

I n s i d e		October 7, 2005 Volume 35   Number 20	
News Briefs . . . . .		2	New Caltech Antenna Installed . . 3
Special Events Calendar . . . . .		2	Spitzer, Hubble Team Up . . . . . 3
Process Improvement Noted . . .		2	Letters, Retirees, Classifieds . . 4

## Cassini scores closeup flybys

By Carolina Martinez

At left is the closest Cassini image of Tethys' icy surface taken during the Sept. 24 flyby. At right is Hyperion as imaged during the Sept. 26 flyby.

CASSINI PERFORMED BACK-TO-BACK FLYBYS of Saturn's moons Tethys and Hyperion on the final weekend of September, coming closer than ever before to each of them.

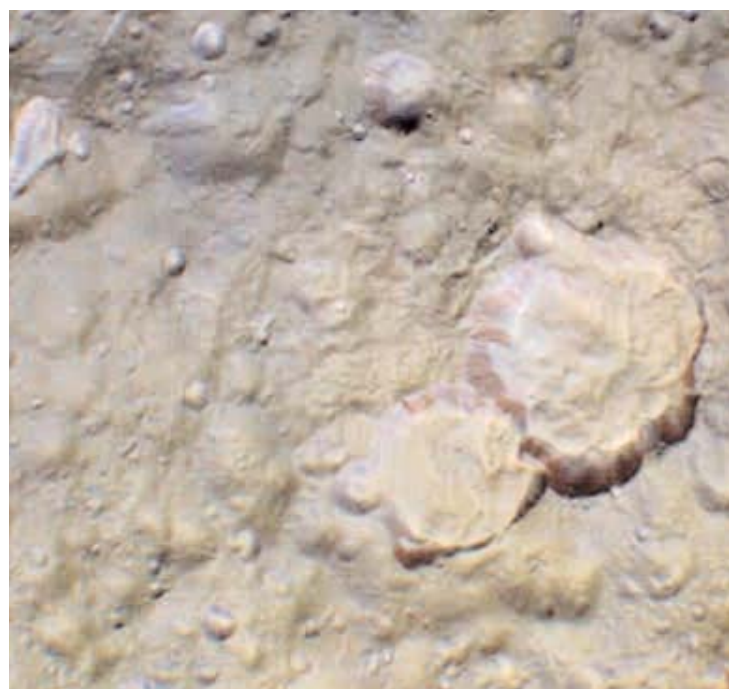
Tethys has a scarred, ancient surface, while Hyperion is a strange, spongy-looking body with dark-floored craters that speckle its surface. New images, mosaics and a movie of these bodies are available at <http://saturn.jpl.nasa.gov>, [www.nasa.gov/cassini](http://www.nasa.gov/cassini) and <http://ciclops.org>.

Images of Tethys taken during Cassini's close approach to the moon on Sept. 24 reveal an icy land of steep cliffs and craters. Cassini photographed the moon's south pole, a region not seen by JPL's Voyager spacecraft.

A giant rift called Ithaca Chasma cuts across the disk of Tethys. Much of the topography in this region, including that of Ithaca Chasma, has been thoroughly hammered by impacts. This appearance suggests that the event that created Ithaca Chasma happened very long ago.

Near a prominent peaked crater named Telemachus are the remnants of a very old crater named Teiresias. The ancient impact site is badly overprinted and eroded by impact weathering and degradation. All that remains is a circular pattern of hummocks that mark where the old crater rim existed. Many of the fresh-appearing craters exhibit unusually bright crater floors, in contrast to the dark-floored craters seen on Saturn's oddly tumbling moon Hyperion.

Images of Hyperion taken on Sept. 26 show a surface dotted with craters and modified by some process, not yet understood, to create a strange, "spongy" appearance, unlike the surface of any other Saturn moon.



A false-color image of Hyperion reveals crisp details and variations in color across the strange surface that might represent differences in the composition of materials. Hyperion has a notably reddish tint when viewed in natural color.

Scientists are extremely curious to learn what the dark material is that fills many craters on this moon. Features within the dark terrain, including a 200-meter-wide (650-foot) impact crater surrounded by rays and numerous bright-rimmed craters, indicate that the dark material may be only tens of meters thick with brighter material beneath.

Scientists will also be examining Cassini's sharp views in hopes of determining whether there have been multiple episodes of landslides on Hyperion. Such "downslope" movement is evident in the filling of craters with debris and the near elimination of many craters along the steeper slopes. Answers to these questions may help solve the mystery of why this object has evolved different surface forms from other moons of Saturn.

Cassini flew by Hyperion at a distance of only 500 kilometers (310 miles). Hyperion is 266 kilometers (165 miles) across, has an irregular shape and spins in a chaotic rotation. Much of its interior is empty space, explaining why scientists call Hyperion a rubble-pile moon. This flyby was Cassini's only close encounter with Hyperion in the prime mission's four-year tour. Over the next few months, scientists will study the data in more detail.

Cassini flew by Tethys at a distance of approximately 1,500 kilometers (930 miles) above the surface. Tethys is 1,071 kilometers (665 miles) across and will be visited again by Cassini in the summer of 2007.



## NASA takes giant step to finding Earth-like planets

By Jane Platt

The W.M. Keck Observatory in Hawaii.

ARE WE ALONE IN THE UNIVERSE? ARE THERE PLANETS LIKE EARTH AROUND OTHER "SUNS" that might harbor life? Thanks to a recent technology breakthrough on a key NASA planet-finding project, the dream of answering those questions is no longer light-years away.

On a crystal clear, star-filled night at Hawaii's Keck Observatory on Mauna Kea, NASA engineers successfully suppressed the blinding light of three stars, including the well-known Vega, by 100 times. This breakthrough will enable scientists to detect the dim dust disks around stars, where planets might be forming. Normally the disks are obscured by the glare of the starlight.

