

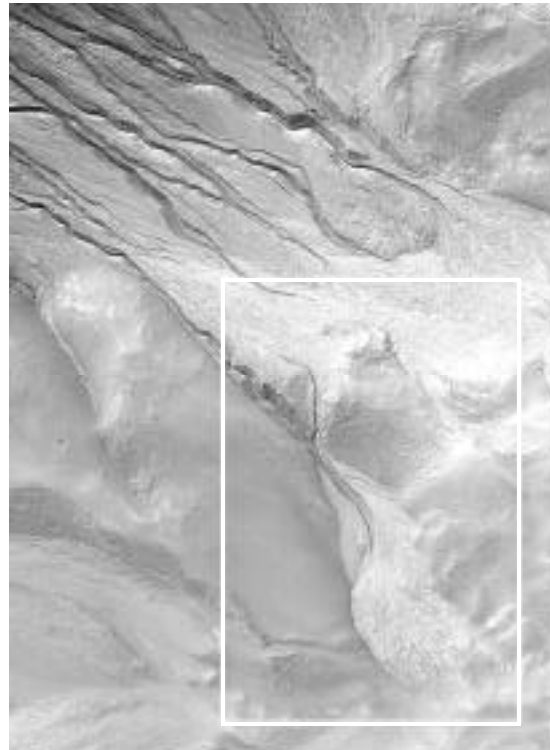
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MGS images suggest liquid water sources on Mars

Numerous deep channels descending a Martian crater wall, and the debris they left behind, are seen in these images taken by the Mars Global Surveyor camera. The boxed area in the left image is enlarged at right. Sunlight illuminates the scene from the upper left. The channels and the debris areas look sharp and there are no small meteor impact craters on them, suggesting that these features are extremely young relative to the 4.5-billion-year history of Mars.

“(The gullies) could be a few million years old, but we cannot rule out that some of them are so recent as to have formed yesterday.”

— Dr. Michael Malin, principal investigator of the camera aboard Mars Global Surveyor



In what could turn out to be a landmark discovery in the history of Mars exploration, imaging scientists using data from JPL's Mars Global Surveyor spacecraft have seen features that suggest there may be current sources of liquid water at or near the surface of the red planet.

The new images, available at <http://www.jpl.nasa.gov/pictures/mars> or http://www.msss.com/mars_images/moc/june2000, show the smallest features ever observed from Martian orbit—about the size of a sport-utility vehicle. NASA scientists compare the features to those left by flash floods on Earth.

“We see features that look like gullies formed by flowing water and the deposits of dirt and rocks transported by these flows. The features appear to be so young that they might be forming today,” said Dr. Michael Malin, principal investigator for the Mars Orbiter Camera on the Mars Global Surveyor spacecraft at Malin Space Science Systems in San Diego. “We think we are seeing evidence of a ground water supply similar to an aquifer. These are new landforms that have never been seen before on Mars.”

The findings are published in the June 30 issue of Science magazine.

“Twenty-eight years ago the Mariner 9 spacecraft found evidence—in the form of channels and valleys—that billions of years ago the planet had water flowing across its surface,” said Dr. Ken Edgett, staff scientist at MSSS and co-author of the paper in Science. “Ever since that time, Mars science has focused on the question, ‘Where did the water go?’ The new pictures from Global Surveyor tell us part of the answer—some of that water went under ground, and quite possibly it's still there.”

“With today's discovery, we're no longer talking about a distant time. The debate has moved to present-day Mars,” said Dr. Ed Weiler, NASA's associate administrator for space science. “The presence of liquid water on Mars has profound implications for the question of life not only in the past, but perhaps even today. If life ever did develop there, and if it survives to the present time, then these landforms would be great places to look.”

The gullies observed in the Global Surveyor images are formed on cliffs—usually in crater or valley walls—and are made up of a deep channel with a collapsed region at its upper end (an “alcove”) and at the other end an area of accumulated debris (an “apron”) that appears to have been transported down the slope. Relative to the rest of the Martian surface, the gullies appear to be extremely young, meaning they may have formed in the recent past. “They could be a few million years old, but we can-

not rule out that some of them are so recent as to have formed yesterday,” Malin said.

Because the atmospheric pressure at the surface of Mars is about 100 times less than it is at sea level on Earth, liquid water would immediately begin to boil when exposed at the Martian surface. Investigators believe that this boiling would be violent and explosive. So how can these gullies form? Malin explained that the process must involve repeated outbursts of water and debris, similar to flash floods on Earth.

“We've come up with a model to explain these features and why the water would flow down the gullies instead of just boiling off the surface,” Edgett said. “When water evaporates it cools the ground—that would cause the water behind the initial seepage site to freeze. This would result in pressure building up behind an ‘ice dam.’ Ultimately, the dam would break and send a flood down the gully.”

The occurrence of gullies is quite rare: only a few hundred locations have been seen in the many tens of thousands of places surveyed by the orbiter camera. Most of are found in the Martian southern hemisphere, but a few are found in the north. “What is odd about these gullies is that they occur where you might not expect them—in some of the coldest places on the planet,” Malin indicated. “Nearly all of them occur between 30° and 70° latitude, and usually on slopes that get the least amount of sunlight during each Martian day.” If these gullies were on Earth they would be at latitudes roughly between New Orleans and Point Barrow, Alaska, in the northern hemisphere; and Sydney, Australia, to much of the Antarctic coast in the south.

