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Spitzer to size up newly found planet

Artist's concept of the planet catalogued as 2003UB313 at the lonely outer fringes of our solar system. Our Sun can be seen in the distance. Credit: NASA/JPL-Caltecb/R. Hurt (SSC/Caltecb)



Later this month, the Spitzer Space Telescope will look toward the recently discovered planet in the outlying regions of the solar system. The observation will bring new information on the size of the 10th planet, which lies beyond Pluto and is identified as 2003UB313.

After the new object was announced, the Spitzer team discovered that the telescope's previous observations of the object were unsuccessful because of an error in the parameters used to target it.

A successful Spitzer detection will determine the object's size. If Spitzer does not see it, astronomers will be able to place a solid upper limit on its size.

The object was discovered by Dr. Michael Brown of Caltech, along with Dr. Chad Trujillo of Gemini Observatory in Hawaii and Dr. David Rabinowitz of Yale University in Connecticut. Brown, Trujillo and Rabinowitz first photographed the new planet with the 48-inch Samuel Oschin Telescope at Palomar Observatory near San Diego on October 31, 2003. However, the object was so far away that its motion was not detected until they reanalyzed the data in January of this year. In the last seven months, the scientists have been studying the planet to better estimate its size and its motions.

"It's definitely bigger than Pluto," said Brown, a professor of planetary astronomy at Caltech.

Scientists can infer the size of a solar system object by its brightness, just as one can infer the size of a faraway light bulb if one knows its wattage. The reflectance of the planet is not yet known. Scientists cannot yet tell how much light from the Sun is reflected away, but the amount of light the planet re-

flects puts a lower limit on its size.

"Even if it reflected 100 percent of the light reaching it, it would still be as big as Pluto," says Brown. "I'd say it's probably one and a half times the size of Pluto, but we're not sure yet of the final size.

"We are 100 percent confident that this is the first object bigger than Pluto ever found in the outer solar system," Brown added.

The planet is a typical member of the Kuiper belt, but its sheer size in relation to the nine known planets means that it can only be classified as a planet, Brown said. Currently about 97 times farther from the Sun than Earth, the planet is the farthest-known object in the solar system, and the third brightest of the Kuiper belt objects.

"It will be visible with (Earth-based) telescopes over the next six months and is currently almost directly overhead in the early-morning eastern sky, in the constellation Cetus," said Brown.

A name for the new planet has been proposed by the discoverers to the International Astronomical Union, and they are awaiting the decision of this body before announcing the name.

Cassini flies by 'Death Star' Mimas, one of Saturn's most tortured moons

By Carolina Martinez

On its recent close flyby of Mimas, the Cassini spacecraft found the Saturnian moon looking battered and bruised, with a surface that may be the most heavily cratered in the Saturn system.

The Aug. 2 flyby of Saturn's 'Death Star' moon returned eyecatching images of its most distinctive feature, the spectacular 140-kilometer diameter (87-mile) landslide-filled Herschel crater. The closest images show Mimas, measuring 397 kilometers (247 miles) across, in the finest detail yet seen.

Scientists hope that analysis of the images will tell them how many crater-causing impactors have coursed through the Saturn system, and where those objects might have come from.

There is also the suspicion, yet to be investigated, that the

Numerous rounded and worn-out craters, craters within other craters and long grooves reminiscent of those seen on asteroids are also seen in the new images.

grooves, first discovered by NASA's Voyager spacecraft but now seen up close, are related to the giant impact that caused the biggest crater of all, Herschel, on the opposite side of the moon.



A dramatic view of Mimas acquired near Cassini's closest approach shows the battered moon against the backdrop of Saturn's rings.

Right: Mimas' most distinctive feature is the Herschel crater in the upper right of the image. The crater is 140 kilometers (88 miles) wide with a prominent central peak.

Spitzer finds hungry black holes

Most of the biggest black holes in the universe have been eating cosmic meals behind closed doors —until now.

With its sharp infrared eyes, NASA's Spitzer Space Telescope peered through walls of galactic dust to uncover what may be the longsought missing population of hungry black holes known as quasars.

"From past studies using X-rays, we expected there were a lot of hidden quasars, but we couldn't find them," said Alejo Martínez-Sansigre of the University of Oxford. England. He is lead author of a paper about the research in this week's Nature. "We had to wait for Spitzer to find an entire population of these dust-obscured objects." Quasars are supermassive black holes that are circled by a giant ring of gas and dust. They live at the hearts of distant galaxies and can consume up to the equivalent mass of one thousand stars in a single year. As their black holes suck in material from their dusty rings, the material lights up brilliantly, making quasars the brightest objects in the universe. This bright light comes in many forms, including X-rays, visible and infrared light.

3 honored by Space Flight Awareness

Three JPL employees who were selected as honorees in NASA's Space Flight Awareness Program traveled to Florida the week of July 11 to see the launch of Space Shuttle Discovery. The launch was delayed, eventually going off July 26, but Bill Heventhal (Section 317A),

Amy Posner (3746) and Richard Rainen (355A) still enjoyed a VIP tour of Kennedy Space Center and a recognition dinner at the Saturn Five facility at KSC.

The trio were the first group of Space Flight Awareness Program honorees to attend a launch event since the Columbia accident in February 2003.

Enceladus is an active, watery world

Saturn's tiny icy moon Enceladus, which ought to be cold and dead, instead displays evidence for active ice volcanism.

Cassini has found a huge cloud of water vapor over the moon's south pole, and warm fractures where evaporating ice probably supplies the vapor cloud. Cassini has also confirmed Enceladus is the major source of Saturn's largest ring, the E-ring.

"Enceladus is the smallest body so far found that seems to have active volcanism," said Dr. Torrence Johnson, Cassini imaging-team member. "Enceladus' localized water vapor atmosphere is reminiscent of comets. 'Warm spots' in its icy and cracked surface are probably the result of heat from tidal energy like the volcanoes on Jupiter's moon Io. And its geologically young surface of water ice, softened by heat from below, resembles areas on Jupiter's moons, Europa and Ganymede."

Cassini flew within 175 kilometers (109 miles) of Enceladus on July 14. Data collected during that flyby confirm an extended and dynamic atmosphere. This atmosphere was first detected by the magnetometer during a distant flyby earlier this year.

The ion and neutral mass spectrometer and the ultraviolet imaging spectrograph found the atmosphere contains water vapor. The mass spectrometer found the water vapor comprises about 65 percent of the atmosphere, with molecular hydrogen at about 20 percent. The rest is mostly carbon dioxide and some combination of molecular nitrogen and carbon monoxide. The variation of water vapor density with altitude suggests the water vapor may come from a localized source comparable to a geothermal hot spot. The ultraviolet results strongly suggest a local vapor cloud.

Life components in universe found

NASA's Spitzer Space Telescope has found the ingredients for life all the way back to a time when the universe was a mere youngster.

Using Spitzer, scientists have detected organic molecules in galaxies when our universe was one-fourth of its current age of about 14 billion years. These large molecules, known as polycyclic aromatic hydrocarbons, are comprised of carbon and hydrogen. The molecules are considered to be among the building blocks of life.

These complex molecules are very common on Earth. They form any time carbon-based materials are not burned completely. They can be found in sooty exhaust from cars and airplanes, and in charcoal-broiled hamburgers and burnt toast.

The molecules, pervasive in galaxies like our own Milky Way, play a significant role in star and planet formation. Spitzer is the first telescope to see these molecules so far back in time.

"This is 10 billion years further back in time than we've seen them before," said Dr. Lin Yan of the Spitzer Science Center at the California Institute of Technology in Pasadena, Calif. Yan is lead author of a study to be published in the August 10 issue of the Astrophysical Journal. Previous missions-the Infrared Astronomical Satellite and the Infrared Space Observatorydetected these types of galaxies and molecules much closer to our own Milky Way galaxy. Spitzer's sensitivity is 100 times greater than these previous infrared telescope missions, enabling direct detection of organics so far away

Since Earth is approximately four-and-a-half billion years old, these organic materials existed in the universe well before our planet and solar system were formed and may have even been the seeds of our solar system.

Special Events Calendar

Ongoing Support Groups

Alcoholics Anonymous—Meets Wednesdays at 11:30 a.m.

Caregivers Support Group—Meets the first Thursday of the month at noon in Building 167-111 (the Wellness Place).

Codependents Anonymous—Meets at noon every Wednesday.

Lambda (Gay, Lesbian, Bisexual and Transgender Networking Group)— Meets the first Friday and third Thursday of the month at noon in Building 111-117. For more information, call Randy Herrera, ext. 3-0664.

Parents Group for Children With Special Needs—Meets the second Thursday of the month at noon in Building 167-111 (the Wellness Place).

For more information on any of the support groups, call the Employee Assistance Program at ext. 4-3680.

Wednesday, August 17

JPL Library Orientation—Stop by Building 111-104 at 11:30 a.m. for an overview of the Library's products and services, and learn how to access numerous electronic resources from your desktop. For more information, call the reference desk, ext. 4-4200.

Thu.-Fri., August 18-19

Von Kármán Lecture Series—Dr. Karina Edmonds, senior

technology transfer specialist in JPL's Innovative Technology Assets Managements Office, will present "Technology of Tomorrow Today: An Overview of Space Technology Spin-Offs" at 7 p.m. Thursday in von Kármán Auditorium and Friday in Pasadena City College's Vosloh Forum, 1570 E. Colorado Blvd. Thursday's lecture will be webcast at *www.jpl.nasa. gov/events/lectures/aug05.cfm*. For more information, call Public Services at ext. 4-0112.

Wednesday, August 24

JPL Library Orientation—Stop by Building 111-104 at 11:30 a.m. for an overview of the Library's products and services, and learn how to access numerous electronic resources from your desktop. For more information, call the reference desk, ext. 4-4200.

JPL Toastmasters Club—Meeting at 5 p.m. in conference room 167. Call Dirk Runge, ext. 3-0465, or visit www. *jplcaltechtoastmasters.com.*

Thursday, August 25

Clogging Class—Meets at noon in Building 300-217. For more information, call Shary DeVore at ext. 4-1024.

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

Friday, August 26

Volunteer Professionals for Medical Advancement—Meeting at noon at Caltech's Athenaeum, 551 S. Hill Ave., Pasadena.