Engineers accomplished this challenging feat with the Keck Interferometer, which links the observatory's two 10-meter (33-foot) telescopes. By combining light from the telescopes, the Keck Interferometer has a resolving power equivalent to a football-field sized telescope. The "technological touchdown" of blocking starlight was achieved by adding an instrument called a "nuller."



This setup may eventually help scientists select targets for NASA's envisioned Terrestrial Planet Finder missions. The success of those potential future missions, one observing in visible light and one in infrared, depends on being able to find Earth-like planets in the dust rings around stars.

"We have proven that the Keck Interferometer can block light from nearby stars, which will allow us to survey the amount of dust around them," said Dr. James Fanson, project manager for the Keck Interferometer at JPL. That survey will begin in late 2006 after the team refines the nuller's sensitivity level.

Combined information from all of NASA's planet-hunting missions will provide a complete picture of possible Earth-like planets: how big they are, whether they are warm enough for life, and if their atmospheres and surfaces show chemical signatures of current life.

"People have been talking about whether there are other Earths out there for 2,500 years. Only now are we developing the technology to go find out," said Michael Devirian, manager of NASA's Navigator Program at JPL, which is investigating potential planet-exploring missions.

So far, scientists around the world have found 150 planets orbiting other stars.

Most are giants, like Jupiter; none is as small as Earth. Scientists believe the best odds of finding life outside our solar system are on Earth-sized planets, particularly those with the right temperature, density and chemistry.

More information on NASA's planet-finding missions, including the Keck Interferometer and Terrestrial Planet Finder, is at <http://planetquest.jpl.nasa.gov>.

JPL manages the Keck Interferometer and Terrestrial Planet Finder missions for NASA's Science Mission Directorate,



# News Briefs

## New policy on NASA logo

NASA Headquarters recently released updated instructions on the use of the NASA logo and taglines. The memo, from Chief of Strategic Communications Joe Davis, states that all NASA mission directorates, mission support offices and centers should use the agency insignia—or “meatball”—as the sole logo on all official communication materials. In addition, the memo called for discontinuing use of slogans and tag lines such as the “Explore. Discover. Understand” line that NASA used earlier this year.

“The memo formalizes what has been our policy for some time,” said FRANK O’DONNELL, manager of JPL’s Institutional Communications Office. “We use the NASA insignia as the main visual identifier on materials for the public, but have ‘Jet Propulsion Laboratory’ and ‘California Institute of Technology’ spelled out where appropriate. At the same time, as JPLers we are not NASA employees, so it would not be appropriate to use the agency logo, say, on our business cards or letterhead. So you will continue to see the red JPL logo on business materials and in internal contexts.”

As for the tag line, said O’Donnell, “The agency experimented with it earlier this year. However, NASA Administrator MIKE GRIFFIN has said the NASA logo is a tree that needs no decoration—the simpler the better.”

For more information on the NASA guidelines, visit <http://communications.nasa.gov>.

## Benefits enrollment coming up

The annual benefits enrollment for active employees will take place Oct. 12–28. During the enrollment, employees will have the opportunity to review all benefit options and change their selections for 2006.

During the week of Oct. 10, employees will receive an enrollment packet that includes a newsletter with details about annual enrollment and explanations of what’s new for 2006; an overview of your choices and prices for 2006; and instructions on how to enroll using the JPL enrollment website.

JPL “Vendors-on-the-Mall” events will be offered Oct. 18, 20, 25 and 28. Representatives from Blue Cross, Vision Service Plan, Kaiser, Delta Dental, SafeGuard Dental, Aetna Life Insurance Company, and MetLife—JPL’s disability insurance provider—will be on Lab to answer questions about health-care benefits and more.

Enrollment for retirees and employees on leave of absence will be held in November. Information and enrollment packets will be mailed to them in late October.

All 2006 benefits are effective Jan. 1, 2006.

For more information, call the Benefits Office, ext. 4-3760.

## Caltech to implement parking fees

Caltech has announced that a new paid parking program will go into effect in October for all campus parking. Caltech faculty, staff and visitors will be required to purchase parking permits of varying lengths. The new regulations will be enforced from 8 a.m. to 5 p.m. Monday through Friday, beginning Oct. 24.

Visitors will be required to purchase parking permits at automated kiosk “pay stations” located in the parking structures on North Wilson Avenue, Holliston Avenue and California Boulevard, as well as parking lot 6, behind the tennis courts on California Boulevard, west of Hill Street, and parking lot 12, at the corner of Wilson Avenue and Del Mar Boulevard.

Permits will range from \$1 per hour to a maximum of \$5 per day.

A free shuttle service between JPL and Caltech is available for staff. The shuttle runs Monday through Friday, departing approximately every 20 minutes between 7:45 a.m. and 4 p.m. Passengers are picked up at the west side of JPL’s main gate and travel to the circular driveway on the north side of California Boulevard, across from Keith Spalding parking lot. A JPL badge or Caltech identification is required and should be shown upon entering the shuttle.

For campus maps and other information, visit [www.parking.caltech.edu](http://www.parking.caltech.edu) or call the Caltech Parking Office at (626) 395-8877.

## Staff invited to technical conference

JPL staff are invited to participate in the annual Mentor Graphics International User Conference, to be held May 3–5, 2006 in Santa Clara, Calif.

This highly interactive, in-depth technical conference focuses on the needs of the entire Mentor Graphics user community and draws attendees from around the world. The primary goal is to deliver readily useful technical content.

The 2006 conference will again offer a wide range of workshops, technical presentations, and networking opportunities, according to FARROKH SHOAR, a principal in the Enterprise Application Section who serves as chairman of the event. He said all JPL technical employees and contracting work force that use electrical computer-aided engineering tools to design are encouraged to share their best practices, success stories and lessons learned with other engineers and designers.