The water supply is believed to be about 100 to 400 meters (about 330 to 1,300 feet) below the surface, and limited to specific regions across the planet. Each flow that came down each gully may have had a volume of water of roughly 2,500 cubic meters (about 90,000 cubic feet)—about enough water to sustain 100 average households for a month or fill seven community-sized swimming pools. The process that starts the water flowing remains a mystery, but the team believes it is not the result of volcanic heating.

“I think one of the most interesting and significant aspects of this discovery is what it could mean if human explorers ever go to Mars,” Malin said. “If water is available in substantial volumes in areas other than the poles, it would make it easier for human crews to access and use it—for drinking, to create breathable air, and to extract oxygen and hydrogen for rocket fuel and to be stored for use in portable energy sources.”

Video surrogate ‘Digital Personnel’ demonstrated

JPL has demonstrated a new voice-activated, digital human-image animation system that uses language to generate digital facial movements.

The system uses the smallest units of speech, called phonemes, to manipulate a person's facial movements in an image. While development is in the early stages, the eventual result will be photo-realistic animation of any human face appearing to be speaking naturally.

“This is voice-driven, so the image morphs in response to a voice or equivalent input,” said principal investigator John Wright of the Visualization and Earth Sciences Applications Group in Section 388. “Real-time animation is a key step in our development process.”

The system, called Digital Personnel, will be developed with Graphco Technologies Inc., Newtown, Pa. The company said the system will enable virtual personnel for commercial applications in numerous markets, including web-based customer support with user-friendly speaking interfaces. Graphco also projects that video telephones, broadcasting, distance learning, video games and motion pictures will also create significant demand for the technology.

Other applications of the system might include product demonstration, promotion and celebrity representation interaction with online customers.

Wright is working in collaboration with fellow group member Dan Peters. The technology is a spinoff of a task developed from 1993–95 at JPL for the U.S. government called Automated Speech Visualization. Wright credited JPL employees Ken Scott, Steve Watson, Dave Kagels, David Freda and Kevin Hussey with the success of the original technology.

Although the technology can be demonstrated today, Wright said Digital Personnel's commercial applications are 12 to 15 months away. He noted that possible medical applications might include helping the hearing impaired to read lips and to speak by seeing how the system simulates mouth and facial movements.

JPL's Commercial Technology and Regional Economic Development Program arranged the transfer of Digital Personnel to Graphco, which recently acquired the rights to the patent-pending technology. The license was originally issued by Caltech.

News Briefs

Free lunch for employees June 28

A free lunch will be served to all JPL badge holders on Wednesday, June 28.

"All personnel contribute to the overall success of the Laboratory," said NANCY KAPELL of Employee Services. "Please join us in a celebration for a job well done."

Lunch will be available from 11:30 a.m. to 1:30 p.m. on the mall or on the Building 303 cafeteria patio. Choices include a barbecued beef sandwich, Tuscan chicken sandwich or garden burger. Also included are a bag of chips, cookies and a beverage.

The Eric Byak Project will provide musical entertainment on the mall only. All JPL employees and contract personnel are invited, and a JPL badge must be worn to participate.

In support of the celebration, JPL cafeterias will be on a special schedule for June 28 only. Cafeteria 190 will be open from 6:30 to 9:30 a.m., with no grill service after 8 a.m., and will be closed for lunch and afternoon break. The 167 and 303 cafeterias will be open from 6:30 a.m. to 3:30 p.m. No grill service will be available after 8 a.m., and the lunch menu will be limited to salad bar, deli bar, one entree and one soup selection.

For more information, contact Kapell at ext. 4-9432.

TOPEX sees end of La Niña

After dominating the tropical Pacific Ocean for more than two years, the 1998-2000 La Niña "cool pool" is continuing its slow fade and seems to be retiring from the climate stage, according to the latest satellite data from the JPL-managed U.S.-French TOPEX/Poseidon mission.

These data, taken during a 10-day cycle of collection ending June 9, show that the equatorial Pacific continues to warm up and is returning to normal as this latest, persistent, two-year La Niña episode is coming to an end. Only a few patches of cooler, lower sea levels remain across the tropics.

In June 1999, La Niña barely had a pulse, but was resuscitated last fall.

It appears that the global climate system is finally emerging from the past three years of dramatic swings from the extra-large El Niño of 1997/98, which was followed by two unusually cool and persistent La Niña years, according to JPL scientists.

Radio clubs test capabilities

JPLs and Caltech's amateur radio clubs will join forces in the annual Field Day activity the weekend of June 24 atop Mount Gleason, 48 kilometers (30 miles) north of JPL in the Angeles National Forest.

Visitors are welcomed to the activity, which demonstrates radio amateurs' readiness to provide emergency communications when needed. The JPL club traditionally supports Lab Security when local emergencies occur.

Operations start at 11 a.m. on June 24 and run for 24 hours.

For Field Day, the two clubs plan to field stations to operate on high-frequency bands using voice and morse code, UHF/VHF using voice, a novice/technician station using voice and one station for communications via amateur radio satellites.

Mount Gleason can be reached via Angeles Crest Highway.

Call BOB POLANSKY at ext. 4-4940 or JAY HOLLADAY at ext. 4-7758.