Wednesday, August 31

Volunteer Professionals for Medical Advancement—Meeting at 10:30 a.m. at the Caltech Credit Union, 528 Foothill Blvd., La Cañada.



Harrel "Buck" Crensbaw, Procurement Quality Assurance Group supervisor, was awarded the Patriotic Employer Certificate from the Department of Defense's National Committee for Employer Support of the Guard Reserve for bis support of employees deployed overseas. From left, David Hernandez, Crensbaw, Captain Amrando Freier and Olga Ceritelli. Both Hernandez and Ceritelli served with the Marine Corp's 4th Low Altitude Air Defense Battalion in Iraq.



From left: Richard Rainen, Amy Posner, Bill Heventhal.



News

Briefs

The Atlas V rocket that carries the Mars Reconnaissance Orbiter sits on the launch pad.

Launch of Mars Reconnaissance Orbiter Postponed

By Guy Webster

The launch of the Mars Reconnaissance Orbiter has been postponed due to a fuel level sensor issue with the Centaur upper stage aboard the Atlas V rocket. While liquid hydrogen was being loaded into the Centaur, fuel level sensors inside the stage sent back erroneous readings. At press time, engineers are determining whether the problem is with the sensor system or the computer software used with it. The next launch attempt is slated to take place Aug. 12.

The spacecraft will arrive at Mars in March 2006 for a mission to understand the planet's water riddles and to advance the exploration of the mysterious red planet.

"We have a big spacecraft loaded with advanced instruments for inspecting Mars in greater detail than any previous orbiter, and we have the first Atlas V launch vehicle to carry an interplanetary mission. A very potent and exciting combination," said NASA's Mars Exploration Program Director Doug McCuistion.

The mission will lift off from Launch Complex 41, Cape Canaveral Air Force Station, Fla. It is the first government launch of Lockheed Martin's Atlas V launch vehicle. "We're ready to fly, counting down through final procedures," said Chuck Dovale, director for expendable-launch-vehicle launches at NASA Kennedy Space Center, Fla. When the Mars Reconnaissance Orbiter arrives in March, it begins a halfyear "aerobraking" process. The spacecraft will gradually adjust the shape of its orbit by using friction from carefully calculated dips into the top of the Martian atmosphere. The mission's primary science phase starts in November 2006.

"Mars Reconnaissance Orbiter will give us several times more data about Mars than all previous missions combined," said James Graf, project manager for the mission.

Researchers will use the data to study the history and distribution of Martian water. Learning more about what has happened to the water will focus searches for possible past or present Martian life. Observations by the orbiter will also support future Mars missions by examining potential landing sites and providing a communications relay between the Martian surface and Earth.

The craft can transmit about 10 times as much data per minute as any previous Mars spacecraft. This will serve both to convey detailed observations of the Martian surface, subsurface and atmosphere by the instruments on the orbiter and enable data relay from other landers on the Martian surface to Earth. NASA plans to launch the Phoenix Mars Scout in 2007 to land on the far northern Martian surface. NASA is also developing an advanced rover, the Mars Science Laboratory, for launch in 2009.



Once upon a time: Storytelling at JPL

Provocative titles such as "MER: Disaster Averted" and "All Good Spacecraft Don't Go to Heaven" draw a roomful of people to the JPL Library once a month. They gather to hear stories of stunning successes, victories snatched from the jaws of various engineering defeats and the "good ole days" when the Lab held the "Miss Guided Missile" contest. JPL Stories, now in its sixth year, was started by JPL's Technical Librarian Teresa Bailey. Universe spoke with Bailey about JPL Stories.

How did you get the idea for a storytelling program?

A few years ago, I attended a national conference on knowledge management. The keynote address speaker distilled what was important about knowledge management in a single word: storytelling. He went on to say that our most important knowledge isn't in a database and it's not in a computer application; it's in our stories.

As a librarian, I'm aware that public libraries have traditionally been places that provide an opportunity for storytelling, poetry readings and other forms of community expression. It hadn't occurred to me our library could serve that same purpose. One day, I was talking about all of this with my division manager, Willis Chapman, and he said, "Why don't you do storytelling in the library?" I responded, "Well, okay," but I had no idea how storytelling would work in the library, or what it would look like. Not much had been written on the institutional benefits of stories when I started thinking about my storytelling project in 1999. There was no guide to follow, no handbook on how to get things started.

What did you do?

I knew about the pioneering work done at JPL from formal reports and discussions at conferences. Storytelling was about expressing the personal experience. Beyond the well-documented specs of a project, I wanted to create a platform for sharing first-hand experience of what it is like to work on a NASA mission.

I decided to set up a few basic criteria. We needed storytellers, that much was certain. But what time would we have our program? How often? How long would it run? Step-by-step, I figured out that we would have the programs in the late afternoon near closing, when many people are winding down for the day. And, even though we're blessed with an abundance of old-timers who have accomplished incredible things here, if we wanted to build community we needed to make our program something that everyone in the community could feel a part of. When I scheduled stories, I would try to mix career types, ages and levels of tenure.

We set up a date for him to speak. I worked with a designer to create a "look" for the program, sent out flyers and put announcements in Universe. I got a lot of feedback: People wrote to tell me that the library was too small, that the time of day wasn't good for people who have to commute, that we should be recording the talks. I even got one crank call asking if we would be serving milk and cookies.

hings to Keep

Were you discouraged?

No, that didn't discourage me. I realized that my goal was to reach the community and the community was responding to the program. I might have shaken them up a little, but I had reached them.

And people came. I was amazed to see more than 70 people show up for our very first program. That wasn't the only surprise. We assumed that the audience would enjoy the stories if we could convince them to come. But we didn't anticipate just how warmly they would respond. People came up to me and thanked me. They told me that the story had given them a feeling of connectedness and belonging.

What are some of the more memorable stories?

All our programs were stories told from a personal point of view, and all were stories that have shared knowledge and experience not typically captured in a formal report.

They are all great, but a few come to mind. Dr. Bobby Williams told us about landing the NEAR spacecraft on an asteroid, and Tom Gavin about "What Could Go Wrong" on a project. We've listened to a parable ("Green Eggs and Ham—JPL Style") that expressed what it's like to be a space discoverer—the struggles and the disappointments, but also the reason to keep going in the face of setbacks. Dr. Edward Stone has told us about his "Journey of a Lifetime" with the Voyager spacecraft, and Dr. William Pickering about JPL's early years. We were excited when Dr. Elachi joined us and told his career story, "From a Part-Time Academic to the Director's Office." Dr. Rosaly Lopes recently talked about "Volcano Adventures on the Earth and Planets." All our programs were stories told from a personal point of view, and all were stories that have shared knowledge and experience not typically captured in a formal report.

How did you go about finding the stories?

I put out a call for storytellers in the Universe. When I did not receive any responses, I realized that I had been too ambiguous. No one knew what to make of my ad. Storytelling, what does that mean? When people thought about storytelling they thought about reading a children's book in front of an audience; it was hard to make the conceptual leap from that to telling a personal story about a JPL experience. So, I started talking. My plan was to talk to some people in management about the program to try to get more direction on my recruiting effort. My management's support was instrumental in generating interest and gaining buy-in for the program by upper management.

Who was your first storyteller?

I had one of my first meetings with Larry Dumas, then JPL's deputy director, to discuss ways that I could promote the program and recruit storytellers. Then he told me, "I would like to be your first storyteller." It turned out that he had been thinking about this for some time. A lot of his job as deputy director dealt with organizational change because we were in the middle of the shift from large missions to faster, better, cheaper, smaller missions. He was responsible for bringing about major changes that disturbed a lot of people, and he found himself thinking about the things that shouldn't be changed—such as core values and work ethics. He knew already what he would call his story: "Things to Keep."

Has it become easier to line up the storytellers?

When I began working on JPL stories, I had to do a lot of selling as I made cold calls to find storytellers. I used to have to go into a long explanation of the program and its benefits to JPL. I don't have to do that anymore. On feedback forms circulated at the end of each program, we receive recommendations for future storytellers. When I call someone now to talk about the program, they've invariably heard about the program and are interested in participating.

Here at the library, the series is enthusiastically supported by our staff and a core team keeps the program on track, including Mickey Honchell, who transforms our space each month, and Barbara Amago, who helps with programming and stands ready to step in and direct the program if needed.

Do you believe the JPL Stories program is a success?

Yes, I do. I like to think that by providing a venue for JPL employees to come together as a community and by sharing the experiences of individuals within that community, we're doing our small part to help make JPL a dynamic, engaging place to work.

For more information, visit http://beacon.jpl.nasa.gov/WhatsNew/JPLStories.htm

Passings

WALTER H. LAIRD, 80, retired from Section 356, died Dec. 7, 2004. Laird worked at JPL from 1958 to 1989. He is survived by his wife Enriqueta, and sisters Lillian Radway and Marion Johnson. Internment took place at the River-

side National Cemetery

etters

This is the month of my retirement, and I want to thank the many outstanding individuals at JPL who have helped me so much in projects, on design teams and on other studies and tasks. Thank you too for taking your time to teach me and for your friendship. It has been a pleasure and a privilege to work with you, and I wish you the best of luck in the future.

David Collins

A special thank you goes out to my friends and colleagues in the JPL community for your support and thoughtfulness during the passing of my grandmother. Your cards and flowers have greatly comforted me in this difficult time.

Michele Judd

I'd like to thank my many JPL friends for your warm sentiments after the recent death of my mother. Being reminded of the kind and caring nature of JPL has helped my wife and me through our difficult time. The plant is a nice reminder of Mom, who died while engaged in one of her favorite hobbies, gardening.

Scott Peer

Thank you, all. Your thoughtful expressions of condolence at the recent death of my father, Casey Dobkowski, are very much appreciated. It is a good feeling to be able to consider all of you at JPL as family.

Ed Dobkowski

To friends and colleagues at JPL: My wife, Julie, and I are grateful for the lovely plant and the kind expression of sympathy from the JPL family on the death of Julie's father. We appreciate vour kindness.

Don Kurtz



AIR CONDITIONERS, window units, 15K BTU, \$150, 8K BTU, \$100 or both for \$200. 249-

tion, \$65; boy's 16" with training wheels, \$25. 626/798-1839.