Shoar said JPL/NASA community members are urged to submit papers and abstracts to the conference. Abstract submissions are due by Oct. 28. For complete submission details and conference information, visit [www.mentor.com/user2user](http://www.mentor.com/user2user).

# 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.

## Tuesday, October 11

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

TIAA/CREF Enrollment Meeting—This noon workshop in T1720-137 is designed to assist employees newly eligible for the Caltech/JPL TIAA/CREF retirement plan with selection of investment options and the completion of their enrollment forms.

## Wednesday, October 12

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

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.

JPL Toastmasters Club—Meeting at 5 p.m. in conference room 167. Call Dirk Runge, ext. 3-0465, or visit [www.jplcaltechtostmasters.com](http://www.jplcaltechtostmasters.com).

## Thu.–Fri., October 13–14

Von Kármán Lecture Series—CloudSat Principal Investigator Dr. Graeme Stephens will present “Looking at Clouds from Both Sides: Clouds in Art and Science” 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/oct05.cfm](http://www.jpl.nasa.gov/events/lectures/oct05.cfm). For more information, call Public Services, ext. 4-0112.



## Saturday, October 15

Folk and Jazz Music—The 3 Jammin’ Gents will perform at 8 p.m. in Caltech’s Beckman Auditorium. Tickets are \$29, \$25 and \$21; \$10 for high school age and younger. For more information, call (626) 395-4652 or visit [www.events.caltech.edu](http://www.events.caltech.edu).

## Sunday, October 16

Caltech/JPL Flying Club—The annual fall picnic will be held at El Monte Airport from 11 a.m. to 5 p.m. See <http://aacit.caltech.edu> for details and directions, and RSVP for free 15-minute introductory flying tours (for CIT/JPL community) to Stuart Stephens, ext. 3-7807.

Chamber Music—The Janaki Trio will give a free concert at 3:30 p.m. in Caltech’s Dabney Lounge. For more information, call (626) 395-4652 or visit [www.events.caltech.edu](http://www.events.caltech.edu).

## Wednesday, October 19

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.

## Wed.–Thu., October 19–20

Investment Advice—TIAA/CREF will offer one-on-one counseling. For an appointment, visit [www.tiaa-cref.org](http://www.tiaa-cref.org) or call (626) 432-6363.

## Thursday, October 20

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

## Saturday, October 22

Shangri-La Chinese Acrobats—This 18-member company will perform at 8 p.m. in Caltech’s Beckman Auditorium. Their multifaceted and multicultural production features acrobatic displays, feats of daring and balance, Kung Fu, brilliant costumes and a touch of Chinese comedy. Tickets are \$25, \$21 and \$17; \$10 for high school age and younger. For more information, call (626) 395-4652 or visit [www.events.caltech.edu](http://www.events.caltech.edu).

## Sunday, October 23

Chamber Music—The Endellion String Quartet will perform at 3:30 p.m. in Caltech’s Beckman Auditorium. Tickets are \$32, \$27, \$22 and \$18. For more information, call (626) 395-4652 or visit [www.events.caltech.edu](http://www.events.caltech.edu).

# Lab meets process improvement goal

By Joel Wilf, Software Quality Improvement Project

JPL recently achieved an important milestone in process improvement. A formal appraisal, based on the Capability Maturity Model Integration (CMMI), determined that Division 31 and the Image Processing Systems Group in Division 38 have achieved a CMMI Maturity Level 2 rating for software. Last year, the Navigation Software Group now in Division 34 helped to pave the way by achieving that same rating and the Dawn Flight Software team achieved Capability Level 2 for the Supplier Agreement Management process area. The appraisal team was led by an external lead appraiser, authorized by the Software Engineering Institute.

CMMI is a model for improving and assessing the “maturity” of an organization’s processes. When an organization is rated CMMI Maturity Level 2, its projects are properly managing requirements and have processes that are “planned, performed, measured and controlled.” It represents how well the projects are operating.

The rating is not an end in itself, but is part of a larger effort led by the Software Quality Improvement Project. “Our real goal,” says Software Quality Improvement Project Manager Chi Lin, “is the measurable improvement of software quality at JPL, especially mission-critical software.” The real payoffs are improved efficiency, fewer defects, lower risks and ultimately better odds for mission success.

“Getting to this point has taken the commitment and cooperation of the flight projects, the senior Lab management, line management at all levels and the program directorates,” said JPL Software Process Owner and Division 31 Deputy Manager David Nichols. “It has truly been a Labwide effort.” At the division level, both Nichols and Division 38 Deputy Manager Annette Larson were active supporters. Software Quality Improvement Deputy Project Manager Dr. Steven Flanagan and process engineers Alan Ferdman, George Rinker, Blake Whittington and Kathleen Crean coordinated the activity and provided guidance to the flight projects. But as Crean acknowledged, “The most important thing was the commitment from the projects.”

The projects from Division 31 were the Multimission System Architecture Platform; Mars Science Laboratory Flight Software; Space Interferometry Mission Real-Time Control; the Deep Space Mission System Service Prepara-

tion Subsystem; and Telemetry, Tracking, Command and Data Management. The Deep Space Mission System Experiment Product Delivery System represented Division 38.

They focused on the following process areas from the CMMI model: project planning; requirements management; configuration management; project monitoring and control; measurement and analysis; and process and product quality assurance. The Experiment Product Delivery System project also worked on risk management.

