

MAMMOTH, St. Moritz #67, studio condo, great complex & price, wonderful loc. near town, on ski bus route, www.mammothreservations. com/rooms/rooms.html, or call owner direct for a JPL disc. 626/791-5376.

OCEANSIDE condo, fully furnished, 2 bd., 2 ba., fireplace, full kitchen, quiet, relaxing, located at beachside, with great ocean view, sleeps 6, 2-night minimum, available weekly or monthly. 909/981-7492, Jim or Darlene.

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

PACIFIC GROVE hse, 3 bd., 2 ba., f/p, cable TV/VCR, stereo/CD, well-eqpd. kit. w/microwv, beaut. furn, close to golf, bches, 17 Mile Dr., Aquar., Cannery Row, JPL discnt. 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.

SAN CLEMENTE COVE timeshare, half block to beach & pier, sleeps 4, one week from April 1 or May 13, $475. 626/836-3931.

SAN FRANCISCO, Nob Hill honeymoon suite, sleeps 2 max, full kitchen, maid service, concierge, reserve early, $125/nite, $750/wk. 626/254-1550.

Universe

Jet Propulsion Laboratory

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theme STARS AND GALAXIES

Twin Keck telescopes pass first test

By Jane Platt

Photo courtesy Dr. Gerard van Belle

The tired but elated summit crew at the end of the first night of observing light from the linked Keck telescopes. From left are Gautam Vasisht, Rachel Akeson, Mark Colavita, Rick Kendrick, Gerard van Belle, Robert Ligon, Peter Wizinowich, Mark Swain and Andrew Booth.

Proving that two telescopes are better than one, a team comprised of astronomers from JPL and the California Association for Research in Astronomy have gathered the first starlight obtained by linking two Hawaiian 10-meter (33-foot) telescopes.

This successful test at the W.M. Keck Observatory on Mauna Kea makes the linked telescopes, which together are called the Keck Interferometer, the world's most powerful optical telescope system. The project will eventually search for planets around nearby stars and help NASA design future space-based missions that can search for habitable, Earth-like planets.

"Successfully combining the light from the two largest telescopes on Earth is a fabulous technical advancement for science," said Dr. Anne Kinney, director of NASA's Astronomical Search for Origins Program, which includes the Keck Interferometer project. "Using them in this way gives us the equivalent of an 85-meter (279-foot) telescope."

"This is a major step in the creation of a whole new class of astronomical telescopes that will have an enormous impact on future knowledge," said Dr. Paul Swanson, the Keck Interferometer project manager at JPL. "Historically, breakthrough technologies like the Hale 5-meter (200-inch) and the Hubble Space telescopes have made discoveries way beyond the purpose for which they were originally built."

Monday night, March 12, starlight from HD61294, a faint star in the constellation Lynx, was captured by both Keck telescopes and transported across a sophisticated optical system across the 85 meters (275 feet) separating the two telescopes. In an underground tunnel that links the telescopes, the collected light waves were combined and processed with a beam combiner and camera. To properly phase the two telescopes, adaptive optics on both telescopes removed the distortion caused by the Earth's atmosphere. Also, the optical system in the tunnel adjusted the light path to within a millionth of an inch.

Testing of the Keck Interferometer will continue for the next several months. Limited science operations, including the search for planets, are expected to begin this fall. Scientists around the world will soon be invited to propose studies they would like to conduct using the Keck Interferometer. Their proposals will undergo a formal review and selection process.

Since 1995, astronomers have discovered almost 50 planets orbiting other stars. With current technology, they can find very large, Jupiter-like planets, 300 times as massive as Earth, that are located close to their parent stars. Such planets are not likely to harbor life. The Keck Interferometer will be able to detect planets farther from their parent stars, which means their reflected light would be dimmer and harder to detect.

The unique pairing process will help pave the way for future interferometers in space, such as the Terrestrial Planet Finder, which will look for Earth-like planets. "This first light from the Keck Interferometer marks a dramatic step forward and will help us accomplish the ultimate goal of the Origins Program—to search for signs of life beyond by examining the light from 'Earths' orbiting nearby stars," said Dr. Charles Beichman, the Origins chief scientist at JPL.

theme MARS

Odyssey prepares for launch next week

Preparations continue at Kennedy Space Center for the April 7 launch of JPL's 2001 Mars Odyssey, the first launch in NASA's restructured Mars Exploration Program.

Odyssey is scheduled for launch at 8:02 a.m. PDT. It will carry a suite of scientific instruments designed to tell us what makes up the Martian surface, and provide vital information about potential radiation hazards for future human explorers.

The Odyssey team conducted vigorous reviews and incorporated "lessons learned" in the mission plan. "The team has looked at the people, processes and design to understand and reduce our mission risk," said Project Manager George Pace. "We haven't been satisfied with just fixing the problems from the previous missions. We've been trying to anticipate and prevent other things that could jeopardize the success of the mission."

Odyssey carries three scientific instruments to map the chemical and mineralogical makeup of Mars: a thermal-emission imaging system, a gamma ray spectrometer and a Martian radiation environment experiment.

The imaging system will map the planet with high-resolution thermal images and give scientists an increased level of detail to understand how the mineralogy of the planet relates to the landforms.

Odyssey's gamma ray spectrometer will allow scientists to peer into the shallow subsurface of Mars, the upper few centimeters of the crust, to measure many elements, including the amount of hydrogen that exists.

"For the first time at Mars, we will have a spacecraft that is equipped to find evidence for present near-surface water and to map mineral deposits from past water activity," said Project Scientist Dr. Steve Saunders. "Despite the wealth of information from previous missions, exactly what Mars is made of is not fully known, so this mission will give us a basic understanding about the chemistry and mineralogy of the surface."