24D (on rollers) and matching 3-shelf bookcase, $15.5"\mathrm{W} \ge 24"\mathrm{D} \ge 60"\mathrm{H},$ excellent condition, bonus: solid wood, audio/visual sliding shelves; \$300 obo. 970-8456, Steve. EXERCISE EQUIPMENT, Nordic Track with carrying case, fair cond., \$150/obo. 248-4003. FAX CARTRIDGE (model PC-102RF) for Brother machines, brand new, \$20; DIET TAPES, Jenny Craig, set of 14, \$25; COMPUTER POWER CONTROL CENTER. 5 power switches + 1 master switch, 5 surge-protected outlets + 2 modem/fax/phone jacks, new, \$20. 790-3899 FURNITURE and TV: sofa bed, vg condition neutral colors, \$75; oak dining room set with 4 chairs, good condition, \$100; desk, wood, small dimensions, good for small space, \$75; futon mattress (full), \$20; 27" TV, works best with VCR as tuner, \$20; dresser, green, wood, threedrawer, \$20; drum table, \$10; located in Altadena 3 mi. from JPL. 626/791-2784. GUITAR, Parker NiteFly-M, 1 year old, likenew cond., w/gigbag, \$650/obo. reverb2020@ vahoo.com

GUITAR, Guild 12 string, seldom played, glossy finished, dreadnought of solid spruce top, laminated mahogany sides, & arched mahogany back, model D25-12-NT-E, serial AD421392 \$840. 957-2852.

JACKET for bird hunting, built-in shell pockets reinforced shooting shoulder, sz. 40 long, clean, \$25; gun case, flexible, zippered, outside like leather, inside cloth lined, good condition, for rifle or shotgun, 49." 626/793-1895. JACKETS, new, 1 brown suede size M and 2 black leather size M, one lined; pictures can be provided; \$60 each. 626/293-8497

JEWELRY: anniversary ring (1 ct) w/gift box, \$750; diamond (chips) ring (10k yg) w/gift box, \$99: Suunto S6 wristop computer, great for sports enthusiasts, \$250/obo, 364-1283. Valerie

JEWELRY: bracelet, 14k tri-color gold diamond cut, \$140; necklace, diamond cut, 14k twosided 18-inch, \$200, Call 818-653-9037. LAWNMOWER, Murray 20 rear-bag push mower, model 11551, plus trimmer; \$95 for both. 545-0455.

LAWNMOWER, gas, \$60/obo; TV, 17-in., Toshiba. color. \$30/obo. 626/914-7853. MISC · toaster oven Black & Decker fully functional, cleaned up, \$10; covered turkey roaster, like new, black iron, self-basting, 15 x 11 x 7.5, \$7; electric dinner bun warmer, vg cond., \$7; many other household and camping items. 626/793-1895.

MISC .: carpet shampooer, needs washer replacement on handle, \$15; red wig, shoulder length, never used, \$20; fishing pole, saltwater, \$25; baseball glove, small, left handed, & conditioner, good cond., \$15; landscape oil painting, autumn tones, \$100; antique cedar chest, lid needs repair, \$75; trash can w/wheels, \$5, '50s Motorola TV "shell," \$20; antique pot w/handle, \$10. 626/357-8210. MISC .: washer/dryer, white, Kenmore heavy duty super capacity plus, top loading washer, less than 1 year old, \$200; quiet pak electric dryer, 3 years old: \$200; play structure, Little Tikes, plastic, w/slide & platform, \$50; chairs, wooden rocking chair w/ floral seat pad, \$50, blue and white check wide upholstered 'chair and a half', exc. condition, \$75, medicine cabinet, wooden w/oval mirror, \$30. bike frame, men's, giant, \$20. Photos/questions ebensinger@netzero.net

MOUNTAIN BIKES, Univega model 806-s, very nice, one with 16" frame, one with 18" frame only ridden a few times, \$500/ea. 760-4318. MOVING SALE: 10-month old items, as news queen bed frames, \$90-140; queen mattress \$140; twin bedframe, \$50; twin mattress, \$70; bunk bed, Tromso, \$100; TV, Daewoo 27' flatscreen, \$160; vacuum, Kenmore HEPA, \$140; broiler, B&D, \$30; microwave oven, GE, \$30; study desk, Jerker, \$60; utility desk, \$30; coffee table, \$50; chest, 4-drawer, \$70; dining table, \$70; tall bookcase, \$55; bookcase Docent, 4-shelf, \$65. 640-7766 or 952-7942. MULTI-FUNCTION PRINTER: HP OfficeJet G85xi; print/copy/fax/scan functions; copy/fax/scan work fine; print function not always reliable; manuals, software, and latest driver included; \$75/obo. 626/577-0068 ORGAN, Yamaha 415 electronic console w/13 pedals, 3 keyboards, 144 rhythm patterns, pd. \$7,500, sacrifice for \$2,000; PORT REPLICATOR, for IBM Thinkpad, works with T20/T21/A20/A21 or X. R series, like new, \$85: ULTRA ATA CONTROLLER CARD with cable, motherboard, brand new, \$20. 790-3899. PRINTER CARTRIDGES (5), Canon ink jet, 2 yellow (BCI-3eY), 2 cyan (BCI-3eC), 1 magenta (BCI-3eM); one HP color cartridge, #78 (C6578DN); all original Canon or HP parts; fit many printers: Canon cartridges cost \$11 each, sell \$5/each: HP cartridge cost \$26, sell \$15. 626/577-0068.

Vehicles / Accessories

'02 BMW 325i 4 dr sedan, 2.5 inline-6; 5 sp. Manual, power locks, mirrors, and windows CD, iPod adapter; keyless entry & alarm, white on sand leatherette, exc. cond., only 22K miles, free maintenance until 48k miles, asking \$21K. 626/449-0997.

CAR TOP CARRIER, large, vg cond., \$150. 714/357-2440, Gerald.

'03 DODGE Ram 1500, 5-speed, 53,000 mi., charcoal exterior, black interior, new tires, and front brakes, one owner, 12,000/obo. 661/586-1668.

'96 DODGE Ram 1500 Laraime SLT, good cond., V8, blue exterior, beige interior, 64,000 miles. 957-7468. Lori.

'02 DUCATI 750 SS, like new, only 800 miles, beautiful red w/full fairings, always garaged and covered, clean title, CA registration good until Dec. '05, basically stock, ready to ride, recently changed oil and filter. I have another motorcycle so this one is a toy, \$7,000. centersun@hotmail.com or 626/441-0150. ELECTRIC BIKE, Giant Lafree full size, like new, feel like Lance without the effort, used for 10.5 mile each way commute to JPL, new battery pack and charger, pennies per day to charge, 20 mph top speed, street legal, no license needed, fun and friendly to the environment, \$450/obo. 323/223-7652, Mike.

'66 FORD Mustang 289 coupe, V8, blue/blue, black plates, always a California car, no accidents, excellent original shape, drives like new, mature owners, beautiful, must sell, \$10,500. 626/296-3441.

'99 HONDA Odyssey LX, green, 70K, vg cond., \$11,200; '97 SATURN SL2, 5sp., green, 4 dr., 75K, new tags, exc. cond., \$3,700. 640-7766 or 952-7942.

'97 HONDA Passport, white with grey interior, 160K miles. V6. auto trans. A/C. cruise. fair cond., runs O.K. but needs some work, \$2,500/obo. 249-2925

'99 JEEP Cherokee Classic, 4 dr., 6 cylinder, 4.0 L, 2WD, auto, pwr. everything, a/c, gold exterior, grav interior, no CD player: no issues. clean and beautiful; \$11,900/obo. tosin@caltech.edu or 626/683-3970. '95 LAND ROVER Range Rover SE, V8 4.0 liter,

auto, 4WD, 138K, tan, leather seats, cd, ps, pw, dual airbags, moonroof, runs great, good cond., \$6,500/obo. 626/296-9073 or 818/515-2461.

'86 LINCOLN Town Car, good cond., July smog ck & license renewal, \$1,995. 790-2013. '04 NISSAN 350Z Enthusiast, 6-speed manual

trans, white color, well cared for, 17K miles, \$24,000.760-4318. '01 NISSAN Frontier work/pickup truck, Aztec

red ext., gray int., 4 cylinder, stick shift, about 36K miles, am/fm/CD, back cab-top, \$10K/obo. 626/808-3891, Colleen.

'91 NISSAN Sentra, 100+ miles, red 4 door, runs good, looks OK, \$1,100/obo. 626/524-0433, Bill.

'04 TOYOTA Corolla LE, 4-dr. sedan, automatic a/c, power steering, power windows & door locks, am/fm/CD, Lo-Jack, Toyota certified with 100K/6 yr extended warranty, exc. cond., must see to appreciate, white, 16,000 miles, estate sale: \$15,900. 248-7525, Walt.

'01 TOYOTA Corolla CE, manual trans, 4 dr., 43K mi., oil changes only required, white w/minor scratches, tires recently replaced (4 Michelins), \$7,995. 626/577-2882.

'99 TOYOTA Corolla CE with power pkg., silver, 1 owner, exc. cond., auto, a/c, pw/pd, am/fm ca 104K mi., mileage accumulated between Valencia/JPL, \$4,700. chazungna@yahoo.com.

'94 TOYOTA Camry, 4 door, gold, auto, a/c, 150K mi., clean, tinted windows, Kenwood stereo system w/10 CD changer, alarm/keyless entry system, wheel locks, all maintenance records available, \$4,200. 626/398-6564. '97 VW Jetta, 98K miles, orig. owner, a/c,

am/fm/stereo, airbags, exc. cond., \$4,000. 619/884-7894, Chris.

Wanted

DONATIONS of functional red "Radio Flyer"type wagons (steel or steel and wood) to serve the nonprofit "Theodore Payne Foundation for Wildflowers and Native Plants" in their CA native plant nursery and propagation projects 626/798-3235.

HOUSING: Quiet engineer seeks small detached

fenced backyard, fruit trees, roses; see www.alumni.caltech.edu/~chrisc; \$1,850, negotiable (includes water, gardener, trash). 626/794-9579, eves.

ALTADENA, Comprehensively furnished extended stay sabbatical house: 3 bd., study, boundary Angeles Nat'l Forest, 3 mi. from JPL, trail access, view, fireplace, oak floors, antiques, furniture, beds, dinnerware, utensils pots/pans, all linens & towels, fine soaps, necessities included; just bring toothbrush & clothes; TV/DVD/VHS, DISH satellite, wireless DSL, garden, fruit trees, patio, garage; private, immaculate; available September. 626/798-3235

ARCADIA, large studio guest house, detached, separate entry, kitchenette, laundry facilities, no pets, non-smokers, shared utilities, \$850. 626/441-0041.