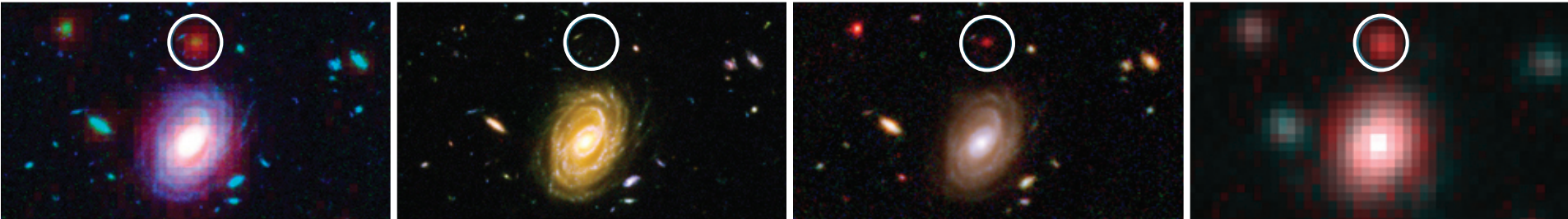
For each area, the projects went through cycles of appraisal and improvement. According to Flanagan, “Process and Product Quality Assurance was the key to making this work. It gave us the ability to check our work in all the other areas.” Internal Process and Product Quality Assurance audits were done for all process areas. In addition, informal CMMI appraisals were held in November 2004 and May 2005. After each informal appraisal, the process engineers analyzed the findings, and recommendations were provided to the projects. The projects worked with the process engineers to systematically address the findings, resulting in significant and measurable improvements in the way the projects function.

By the time the formal appraisal was conducted last week, the projects were ready. Lead Appraiser Ray Kile said, “It’s a pleasure to come to an organization as well prepared as JPL.” Division 31 projects passed with only a few minor findings and the Division 38 project passed with a perfect score.

What is the next step? JPL has an institutional goal of achieving CMMI Maturity Level 3 in 2007 for the Engineering and Science Directorate. Nichols, Lin, and the SQI Team are already looking forward to that goal—with the larger purpose in mind. “CMMI is not simply about a goal,” Nichols said. “It’s about making processes routine so we can focus on innovation while maintaining product quality.”

For more information on the Software Quality Improvement Project, visit the JPL Software website at <http://software.jpl.nasa.gov>. For more information on CMMI and its implementation at JPL, visit <http://software.jpl.nasa.gov/category.cfm?category=6>.





# 'Big baby' galaxies found in newborn universe

By Gay Yee Hill

*Spitzer and Hubble combined forces to uncover one of the most distant galaxies ever seen (left). The galaxy, named HUDF-JD2 (circled), is not seen in Hubble's visible-light image (second from left), but was detected by Hubble's near infrared camera and multi-object spectrometer (second from right). It appears even brighter at the longer infrared wavelengths, as revealed by the Spitzer infrared camera (right).*

Two of NASA's Great Observatories, the Spitzer and Hubble Space Telescopes, have teamed up to “weigh” the stars in several distant galaxies. One of these galaxies, among the most distant ever seen, appears to be unusually massive and mature for its place in the young universe.

This came as a surprise to astronomers. The earliest galaxies in the universe are commonly thought to have been much smaller associations of stars that gradually merged to build large galaxies like our Milky Way.

“This galaxy, named HUDF-JD2, appears to have ‘bulked up’ amazingly quickly, within the first few hundred million years after the big bang. It made about eight times more mass in stars than are found in our own Milky Way today, and then, just as suddenly, it stopped forming new stars,” said Dr. Bahram Mobasher of the Space Telescope Science Institute, Baltimore, and the European Space Agency, Paris.

The galaxy was pinpointed among approximately 10,000 others in a small patch of sky called the Hubble Ultra Deep Field. The galaxy is believed to be about as far away as the most distant known galaxies. It represents an era when the universe was only 800 million years old. That is about 5 percent of the universe's age of 14 billion years.

Scientists studying the Ultra Deep Field found this galaxy in Hubble's infrared images.

They expected it to be young and small, like other known galaxies at similar distances.

Instead, they found evidence the galaxy is remarkably mature and much more massive. Its stars appear to have been in place for a long time.

Hubble's optical-light Ultra Deep Field image is the deepest image ever taken, yet this galaxy was not evident. This indicates much of the galaxy's optical light has been absorbed by traveling billions of light-years through intervening hydrogen gas. The galaxy was detected using Hubble's near-infrared camera and multi-object spectrometer. It was also detected by an infrared camera on the Very Large Telescope at the European Southern Observatory.

At those longer infrared wavelengths, it is very faint and red.

The big surprise is how much brighter the galaxy is in longer-wave-length infrared images from the Spitzer Space Telescope. Spitzer is sensi-

tive to the light from older, redder stars, which should make up most of the mass in a galaxy. The infrared brightness of the galaxy suggests it is massive. “This would be quite a big galaxy even today,” said Dr. Mark Dickinson of the National Optical Astronomy Observatory, Tucson, Ariz. “At a time when the universe was only 800 million years old, it's positively gigantic.”

Spitzer observations were also independently reported by Dr. Laurence Eyles from the University of Exeter in the United Kingdom and Dr. Hao-jing Yan of Caltech's Spitzer Science Center.

They also revealed evidence for mature stars in more ordinary, less massive galaxies at similar distances, when the universe was less than 1 billion years old.

The new observations reported by Mobasher extend this notion of surprisingly mature “baby galaxies” to an object which is perhaps 10 times more massive, and which seemed to form its stars even earlier in the history of the universe.

Mobasher's team estimated the distance to this galaxy by combining information provided by the Hubble, Spitzer and Very Large Telescope observations. The relative brightness of the galaxy at different wavelengths is influenced by the expanding universe and allows astronomers to estimate its distance.

They can also get an idea of the makeup of the galaxy in terms of the mass and age of its stars.

While astronomers generally believe most galaxies were built piece-wise by mergers of smaller galaxies, the discovery of this object suggests at least a few galaxies formed quickly long ago. For such a large galaxy, this would have been a tremendously explosive event of star birth.