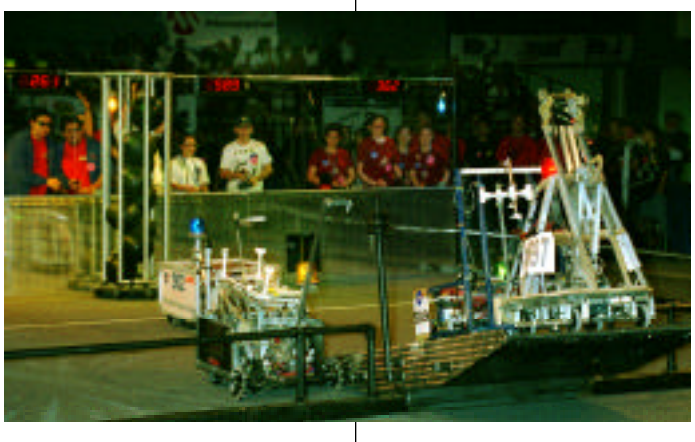
The radiation experiment will be the first to look at Martian radiation levels as they relate to the potential hazards faced by future astronauts. The experiment will take data on the way to Mars and in orbit around the red planet.

After completing its primary mission, the Odyssey orbiter will provide a communications relay for future landers.

theme TECHNOLOGY

Lab lends a hand to kids in robotics competition

By Carolina Martinez



Bob Brown / JPL Photolab

High school students and their robots square off at the FIRST competition at the Los Angeles Sports Arena.

JPL engineers and support staff assisted high-school students from Southern California, Central California and Arizona during a regional robotics competition held March 15–17 at the Los Angeles Sports Arena.

Sixty-six JPLers spent numerous hours helping make the competition possible. About half of the volunteers were engineers who coached and mentored the teams from the beginning of the design stages up to the actual competition rounds. Other JPLers volunteered to staff key positions during the three-day event as referee, judge, time clock monitor and as crowd-control monitors.

The robots took part in the For Inspiration and Recognition of Science and Technology (FIRST) Southern California regional, where 47 robots and nearly 2,000 high school students engaged in all the thrills of competition. FIRST is a non-profit organization whose mission is to generate interest in science and technology.

"This program exposes kids to careers they may not have considered before," said Rob Steele, a JPL robotics engineer and mentor to the student team at Hope Chapel Academy, Hermosa Beach. "In some respects, it's like working on a mission, where each person works on one part or component toward one common goal: mission success."

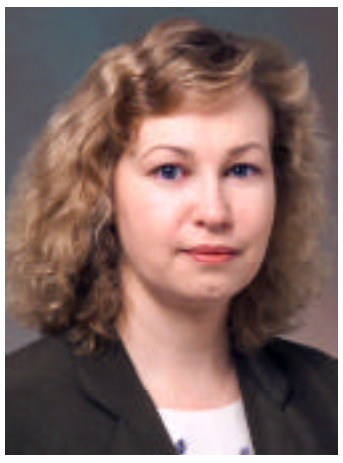
In this case, Steele said, a five-team alliance—Bellarmine College Preparatory, San Jose; Hamilton High School, Chandler, Ariz.; Hope Chapel Academy, Hermosa Beach; Mira Costa, Manhattan Beach; Redondo Union High School, Redondo Beach; and Newbridge High School, Los Angeles—took the championship at the regional and will work together in a national robotics competition at Disney's EPCOT Center in Orlando, Fla., April 5-7.

The regional was one of 13 competitions in the country, in which more than 530 teams competed.

Nationwide, NASA has awarded 100 sponsorships to high schools. Locally, JPL has awarded 24 teams with sponsorships to help competitors in the Southern California regional contest. The Laboratory is sponsoring three of those 24 teams to go to the nationals: Hope Chapel Academy—part of the championship alliance—as well as Archer School for Girls and King Drew Magnet High School of Medicine and Science, both in Los Angeles.

Results of the regional and other information about FIRST are available online at *http:// www.usfirst.org.*

News Briefs



Dr. Victoria Meadows

Team chosen for astrobiology institute

JPL researchers have been chosen by NASA to be one of four new teams that will be part of the agency's Astrobiology Institute, a national and international research consortium that studies the origin, evolution, distribution and future of life on Earth and in the universe.

After a highly competitive peer-review process, teams from JPL, Michigan State University, the University of Rhode Island, and the University of Washington were selected.

DR. VICTORIA MEADOWS will lead the JPL team, which will conduct research on recognizing the biospheres of extrasolar planets. The results of her team's work are expected to directly influence the development of future space missions such as Terrestrial Planet Finder, which will look for habitable planets around other "suns."

"This work will help us determine what the signatures of life on an extrasolar planet will look like, once we have the technology to study them," Meadows said.

JPL has been active in the astrobiology field since 1997 by forming an astrobiology research element, and element lead DR. KENNETH NEALSON was a recipient of the original round of Astrobiology Institute grants in 1998 to study the co-evolution of planets and biospheres.

Children invited on Lab April 26

"You are the Future" is JPL's theme for Bring Your Child to Work Day, which will be held on April 26. Though the national program focuses on girls, the event at JPL is open to all children between the ages of 9 and 17

Signup information can be found on the Human Resources Directorate home page at *http://hr.* Information about the national event is at *http://www.takeourdaughterstowork.org*. The deadline for submitting participation and medical release forms is April 9.

Asteroids get Irish names

JPL asteroid hunter and planetary astronomer ELEANOR HELIN has given Irish names to two asteroids in time for St. Patrick's Day, March 17.

Discovered in July 1987 by Helin, the asteroids have been officially christened by the International Astronomical Union and honor Irish contributions to astronomical research.

One asteroid is named for the Armagh Observatory in Northern Ireland, which is active in the studies of near-Earth objects. The 10,502nd asteroid found, it is called ArmaghObs. Its official designation was 1987 OT.

Another, formerly 1987 QF6, was given the ancient Gaelic name for the town of Armagh, which St Patrick founded in 445 A.D. as "Ardmacha."

Helin, the principal investigator of JPL's Near-Earth Asteroid Tracking program, has had a long association with the Armagh Observatory and she named the asteroids in part to honor that collaboration, and the observatory staff members who have made many contributions to asteroid research.