Caltech to restrict public photography

Citing disruptions to its students, faculty and staff, Caltech will no longer allow members of the public to shoot private, special-event photography on its campus. The ban, effective July 1, includes such events as weddings, engagements, family portraits, etc.

However, all JPL staff, Caltech faculty, staff, students and alumni; and guests using the Athenaeum for wedding receptions will continue to be able to use the campus for private photos.

Caltech-affiliated persons wishing to use the campus for private photography should call SUSAN LEE at (626) 395-6327 or send an e-mail to suze@caltech.edu. Permits for private photo sessions need to be obtained at least a month in advance of the event.

Parking area, road closure noted

All parking spaces will be eliminated on Pioneer Road from Building 150 to the intersection of Explorer Road during the modification of a storm drain system and the installation of new curbs and gutters.

Construction activities will last approximately two months. Pioneer Road will be closed to all traffic during paving demolition, grading and new paving operations. Periodically, bus operations on the hill will be curtailed.

Call BERNIE BAKKEN at ext. 4-4654 or PAUL KULKARNI, ext. 4-2210.

Special Events Calendar

Ongoing Support Groups

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

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

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

Parent Support Group—Meets the third Thursday of the month at noon in Building 167-111. Call Greg Hickey at ext. 4-0776.

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

Friday, June 23

OHS Talk—Dr. Rene Pidoux, a cardiologist at Glendale Adventist Medical Center, will present "Cardiovascular Health & Heart Disease Prevention 2000" at noon in von Kármán Auditorium. Sponsored by Occupational Health Services.

Monday, June 26

Caltech Ballroom Dance Club—The second of four successive Monday sessions of East Coast Swing will be presented from 7:30 to 9 p.m. The course costs \$24, is taught by a professional dance instructor and is held in the campus' Winnett Lounge. Refreshments and dance practice time until 9:30 p.m. are provided after each class. See www.its.caltech.edu/~ballroom or call Don at 626/791-3103.

Tuesday, June 27

Remote Agent—Dr. Ben Smith of the Exploration Systems Autonomy Section 367 will discuss the state-of-the-art artificial intelligence system software that autonomously

commanded JPL's Deep Space 1 mission. To be held at noon in the Building 167 conference room.

Tuesday, June 27–Thursday, June 28

Library, Archives & Records Section Open House—The annual event begins Tuesday from 11 a.m. to 2 p.m. in the reference service area, Building 111, with poster sessions that will highlight how to use the Archives and Records Center and access the JPL Experts database and Knowledge Management. On Wednesday and Thursday from 11 a.m. to 1 p.m., demonstrations in Building 111-111 will show how to search for scientific and technical information on the web and give techniques for maximizing search results. For more information, call ext. 4-4200 or e-mail to library@jpl.nasa.gov.



Wednesday, June 28

Job Fair—JPL open positions in software and information technology will be spotlighted from 4 to 8 p.m. in von Kármán Auditorium.

JPL Hang Gliding Club—Meeting at noon in Building 126-346.

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

Thursday, June 29

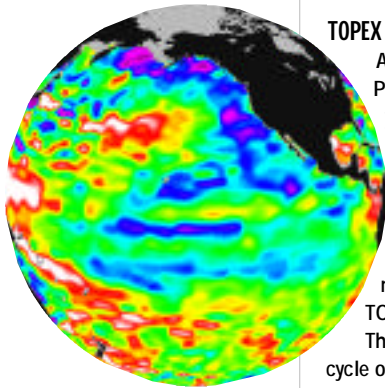
JPL Golf Club—Meeting at noon in Building 306-302.

Wednesday, July 5

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

Thursday, July 6

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



The equatorial Pacific continues to warm up and is returning to normal as the latest, persistent two-year La Niña episode is coming to an end. Only a few patches of cooler, lower sea levels (blue and purple) remain across the tropics.

Teenager wows rocket scientists

By Gia Scafidi

There she stood presenting her research entitled "Sailing into Space—Reflecting on a Solution," in the midst of more than 100 veteran rocket scientists at the Advanced Propulsion Research Workshop at JPL on June 1.

It was not shocking at all that Ulyana Horodyskyj was a female, though men filled nearly every seat in the auditorium; nor was it surprising that she was small in stature. What was so remarkable was the fact that she was only 14 years old.

With a confident, intelligent air, this ninth-grader from North Royalton, Ohio shared her recent discovery that plus or minus 35.26 degrees is the ideal tilt angle required to achieve maximum thrust of a solar sail. Through computer simulations using Newton's laws of motion, Kepler's laws of orbital motion and Euler's method, this young scientist demonstrated her technique for estimating the trajectory of a solar sail, noting how forces of gravity and sunlight influence the sail's propulsion. She concluded her presentation with a look at solar sails' ability to hover continuously over planet poles and function without fuel, tasks which rockets cannot perform.

"The conference wasn't intimidating at all, just a little nerve-wracking," Ulyana said. "This all hasn't sunk in yet; it's pretty overwhelming."

And understandably so.

In the past several months, Ulyana has made leaps and bounds in the science world. She

placed first in the Northeastern Ohio Science and Engineering Fair's Earth and space category, where she competed against more than 500 7th through 12th-graders, received seven special awards and was named the Grand Award Winner in the physical science category. Those standings then qualified her to go on to Intel's International Science and Engineering Fair in Detroit. There, she competed against 1,200 students from all over the world and was awarded third place by the American Astronautical Society and first by the U.S. Army in the Earth and Space Division.