JPL manages the Spitzer Space Telescope mission for NASA. Science operations are conducted at the Spitzer Science Center. The Hubble Space Telescope is a project of international cooperation between NASA and the European Space Agency.

The Very Large Telescope is a project of the European Southern Observatory at the Paranal Observatory in Atacama, Chile.

For more information and images, visit [www.spitzer.caltech.edu/Media](http://www.spitzer.caltech.edu/Media) and <http://hubblesite.org/news/2005/28>.

## Array anntenna dedicated at Caltech

By Susan Braunheim-Kalogerakos

*Dr. Charles Elachi speaks at the dedication of the new antenna at Caltech.*

A Sept. 22 ceremony celebrated the installation of a new 6-meter-diameter antenna to be used at Caltech to research very high-sensitivity microwave receivers for space communication, radio astronomy and antenna-arraying techniques.

The Caltech antenna is part of a collaborative effort between JPL and Caltech. For the past two years there has been a work order from JPL to Caltech to design integrated circuit low-noise amplifiers and other receiver modules for the breadboard Deep Space Network (DSN) array.

The 6-meter-diameter Caltech antenna is one of three antennas purchased by JPL as part of an investigation of large arrays of small antennas to greatly expand the capability of the DSN. Two antennas identical to the one at Caltech are installed on the mesa above JPL and will be used along with a new 12-meter antenna in a test of the array receivers and processing equipment. The antenna at Caltech is not currently part of this breadboard array but is anticipated to support the development of future space-communications instruments.

“The JPL/Caltech collaboration on these antennas and front-end receivers is laying the foundation for a revolutionary increase in NASA's ability to support future space missions,” said Joseph Statman, JPL's microwave array project manager.

Sander Weinreb is a principal engineer at JPL and is in charge of microwave receivers for the breadboard array. He is also a faculty associate at Caltech and supervises the research of graduate students in the microwave area. “I have worked on the development of antenna arrays for radio astronomy and for the search for extraterrestrial intelligence for most of my career and it is very satisfying to see this technology being planned for future DSN communications,” he said. “I believe that a large upgrade in DSN capability is needed and that large arrays of small antennas is the best way to accomplish this.”

The Caltech antenna is hydroformed, a process that uses gas or fluid to force flat sheets of aluminum against a precise mold. This process provides a high-quality antenna at very low cost. Most large antennas are made up of many surface panels that do not add to the strength of the structure and require costly backup structures for support. The one-piece hydroformed shell is very stiff and resists gravitational and wind forces with only a simple backup structure.

“This antenna was also designed, in part, to prove that this low-cost antenna production technique is viable without compromising antenna performance,” said Christopher Yung, supervisor for the Antenna Front End System Engineering Group and task manager for the 6-meter antenna implementation. “This antenna will provide an operational platform for testing of other JPL and Caltech developed radio frequency telecommunication and command equipment.”

Specific uses for the antenna could include a demonstration of a direct Mars to Caltech communication link using the Mars Reconnaissance Orbiter spacecraft, radio astronomy observations of very fast and intense pulses observed coming from the Crab Nebula and interferometry between Caltech and JPL to aid spacecraft navigation. Another potential application is the development of equipment to examine the microwave spectrum of Earth-like planets that are expected to be discovered by the Kepler spacecraft by 2011.

The antenna was placed atop Caltech's Moore Electrical Engineering Building to attract and educate students who may later enter the professional engineering pipeline. “By placing the antenna at Caltech we hope to encourage and inspire the students to participate in deep-space communications,” Yung said. “Hopefully, the talented Caltech graduates will join the JPL workforce and strengthen future DSN engineering capabilities.”





# Service awards

For the period of July and August the following JPL recipients celebrated 25 or more years of service and were invited to attend a luncheon and ceremony in their honor on Sept. 7.

50 years: Jerry Person.

45 years: Fred McLaughlin, Roger Okamoto, Robert Vincent.

40 years: Allen Berman, John Borthwick, Michael Devirian, James Layland, Michael Salsman, Fred Vescelus.

35 years: Eugene Burke, Alice Smilgis.

30 years: Ronald Boain, Gary Lau, Milton Lavin, Richard O'Toole, Eugene Poyorena.

## Letters

Marianus and I would like to express our belated thank you to the SIM Project for their encouragement and support after the passing of my mother-in-law. Thank you for thinking of us.

Audrey Doran and Marianus von Korff

First I would like to thank Caltech and JPL for giving me the opportunity to work and learn at this world-class institution as a contractor and JPL employee for the past 40+ years. Without the challenges given to me I could not have achieved all the successes that I had. Next I would like to thank all of those whom I have had the pleasure to meet and work with over the course of time. Each one of you will remain a part of my being. To those who attended my retirement party, stopped by to say goodbye or called, I appreciate spending the time with you. Your cards, gifts of food vouchers, cash, flowers and other items are greatly appreciated. To my colleagues in security, thank you for allowing me to feel welcomed and be part of the team and thank you for the warm send-off party. It has been a great ride.

Cecil W. Brower

## Retirees

The following JPL employees retired in October:

Jay Holladay, 42 years, Section 315A; Kenneth Bartos, 41 years, Section 333; Srinivas Mohan, 35 years, Section 312E; Eleanor Manning, 29 years, Section 335J; Patricia Lux, 24 years, Section 9200; Malcolm Calhoun, 17 years, Section 335E.

## Classifieds

### For Sale

BABY ITEM, Medela Pump-In-Style breast pump, like new, excellent condition, \$150. 626/646-1937.

BASSINET, Pottery Barn Kids, less than 1 year old, vg condition, with green bumper, skirt, sheets and mattress, \$175. 951-3532.

BICYCLE, 2005 Giant OCR2 mid-level road bike, small-sized silver frame, Tiagra/105 components, less than 400 mi., clipless pedals, \$650. 562/795-5533, Steven.