Eight JPL intelligent systems proposals chosen for development

Eight JPL proposals were recently selected for funding under an Intelligent Systems NASA research announcement.

JPL received partial funding of about $1.5 million for the first year of a three-year cycle for the eight selected and four deferred proposals. Each proposal will receive increased funding, to be determined, in fiscal years 2002 and 2003.

In the competition, six proposals by NASA's Ames Research Center were accepted, with three each awarded to Carnegie Mellon University, Pittsburgh, and the Massachusetts Institute of Technology.

The winning JPL proposals:

• Continual Coherent Team Planning: Many future NASA mission concepts involve teams of tightly coordinated spacecraft/rovers in dynamic, partially understood environments; this task is about developing distributed autonomy in the face of tight coordination requirements. Planning involves using high-level team goals to command a team of spacecraft/rovers that collectively manages the creation and execution of a shared team plan. Dr. Anthony Barrett is principal investigator.

• An Onboard Scientist for Multi-Rover Science Exploration: A unique integration of artificial intelligence planning and machine-learning techniques to autonomously provide both scientific direction and distributed control for a team of rovers. Onboard distributed data-analysis and distributed planning systems enable the team to investigate science goals with little or no ground communication. Dr. Tara Estlin is principal investigator; JPL co-investigators are Drs. Eric Mjolsness, Rebecca Castano and Ashley Davies.

• Autonomous Vision Guided Safe and Precise Landing: This task will develop machine vision algorithms and passive image-based control algorithms that enable safe and precise landing on hazardous terrain. The proposed algorithms will provide estimates of motion- and target-relative position that will be used to guide a lander during precision landing, and will also enable hazard avoidance by providing estimates of 3-D surface topography. Dr. Larry Matthies is principal investigator; co-investigator is Andrew Johnson.

• Using Combinatorial Optimization Algorithms to Improve Automated Planning and Scheduling: Will develop a revolutionary automated planning and scheduling technology that can solve large, complex planning problems faster and better than—and in some cases that are infeasible—for existing planning technology. It will enable more capable onboard planning systems, which are at the core of spacecraft autonomy. Dr. Benjamin Smith is principal investigator; JPL co-investigators are Dr. Steve Chien and Russell Knight.

• Multi-Media Human Computer Interfaces for Mission-Critical Systems: Objective is to expand the collaboration of cognitive and computer scientists to comprehend multimedia interfaces that also include speech and other audio data, textual information and a variety of other modes of communication. Dr. Hamid Kohen is principal investigator.

• Intelligent Engineering Time-Series Pattern Matching: Will develop effective search methods for large-scale time-series data, similar in spirit to an Internet search engine, but for mission sensor data (and more complex types of "keywords"). It is intended for both onboard autonomy and ground-based mission operations. Dr. Dennis DeCoste is principal investigator.

• Autonomous Knowledge Discovery from Simulators: Will develop data mining and knowledge discovery techniques to enable efficient, in-depth exploration and exploitation of large-scale numerical simulators emphasizing two science applications: origins of the planets/long-term behavior of solar system bodies; and magnetospheric dynamics. A unique aspect of this work is that the analysis is not confined to a static dataset; instead, the simulators can be used to generate new data leading to rich opportunities for active learning. Dr. Michael Burl is principal investigator.

• Quantum Entanglement: Revolutionary New Algorithms for Phase Synchronization in Time and Space: This program aims to accomplish development of quantum information theory protocols to synchronize atomic clocks nonlocally and discovery of new quantum algorithms based on distributed entanglement that enable novel sensor and quantum communication technologies. Dr. Ulvi Yurtsever is principal investigator.

Dr. Virendra Sarohia, JPL's program proposal manager for NASA research announcements, noted that more than 100 JPL concepts were evaluated internally to begin the proposal process. A JPL review board narrowed that number down to 66 proposals that were initially submitted the NASA sponsor. JPL was encouraged to submit 48 proposals for full consideration, the highest number of any NASA center.

The four deferred JPL proposals were led by Drs. Steve Chien, who had two; Terry Huntsberger and Michael Turmon.

Special Events Calendar

Ongoing Support Groups

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

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

End of Life Issues and Bereavement—Meets the second Monday of the month at noon in Building 111-117. Call the JPL Employee Assistance Program at ext. 4-3680.

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 the first Tuesday of the month in Building 167-111. For information, call the Employee Assistance Program at ext. 4-3680.

Tuesday, April 3

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

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

Wednesday, April 4

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

Music on the Mall—KTLA traffic reporter Jennifer York and her quartet will appear at noon.

Thursday, April 5

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

JPL Macintosh Users' Group—Meeting at 11 a.m. in Building 180-101. An Apple Representative will give a technical demonstration of MacOS X. For more information, call Jeffery Nunes at ext. 4-8367.

Friday, April 6

All-Mozart Concert—The Caltech Chamber Singers and Chamber Orchestra will perform at 8 p.m. in the campus' Dabney Lounge. Admission is free. For information, call (626) 395-4652.

Bavaria and the Black Forest—This travel film will be shown at 8 p.m. in Caltech's Beckman Auditorium. Tickets are $9 and $7. For information, call (626) 395-4652.

Sunday, April 8

All-Mozart Concert—The Caltech Chamber Singers and Chamber Orchestra will perform at 3:30 p.m. in the campus' Dabney Lounge. Admission is free. For information, call (626) 395-4652.

Chamber Music—The New York Woodwind Quintet will perform at 3:30 p.m. in Caltech's Beckman Auditorium. Tickets are $27, $23, $19 and $15. For information, call (626) 395-4652.

Tuesday, April 10

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

JPL 2001 Lecture Series—Dr. Lee-Lueng Fu, Jason-1 and TOPEX/Poseidon project scientist, will present "Jason-1: Succeeding TOPEX/Poseidon in the Quest for Understanding Ocean Climate" at 11 a.m. in von Kármán Auditorium.