Ulyana's next stop was the Junior Science and Humanities Symposium's regional competition in Ohio, where she received a first place \$4,000 scholarship and advanced to the nationals in Washington, D.C. There, her research was put in the Engineering and Computer Science category (against all boys) and placed first. She was awarded a \$16,000 scholarship and was one of eight students chosen to represent the United States at the International Youth Science Forum in London this summer. Her research was also named the best Earth and Space project at the University of Akron District's Science Day, which qualified her to go on to the State Science Day in Columbus, Ohio.

"You can definitely say it's been a hectic spring," said Horodyskyj's father, Ivan. "What started out as a small science project last

summer has taken on a life of its own."

Though initially small, the science project had a lot of support along the way. Ulyana had help from her two older brothers, her father, and various scientists.

Charles Garner, senior engineer in JPL's Section 353 Gossamer Systems Group, provided Ulyana with information about solar sails' orbits and actual materials for making her sails. "Oh, I just thought she was outstanding," said Garner. "She is so smart."

Robert Forward, vice president and chief scientist at Tethers Unlimited, Inc., a JPL consultant, also answered many of Ulyana's solar sail questions. "Her research report shows trial and error," said Forward. "One can see that she was actually learning during the process, as opposed to just regurgitating the information she read about. This project has clearly helped her experience discovery."

And, apparently, the end of the exploration period is nowhere in sight. Ulyana plans to continue working on solar sails, broadening her horizons to discover more about the effects of different sail shapes and various steering mechanisms.

"We're very proud of her," said her father. "We're also a little worried thinking about what's next. But we know that whatever she embarks on, she will have plenty of help and support from the people she's met along the way."



Ulyana Horodyskyj addresses scientists at JPL workshop.

QUESTION You've been at JPL for more than a year now. It's been quite an eventful time, has it not?

A That's an understatement. The real possibility of severe budget cuts in 1999; the two lost missions to Mars; the subsequent multiple press conferences and investigations—the combination of all these events and activities placed considerable stress not only on people at the Laboratory but on our image as well. And because these stories played out over extended period of times, we were largely in a reactive mode. I am accustomed to proactive stances. That's what we're hard at work on now.

QUESTION How so?

A By consolidating our communications efforts and building infrastructure. As everyone knows, our slate of missions ballooned in the '90s. However, money and effort being spent on communicating with the public was being cut into thinner slices of the pie. Clearly, we have a far better chance of reaching more people with our messages in a meaningful way if we coordinate. That's why we created the Office of Communications and Education, and that's why we have merged under a "virtual roof" the outreach, public affairs and educational communities. But consolidation is only half the battle. We now have to begin reshaping our messages in an even more accessible way so that people can better absorb and relate to them.

QUESTION For example?

A First, we have to think about our communications activities as stories. Our missions are grand adventures full of considerable risk and sizeable rewards. They are also science detective stories. People love these kinds of stories. And good stories last a long, long time. Just look at Homer's *Odyssey*. And if a picture is worth a thousand words, imagine the megabyte impression that an animated digital image can have. Good stories, great visuals. Only one ingredient is then missing: people. If we want to connect with the public, we have to put more of a human face on our missions, especially if we want to attract younger people, as we need to do.

QUESTION OK, this sounds like packaging. What about content?

A The content is our great, great strength. Content equals destination—and

months ago, just four days after the loss of Mars Polar Lander, we lost our just-named Outreach Manager in the just-forming Outreach Office to a dotcom company. That set us back. But we're pretty much back on track. Kim Shepard has stepped up to be the acting Outreach Manager. Dr. Parvin Kassaie has recently joined us as the Education Manager. Frank O'Donnell has just hired four new media relations specialists in the Media Relations Office. And, of course, there was moving all of the full-time outreach group into our new organization. That's a lot of activity. We've now set up integrated communications teams based upon five themes—Solar System, Earth, Mars, Universe and Technology—that bring different skills to the table. But calling a team a 'team' doesn't make it a team. We're like an expansion team, to use a sports analogy. I don't think we'll win the national championship in our first year, but I'm expecting a winning season. Critical to making this work are our five theme 'leads'—Anita Sohus for Solar System, Marguerite Syvertson for Earth, Michelle Viotti for Mars, Jane Platt for Universe, and Alice Wessen for Technology. They've taken on a big leadership role in coordinating all these various activities. They need all the support the Lab can give them.

QUESTION What's been the reaction from the projects?

A Some managers saw the logic and necessity from the get-go; a few have been slower in warming up. I got some really good advice not long ago. "You gotta go out and press the flesh with the project managers," I was counseled. It's not unlike the plumber who has a leaky faucet at home. As a communications manager, I've got to do a better job of communicating.

QUESTION What are you saying to them?

A My message is simple. The consolidation effort intention isn't about taking something—dollars, people, control, whatever—away. It's really about giving the project more of what they—and all of us—ultimately want: more meaningful awareness by the American public about our missions and their purpose. I haven't gotten anything but a positive response when the consolidation is framed that way. Part of it, frankly, is learning how to communicate in JPL's own language. If you talk about "partnerships" you can see some people's eyebrows raising. Turn that around and translate the word partnership into a

COMMUNICATE! COMMUNICATE! COMMUNICATE!