BICYCLE, boys 20" GT Dyno, excellent condition, \$65. 626/798-1839.

BICYCLES, 2 classic old Schwinn's, need restoring, one 12" and one 16," \$5 each/obo. 626/797-6490.

TRUNDLE BED, excellent condition, \$100. 626/797-6490.

BIKE RACK, Yakima lockjaw for SUV-type vehicle, 2 mounts to accommodate 2 bikes, all mounting hardware and keys included, \$100. 626/858-0818.

COMPUTER DESK/HUTCH, 72" x 24", keyboard tray, 5 drawers, hutch has 2 shelved cabinets, \$250, originally \$1,100. 626/445-2616, jazzqt@earthlink.net.

COMPUTER WORKSTATION: accommodates all your equipment in a small space; wooden, light brown unit to fit PC, printer and CD/DVDs: pull-out shelf for keyboard and mouse pad; leave your e-mail address to see a picture, \$60/obo. 626/793-3408.

ENDELLION STRING QUARTET TICKETS (3), Sunday, Oct. 23, 3:30 pm, Beckman Auditorium; Haydn, Beethoven, Tippet; Orch. C. Row R. seats 103/104/105, \$24. 626/644-5558, Larry.

EXERCISER, head-to-foot, like Bowflex but uses calibrated bungee cords, vg cond., \$480/obo. 626/794-1050, eves., Harry.

EXERCISER, Image 4.0 home gym, includes bench, \$100. 364-1283.

EXERCISER, Weider 8510 home gym system, \$100. 243-8255.

FURNITURE: wood hutch, \$50; faux leather maroon sectional couch w/ottoman, \$50; very plain wood entertainment center, \$20; kitchen table, seats 4, gray and black (no chairs), \$7. 626/390-8763, Stacey.

FURNITURE: large hutch, lighted, \$450; oak TV stand, large, w/storage \$375; 5-pc. bedroom set, \$2,000; piano, \$600, patio table with glass top & 4 chairs, \$300; many other items, best offer. 248-0491.

GARDEN FOUNTAIN, 3-tier rock with 2-, 3-, and 4-ft. bowls, \$300. 243-8255.

HEARTRATE MONITOR: Polar M61, almost new, black wristwatch receiver, coded chest strap transmitter and user manual; also monitors target HR zones, exercise duration, calories & more; ideal for improving fitness & tracking exercise progress; \$100. 243-2984.

JEWELRY: diamond anniversary ring (1 ct tw) w/gift box, \$750/obo; diamond ring (10K YG) w/gift box, \$99; Suunto S6 wrist-top computer, great for the extreme sports enthusiast, \$250/obo. 364-1283.

L.A. KINGS TICKETS, hockey is back, various games during the season, on the blue line, 14 rows from the ice, great view, \$140 for two. 626/852-0821.

MATTRESS, Tempur-Pedic + Foundation, queen, almost new, exc. cond., material NASA-approved, great for people with back problems, \$1,075. 352-4033, after 5 pm.

MISC.: fishing pole (saltwater), \$25; baseball glove, small, left handed, & conditioner, good cond., \$15; landscape oil painting, autumn tones, \$75; trash can w/wheels, \$5; '50s Motorola TV "shell," \$20; antique pot w/handle, \$10; wig, red, shoulder length, never used, \$20; home gym, \$75. 626/357-8210.

MISC.: fax cartridge for Brother machines, model pc-102fr, brand new, \$20; Jenny Craig diet tapes, 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.

MISC.: frying pan, black cast iron, 10" diameter, antique, \$5; toaster oven, \$10; covered turkey roaster, self basting, like new, \$7; 12" porcelain serving platter, \$5; six 10" porcelain dinner plates, nice patterns, \$9; 30 other items; call for list. 626/793-1895.

MISC.: formal dinner jacket, burgundy, sz. 40 long, for cruises or any formal occasion, like new, \$25; with tuxedo pants, sz. 34/31, \$10 more, for 6-ft. man with medium build. 626/793-1895, Albert.

ORGAN, Yamaha 415 electronic console w/13 pedals, 3 keyboards, 144 rhythm patterns, pd. \$7,500, sacrifice for \$2,000. 790-3899.

PIANO, Gulbransen 4'6" baby grand, dark-stained mahogany finish, real ivory keys, \$1,500/obo; CABINET OR CREDENZA, walnut finish, 3'6," \$75; sleeper sofa free. 790-2013, R. Ferber, retiree.

PIANO, grand, K. Kawai limited edition, Brazilian rosewood KG-2C, 5'10", excellent condition, single owner, beautiful sound and action, technician reference, serial number 849229 (1977), \$11,450. 626/462-9457.

REFRIGERATOR, full-size Whirlpool side-by-side, exc. cond., grandmother moved into apt. & didn't need it, \$250/obo. 626/826-3132.

ROUTER, Netgear cable/DSL Web safe gateway RP614, Netgear FA311 rev-C1 card, D-Link DFE-530TX+ 10/100Mbps fast Ethernet PCI adapter, 75' Cat V cable, user manuals and software, \$20. 626/241-7084, Steve.

SANDER, Porter-Cable Random-Orbit (5"), model 333K, includes case, brand new, never opened, \$50 (sells for \$65 on Amazon). 353-4400, Brian.

SCI/FI MAGS, Astounding/Analog, 71-yr. collection, Nov. '34-present, \$3,000. 626/799-5545, Dale.

SINKS for bathroom, like new, excellent cond., porcelain, white, \$25. 626/646-1937.

SNOWBOARD, 123 cm Burton with bindings and size 5 Lamar boots, great condition, brand new \$80; Boeri snowboard helmet; all for \$100. 661/254-7443.

SOFA, creamy beige with multicolor earth tone pillows, located in Culver City, photo available, \$350/obo. 310/779-1650.