Tues., April 10–Wed., April 11

Investment Advice—TIAA/CREF will hold one-on-one counseling sessions from 9 a.m. to 3 p.m. in T1720. For an appointment, call TIAA/CREF at (877) 209-3140, ext. 2614, or go to the TIAA/CREF Web site at *www.tiaa-cref.org.*

Wednesday, April 11

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

JPL Toastmasters Club—Meeting at 5:30 p.m. in the Building 167 conference room. Guests welcome. Call Jim Raney at ext. 4-6301.

Fidelity Investment Workshop—For employees who are currently participating in their employer sponsored retirement plan and are greater than 10 years from retirement. The goal is for participants to determine whether their asset allocation is in line with their future savings needs. Attendees will be asked to consider whether they are deferring as much as they can, and shown the advantages of incremental changes in their deferral rate and asset allocation. The presentation also describes the importance of reviewing, reevaluating and rebalancing portfolios on a regular basis. To be held from 2 to 4 p.m. in the Building 167 conference room.

"Understanding the World, One Molecule at a Time"—Dr. Stephen Quake, Caltech associate professor of applied physics, will speak at 8 p.m. in Beckman Auditorium. Admission is free. For information, call (626) 395-4652.

Thursday, April 12

Microwave Theory and Techniques Society—Peter Asbeck, professor of electrical and computer engineering at UC San Diego, will discuss "Smarter Power Amplifiers for More Efficient Cell Phones" at Caltech's Moore Laboratory, room 070, 7:30 p.m., following a dinner at Avery Library 6:30 p.m. ($10). For more information, call (800) 275-8765.

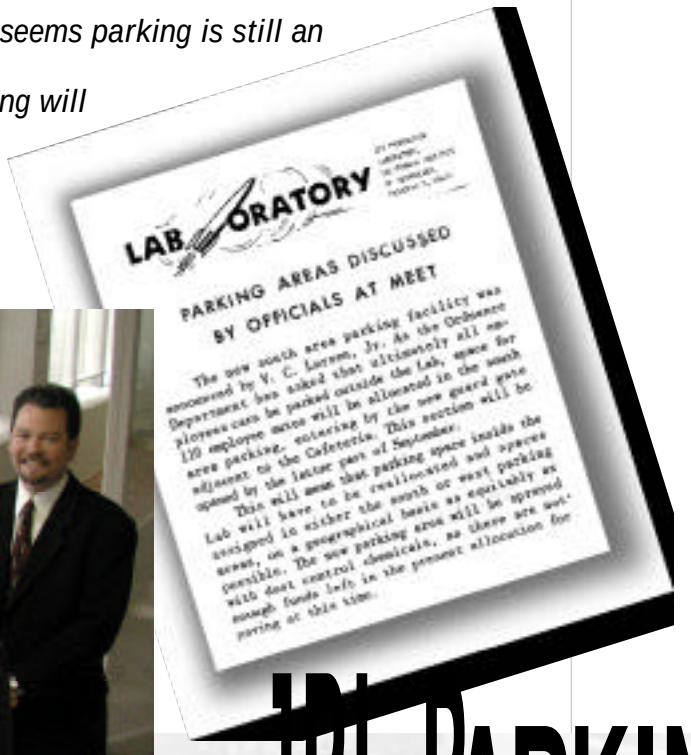
Retirement Plans—A TIAA/CREF workshop will assist newly eligible participants with investment options and in completing enrollment forms at noon in T1720-137.

"Yuri's Night"—A celebration of the 40th anniversary of humanity's entry into space with Yuri Gagarin's historic orbit of the Earth will be held at the Hollywood Palace, 1735 Vine St., from 9 p.m. to 2 a.m. A display booth will feature JPL engineers and scientists. Tickets are $10 if purchased before April 1, $15 if purchased before 10 p.m. April 12, and $20 after 10 p.m. Tickets are available through *http://la.yurisnight.net*, or Sticky Tickets at (800) 464-2275. All proceeds benefit Permission to Dream, a project hosted by the Space Frontier Foundation to give telescopes to inner-city schools and schools in Africa; and Under Africa Skies, a project to send space educators to schools in Africa.

Continuing

"QED"—Alan Alda portrays former Caltech physics professor and Nobel Prize winner Dr. Richard Feynman in a new stage presentation at the Mark Taper Forum in Los Angeles. The production runs through May 13. Regular performances are held Wednesdays through Saturdays at 8 p.m.; Saturdays and Sundays at 2:30 p.m. No performances are held Mondays or Tuesdays. Ticket prices vary. For information, call the Center Theatre Group box office at (213) 628-2772 or log on to *http://www.TaperAhmanson.com.*

Anecdotal evidence has it that parking has been a long-standing issue at the Laboratory. This evidence is anecdotal no more; see inset of a copy of the newsletter "Lab-Oratory," which prominently features a story about parking at JPL in 1951. Fast forward to 2001, and it seems parking is still an issue, and with anticipated personnel growth, the demand for parking will exceed supply in 2003 if no actions are undertaken.


LAB-ORATORY

PARKING AREAS DISCUSSED BY OFFICIALS AT MEET

The new south area parking facility was uncovered by V. C. Larsen, Jr. As the Ordnance Department has asked that ultimately all employee cars be parked outside the Lab, space for 170 employee autos will be allocated in the south area parking, entering by the new guard gate adjacent to the Cafeteria. This section will be opened by the latter part of September.

This will mean that parking space inside the Lab will have to be reallocated and spaces assigned in either the south or west parking areas, on a geographical basis as equitably as possible. The new parking area will be sprayed with dust control chemicals, as there are not enough funds left in the present allocation for paving at this time.


Bob Brown / JPL Photolab

JPL PARKING: ARE WE ALL SPACED OUT?

By Angela McGahan

Adding to the existing concerns over parking lot capacity recently has been the status of the leases for the East and West parking lots. JPL contracts with the City of Pasadena for the East lot in five-year increments. "Although the current contract is due to expire in June 2003, there is no reason to believe that the lease will not be renewed at that time. JPL contracts with the Flintridge Riding Club for the West parking lot, and the lease term expired a few weeks ago. However, the Lab is currently in negotiations with the Riding Club for a subsequent lease extension." said Kirk Dawson, JPL Associate Director for Institutional issues and Chair of the Institutional Management Committee (IMC).