ARCADIA, apt, 2 bd. / 1 ba. +den, garage, upstairs unit, clean, spacious, washer/dryer in unit, a/c, stove, walking distance to shops, near Santa Anita Fashion Park, exc., quiet neighborhood, close to JPL, no pets, water/gardener/trash included, \$1499 +util., sec. deposit, short-term ok. 626/576-7333. EAGLE ROCK, 1 bd. in a 2 bd./2 ba./2-story apt. on Fair Park Ave right off Eagle Rock Blvd., 1 block south of Colorado Blvd., bedrm. for rent has its own ba., very secure building, very clean apt., quiet neighbors, great neighborhood, no pets, no smokers, \$695. 323/472-4590.

LA CANADA, 1-bd. apt., very close to JPL, La Canada schools address, next to Caltech Credit Union across from shopping and Starbucks, includes new stackable washer/dryer, refrigerator and stove, \$850. 952-4444, ext. 201.

PASADENA, beautiful home in Upper Hasting Ranch, 3 bd., 2 ba., fam. room, den, breakfast bar in kitchen, remodeled baths and kitchen, fireplace, 2 car attached garage, very private backyard, avail., 1-year lease, \$2,975 & util. 626/351-9641 or bettyrs@earthlink.net. PASADENA: for lease, fully remodeled 4 bd., 3.5 ba. house situated on very desirable, quiet street in the Caltech/Ritz-Carlton neighborhood; walking distance to Caltech (5 min.), Lake Ave., Old Town; formal living room, formal dining room, large sunny den, spacious kitchen with island, spa/hot tub, new large/ wide stone driveway leading to 2-car garage, beautifully manicured lawns; new carpeting hardwood floors, lots of storage space, \$4,295. 626/795-4235.

SAN GABRIEL, beautiful guest house in quiet neighborhood, newly remodeled kitchen, 2 bd., 1.5 ba., unfurnished, laundry hookup, wall a/c, wall heater, 2-car parking space, storage available, gardener/water/trash paid, \$1,100. scorrea00@yahoo.com, Patricia Cisneros 626/230-3799, after 6 p.m.

SIERRA MADRE, 2 bd./1.5 ba. townhouse-style apt. to share, 1,000 sq ft, large patio, a/c, quiet street, garage parking, W/D in unit, n/s, \$635 + 1/2 util. 626/355-5667.

SOUTH PASADENA townhouse, brand-new construction (Mission Meridian Village), 2 bd., 2 1/2 ba., \$2,595. http://rent.k-von.com, 626/233-9496.

Vacation Rentals

BALBOA ISLAND, cute, 2 bd., 1 ba., fully furnished upstairs apartment w/covered deck, just steps from the bay on Little Island & a short walk to the main st., includes laundry, sleeps 5, avail. mid-September at winter rates of \$85/nite. 626/351-9641 or bettyrs@ earthlink.net

BIG BEAR LAKEFRONT, luxury townhome, 2 decks, tennis, indoor pool/spa, beautiful master bd., suite, slps. 6. 949/786-6548.

FLORIDA condo, beautifully furn. 2 bd., 2 ba. second floor, on the surf of New Smyrna Beach, half-hour to Cape Canaveral, 90 minutes to Disney World; enjoy all the comforts of home, quiet, relaxing, overlooks beach. BBO/pool/game room, easy walk to stores and restaurants. 760/439-7821, Darlene, dfhauge@yahoo.com.

HAWAII, Maui condo, NW coast, ocean front view, 25 ft. fr. surf, 1 bd w/loft, compl. furn. phone, color TV, VCR, microwave, d/w, pool, priv. lanai, slps 4, laundry fac., rate \$145/nite/2, \$20/nite/add'l person. 949/348-8047, jackandrandy@cox.net.

HAWAII, Maui, Westin Ka'anapali Ocean Resort, 7 nights, Oct 30 - Nov 6; 5-star luxury right on the beach; 1 bd. w/king heavenly bed, living room with queen sofa bed, fully furnished kitchen, 2 TVs, DVD player, whirlpool tub, plush bathrobes, private balcony, wash/dryer, free high-speed internet, large pool w/water slide, fitness center; sleeps 4, 900 sq. ft.; \$190/night/obo (compare to Westin's \$450/night); view resort at www.westinkaanapali.com. 626/794-9579 or fivestarresorts@earthlink.net.



For Sale

for fish or reptile, no leaks, \$20. at rmndoza@gmail or 310/351-3269, Ricardo ART DRAWER, Hamilton 5-drawer steel flat file for 36" x 48" sheets with wood stand and top, 3 drawers have dust covers, \$600/obo. 626/798-8290, Katherine

BICYCLES, boy's 20" GT Dyno, excellent condi-

JPL'S ONLINE NEWS SOURCE

View this and previous issues of Universe at

dailyplanet.jpl.nasa.gov/ universe/index.php

E-mail us at

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universe@jpl.nasa.gov

2669.

AQUARIUM, twenty-nine gallon, can be used

Laboratory, 4800 Oak Grove Drive, Pasadena, CA 91109.

Notice to Advertisers

Advertising is available for JPL and Caltech employees, contractors and retirees and their families. No more than two ads of up to 60 words each will be published for each advertiser. *Items may be combined within* one submission. Ads must be submitted via e-mail to universe@jpl.nasa.gov and 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.

menter, racking container, airlocks, siphons. bottle capper and hydrometer; this kit has almost everything you need to get started making your own beer; items are used but in good cond., \$20. 626/355-4447, John.

CHAISE, contemporary, white, excellent condition, was \$699, now \$95, 626/646-1937.

COFFEE TABLE, round, solid dark brown wood, 45" diameter, imported from China carved all around the perimeter, beautiful, \$185.545-0455.

COMPUTER, Mac G4 Cube with all the trimmings, OS 9, \$500/obo. 562/234-0718. COPIER & PHOTO PRINTER, Canon, new, box never opened. \$40, 626/359-7666.

DINING SET, 5 piece, dark wood, 30 x 56 table with 4 white upholstered chairs, good condition, \$350. 626/510-9152.

DISNEYLAND TICKETS, 4 adult @ \$43.50/ea.: HOUSE FAN, 30" drive, never used, \$100; EX-ERCISER, Nordic Trac, exc. cond., \$100/obo. 626/797-3082.

DRAPERY, floor-length tie-back panels and valance, light blue floral chintz fabric, vg condition, 2 sets, \$60; DRAPES, loose weave, cream with pink dots, floor length, 2 sets, vg condition, \$60; photos available, all have been cleaned and are on hangers. 909/596-4390.

DRYER, Fridgidaire electric, excellent condition, \$100/obo. 626/446-1748.

ELETRONIC TEST EQUIPMENT, 1960's vintage, with about 200 new vacuum tubes variacs, power supplies & other related stuff. 790-2013.

ENTERTAINMENT CENTER, custom 2-piece Golden Oak, TV/stereo cabinet 55W x 60H x REFRIGERATOR, GE model no. TBXW182PB, 64.25" H, 29.5" W, 29" D, \$60. 626/241-7084, Steve.

ROCKING ARMCHAIR, late '60s vintage, wood is walnut finish, barrel shape with curved spindle backs, orange crushed velvet seat and back cushions, \$25. 249-3677, evenings

SOFA, 7-ft. overstuffed, California beige, ultrasuede, very high quality, vg cond., \$600/obo. 562/234-0718.

TV, Sony 13" color, no problems, \$65. 249-3677, eves.

TV, 32" Sony Trinitron console in full wooden cabinet, glass-covered storage, exc. condition, #KV-32TW77, \$150; oak stereo cabinet on wheels, 36x24x17, tinted glass magnetic doors, \$50; Kenwood multiple 5-Disc carousel CD player, model DP-R791 w/remote, 1-bit dual D/A converter, exc. cond., \$50; Kenwood integrated stereo system, model KRX-891 w/digital tuner, twin dubbing cassette decks and amp. w/remote, \$85. 626/398-4960.

VACUUM CLEANER, Shark Spectra EuroPro w/Hepa filter, extra wide, extra bags and extra filter included, all gadgets intact, \$25. 626/398-4960.

house/guest house to rent in nice neighborhood. 310/647-7983, please leave message. MATH TUTOR, Jr. & Sr. high school level classes (geometry, pre-algebra, algebra I & II, SAT math, etc), eves and/or weekends, also looking for English tutors. 888/784-1639, leave msg. David.

SPACE INFORMATION/memorabilia from U.S. & other countries, past & present, for personal use. mrayman@alumni.princeton.edu, 790-8523. Marc Rayman.

VANPOOL RIDERS, full- and part-time riders, from Fontana w/stops in Rancho Cucamonga and La Verne, save gas, be energy-efficient and ride to work in a new 2005 Ford luxury 14-passenger van, full-time riders (JPL employees) can qualify for a \$50 a month vanpool subsidy as well as a \$300 TVS subsidy. Rhea Clearwater, ext. 4-5831 or Mike Taylor, 4-8343 for vanpool times, route and monthly fares or the Rideshare Office, 4-7433 for more information and the benefits of vanpooling.

Free

BUNNIES, 2 lop eared, friendly, mature spayed females; includes hutch (cage) and all supplies great low-maintenance pets; moving, must find a new home for these cute girls. 323/223-7652, Mike.

For Rent

ALTADENA, charming, 2 bd. / 1 ba. house near Christmas Tree Lane; hardwood floors, fireplace, appliances, whole-house fan,

MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, slps. 6-8, fully equip'd kitchen incl. microwave, D/W, cable TV, VCR, phone, balcony w/mtn. vw. Jacz., sauna, streams, fishponds, close to Mammoth Creek, JPL disc'nt. 626/798-9222, 626/794-0455 or valeriee@caltech.edu.

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

OCEANSIDE beachfront: lovely 2 bd., 2 ba. single-level deluxe condo with fireplace and white water ocean views (end unit); luxurious gated complex on the sand w/game rooms, fitness room, pools, BBQs & Jacuzzi; 10-minute walk to pier or harbor; sleeps 6, JPL discount. www.beachvisitors.com, 760/433-4459.