SOFA with 2 end recliners and matching recliner chair that swivels, very comfortable, excellent condition, pictures can be sent by e-mail, \$500/both. 661/254-7443.

SOFTBALL BAT, Worth Megacell, 34," 26 oz., 10 oz. drop, 2 1/4" diameter, 7046 alloy, model SW4PIA, BPF 1.20, \$15. 626/241-7084, Steve.

SPEAKERS: Bose Acoustimass 10 II home entertainment system, 5 double speakers + subwoofer (black), \$485, sells on eBay for \$500-\$560 + shipping; Bose floor stand pair (black), \$60; 4 Bose wall/ceiling speaker brackets (black), \$20 each; all in vg to excellent cond.; BOOKCASE, antique style, solid oak bookcase with beveled, leaded glass windows, approx. 22" W x 32" H x 13" D, good cond., \$60. 249-6786.

STROLLER, Instep Ultra lightweight alum-inum double jogger in excellent cond., 5-point harness, reclining seats, accommodates 2 children with a combined weight of 100 lbs., quick release wheels, hand brake, dual rear parking brakes, folds in half for easy storage, \$100. 323/449-9800 or jckrice@yahoo.com.

TAG SALE, huge, items from 100+ families; bedroom sets, dining sets, electronics, toys, books, linens clothes for men, women and children; Saturday, Oct. 9 on the corner of Hastings Ranch Drive and Sierra Madre Blvd., 7 am-2 pm, all proceeds benefit Hastings Ranch Nursery school.

WARDROBES, 2 Ikea blue Askedal, glass doors, 4-drawer, lights, \$125 ea./obo; one 93" x 59" 3-door oak-vener, Ikea Pax, lights, \$250/obo; pine computer hutch, \$75/obo; pictures avail.; other moving sale items too. subert@earthlink.net. 626/794-8616, Albert.

### Vehicles / Accessories

'01 BMW R 1100R motorcycle, Special Edition, absolutely pristine, new tires/brakes, 17.2K mi., \$5,900. 626/578-9219, Jim.

'04 CHAPARRREL 220 SSI boat, excellent condition, only 50 hours, yellow, Bowrider, holds 12 people, wonderful for family, includes sharkskin cover and all accessories, \$28,500. marclaky@earthlink.net.

'68 CHEVY Camaro SS, 350 hp, 49,000 miles, clean int., engine runs great, a restoration/ street rod project I am 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, \$14,000. 310/445-6625, Steve.

25 years: Andrea Angrum, Thomas Antczak, Farrokh Baher, Steven Bard, Artur Chmielewski, Daniel Coulter, Leslie Deutsch, Dariush Divsalar, Samuel Dolinar Jr., Richard Ewell, George Fox, Margaret Frerking, Brian Hammer, Christopher Hartsough, Michael Hasbach, Mona Jasnow, Violet Krihan, Webb Marner, Mark McKelvey, David Pieri, Manoucher Shirbacheh, Kent Volkmer, David Wagner, Reed Wilcox.

For information about the programs and services offered by Employee Services and Recognition, visit <http://hr/esr>.

'64 DODGE Dart 270 Classic (Dodge 50th anniversary yr.), exc. cond., 4 door, gold, auto trans, pwr. steering, slant 6, new tires, 140,700 miles (70,000 on rebuilt motor. 15,893 at purchase in 1965), have all maintenance receipts & owner's manual, \$3,900/obo. 626/449-6698, Kathie.

'96 HARLEY Custom Rigid, rigid frame by Atlas, 80CI S&S, 3" drivebelt, 5-spd. trans, 180 rear tire, 21" front wheel, custom forward controls, a great bike, lots of attention, is registered and I have pink, \$13,000/obo. 626/497-9591, Gene or guido576@yahoo.com.

'01 HONDA Accord EX 4-dr. sedan, automatic, beige, power windows/locks, alloy wheels, moonroof, CD player, a/c, 85K miles, clean int./ext., exc. cond., \$9,500, ando, shige-masa@sbcglobal.net, Ando or 626/792-8587.

'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 condition, \$6,300/obo. 626/296-9073 or 818/515-2461.

LAZY DAZE, 26.5', low mileage, sleeps 6-8, a/c, awning, microwave, oven, refridg., loaded, no accidents, looks/runs great, \$15,250/obo. 248-0491.

'02 LEXUS IS 300, 36.5K miles, loaded, auto, 6-CD changer, GPS navigation system, everything power, moonroof, leather power seats, spoiler, good condition, \$22,000. 909/599-3230.

'93 MERCEDES E-300, 6 cyl., 3.0 L, 133K mi, hunter green, leather interior, custom sound system, garage-kept, all service records, vg cond., \$7,200/obo. 626/797-6824, marybethmurrill@yahoo.com.

'87 MITSUBISHI LS van, 7 passenger, 110K miles, great body & interior, new alternator, belts, new front brakes/rotors, exhaust/conver-ter; runs well, though intermittent fuel pump needs to be replaced; \$1,000/obo. 248-2931.

'94 NISSAN Altima, auto, power doors/windows/sunroof, 100K mi., runs great, \$2,400/obo. 626/221-5355, David or 626/483-5538, Ana.

'95 OLDSMOBILE 88 LS, burgundy/tan leather, 72,000 miles, 1 owner, no accidents, dual airbags, premium CD sound system, cruise control, power seat/windows/side mirrors/door locks, \$2,800/obo. 281-7196.

'02 PONTIAC Grand Am Ram Air Edition, 4 dr. metallic green, chrome wheels, gray leather interior, auto, PS, PW, PL, sunroof, tinted windows, Monsoon sound system, excellent inside and out, 56,000 miles, sacrifice \$11,000. 626/644-0464.