As part of ongoing efforts to resolve JPL's parking problems, Dawson tasked Bruce Fischer, JPL Facilities Manager, to establish a cross-organizational team to consider parking options. Individuals from all Lab Directorates—including both exempt and non-exempt personnel—comprised the Parking Study Team.

The team's goal was to identify new, creative, implementable parking options that will improve the reality as well as the perception of parking at JPL. The team met over the course of four months and grappled with such parking issues as limited supply, increasing demand, and policy guidelines.

In order to gather information and provide the JPL community a forum in which to air their parking-related issues, the team hosted a Town Hall meeting in von Kármán Auditorium in February. As a result of the meeting and written suggestions, the team reviewed, sorted and analyzed more than 350 suggestions, narrowing the options to a list of recommendations that included near- and long-term solutions; some low-cost, others expensive.

The most frequently suggested solution, and one that would go a long way to improving the parking capacity at JPL, was to build multilevel parking structures. Unfortunately, JPL cannot directly fund such a project. "Infrastructure upgrades over $500,000 must be requested through the NASA Construction of Facilities Program. In the past, infrastructure additions such as a parking structure lost out to higher-priority upgrades required to support the program/project work at JPL. The team's work, however, identified the critical need for a parking structure," Fischer explained.

Some of the other frequently suggested solutions, such as requiring parking under all new buildings, and re-striping and reconfiguring the East and Arroyo lots, are currently being implemented. The planned Flight Project Center building (near the corner of Surveyor and Mariner roads), expected to be completed in 2004, will provide 40 to 100 new parking spaces. The Facilities Division has engaged a parking consultant that is currently in the process of evaluating the configuration of the East and Arroyo lots, and will make their recommendations shortly.

Did You Know?

- **JPL has 4,416 parking spaces—2,270 spaces on-Lab and 2,146 off-Lab (East and West lots combined).**
- **Approximately 6,000 people are on Lab at any one time.**
- **882 people arrive in either a carpool or a vanpool on an average day. The carpooling and vanpooling population provides approximately 550 parking spaces to those of us who drive. (From JPL's last Average Vehicle Ridership survey, May 2000.)**

Under the current mantra of "every available parking space needs to serve as an active parking space," storage containers that were taking up valuable spaces are in the process of being removed and relocated. So far 31 storage containers have been removed, making 24 parking spaces available, and the removal campaign will continue.

Some of the low-dollar suggestions to the Parking Study Team include promoting an increase in telecommuting, flextime, and alternative work schedules. The team also considered a recommendation that motorcycle parking rules be reviewed and that motorcycle riders be given incentives in order to generate increased motorcycle ridership, and in turn free up parking spaces for cars. Promoting the La Canada shuttle and expanding and improving the shuttle service, and turning up the volume on rideshare marketing and incentives, are other ways that would translate into more capacity by reducing demand.

On the perception side of the issue, some of the suggestions the team received were to increase parking enforcement and to address policy changes that would focus on the perceived inequities of on-Lab parking eligibility. This team was not specifically tasked to review the current status of JPL's parking policy, but recognized that policy feeds capacity. The team recommended that the IMC should establish a high-level committee with authority to change criteria for on-Lab parking eligibility.

The Parking Study Team presented its recommendations to the IMC on March 22. Although the initial period of information-collecting and analysis is over, the team's work is not finished. It is anticipated that many of the team's members will be called upon to serve on the policy review committee, and members of the team from the Facilities and Security divisions will continue to implement the identified actions.

The implementation of these actions, the feasibility of expanded telecommuting and flex-time and the willingness of the Lab community to expand the use of ridesharing (vanpooling and carpooling) should help reverse the downward trend in parking availability. The JPL community is urged to stay tuned, and stay in touch, as this is the first step into making the parking issue at JPL more anecdotal than evidentiary. You can find the latest information on the status of many of the solutions mentioned in this article by logging on to *http://jpl-facilities/665/section665.html.*

Parking study team members, from left: Helmut Partma (representing 5X), Joe Courtney (6X), Chuck Boles (6X), Page Garcia (8X), John Miranda (6X), Lorna Deady, Section 900; Kirk Dawson (1X), Karen Phillips (2X), Bruce Fischer (6X) and Peter R. Jones (4X and 7X). Team members not pictured are Suzanne Bradfield (19X) and Carl de Silveira (3X). Above right: Parking has been an important issue for Lab employees for a long time, as addressed by this September 1951 article in the "Lab-Oratory," Universe's predecessor.

Space Flight Awareness honorees visit KSC

Four JPL employees attended the launch of Space Shuttle Discovery earlier this month as part of the Space Flight Awareness Program.

Honorees Mona Jasnow, Section 183; Todd Barber, Section 353; Cindy Jeffries, Section 910; and Laura Sergott, Section 250, toured Kennedy Space Center as part of their award.

Discovery carried the three members of the Expedition Two crew to the International Space Station; the first three astronauts to inhabit the orbiting platform returned to Earth aboard Discovery.

The purpose of the SFA Program is to recognize and motivate employees and contractors and to increase awareness in the Space Shuttle/Space Station Program. In 1987, with growing emphasis in the payload area, several NASA centers and contractors who had not previously participated, including JPL, were invited and encouraged to join the program.

The Space Flight Awareness Program is part of JPL's Reward and Recognition Program. For more information, log on to *http://eis.jpl.nasa.gov/sec614/reward.*

From left:Honoree Laura Sergott, Section 250; honoree Mona Jasnow, Section 183; Gael Squibb, Section 900, distinguished guest; honoree Cindy Jeffries, Section 910; John Olivas, astronaut and former JPL employee; and honoree Todd Barber, Section 353.