ROSARITO BEACH condo, 2 bd., 2 ba., ocean view, pool, tennis, short walk to beach on prvt. rd., 18-hole golf course 6 mi. away, prvt, secure parking. 626/794-3906.

TIMESHARES (2), many locations, 1 bd. (upgrades may be available), upscale accommodations with kitchens, great for families, worldwide, great rates. 364-1283, Valerie.

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MRO is on cruise

Jet

Trajectory correction due Aug. 27

By Guy Webster



La

Propulsion

Team members in JPL's Mission Support Area analyze the data that reveal the successful status of Mars Reconnaisance Orbiter as it leaves Earth on Aug. 12. From left: Bryan Allen (mission controller), Stan Butman (telecom engineer), Tracy Drain (mission controller).



Tiny icy moon `feeds' giant Saturn ring

By Carolina Martinez

How did those beautiful rings of Saturn form?

This is one of the big mysteries people have wondered about since the rings were discovered. Answering this question is a key science objective for the Cassini mission. Cassini has found a partial answer by discovering that the moon Enceladus is "feeding" Saturn's largest ring, the E-ring.

During a close flyby of Enceladus on July 14, Cassini's cosmic dust analyzer directly measured that Enceladus' south pole is spewing tiny ice grains that are being scooped up into the expansive E-ring. This flyby was so close, within 175 kilometers (109 miles), that it allowed the spacecraft to take a direct sniff at Enceladus and measure the dis-

> tribution of the freshly produced grains within the E-ring. The instrument found that slow-moving dust grains cannot escape the moon's gravity and are trapped to form a cloud around the moon, but the faster dust grains get away from Enceladus and replenish Saturn's E-ring.

JPL's Mars Reconnaissance Orbiter, launched on Aug. 12, has completed one of the first tasks of its seven-month cruise to Mars, a calibration activity for the spacecraft's Mars Color Imager instrument.

"We have transitioned from launch mode to cruise mode, and the spacecraft continues to perform extremely well," said JPL's Dan Johnston, Mars Reconnaissance Orbiter deputy mission manager.

The first and largest of four trajectory correction maneuvers scheduled before the orbiter reaches Mars is planned for Aug. 27.

For the calibration task on Aug. 15, the spacecraft slewed about 15 degrees to scan the camera across the positions of the Earth and moon, then returned to the attitude it will hold for most of the cruise. Data were properly recorded onboard, downlinked to Earth and received by the Mars Color Imager team at Malin Space Science Systems, San Diego. Dr. Michael Malin, principal investigator for Mars Color Imager, said the image data are being processed and analyzed.

This multiple-waveband camera is the widest-angle instrument of four cameras on the orbiter, designed for imaging all of Mars daily from an altitude of about 300 kilometers (186 miles). Imaged at a range of more than 1 million kilometers (620,000 miles) away, the crescent Earth and moon fill only a few pixels and are not resolved in the image.

However, this is enough useful information to characterize the instrument's response in its seven color bands, including two ultraviolet channels that will be used to trace ozone in the Mars atmosphere. This is the first of two events early in the cruise phase that check instrument calibrations after launching. The second will occur in early September when higher resolution cameras are pointed at Earth and the moon as the spacecraft continues its flight to Mars.

The Mars Reconnaissance Orbiter will reach Mars and enter orbit on about March 10, 2006.

After gradually adjusting the shape of its orbit for half a year, it will begin its primary science phase in November 2006. The mission will examine Mars in unprecedented detail from low orbit, returning several times more data than all previous Mars missions combined.

Scientists will use its instruments to gain a better understanding of the history and current distribution of Mars' water. By inspecting possible landing sites and by providing a high-data-rate relay, it will also support future missions that land on Mars.

More information about the mission is available online at *www.nasa. gov/mro.*

The mission is managed by JPL for the NASA Science Mission Directorate. Lockheed Martin Space Systems, Denver, prime contractor for the project, built both the spacecraft and the launch vehicle.

a higher surface temperature detected by Cassini's composite and infrared spectrometer, which detected temperature differences at the south pole.

Cassini's 'bag of tricks'

Cassini is proving that having multiple instruments, capable of in-situ measurement and remote sensing, is invaluable. Its entire bag of tricks is helping solve the Saturnian-ring puzzle. At Enceladus several instruments have detected a localized atmosphere at the south pole, while another has detected huge temperature differences. The discoveries have turned the picture of Enceladus from a dead, cold body into an active, warm moon (see *http://saturn.jpl.nasa.gov/news/press-release-details. cfm?newsID=592*). The next close Enceladus flyby is March 2008.

The measurements that confirmed Enceladus as the source of the



One ring to rule them all

This discovery is the first direct confirmation that the moons of Saturn are responsible for forming one of Saturn's rings. This information may play a key role in deciphering how the other rings of Saturn formed.

Saturn's rings are an enormous, complex structure. From edge-to-edge, the ring system would not even fit in the distance between Earth and the moon. The seven main rings are labeled in the order in which they were discovered. From the planet outward, they are D, C, B, A, F, G and E.

Saturn's remarkable E-ring is the largest planetary ring in our solar system, spanning all the way from Mimas' orbit to Titan's orbit, about 1 million kilometers (621,370 miles). It is by far the most extended ring around Saturn.

Enceladus and its "tiger stripes" as captured by Cassini on July 14.

Making the ring

Until recently scientists assumed that the dust at Enceladus was produced by a process similar to that observed at the Galilean moons of Jupiter: micrometeoroids striking the moon's surface and blasting dust particles loose. However, the Cassini data show that the E-ring is being replenished not only by dust particles from micrometeoroid hits on the surface of Enceladus but also from grains expelled from possible vents located in the south polar region. The possibility of vents is revealed by E-ring were performed using the high-rate detector, a subsystem of the cosmic dust analyzer. The detector was developed by the University of Chicago. The cosmic dust analyzer is operated by scientists at the Max Planck Institute for nuclear physics in Heidelberg, Germany. Design and preliminary analysis of the measurements is based on models that were developed in the University of Potsdam, Germany.

Additional information on the Cassini mission is available at *http://saturn.jpl.nasa.gov.*

Cassini's whirlwind tour of Titan continues

Cassini successfully completed another close encounter with Titan on Aug. 22. This time Cassini focused on the hazy moon's south pole. The composite and infrared mapping spectrometer was riding "shotgun" on this flyby with the main observations designed around this instrument. The instrument can map how cold Titan is. The spectrometer studied Titan's atmosphere to find out if the same processes that happen on Earth take place on Titan. It is summer in Titan's southern hemisphere so this part of Titan is in perpetual daylight right now.

The next Titan flyby will be on Sept. 7, when Cassini will come within 1,075 kilometers (668 miles) of the surface. Cassini's radar will peer through Titan's foggy veil to reveal surface features.

Follow Cassini's travels of Earth's wayward twin, Titan, by checking the Cassini Web page at *http://saturn.jpl.nasa.gov*.

NASA names new leaders

DR. MARY CLEAVE has been named associate administrator for NASA's Science Mission Directorate. DR. COL-LEEN HARTMAN will be the directorate's deputy associate administrator.

Cleave previously served as the director of the Earth-Sun System Division in the Science Mission Directorate. She began her NASA career at the Johnson Space Center when she was selected as an astronaut in May 1980. She flew space shuttle missions in November 1985 and May 1989. Cleave also served as project manager for the Sea-viewing Wide Field-of-view Sensor (SeaWiFS), an ocean color satellite sensor monitoring global marine chlorophyll concentration.

Hartman, while serving as a special assistant to the NASA administrator, served as agency liaison within the Office of Science and Technology Policy, Executive Office of the President.

Hartman has been a senior program executive and scientist for more than 24 years, formulating programs, evaluating proposals, and making recommendations and decisions in response to the needs of the science community. Prior to her White House service, she served as the National Oceanic and Atmospheric Administration's deputy associate administrator for Satellite and Information Services, managing NOAA's civil environmental remote-sensing satellites and the three National Data Centers.

New Weight Watchers series offered

JPL and contractor employees are invited to join the successful Weight Watchers at Work series. Those considering joining may attend a free orientation meeting on Tuesday, Aug. 30, at 11:30 a.m. in Building 79-16. The location is subject to change.

The cost for the 17-week series is \$203.15 (\$11.95 for each meeting) paid by check, cash, Visa, MasterCard, Discover Card or American Express. A three-check payment plan is available if you sign up on or by Sept. 6. Checks payable to Weight Watchers for \$67.72 each are collected (all must be dated Sept. 6) at the first meeting and are deposited Sept. 6, Oct. 6 and Nov. 7.

JPL and contractor employees are welcome to join the series at any time. Those who join after the first week are required to pay \$12 for each remaining meeting. The total for all remaining meetings is due at the time of enrollment. This and other information can be found at *http://eis.jpl.nasa. gov/hr/esr/wellness/wwatchers.htm.*

269 customer focus upgraded

The Acquisition Division's Universities Subcontracts Section (269) has recently reorganized to improve customer focus.

"Satisfying the customer and providing for better customer and university relations in response to resource challenges was the driver for implementation of these changes," said acting supervisor DELLA BORLUND. "A complementary goal was to achieve convenience for Acquisition Division customers to easily determine the single point-of-contact subcontracts manager for each state."

The primary changes include shifting the Eastern States group territory westward to include Montana, Wyoming, Colorado and New Mexico. Subcontracts in these states have been reassigned to managers in the Eastern States group. Another significant change consolidated and assigned universities and non-profits within a single state to a single subcontracts manager.

Employees affected by this change, particularly those who have or will have a university or non-profit subcontract for principal investigator or co-investigator science investigations and/or research, can view the new assignments at *http://acquisition. jpl.nasa.gov/crei.*



Ongoing Support Groups

Alcoholics Anonymous—Meets Wednesdays at 11:30 a.m.

Caregivers Support Group—Meets the first Thursday of the month at noon in Building 167-111 (the Wellness Place).

Codependents Anonymous—Meets at noon every Wednesday.

Lambda (Gay, Lesbian, Bisexual and Transgender Networking Group)— Meets the first Friday and third Thursday of the month at noon in Building 111-117. For more information, call Randy Herrera, ext. 3-0664.

Parents Group for Children With Special Needs—Meets the second Thursday of the month at noon in Building 167-111 (the Wellness Place).

For more information on any of the support groups, call the Employee Assistance Program at ext. 4-3680.