Blaine Baggett is JPL's Executive Manager of Communications and Education. A former television producer, book author, and advertising executive, he is charged with reengineering the communications and education activities at JPL. He spoke to Universe about the efforts now underway.

what we learn when we get there. People are fascinated, just like we are, although maybe for different reasons, with our destinations. Space is an example of what marketers call being "pre-sold." All you have to do is say the word "space" and people stop what they're doing to listen. I think we can build on these inclinations by putting our destinations in the foreground of all of our communications activities. Then let's tell them about all of our remarkable machines, instruments and science. This strategy will work in every communications medium for every place we explore. Planets. Comets. Asteroids. Moons. Galaxies. And the Earth itself. You name it. People can't get enough when it comes to our destinations.

QUESTION Back to the consolidation. How is it going?

A Not as fast as I would like. Six

Project Work Agreement, or better yet, call it by its acronym, "PWA," and you begin getting nods of affirmation.

QUESTION But you're not a fan of acronyms!

A A couple of people have told me it takes two full years to get JPL's internal code down. Acronyms are not time-saving devices in the long run. And they have a funny way of spreading from identifying procedures and departments to becoming even the names of spacecraft. Unless you're IBM or 3M—and you plan on being around for a long time and spend millions of dollars in advertising—you're not going to be very effective with the public by using acronyms. Initials work best as monograms on your clothing—because hopefully you already know who you are.

QUESTION Why are you such a big proponent of the Internet?

A What radio was to the generations of the '30s and '40s, what television was to the generations of the '50s through the '90s, the Internet will be for our children. Only in this case, the future is already here. You could put all your "outreach" money and effort into an Internet communications bucket and you still won't be able to keep up with its potential.

QUESTION What's going on with the von Kármán museum?

A That's another reengineering project. We're renovating. We intend to give visitors a more thorough impression of the Lab's activities based upon our five themes. Up to now it's been a hodge-podge of throwing into the space whatever exhibits were available at any given time. We're going to change that.

QUESTION What has it been like coming from public television to JPL? Big sea change?

A There are interesting similarities, actually. The headquarter/field center dynamics are similar. The big difference is scale of resources. KCET had an operating budget of less than \$50 million. JPL is a billion-dollar-plus enterprise. I keep reminding myself of that. Because if we really pull our resources together, the impact we can have is nothing short of extraordinary.

Lab enjoys Heritage Week



Saxophonists from JPL's Big Band Theory, from left, Chris Woodcock, Les Deutsch, Leslie Tamppari, Sarah Lundeen and Hamil Cooper entertain the lunchtime crowd during American Heritage Week festivities last week. At right, Navajo tribeswomen perform a traditional sage dance.



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

On behalf of myself and my husband, I would like to send a big thank you to all of our friends who supported us over the years here at JPL, through good times and bad. There was a lot of fun and a lot of adventures. We are looking forward to our new adventures back in New England, but will always remember the joys of JPL fondly. Best wishes,
Linda Robeck (and Don Fuhrman)

I wish to thank all my friends, co-workers and supervisors who gave me support during the illness of my father, for the sympathy after my father's passing and to the ERC for the beautiful peace-lilly plant. It made me feel that everyone I know at JPL was there beside me. Sincerely,
Vincent J. Donadio Jr.

My thanks and appreciation to my many friends in TMOD for their kind words of sympathy and concern at the passing of my mother. A special thank you to those in the Outreach community who stepped in and took over my responsibilities for Open House when I had to rush to England. The plant from ERC was beautiful and much appreciated. The support from my JPL friends was truly meaningful.
Shirley Wolff

My family and I would like to express our gratitude to my friends in the Earth and Space Sciences Division for their kind expressions of sympathy at the recent passing of my father and to the ERC for the lovely plant. My father led a full and loving life and will be sorely missed.
Keri Oda Smith and family

I would like to thank all my fellow employees for their comfort, support and generosity on the recent passing of my mother-in-law, Marion Smilgis. The generous contribution to the Osteoporosis Society is very much appreciated and is treasured by our family. Thanks also to ERC for the lovely plant.
Alice M. Smilgis

Retirees

The following JPL employees retired in June: Neil Herman, 42 years, Section 776; John Leflang, 39 years, Section 311; Alford Beers, 36 years, Section 920; Donald Young, 35 years, Section 320; James Daniels, Section 387, 24 years; Li-Jen Cheng, 23 years, Section 344; Antonette Burke, 22 years, Section 820; Priscilla Miranti, 17 years, Section 310; Chris Roach, 16 years, Section 366; Marilyn Giandomenico, 14 years, Section 366; Frank Parker, 13 years, Section 314; James Tribbett, 12 years, Section 313.

Classifieds

For Sale

BEDROOM SET, 1950s Danish modern, full bed, 2 dressers & 2 nt. stands, \$500/obo. 768-4436, after 6 p.m.
BOOTS, Western, (1) Nocona 9-1/2D, blk., silver-tipped toes, fancy sides, \$85; (2) Dan Post 9D, lt. brown, dark fancy sides, \$65; (3) Tony Lama 9D, blk. plain, \$50; all exc. shape. 249-0453.
CELL PHONE, Nextel 1000 plus, w/2-way radio, speaker phone; perfect cond., 6 mo. old; pd.