View this and previous issues of Universe online

http://universe.jpl.nasa.gov

Universe

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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 ERC and the Universe office, Bldg. 186-118, or via e-mail to 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

I would like to thank my friends at TAP and the Discovery Program for their compassion and support during the recent illness of my father and subsequent death. I especially thank Program Office 870, and Shari, for the beautiful floral arrangement that was sent. Your telephone calls of concern for my family were deeply appreciated and your kindness a great comfort.

Esther Cano Rodriguez and family

I would like to thank our JPL friends and colleagues for their sympathy and support following the passing of my father, Bill Fisher. Your thoughts and prayers were greatly appreciated. Our thanks also to the ERC for the beautiful plant sent in his memory.

Terry Fisher and family

On behalf of my family and myself, I would like to thank the ERC for a beautiful plant sent on my mother's passing.

Rabi Wang

I want to thank everyone who arranged my retirement party in von Kármán Auditorium and thank everyone who attended. It was a most wonderful event. I sincerely appreciate all your kind greetings and well wishes. The company, the food, and the program were fabulous. A special thanks to the "Galileo Not Ready for Real Time Players," who pretty much stole the show. The entire event was perfect. It was a great sendoff.

Bill O'Neil

Passings

MARY PHILLIPS, 72, a retired administrative secretary in Section 339, died of cancer Feb. 24.

Phillips joined the Lab in 1970 and retired in 1987. She is survived by five children, 11 grandchildren and seven great grandchildren.

Private services were held in North Carolina.

DAVID BROWNE, 90, the original editor of Universe's predecessor, "Lab-Oratory," died March 3.

Browne worked at JPL from 1951– 55. Memorial services were held March 18 in Pasadena.

WENDELL SMITH, 78, a retired offset pressman in Section 641, died of pneumonia March 16.

Smith joined JPL in 1964 and retired in 1985. He is survived by his wife, Nancy, children Robin and Wendell Jr., and five grandchildren.

Services were private.

Classifieds

For Sale

AIRLINE TICKET, round-trip, anywhere Southwest flies, travel must be completed by May 18, $300/obo. 626/355-3886, Rosemary or Katherine.

BBQ, Sunbeam gas grill, wooden shelves on both sides for food, utensils and plates, cover included, $50. 714/903-8888.

BED, twin, white arched metal headbd. & footbd., exc. cond., $90/obo. 310/670-6830.

BIKE, 20-year-old men's Nashbar, Sport Ex road bicycle, 18 speed, 60 cm frame, good tires, make offer. 626/355-5405.

CELL PHONE ACCESSORIES, Nokia, 6100 series, hands-free kit and car charger, paid $50, sell for $20/obo. 714/903-8888.

COFFEE, Kona, top of the line 100% pure & sun dried, hand picked from top qual. trees, rich, dark roast, ltd. supply, disc. 45% at introductory price of $21/lb. 626/584-9632.

DESK/CHAIR, antique mahogany, roll top, $1,500; TABLES, 2 custom rod iron indoor/outdoor, w/heavy glass top, $2,500. 248-8853.

DESK, roll-top, maple, exc. condition, $500. 249-0283.

FURNITURE: bed, Ethan Allen, queen size maple poster bed, $350; table, maple, Ethan Allan, 48" round, plus center leaf and 4 matching captain's chairs, $300; sofa/sleeper, new, queen, loose pillow, muted tan/purple/blue plaid, $450. 626/355-0989.

FURNITURE: brand new La-Z-Boy sofa, love seat & rocker, paid $1,880, will take $1,500 firm. 541-0131, Gary or Sue.

GRAVE SITES, 4 adjacent plots in Rose Hills Memorial Park, Cypress Lawn section, lot 2842, plots 1, 2, 3 & 4, all for $2,500. 805/739-9204, day or eve.

LAMPS, 3 unique wagon wheel hubs, 2 are old & weathered, 1 is hand carved, all are 13- 14" tall, sitting on one end the light comes through spokes slats, $5 ea./obo. 909/593-4046 or vivdavies@starquest.net.

MICROWAVE, $25/obo; TOASTER, $10/obo; FERN, outdoor, hanging, $10. 626/449-3699.

MISC: sectional couch, beige, almost new, $300; coffee table, $75; 4 stacked tables, $200; bar cart, $150; child's bike, toys, etc., best offer. 248-8853.

MOVING SALE: chest freezer, 15 cu. ft., Kenmore, $125; couch/futon, 52" w x 6' l, $50; bunk beds & mattresses, $100; oak table, 42"w x 5' l & two 17" leaves, w/6 chairs, $700; wood desk w/return, $100; oak ent. ctr. w/cut glass door, 5' w x 55" tall, $300; oak ent. ctr., 5' w x 6' tall, $250; photos at http://www.gg.caltech.edu/~rjacobs/overtheedge/furn01.html. 626/574-0480.

ORGAN, Conn Theatrette 551, type 3, electric, 2 keyboards, foot pedals & cassette recorder, $300. 249-0283.

PIANO, Chickering Grand, mfg. in 1923, gd. cond., beautiful presentation, located at Pasadena-area residence, photo at http://jaw.deepspace.com/piano.html, $3,200/obo. 661/251-6916.

PLANTS; variegated Ficus Benjamina, 4 ft. tall, $25/obo; Kentia Palm, 3 feet tall, very graceful, $35/obo. 626/449-3699.

PRINTER, color inkjet, Compaq IJ1200, brand new, box unopened, 2400 x 1200 res., $100 ($40 less than retail). 353-4400, Brian.

REFRIGERATOR, 17 cu. ft., frost-free, almond, exc. cond., $85. 626/744- 2714, eve.

SCANNER, brand new, never used, still in box, Visioneer 3300, 1600 x 200 dpi, optical resolution, 36-bit color, Win 95/98, Win NT4.0/2000, $80. 626/304-0794, Patty.

SEWING MACHINE, Pfaff Creative 1471 with accessories and instruction manuals, electronic machine with dual feed mechanism, great for quilters, Blue Book price $474, sell for $425/obo. 792-8685, eve.