Wednesday, August 31

JPL Library Orientation—Stop by Building 111-104 at 11:30 a.m. for an overview of the Library's products and services, and learn how to access numerous electronic resources from your desktop. For more information, call the reference desk, ext. 4-4200.

Thursday, September 1

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

New Technology Reporting—Join the Innovative Technology Assets Management Office from 11:15 a.m. to 12:45 p.m. in the 303 cafeteria. Learn about patents, licensing, copyright and monetary awards. For more information, call Karina Edmonds, ext. 3-2827. Tuesday, September 6

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

JPL Genealogy Club—The regularly scheduled meeting has been postponed one week due to the Labor Day holiday.

University of La Verne Open House— Hosted by Professional Development from 11:30 a.m. to 1 p.m. in the 167 cafeteria's special events room. The university will review its five degree programs and one certification, as well as tuition and courses. For more information, visit *http://ulv.edu/sce* or contact Greg Schmutzer, director of recruitment/admissions, at (909) 985-0944 or (800) 695-4858, ext. 5228. For questions about the open house, call Professional Development at 4-3750 or visit *http://hr/et*.

Wednesday, September 7

Associated Retirees of JPL/Caltech— Meeting at 10 a.m. at La Cañada United Methodist Church, 104 Berkshire Place, La Cañada. Call (626) 794-1698 to leave a message for an ARC board member.

JPL Library Orientation—Stop by Building 111-104 at 11:30 a.m. for an overview of the Library's products and services, and learn how to access numerous electronic resources from your desktop. For more information, call the reference desk, ext. 4-4200.

JPL Web Developers—Meeting at noon in the Building 167 conference room.

Thursday, September 8

Clogging Class—Meets at noon in Building 300-217. For more information, call Shary DeVore at ext. 4-1024.

Three JPL-led technologyvalidation studies move forward



Jeff Tie



Oliver Lay

Three JPL-led investigations were among 11 selected by NASA last month as part of the New Millennium Program's Space Technology 9 Project. In the "Precision Formation Flying System Technology" area of study, Jef-

frey Tien of the Advanced Radiometric and Gravity-Sensing Instrument Group was selected for "Autonomous Formation Flying Sensor" and Oliver Lay of the Deep Space Tracking Systems Group was selected for "Modulated Sideband Technology for Absolute Ranging (MSTAR) Range Sensor." In the "Descent and Terminal Guidance System Technology for Pinpoint Landing and Hazard Avoidance" category, Larry Matthies, supervisor of the Machine Vision Group, was selected for "Descent Image Navigation and Hazard Detection."

The study led by principal investigator Tien proposes to provide the formation sensor subsystem needed to validate a precision formation flying system technology capability. Validation on ST9 reduces the risk and cost of implementing this technology on such future NASA missions. The proposed auton-omous formation flying sensor is applicable to both Earth-orbit and deep-space environments.

The sensor on each of two or more spacecraft that are flying in formation continuously senses the size, shape and relative orientation of the formation without any external information or intervention. This geometric information enables the formation to be continuously and precisely controlled. The sensor distributes multiple transmit and receive wide-beam antennas across the surface of the spacecraft to provide full-sky coverage. It can sense any geometric configuration of the spacecraft within the specified operating range of 0.03 to 10 kilometers.

JPL co-investigators on this study are Dr. Lawrence Young, Dr. George Purcell, Yong Chong, Mike Ciminera and Bryan Bell.

The MSTAR Range Sensor, led by principal investigator Lay, is a laser ranging system capable of measuring distances with submicrometer accuracy. This is 10 to 100 times more accurate than the current state-of-the-art. The system planned for ST9 would measure the separation between two spacecraft flying in formation up to 1 kilometer apart, with an accuracy of 100 micrometers. Other team members are Tien, Serge Dubovitsky and Robert Peters of JPL and James Leitch of Ball Aerospace.

Principal investigator Matthies' experiment will validate terrain-relative guidance and navigation technology and pinpoint propulsive-landing technology using a sounding rocket as the experiment carrier. This payload, an automated descent/landing system, will be launched into space on a suborbital trajectory, then reenter the Earth's atmosphere using a combination drag device/parachute system to achieve a targeted landing approach velocity. Sensors on board will determine the vehicle's flight path in real time and, upon reaching a predesignated height above the ground, the vehicle will begin scan-



ning the terrain for identifying features. Upon separation from the subsonic parachute, the propulsion subsystem will maneuver the lander to a safe target landing site designated by the lander's guidance system.

The flight path followed during ascent and descent is designed to subject the vehicle's guidance, navigation and

control system to a dynamic environment spanning a range representative of several different target body environments.

JPL co-investigators are Andrew Johnson, Yang Cheng, Andy Collins, Gary Burke, Sarath Gunapala and Anton Ivanov.

The selected investigators will conduct studies of their advanced spacecraft technologies that are candidates to fly within the next five years. The total

News

Briefs

Dr. Mary Cleave





Larry Matthies

It was developed at JPL with funding from a Cross-Enterprise NASA Research Announcement to meet the future needs of large space-based optical systems, such as the Terrestrial Planet Finder interferometer. With telescope optics distributed over multiple spacecraft, these concepts depend on precise laser ranging to position and stabilize the system, instead of the rigid structure of traditional designs. project cost is \$1.2 million for this phase.

The technology providers join five NASA-led system technology capability area teams to conduct concept definition studies. The studies will include technology-validation experiment descriptions; rationale for flight validation; system development approach; partnering relationships; schedule and cost data. NASA will evaluate the reports and select the concept area that will fly in space as the Space Technology 9 flight validation mission.

For more information about the New Millennium Project, visit *http://nmp. jpl.nasa.gov.*

Drought warning system proposal selected Although they seemingly get less attention, droughts are as much a part of weather and climate extremes as floods, hurricanes and tornadoes. In fact, the cycle of severe lack of water makes drought the costliest and deadliest natural hazard in the world.

In the United States alone, the economic impact of drought is estimated at \$6 billion to \$8 billion annually. But since droughts develop over large land areas and over extended periods of time, they are much more difficult to identify than other natural disasters; thus the lack of a national drought monitoring system.

Help is on the way, as a JPL scientist has been named to lead an effort to create the first systematic prototype for early drought warning.

Dr. Son Nghiem of the Polar Remote Sensing Group (334J) is the principal investigator for a recently selected NASA proposal titled "National Drought Monitoring System for Drought Early Warning Using Hydrologic and Ecologic Observations from NASA Satellite Data."

"We will obtain products derived from NASA satellite data including the Moderate Resolution Imaging Spectroradiometer (MODIS), Advanced Micro-

wave Scanning Radiometer (AMSR) and QuikSCAT/SeaWinds Scatterometer to integrate with in-situ and surface measurements for drought detection and monitoring and for drought forecast," Nghiem said. "The results will be crucial for decision makers in such areas as hazard management and mitigation, water management, agriculture, hydropower and forestry."

JPL will work with organizations such as the National Drought Mitigation Center, the Climate Prediction Center, the Climate Diagnostic Center and the Dartmouth Flood Observatory to build the prototype. The new system will supplement current ground-based measurements—such as soil moisture—with satellite-based data.

Nghiem said the Western Governors' Association, which has recognized the potentially important role of remote sensing in improving drought monitoring, has led efforts to create a national drought information system for early drought warning. He added that, if successful, the new system could provide valuable assistance to other drought-prone areas worldwide, especially where in-situ station networks and environmental data are poor or even non-existent.

A BROADER By Linda Doran, Mars Public Engagement SIGN OF DISCOVERY

Blind students explore Mars with computer skills and adventurers' hearts



Above: Posing with a full-scale model of the Mars rovers are, from left, Connie Gennaro, Ashitey Trebi-Ollennu, David Wright, Grace King, Thien Vu and John Callas. Top right: King checks messages on a Braille PDA. Center: Wright works on a computer program that produces images of Mars. Bottom: Vu conducts an oral review of a report on a computer workstation.







Universe

David Wright is a college-bound athlete who plans to study computer science at the University of Chicago and pursue a gymnastics career. He would also like to be a pilot.

There's just one remarkable obstacle: he's blind. David lost his sight to glaucoma about four years ago. Even so, he was vice president of his public high school senior class and recently missed qualifying for a state-level gymnastics championship by one-tenth of a point.

That's right, one-tenth of a point.

And you thought you had challenges.

"Competing against sighted people when you're blind has its own satisfaction," he said.

"I didn't want people to look at me as the blind guy, but to say, 'He's cool, he's talented, he's got gifts. He's got potential.' And at the end of my high school career, people knew me for who I was."

Grace under pressure

To meet David and his two colleagues, Grace King and Thien Vu, who spent five weeks this summer as interns at JPL, is to be reminded that persistence and hard work can overcome almost any challenge. JPL's EXCEL interns attended science and engineering meetings to plan the rovers' activities. They shadowed planners throughout the process of building and sending commands to Mars. They also produced technical reports about ways to engage blind people in space exploration. Thien wrote a proposal for "Mars Exploration Rover Exhibits for the Blind." David worked on the "Mars Student Imaging Program."

The students carry Braille personal digital assistants. They listen to talking software instead of reading words on a screen. To peruse Web photos, they listen to descriptions of each image that are now imbedded in Web code on Mars sites. Over the past year, in fact, JPL websites have undergone a lot of "behind the scenes" adaptations to allow assistive technologies to work better, as well as to ensure JPL is in compliance with federal guidelines for accessibility (Section 508c of the Federal Rehabilitation Act).

Accessibility at JPL didn't stop at the computer screen for these students. John Callas, deputy project manager and science manager of the Mars Exploration Rovers, escorted the interns on tours of JPL along with Mars Public Engagement representative Connie Gennaro. Rover drivers Ashitey Trebi-Ollennu and John Wright (no relation to David) showed them how engineers plan the rovers' paths and manipulate their robotic arms.

Callas gave the interns tactile images of the rovers that let their fingers do the walking. The images consist of tiny, raised dots showing the spacecraft deck, antennas,

Consider, for example, that Grace, who was born blind, was president of her high school student council, a semifinalist in public high school forensics, and a competitor in track and wrestling.

She plays goalball, a game initially designed for World War II veterans. In goalball, two teams of three blind or blindfolded players try to score goals with a basketball-size ball with bells inside it. They track the ball by the sound it makes. A strong player can roll the ball at 30 mph.