\$200, sell for \$100. 626/577-1623.
COMPUTER, IBM 386 PC, 8 MB RAM, 60-MB HD, 13" display, incl. software, \$75; OT-TOMAN, '60s style, round, flat top, cream color vinyl w/leather texture, 12"x19" H, \$25; CHAIR, '60s style, straight back, upholstered, dark olive fabric, walnut base, for office/liv. rm., \$35. 626/289-2795.

COMPUTER, 486/33 MHz, 470 HD, 24X CD-ROM, Colorado 250 backup, ATI monitor, make offer; CALCULATORS, HP-48S and HP-15C, w/manuals, make offer. 626/798-8777, Paul.
COMPUTER, Sun Ultra5, SparcIIi, 64 MB RAM, 4.3 GB internal HD, CDROM, 10/100BaseT thernet, floppy dr., Solaris 2.6, gcc & Java2 installed, incl. 19" color monitor, keyboard & mouse, \$1,400. 248-6263.

DRESSER, child's, 6 drawer, white, gd. cond., \$150; BED, girl's, castle theme, \$50. 249-9364.
EXERCISER, NordicTrack Medalist ski-simulator, unused, \$400/obo (orig. \$900). 957-3022, eves., or lydlar@earthlink.net.
FURNITURE, all kinds: oak roll-top desk, walnut etagere, girl's French provincial bedroom set (desk, dresser, chest-of-drawers, bedside stand); solid-wood, cargo-type bunk bed, bookcase and chest-of-drawers; Wurlitzer ebony upright piano, large butcher-block oak kitchen island, ready for installation; STOVE, 2-oven, self-cleaning gas; BICYCLES, men's and women's; many other pieces, moving to smaller house. 626/446-2091, eves/weekends.

HIGH CHAIR for baby, Graco, never used, adaptable, 2 trays, \$59/obo; SWING, Graco, \$35/obo; WALKER\$8. 626/797-6228, Krystyna.
LIGHT METER, scale in foot-candles; DISC DRIVE, Jaz, for PC. 909/392-0379.
MISCELLANEOUS: steam iron, GE Power Spray, vg cond., \$15; floor lamp, black base & pole, off-white shade, gd. cond., \$12. 626/577-8107.
PRINTER, Epson 600 color inkjet, w/Mac serial cable, seldom used, like-new cond., selling to replace with USB printer, \$50. 626/797-5672.

R.C. CAR, gas powered, Traxxas, Nitro Rustler, O'Donnell pipe, Dirthog tires, chrome rim, recoil starter, radio, Pro-15 race eng., ready to run, exc. cond., 6 mo. old, \$249. 909/592-2279.
SOFA BED, newly upholstered, \$150; KNITTING MACHINE, studio, \$75. 626/355-6891.
SWITCH, new 4:1, Belkin, auto, share up to computer peripherals, orig. \$100, sell \$35; BATTERIES: for Nokia cell phone 6100, \$15; for Sony Camcorder, \$10; for Sony Mavica, new, orig. \$70, sell \$30; MONITOR, Sony Triniton, 15", color, \$125; MOUSE, Logitech scrolling, new, \$17. 366-6134.

TOOL CHEST, machinist's 5-drawer, steel, \$18; CIRCULAR SAW, Craftsman, 6 1/2", extra blade, \$21; PHONO RECORDS, 33 rpm, musicals, 25 for \$5 or singles 75 cents; LOUDSPEAKERS, pair, Hitachi, lg. walnut cabinets, \$12; BUN WARMER, electric, \$8. 626/793-1895.
WASHER/DRYER, gas, exc. cond., white, \$350 for both. 731-0470.

WASHER, GE heavy duty extra-lg. capacity, white, 7 cycles, includes mini-washer, \$100; DRYER, GE automatic, gas, heavy duty, avocado color, \$50. 626/794-0455.
WEDDING DRESS, new, white, size 10, still has tags, long sleeves, short train, lots of applique, cost \$3,000, sell \$500/obo. 951-1093.
WEDDING DRESS, white satin w/cathedral length train, size 4-6, headpiece included, \$250. 626/355-6891.

Vehicles & Accessories

'97 ACURA CL coupe, 2.2L, red w/black leather interior, 5 spd., sun/moonroof, CD, 76K mi., \$13,500/obo. 253-6645.
'95 BMW 525ia, premium pkg., gray/black leather, CD stacker, ext. warr., very well kept, 72K mi., \$23,000. 626/797-2117.
'84 CHEVROLET Caprice, V8, 4 dr., a/c, pwr. win/seats/dl/steering/am/fm/cass., auto, runs/looks great, 121K mi., \$3,500. 626/797-1310.
'40 CHEVROLET Special Deluxe, 4 dr. sedan, runs gd., gd. body, stock orig., partially restored. \$7,500/obo. 661/296-6260, Terry.
'74 DODGE RV, sleeps 5, self-contained, new brakes, only 50K mi., \$3,000/obo. 626/792-6706.
'96 FORD Escort LX, exc. cond., 5 spd., 2 dr., 57,000 miles, a/c, am/fm/cassette, \$6,900/obo. 909/323-3640.
'95 FORD Mustang, 3.8L V6, 5-spd. manual, 53K mi., silver, a/c, power everything, cruise, stereo CD/cass., dual air bags, no scratches/dents, \$7,900/obo. 249-0038.
'93 FORD Explorer EXL, beige, auto, air, cass., records, like new, lic.# SMPLY E, \$10,000/obo. 500-9219.
'92 FORD Explorer XLT, 4x2 WD fully equip., power moonroof & alarm, gd. cond. \$7,200. 626/351-1802.
'66 FORD Mustang, classic, invoice & most repair/service receipts, orig. owner, yellow w/parchment int., 289 V8, exc. mech. cond., new rear brakes & front Michelin tires, driven

nearly every day, very clean inside & out, no dents, see & drive to appreciate, \$5,900. 626/794-7007, Margialden@aol.com.
'98 HONDA Civic LX, white/gray, 4 dr., 5 spd., 37K mi., a/c, pwr./win./locks, \$13.5K. 805/577-2407, x495-2407.