STOVE, vintage 1940s, cobalt blue, fully restored, new wiring/paint/insulation; has built-in salt & pepper shakers, perfect cond., $3,000. 626/287-9433.

SWING SET and play structure, includes 2 swings, rocket-rider, hoops, monkey bars, climbing rope, slide, playhouse and upper-deck w/ladder, all redwood construction with galvanized lag-bolts for durability and easy assembly, very good cond., orig. price over $1,000, sell $350. 626/303-3719, evenings.

TABLE, dinette, sq. glass top 5' x 5' w/metal feet and 4 matching chairs, $800/obo; BAR STOOLS, 4 matching, metal frame, all in superb cond., $400/obo. 626/398-3480.

Vehicles / Accessories

'92 ACURA Legend LS, auto transmission, all options, beige/gold, 84K miles, always garaged, exc. cond., all service records available, new timing belt and new brakes, $10,800. 236-4869, after 5 p.m., Harold.

'89 CHEVROLET S10 Blazer, V6, auto, 2x2, a/c, pwr. wndws./dr. locks, am/fm/cass., cruise ctrl., tilt whl., tinted wndws., tow pkg., lug. rack, full-size spare, 128K mi., well-maint., $3,800. 626/ 794-1716.

'86 CHEVROLET S10 Blazer, 4x4, 128,000 mi., 1 owner, a/c, pwr windows/locks/steering, trailering hookup, roof rack, tilt steering, cruise cont., runs gd, everything working, gd tires, passed last emission test. $3,200. 661/513-9079.

'94 DODGE Intrepid sedan, 4 dr., blue, 58K miles, a/c, cruise control, power steering, windows, door locks, new tires, exc. cond., $5,000/obo. 500-0330.

'92 DODGE Shadow, automatic, white, 114K miles, a/c, good cond. $3,000. 626/398-7573.

'91 DODGE Grand Caravan, white, 117K miles, 7 passenger, cruise cont., power steering, windows, door locks, tow package, new tires, well maintained, $3,000/obo. 500-0330.

'97 FORD Escort LX, auto, air, exc. cond., 76K miles, $5,500/obo. 626/351-9880, eves. and weekends.

'96 FORD SVT Cobra Mustang conv., 5 speed, all black, leather interior, stereo w/CD changer, security alarm w/LoJack, clean, well maintained, exc. cond., no modifications to body or engine, garage-kept w/cover, less than 27K miles, $21,000/obo. 626/379-1540.

'91 HONDA Civic LX, 165K miles, 4 door, automatic, a/c, power windows/doors, am/fm/cass., well-maintained, exc. transportation, $3,800. 626/332-1597, after 5 p.m.

'96 JEEP Grand Cherokee LTD, V8, 4 w/d, always garaged, exc cond., $17,400. 957-5382.

'91 LEXUS LS 400, 122K mi., $11,000. 790-0697.

'94 MAZDA 626 ES sedan 4 dr., V6, silver w/gray lthr int., auto, a/c, pwr. s/w/d/l, cc, am/fm stereo/cass., ABS, moonrf, alloy whls., exc. cond., all maint. records, $4,950. 830-8993, eve. & wkend. or 903-8979, cell.

'90 MAZDA Miata, convertible, red, 5 speed, with roll bar and 6 spk. audio system, 100K mi., $3,500 obo. 626/798-1990, Bob.

'91 MERCURY Tracer Wagon, red, auto, a/c, roof rack, am/fm/cassette, exc. cond., 90,000 miles, 30 mpg+, $4,000 firm. 626/458-7794.

'92 PONTIAC TransSport SE van, red/black, 109K mi., 6 seats, engine has just 29K mi., good cond., $4,000. 249-6543, after 5 p.m.

'80 PONTIAC Grand Prix, runs well, auto, new battery, 100K+ mi., needs some work, $1,250/obo. 626/398-6564.

'95 SATURN SL sedan, 5 speed, white exterior, gray interior, a/c, 74,000 miles, exc. running cond., good physical condition, 27 city & 37 freeway mpg, am/fm/tape, no accidents, $4,900/obo. 957-5742.

'93 SUBARU Impreza L, hatchback, automatic, p/w, p/m, CD, cassette, 5 dr., good cond., no mechanical problems, 137K mi., $3,400/obo. 626/222-1725.

'89 TOYOTA Supra, turbo, V6, 5 speed, 120K mi., new clutch/brakes, sport roof, ac, ps, pw, pdl, alarm, tilt wheel, cruise, am/fm/cd, ABS, good condition, $4,400/obo. 626/449-2007.

'95 VOLVO 850 GLT wagon, 5 speed, good cond., 102K mi., green/beige, leather interior, theft deterrent, sunroof, winter pkg., child booster seat, AM/FM/tape/6 CD changer, $12,500. 952-9463, evenings.

Wanted

BABYSITTER, part time, for a toddler (boy, 2.5) in Altadena; mother with child OK. 626/791-0585, evenings, Ulvi or Ayse.

HOUSING: returning graduate researcher couple, non-smokers, seek 1 bd. from end of May to end of Dec., must allow pets. 720/ 890-1310 or 303/492-8274, jahm@mail1.jpl.nasa.gov.

HOUSING: the Educational Affairs Office seeks help in locating furnished apartments, houses or rooms for students in the Summer Intern Program to rent for about 2 mo. Ext. 4-1444, Lisa Campbell.

TO RENT, Australian professor visiting JPL seeks rental accommodation for self and family in La Canada school district, Aug. 2001 to Feb. 2002. 952-1456.

VOLLEYBALL PLAYERS, coed, all levels of play, Tuesday nts. 8-10 at Eagle Rock High School, $3/night. 956-1744, Barbara.

Free

BAND SAW and radial arm saw, worn but working. 626/797-5804, leave message.

CATS, 2 kittens found at service station, brother (long-hair beige Tabby, a little shy) and sister (short hair calico, very friendly); received 1st set of shots, both spayed/ neutered, litter trained. 626/287-9433.