"And you can take it with your face, which I've done," said Grace, with just a touch of satisfaction. "And it was really painful. But I stopped the ball. I was a center and I could defend very well."

At JPL, Grace compiled a report about a multi-sensory kit for enabling blind students to learn about Mars rovers Spirit and Opportunity. Her major is assistive technologies at Northcentral Technical College in Wausau, Wisconsin, a field that uses technology to make things accessible to people with special needs.

Helping NASA provide access to all

All three interns worked at JPL as part of the EXCEL program, jointly sponsored by NASA and the National Federation for the Blind. EXCEL stands for "Excellence through Challenging Exploration and Leadership," and seeks to provide blind youth with early employment experience in NASA careers. The interns were selected in a nationwide search. Three others worked at NASA's Goddard Space Flight Center outside Washington, D.C. wheels and other parts.

The students also have tactile images of rover tracks in the martian sand and tactile maps of JPL for navigating their own way around Lab.

Deeper insight through hands-on work

Thien, who has deteriorating eyesight from a condition known as retinitis pigmentosa, plans to study aeronautical engineering when he transfers to UC Davis this fall. He would have liked his JPL internship to last longer.

"In the beginning I had thought that they were going to place me in the corners somewhere and give me simple, non-important things to do," he wrote. "Instead, I was involved in as much of things as I wanted to be involved in. In other words, it was a blank canvas. All that is required of me is to merely ask and let others know of my interests for what I wanted to do. If they could help out, they simply did, and if they didn't, they would point in the most likely direction to go."

Getting out into the real world has given him a different perspective from that of many of his college peers, he said, adding that he still has a lot to learn.

Don't we all ...

Oh, and remember that dream about becoming a pilot? David Wright has already looked into it. It's been done in Ireland with the help of computer software. Whether in the sky or helping explore beyond Earth, the EXCEL students prove that, with a little technology and a dream, anything is possible. That's exactly the NASA way.

Additional reporting by Christine Johnson, Mars Public Engagement.

JPL team's proposal proves best

By Mark Whalen

From left: JPL SHARP students Marco Garcia, David Navar. Erin Schumacher, Kim DeRose, Edward Sanchez, Marli Wang, Justin Wilburn and Victor Mejia



A team of high-achieving students who summered on Lab has proven the best among their peers in a NASA-wide proposal contest. The competition, known as the Joint Project Activity, pitted approximately 75 teams of students participating in the agency's Summer High School Apprenticeship Research Program (SHARP).

Students were required to submit proposals relating to NASA's Vision for Space Exploration. The JPL team, consisting of David Navar, Alissa Sasayama, Anjali Tripathi, Marli Wang and Justin Wilburn, won for their proposal "Development of Resources and Infrastructure of the Lunar Landscape." The team generated their proposal with help from JPL scientists, engineers and technologists.

The team explored a crewed mission to the moon in 2020, proposing ways to use the moon for colonization and as a base for interplanetary travel. Their "Development of Resources and Infrastructure on the Lunar Landscape" would examine the moon's capabilities for energy extraction, construction and nutrition. The results of their investigations proposed to help determine ways of using the moon as a testing ground for sustaining life beyond Earth, while providing technologies to use here at home.

Team members won various prizes but reveled in their win over SHARP students who worked at all of the NASA centers.

"This was a fantastic group," said Eva Graham, JPL's Minority Education Initiatives Manager. She noted that three of the JPL SHARP students will return to local high schools in the fall, while others will attend prestigious colleges such as Harvard, Yale, Stanford and the Massachusetts Institute of Technology.

SHARP is designed for students who have demonstrated a strong interest in and aptitude for science, technology, engineering and mathematics. One of the program's objectives is to encourage the career paths of pre-college students who have been traditionally underrepresented in those fields. Participants live within 50 miles of a NASA center. The program runs for approximately eight weeks during the summer, usually from mid-June through mid-August.

assings

JAMES CAPPS, retired from the former Section 144, died Aug. 11. Capps worked at the Lab from 1966 to 1984. He is survived by his wife, Gladys, daughter Sherry Ruskman, son Michael McCall and grandchildren Chris McCall, Kristin McCall, Kelly McCall, Chris Ruskman and Lee Ruskman.



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etters The Seraji family expresses its

gratitude to JPL for the card and the lovely plant received in the passing of our mother, Nezhat Seraji. Homayoun Seraji

Special thanks to all my friends and colleagues for the warm support and thoughtfulness during the passing of my mother. Your cards, flowers and sweetness have been immensely appreciated by me in this difficult time Margareth Olm

On behalf of my son Jeff, our families and myself, thank you. Words alone cannot express our gratitude to the JPL community for your kind thoughts. prayers and gifts upon the tragic death of my daughter-in-law, Donna, and unborn child, Aurora, who was to be their third. Special thanks to all personnel in Division 22X and 21X. Barbara Mochrie

I would like to thank all the thoughtful expressions of condolences, flowers and plants at the recent death of my daughter. Our family really appreciated your kindness and prayers. Constance F. McCaig



DANCE TICKETS (2), for Alvin Ailey American Dance, Dorothy Chandler Pavilion, Feb. 22, 7:30, seats in founders circle, \$135, 790-8523

DRUM SET, Tama, w/3 ZBT Zildjian cymbals 2 pearl boom stands, \$325, 957-6821. ESTATE SALE, high-end, exc, cond; king bd, 7-pc. set, \$998; twin bd. 4-pc. set, \$400; brand new Whirlpool fridge 16 cu ' \$250 secretary, \$350; elec. 1954 Hotpoint double oven, \$200; coffee table w/white marble top, \$500; sofas, desk, chairs, oil paintings, etc., etc. 626/287-7877.

MINING EOUIPMENT, miscellaneous, used includes jaw crusher, steel ladders, Ingersoll-Rand air compressor, high-pressure hoses. jack hammer bits, winches, steel cables and heavy duty bearings: was used by a serious hobbyist; also various sizes/shapes of angle iron and I-beams, and assorted lumber and timbers. 626/355-4475, JLesh@keyway.net. MISC.: wireless PC card (802.11G), \$5; small animal carrier, 15 x 18 x 24, \$20; Nakamichi cassette deck, \$50; Epson 850N network inkjet printer, \$25; Eclipse car radio components, make offer. 957-5382.

MISC.: chair for office, leather-like vinyl, on rollers, adjustable back and seat, like new \$35; vacuum cleaners (2), DustBuster Feath-er-lite; like new, \$25/ea.; Christmas decorations: large box of misc. items, Nutcrackers, small ornaments, figurines, Santas, \$40 for entire box. 378-3003.

MISC.: fishing pole (saltwater), \$25; baseball glove, small, left handed, + conditioner, good cond., \$15; landscape oil painting, autumn tones, \$100; '50s Motorola TV "shell," \$20; antique pot w/handle, \$10; red wig, shoulder length, never used, \$20; home gym, \$75; Polaroid camera, \$10. 626/357-8210. NASCAR TICKETS (2), Nextel Cup 500, Sept. 2-3-4, Calif. Speedway; Sec. 45, Row 41, Seats 19-20, \$200. 626/484-1278, cell, Sandy PIANO, Chickering baby grand, good condition, needs minor tuning & reconditioning, and some wood refinishing; has been in our family since 1930; \$5,800. 378-3003. SCOOTER, 3-whl. heavy duty Senior Citizen Amigo Baja w/batteries, charger & basket mint cond., have all documents, \$1,200/obo 248-3912.

SOFA/LOVESEAT, light beige/plaid/fabrique, clean and kept well, sofa (\$80), loveseat (\$50)/obo, can sell separately, quick moving sale, pics available. 626/354-1944. TROPICAL PLANTS, plumerias, variety of colors and sizes; shell gingers. 626/444-6156. WASHER & DRYER, Roper, great cond., only used 6 mo_both white: washer: 4 cycles 2 speeds; dryer: electric; \$300/obo. 726-5129.

Vehicles / Accessories

'97 AIRSTREAM SAFARI trailer, 25,' twin beds, am/fm, electric + gas refridg., awning nare tire vg cond \$13,250,626/445-1296

cargo cover; very clean in/out, exc. cond.; only \$15,300/obo. 909/851-1331 '00 FORD Explorer XLT, 77K mi., white power everything, automatic, brush guards owner, new trans, 1-yr. warranty, exc cond., \$11K, 310/990-3373. '93 FORD Explorer Sport 4WD, 5-spd, manual, tow pkg., bike rack and Yakima top rack, grill guard, 2m radio, 105K mi., 1 owner, good cond., great toy carrier, \$1,800/obo 626/355-2541, jimbo_lg@yahoo.com. '96 FLEETWOOD Sedona tent trailer. 17 feet. sleeps 6, includes new cover, awning, new large-capacity battery, porta potty, \$2,500/

obo. 415-0341 '95 LAND ROVER Range Rover SE, V8 4.0 L, auto, 4WD, 138K, tan, leather seats, cd, ps pw, dual airbags, moonroof, runs great, good cond., \$6.500/obo, 626/296-9073 or 818/515-2461

94 MERCURY Sable, dark green sedan, 61,000 miles, very clean, 3.8L V6, prem sound, front airbags, a/c, pw, pdl, pseats, cc, tilt \$2,500, 323/845-9340

Lost & Found

LOST on Lab: 2 cats, one all black, one orange tabby, have collars and tags, they live on Viro Rd., reward. 203-8284, Roy

Wanted

COMPUTER, Apple laptop, for novice, desire relatively recent one but don't need latest or most powerful. 951-9570, Don.

JUNIOR TOASTMASTERS CLUB MEMBERS for "Teen Expressions," ages 12-17, provides training in communication and leadership skills, meets every Friday at 7 p.m. in West Covina, \$10 materials fee. 626/962-7909 Tadd or Keena Small.