'96 HONDA Civic LX sedan, 5 spd., a/c, cc, pwr. s/w/d/l, am/fm stereo/cass., silver w/gray int., only 37,500 mi., \$10,200. 248-2561.
'85 HONDA Civic 4-dr., auto, records, needs work \$700. 626/345-0969.
'96 LEXUS ES 300, only 42K mi., immac. cond., loaded, pwr everything, incl. moonfr., 6-disc CD, am/fm stereo cass., lthr., cc, a/c, auto climate ctrl., must sacrifice, \$20K. 249-9437, eves.
'84 MILLER Tiltbed equipment trailer, completely refurbished, tilt, new deck/tires/brakes/elec., will support 21,000 lbs., exc. cond., \$4,500/obo. 626/798-6249.

'96 NISSAN XE Xtracab truck, auto, air, p/s, am/fm/cass., tachometer, bedliner, royal blue, exc. cond., 64K mi. 626/915-2715.
'90 NISSAN 240SX coupe, 110K mi., dark blue, \$2,400. 363-7064.
'89 RANGE ROVER, exc. body & eng., sunroof, CD, Lo-Jack, leather interior. 310/858-1874, eves.
TIRE, BF Goodrich, Touring, P205/55R15, blackwall, used less than 100 mi., \$95/obo. 626/398-9302.

'89 TOYOTA Camry, white, 96K mi., exc. cond., a/c, auto, pwr./w/l/s, am/fm, cc, \$5,399. 626/579-7403.
'89 TOYOTA Supra Turbo, 5 spd., 114K mi., gd. cond., \$6,000/obo. 626/449-2007.
'85 TOYOTA hatchback, well maintained, vg cond. in and out, good tires & brakes, already passed smog check, \$2,900/obo. 790-6941.
'93 VOLVO 940 turbo wagon, mint cond., loaded w/heated leather seats, s/r, ABS, pwr. everything, side impact protection system, all service records, super clean. 74K mi. \$12,950. 790-2799, Larry.

Free

KITTENS, 3, born on May 4, M, need caretakers after weaning. 249-2889.
PUPPIES: 1 black Lab mix, 8-9 mo. old, house-broken, all shots, spayed, loving, good w/cats/children, rescued from empty apt.; 1 German Shepherd mix, F, 7 wks. old, found in forest over Memorial weekend, healthy, has 1st set of shots, both need a home. 626/287-9433.
REFRIGERATOR, 11 cu. ft., 1 door: works great, just come get it; perfect for a small apt. or garage; Sierra Madre area. 626/836-4960.

Wanted

BOOTS, Western style, with at least 1/2" heel, size 6-1/2, needed by June 30 for horseback riding summer camp. 909/305-9922, Cindy, eves and weekends.
COMPUTER for very bright high school student who recently gave presentation at JPL, updated PC desired (currently using 486); will be forwarded to a good home; you may be helping a future JPLer. 626/449-9385, Patricia.
FAMILY CAR, trustworthy, reasonable, grandma-ish 4 door, automatic. 626/744-5409.
JPL WIDOW seeks moderately priced, 1- or 2 bd. condo, apt. or sm. house to rent, or lease-option to buy; prefer close to JPL, Glendale, La Crescenta, Pasadena, N. Valley. 661/718-2528, marjwins@aol.com.
SPACE INFORMATION/memorabilia from U.S. & other countries, past & present. 790-8523, Marc Rayman.
TO RENT house, 2 bd., 2-car pkg, no carpet or stairs, near JPL; for JPLer and handicapped roommate: can pay up to \$1,300/mo. 970-2736, anytime.
VOLLEYBALL PLAYERS, coed, all levels of play, Tues. nights, 8-10, Eagle Rock H.S., \$3/nt. 956-1744, Barbara.

For Rent

ALTADENA, lg. furn. rm. w/cable TV, also share 3 bd., 3 ba. hilltop house, pool, patios, view (incl. JPL); c/a/h., all amen., kitch., d/w, laundry rm., priv. off-st. pkg. spot, 11 min./JPL; smoking OK (owner smokes); \$500, incl. all util. + dep. 626/794-1050, after 5 p.m., Harry.
ALTADENA, charming 2 bd., 1 ba. house near Christmas Tree Lane, hrwd. flrs., f/p, appliances, fenced backyard., fruit trees/roses, \$1,500 negotiable, incl. water/gardener/trash, see at www.alumni.caltech.edu/~chrisc. 626/794-9579.
EAGLE ROCK, rm./bathrm. in comfortable nice house, quiet & safe area, 7 mi. from JPL, use of gar., wash/dryer, kitch. & pool, util. incl. non-smoker, \$425. 323/256-0535, lucia@bluemolly.com, Lucia.
GLENDALE, 1-bd. condo, nr. Montrose, gated area, view, lovely pool, covered car space with

storage, \$750. 661/259-6390.