CATS, several wonderful middle-aged kitties need new homes because owner recently passed away. 626/791-3763, Judy.

DOG, 2-year-old, male German Shepherd; neutered, has all shots. 626/287-9433.

DOG, to good home, pretty Lab/Aussie mix, neutered male, black/chocolate w/med./long hair, 1 year old, 55 lbs., gd. with kids, professionally trained; playful but not overactive, very loving, likes other dogs but the older dog at home can't adjust to him. 661/298-2680.

DOG, 1-year-old "Woody" grew up w/children and toddlers, kind personality, loves to play, Huskie/Shepherd mix, all shots, black w/white tummy & paws, we've got to move and aren't allowed to take him. 626/446-4672, lv. msg.

Lost & Found

Lost: Wedding band, slightly bent; very high sentimental value; possibly lost in vicinity of Bldg. 183. Matt at 4-2259 or e-mail mtuch@jpl.nasa.gov.

For Rent

ALTADENA 2 bd., 1 ba + 2-car garage and fireplace, immaculate condition, approx. 4 miles from JPL. 626/797-9546.

LA CANADA, room in lovely priv. home, priv. bath, gar., kitch. privileges, $450. 952-3382.

LA CANADA/FLINTRIDGE, rm, kitch. privileges, BBQ, pool, off-st. parking. 790-1280.

LA CRESCENTA, cozy 2-bd. house w/pool, private, high above Foothill, $1,450. 952-6007.

MONROVIA, lg. rm. in house, private ba., full privileges including pool, 12 miles from JPL, no pets, $475. 626/358-7728, after 7 p.m.

PASADENA house, 1-yr. lease beginning June '01, fully furn., 2 bd., 1 ba., 2 miles/Caltech, charming, comfortable, fireplace, hardwood floors, fruit trees, located in historic bungalow neighborhood, $1,300. 626/797-7407 before 9 p.m. or cobb_salad@hotmail.com.

PASADENA, awesome 2-bd., 2.5-ba., 3-story townhouse to share w/fun-loving, considerate, responsible non-smoker; must see; priv. floor w/bdrm. and bathrm., spacious 2-car gar., washer/dryer, cent. air/heat, skylights, fireplace, balcony, huge kitch. w/dishwasher, new carpets, great n'borh'd; $650+ deposit +1/2 util.; 64 N. Oak. 626/229-5240, Lavonne.

SOUTH PASADENA apt. to share, 2 bd., 1.5 ba., secure parking, large bd., near Fair Oaks and 110, $500. 626/799-5512, Mr. Monico.

Real Estate

ALTADENA, "Meadows," min. from JPL, mtn., cyn. and city views, 1,350 s.f., roomy & spacious, 2 bd., 1 ba., 10,460 s.f. lot, new hardwood floors, carpet, open house Sundays, call for times, a must see, 4118 Canyon Crest Rd. 626/797-7893.

LA CANADA/FLINTRIDGE, hilltop home above Flintridge Sacred Heart Academy, modern house designed by Millard Sheets, spectacular views thru floor to ceiling glass windows, on .5 acre lot, 4 bd., 2,300 sq. ft. + 900 sq. ft. covered decks and patios, La Canada schools, for sale by owner, $790,000. 790-4981.

SUNLAND/TUJUNGA, why pay twice the price for half the house? 15 easy minutes to JPL, never any smog, seldom even fog at the 1,650 foot elevation of this 3 bd., 2 ba., 2,900 sq. ft. home with loads of extras on a 10,000 square foot level lot, $349,000. http://www.its.caltech.edu/~sharonb/ or 352-7321.

Vacation Rentals

BIG BEAR cabin, quiet area near village, 2 bd., sleeps 8, completely furnished, f/p TV/VCP, $75/night. 249-8515.

BIG BEAR LAKEFRONT lux. townhome, 2 decks, tennis, pool/spa, nr. skiing, beaut. master bdrm. suite, sleeps 6. 949/786-6548.

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

HAWAII, Kona, on 166 feet of ocean front on Keauhou Bay, priv. house & guest house comfortably sleeps 6; 3 bd., 2 ba., rustic, relaxing and beautiful, swimming, snorkeling, fishing, spectacular views, near restaurants, golf courses & other attractions. 626/584-9632.

HAWAII, Maui condo, NW coast on beach, w/ocean view, 25 ft. fr. surf, 1 bd. w/loft, compl. furn., phone, color TV, VCR, mcrowv., d/w, pool, priv. lanai, slps. 4, 4/15-12/14 $105/nt./2, 12/15-4/14 $120/nt./2, $10/nt. ad'l person. 949/348-8047.

MAMMOTH, Chamonix condo, at lifts 7, 8, 16, 17, walk to Warning Hut, 2 bd., 2 full ba., sleeps 6, fully equipped elec. kitch., incl. microwave & extras, f/p & wood, color TV/VCR, cable, FM stereo, o/d Jacz., sauna, game, rec & Indry rms, conv. to lifts, shops, special events, spec. midwk rates. 249-8524.

MAMMOTH, Courchevel, walking distance to Canyon Lodge and lifts, 2 bd., 2 ba., sleeps 6, fully equipped unit. 661/255-7958.

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., Jacz, sauna, streams, fishponds, 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 or harbor, pool, spa, game rm., sleeps 4. 949/786-6548.

OCEANSIDE condo, fully furn. 2 bd., 2 ba., f/p, full kitch., quiet, relaxing, beautiful setting, located at beachside, BBQ, pool, spa, game rm, great ocean view, easy walk to pier and restaur., slps. 6, 2-nt. min., avai. weekly or monthly. 909/981-7492, Jim or Darlene.

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.

SAN CLEMENTE COVE timeshare, half-block to beach & pier, sleeps 4, one wk from 4/1 or 5/13, $475. 626/836-3931.

SAN FRAN., Nob Hill honeymoon suite, slps 2 max, full kitch., maid srvc., concierge, reserve early, $125/nite, $750/wk. 626/254-1550.