ROOM with cooking privileges or small apt for a young, single, male; English-speaking engineer visiting from ESA/ESTEC; friendly, outgoing all-around nice guy; Jorge Diaz will be training with the NAIF Group at JPL Oct. 10 through Jan. 6: will have his own car for transportation. Ext. 4-3869, Chuck Acton. SPACE INFORMATION/memorabilia from U.S. & other countries, past & present, for personal use. mrayman@alumni.princeton edu. 790-8523. Marc Ravman

VANPOOL RIDERS, from Victor Valley/ Hesperia. Ext. 4-1424, Scott. VANPOOL RIDERS, from Fontana w/stops in Rancho Cucamonga & La Verne, save gas, be energy-efficient and ride in a 2005 Ford 14-passenger van, full-time riders (JPL employees) can qualify for a \$50/mo. vanpool subsidy and \$300 TVS subsidy Ext. 4-5831

Free

ALTADENA, lovely studio apt., near Lake St., 5 mi. to JPL, living-bedrm./bathrm./kitchen, a/c, \$750, includes utilities. 626/794-5096 ARCADIA quiet studio hardwood floors close to mall, entertainment and restaurants \$700. 714/296-0176.

LA CANADA apt., 2 bd., 1 ba., w/lg. patio & gorgeous views; one-of-a-kind opportunity to lease a great unit in a quiet building in La Canada w/views to Catalina (on clear days, of course); recently remodeled w/new appliances, fixtures & Berber carpets; 2 min. walk to Foothill shuttle; \$1,450. 957-1009, A.J. LA CANADA, studio guest house, just remodeled; kitchenette, storage shed, patio, parklike yard; includes utilities, satellite TV; no

pets/smoking, single quiet person; \$1,050 790-6738. PASADENA: seeking roommate to share a 2

bd./2.5 ba. townhouse w/2-car garage + lots of storage space; great location 6 miles/JPL, nr. Caltech, across from PCC; room has private bath, can be fully or partially furn .; washer/dryer, patio, a/c, fireplace, cable mo-dem, WiFi, DirecTV, HD TIVO, + all utilities included (except long distance phone); no pets, sorry; \$850 + 1-mo. deposit; month-tomonth lease must be approved by landlord. 626/844-9286, Dave.

SIERRA MADRE, 2 bd./1.5 ba townhousestyle apt. to share, 1,000 sq. ft., lg. patio, a/c, quiet street, grg. pkg, W/D in unit, n/s, \$635 + 1/2 util. 626/355-5667.

W. TOLUCA LAKE, spacious, luxury cottage, brand-new refrig. & w/d, plus double oven/ range, disp., dw, fireplace, new carpet, newly redone tile bath; huge walk-in designer closet/ dress. rm.; huge master bd. w/vaulted ceiling; loads built-in storage & bookshelves; enclosed garage w/remote; \$1,995, including gas, water, elec., gardening & security. 980-1638.

Vacation Rentals

BALBOA ISLAND, cute, 2 bd., 1 ba., fully furnished upstairs apartment w/covered deck, located just steps from the bay on Little Island & a short walk to the main street. includes laundry, sleeps 5, avail, beginning mid-Sept. at winter rates of \$95/nite. 626/351-9641 or bettyrs@earthlink.net. BIG BEAR LAKEFRONT. Juxury townhome, 2 decks, tennis, pool/spa, beautiful master bd suite, sleeps 6. 949/786-6548.

CANCUN, Mexico, spring break April 1-8, 1 bd./1 ba. condo, sleeps 4, \$1,900/wk. 310/990-3373.

CARIBBEAN, beautifully furn. 1-bd. condo w/full kitchen & bath at 5-star RCI oceanfront resort on Dutch/French/Caribbean island of St. Maarten in the Netherland Antilles; sleeps 4 comfortably; on-site and walking dist. to nightclubs, restaurants, duty-free shopping, pools: great for singles or families: available Thanksgiving week, Nov. 19-26. 323/550-1150 or e-mail forbuvingstuff@cs.com FLORIDA condo beautifully furn 2 bd 2 ba second floor, on the surf of New Smyrna Beach, half-hour to Cape Canaveral, 90 min to Disney World; enjoy all the comforts of home, quiet, relaxing, overlooks beach, BBQ/ pool/game room, easy walk to stores and restaurants. 760/439-7821, Darlene, dfhauge@yahoo.com

Laboratory, 4800 Oak Grove Drive, Pasadena, CA 91109.

Notice to Advertisers

Advertising is available for JPL and Caltech employees, contractors and retirees and their families. No more than two ads of up to 60 words each will be published for each advertiser. Items may be combined within one submission. Ads must be submitted via e-mail to universe@jpl.nasa.gov and 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.

The following JPL employees retired in August: Robert Hamilton, 42 years, Section 2815; Yvonne Barraza, 41 years, Section 2724; Lothar Kirk, 40 years, Section 3764; James Layland, 40 years, Section 970; Cecil Brower, 27 years, Section 2034; Maxine Riffel, 22 years, Section 2746; Avinash Karnik, 14 years, Section 7250.



For Sale

BED. king-sized mattress, box spring & frame; firm, excellent condition; \$375. 626/794-0081, evenings, Bonnie

BED. captain's twin w/mattress, 2 drawers, 30" wide x 24" deep, \$50/obo. 249-5318.

BED, trundle, black metal frame, mattresses included, all in great cond., \$75/obo. flowry@reasons.org, Frances Lowry.

BIKE, mountain, child's 20," 6-spd. grip shift, vg cond., seldom ridden, \$35. 626/303-1927. CONCERT TICKETS (2), Wavefest at the Greek Theater, Sat., Oct. 1, 5 p.m., Sec. B, Row B, Seat 113/115; Kenny G, Poncho Sanchez, David Benoit; selling at face value + Ticketmaster fees; \$196/both. 323/550-1150 or e-mail forbuyingstuff@cs.com

'02 BMW 325i, 4-dr. sedan, 2.5 inline-6; 5-sp manual; power locks/mirrors/windows; CD; iPod adapter: keyless entry & alarm: white on sand leatherette; exc. condition; only 22K miles: free maintenance until 48K miles \$21K. 626/449-0997.

'97 BMW 528i, 93K miles, silver/gray, 4 dr., auto transmission, premium cold weather pkg., immaculate cond., \$13,500. 310/543-8878 or e-mail thuyhaitran@yahoo.com

'68 CHEVROLET Camaro SS, 350 hp, 49,000 mi., clean int., engine runs great, a restoration/street rod project I'm unable to complete, front right replacement fender is in primer color, add new paint and you have a fantastic car, see www.sassybee.com/camaro, \$18,000/obo. 310/445-6625, Steve .

01' DODGE RAM 1500 Ouad Cab. short bed. 5.2L V8, 59,000 mi., silver, excellent cond., 3" Fabtech suspension lift, custom rims, 33" all-terrain tires, tourneau cover, bedliner, flowmaster exhaust w/chrome tip. K&N air filter, Alpine stereo w/custom subwoofer enclosure. 5-speed manual transmission. runs great, extremely clean and well cared for, make an offer I can't refuse, \$11,000/obo. 310/490-2726.

'99 DODGE/Plymouth Neon Expresso, forest green. 2-dr. coupe w/spoiler. 76.000 miles. automatic, original owner, some dents, runs great, \$2,700/obo. 395-3867, Joline.

'01 FORD Explorer XLT, V8, blk, AWD, low miles (27,300), extended wrnty, front/rear a/c, leather, front/rear airbags, prem. sound, 6-CD, mnroof, pwr. seats/door locks, cruise, autodim rearvw. mirror, alloy whis, keyless door entry, remote alarm, fog lamps, running boards, flared mldngs, bkup sensors, rear wiper, roofrack, tow hitch, privacy windows

CATS, Punkin, Purrl and Honey looking for good homes, 2 orange kittens (female, 17 weeks) and their tabby mom (1 year old, spayed). 626/447-8475.

Rhea Clearwater or 4-8343, Mike Taylor.

KITTENS (2), precious, homeless, orange/ black and black, looking for a new family. 626/622-4141, Joey.

For Rent

ALTADENA: comprehensively furnished extended stay sabbatical house: 3 bd., study, boundary Angeles Nat'l Forest, 3 mi. from JPL, trail access, view, fireplace, oak floors, antiques, furniture, beds, dinnerware utensils, pots/pans, all linens & towels, fine soaps, necessities included; just bring toothbrush & clothes; TV/DVD/VHS, Dish satellite, wireless DSL; garden, fruit trees patio, garage; private, immaculate, semirural neighborhood, 626/798-3235.

ALTADENA, charming, 2 bd., 1 ba. house near Christmas Tree Lane; hardwood floors fireplace, appliances, whole-house fan fenced backyard, fruit trees, roses; \$1,850, negotiable (includes water, gardener, trash); see www.alumni.caltech.edu/~chrisc 626/794-9579, eves.

ALTADENA, fully furn, 1 bd., 1 ba, guest house; ideal for 1 person; hardwood floors, TV/DVD/CD, dinnerware, utensils, pots/pans bed linens & towels; utilities included (electrical, gas, water and trash); street parking, no smoking, no pets; month-to-month lease, \$1,200. 626/791-0317.

ALTADENA, room in large beautiful house 2.5 mi. from JPL, non smoker, clean, must love dogs; \$550 + 1/2 utilities furnished, \$500 + 1/2 utilities unfurn. 626/712-3451

HAWAII, Maui condo, NW coast, ocean front view. 25 ft. fr. surf. 1 bd w/loft. compl. furn. phone, color TV, VCR, microwave, d/w, pool, priv. lanai, slps 4, laundry fac., rate \$145/nite/2, \$20/nite/add'l person. 949/348-8047, jackandrandy@cox.net

HAWAII. Maui Westin Ka'anapali Ocean Resort. 7 nights, Oct. 30-Nov 6; 5-star luxury on the beach: 1 bd. w/king heavenly bed. living rm. w/queen sofa bed, fully furn. kitchen, 2 TVs, DVD player, whirlpool tub, plush bathrobes, private balcony, wash/dryer, free high-speed internet, large pool w/water slide, fitness center; sleeps 4, 900 sq. ft.; view resort at www.westinkaanapali.com; \$190/nt./obo (compare to Westin's \$450/nt.). 626/794-9579 or fivestarresorts@earthlink. net.

MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, slps. 6-8, fully equip'd kitchen incl. micro-wave, D/W, cable TV, VCR, phone, balcony w/mtn. vw., Jacz., sauna, streams, fishponds, close to Mammoth Creek, JPL disc'nt. 626/798-9222, 626/794-0455 or valeriee@caltech.edu.

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

ROSARITO BEACH condo, 2 bd., 2 ba., furn-ished, ocean view, pool, tennis, short walk to beach on priv. rd.,18-hole golf course 6 mi. away, priv. secure parking. 626/794-3906.