LA CRESCENTA, spacious home above Foothill, 7 mi./JPL, 3 bd., 2 ba., lg. liv. rm. w/fireplace, formal din. rm., lg. kitch. w/breakfast area, stove dishwasher, huge fenced yd. w/patio, \$1,650. 957-8332.
LA CRESCENTA studio guest house, avail. July 1, \$500 (utilities included). 248-5918.
LA CANADA guesthouse, fully furn., summer rental, short-term monthly, close to JPL, no smoke/pets. 790-7727.

LA CANADA guest room, separate, small bedroom furnished w/bathrm. priv. entrance with on-street parking, \$475. 790-1893.
LA CANADA FLINTRIDGE, room, priv. ba., kitch. privileges, pool, BBQ, off-st. parking, avail. July 1. 790-1280.
LA VERNE/CLAREMONT area, 2-bd., 2 1/2-ba. town-house, att. 2-car gar. w/washer/dryer hookups, priv. backyd., approx. 1,400 sq. ft., avail. 1st part of July, \$950 + deposit. 909/596-5774.
MONTROSE apt., 1 bd., 1 ba., a/c, garden, off-st. pkgng., Indry, charming, trash/wtr./grdnr. pd., 10 min./JPL, walking dist. to Montrose Mall, \$675. 248-4637.
SOUTH PASADENA, fully furn. studio apt., nice area at 1718 Huntington Dr., betw. Marengo and Milan Sts, car space, laundry facilities on premises, utilities pd., non-smoker, no pets, \$565. 626/792-9053, Marilyn.

Real Estate

LA CANADA-FLINTRIDGE, view home, 4 bd., 2.5 ba., c/a, 2,778 sq. ft., 2-car gar., lg. driveway, 15-ft. swim spa, LC schools; very quiet st. and neighborhood; 53,954 sq. ft on 2 lots w/oak forest and creek; 2.5 mi./JPL; see www.realtor.com, "La Canada", "Ca", MLS ID=G202353; \$849,500. 952-9654.
SUNLAND home, 3 bd., 2 ba., 1,500 sq. ft., lg. lot in quiet cul-de-sac, \$229,000. 353-3323.

Vacation Rentals

BIG BEAR cabin, quiet area near village, 2 bd., slps. 8, compl. furn., f/p, TV/VCR, \$75/nt. 760/246-7754.
BIG BEAR LAKE cabin, near lake, shops, village, forest trails; 2 bd., sleeps up to 6, fireplace, TV, VCR, phone, microwave, BBQ & more; JPL disc price from \$65/nt. 909/210-9182.
BIG BEAR LAKEFRONT, lux. townhome, 2 decks, tennis, pool/spa, beaut. master bd., suite, sleeps 6. 949/786-6548.
CAMBRIA ocean front house, sleeps up to 4, exc. view. 248-8853.
HAWAII, Kona, on 166 ft. of ocean front on Keauhou Bay, priv. house and guest house comfortably sleep 6; 3 bd., 2 ba., rustic, relaxing & beautiful; swimming, snorkeling, fishing, spectac. views, nr. 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, microw., d/w, pool, priv. lanai, slps. 4, 4/15-12/14, \$100/nite/2, 12/15-4/14, \$115/nite/2, \$10/nite add'l. person. 949/348-8047.
LAKE TAHOE, N. shore, 2 bd., 2-1/2 ba. condo, sleeps 6-7; private sandy beach, pool; great location, all amenities, hiking, golfing, fishing, 2 mi./casinos; JPL discount summer weekly rate \$650. 626/355-3886, Rosemary or Ed.
LAKE TAHOE, W. shore @ Homewood in Chamberlands, full amen., assoc. pool, tennis, priv. beach & club, 3 bd. + loft, 2 ba., slps. 8, linens provided, full kitch. & laundry, TV/VCR, wood stove, 2 day min., JPL disc., \$700/wk., \$75 cleaning fee. 626/585-0321, Bob or Nicole.
MAMMOTH, Chamonix condo, 2 or 2 full ba., slps 6, fully equip. elec. kitch. w/microw. & extras, f/p & wood, color TV, VCR, cable, stereo, pool & sun area, Jacz., sauna, game, rec. & laundry rms., play & BBQ areas, conv. to hiking, shops, summer events, daily/weekly rates. 249-8524.
OCEANSIDE, on the sand, charming 1-bd. condo, panoramic view, walk to pier & harbor, pool/spa, game rm., sleeps 4. 949/786-6548.
OCEANSIDE beachfront apt., 1 bd., sleeps 4. 626/798-1345.
PACIFIC GROVE house, 3 bd., 2 ba., fp, cable tv/vcr, stereo/CD, well-eqpd. kitch. w/microw, 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.
SOUTH LAKE TAHOE KEYS waterfront, 4 bd., 3 ba., 1 bd. & liv. rm. upstairs, hcp. access fair, slps. 12+, f/p, decks, gourmet kitch., boats, TVs, VCR, stereo, in & o/d pools, bch., tennis/casinos/ golf; 3-day min., \$1,195/wk. [1 June-15 Sept. 22 Nov-1 April], \$595/wk. low seas., + \$90 clean fee. 949/515-5812.