'97 PONTIAC Trans Sport minivan SE, extended/4 dr. (second sliding door, also power operated), bright silver metallic, V6, 3.4 L, 1 owner, very well maintained, no accidents, 43,700 mi, roof rack, dual front airbags, antilock brakes, alloy wheels, a/c, ps, cc, tilt, p/seats/windows/door lock, tint, am/fm stereo/cassette, CD, all service records avail., \$6,950/obo. 626/577-2765 eve.

'95 PONTIAC Grand Prix GTP Sport, 95K miles, black, good condition, \$2,700. 352-4885.

'98 TOYOTA Sienna minivan, V6 LE, 194 HP, 80K miles, light blue, exc. cond., dual a/c, 12-disc CD changer, dual sliding doors, one owner, under extended warranty, \$9,900/obo. 909/592-2279.

'03 TRUCK RIM/TIRE SET for standard Chevrolet Silverado 3/4-ton truck, 8-lug, 16 x 6-1/2," low mileage, balanced, ready to mount, \$200/obo. 909/593-8950, Don.

'64 DODGE Dart 270 Classic (Dodge 50th anniversary yr.), exc. cond., 4 door, gold, auto trans, pwr. steering, slant 6, new tires, 140,700 miles (70,000 on rebuilt motor. 15,893 at purchase in 1965), have all maintenance receipts & owner's manual, \$3,900/obo. 626/449-6698, Kathie.

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'03 TRUCK RIM/TIRE SET for standard Chevrolet Silverado 3/4-ton truck, 8-lug, 16 x 6-1/2," low mileage, balanced, ready to mount, \$200/obo. 909/593-8950, Don.

### Lost & Found

LOST: One gray/black pouch, with (1) Fujifilm picture card with personal pictures and other personal items. 653.7827 or Ext. 4-7005.

### Free

CLEAN FILL DIRT, 12 cu yds avail., haul as little or as much as you like, near Los Robles/Jackson, Pasadena, dtrask6@its.caltech.edu; until Oct. 31: 626/791-3103.

ORGAN, 1976 Thomas Symphony model, bench and full foot-pedal set, pick up in Glendale area. 634-4772, Carl de Silveira.

SQUARE DANCING CLASS, a fun, easy way to exercise, reduce stress and make new friends; come as you are, no partner needed, we supply them; join the Spellbinders Wed., Oct. 12, 7:30 p.m., War Memorial Bldg., 435 Fair Oaks Ave., South Pasadena. 248-6062, Elizabeth.

TERRARIUM for small reptiles, with screen top, approx. 18" x 36". 249-6786.

WEIGHT SET from a gym, professional, bench/military press machine with 200-lb. weight stack, approx. 400 lbs. weights, lat pull-down machine, squat rack, curling bar, much more, 15 from JPL, must take all equipment. 626/798-2517, Kathi or Craig.

### Wanted

DOG HOUSE for large dog. 626/398-0745.

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, David, please leave msg.

ROOMMATE: 2-bd. apt. near Venice beach, no pets or smoking, Ez access to 10 fwy., credit check reqd. furnished, except for your bedrm. 626/590-8332, cell, Skye, after 3 p.m.

SINGER/LYRICS WRITER, 20-26 years of age, influences: Sevendust, 311, Deftones; call for web URL. 626/357-8210.

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

VANPOOL RIDERS, Lancaster/Palmdale/Little-rock/Acton area, van leaves Angeles Forest Park & Ride 5:40 a.m., leaves JPL 4 p.m., cost \$180 or \$9/day. Ext. 3-0505, Frank Shanklin.

### For Rent

ALTADENA, small separate studio apt., beautiful residential neighborhood, near Lake St., 5 mi to JPL, living-bedroom, bathroom and kitchen, a/c, \$750 includes utilities. 626/794-5096.

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](http://www.alumni.caltech.edu/~chrisc). 626/794-9579, eves.

ALTADENA, spacious studio, full bathrm. & kitchen, washer/dryer in unit, 1 block from JPL, all utilities paid, 840 Ventura St., \$1,200. 626/798-5796.

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. 626/798-3235.

ALTADENA, large room in 4-bd. house w/JPL employee, very quiet neighborh'd, appliances, utensils, pots/pans, cable modem, 2 fireplaces, backyard BBQ, in-ground pool, 3 miles from JPL, \$600 incl. utilities. 634-5136.

ARCADIA apt., 2 bd. + den, 1 ba., garage, upstairs unit, clean, spacious, washer/dryer in unit, a/c, stove, walking distance to shops, near SA Fashion Park; quiet residential neighborhood, close to JPL, no pets, water/ gardener/trash included. \$1,499 + util., sec. deposit. 626/576-7333 or clin@mcw.edu.

PASADENA, 1 large room with private bath in a 3-bd. charming house w/ JPL/Caltech employees, beautiful and safe neighborhood (near Orange Grove and Hill), easy 15-min drive to JPL, gated parking, in-ground pool, patio, deck, built-in BBQ, large backyard with gardens, cable modem, fireplace, HW floors, etc., \$800, includes all utilities (power, water, gas, etc). 626/590-8844.

PASADENA: seeking housemate to share modern 2 bd./2.5 ba. townhouse w/2-car gar. + lots of storage; quiet, tree-lined loc. 6 mi./JPL, nr. Caltech, across fr. PCC; rm has priv. ba., can be partially furn.; washer/dryer, patio, a/c, fire-place, cable modem, WiFi, DirecTV, HD TIVO+ phone included in unit; no pets; includes all util. (except long-dist. phone); excellent credit report required; \$850 + plus 1 mo. deposit; mo.-to-mo. lease approved by landlord. 626/844-9286, Dave.

### Real Estate

DUARTE townhome, 3 bd., 2 1/2 ba., remodeled kitchen and courtyard, \$410,000. 626/930-8718.

### 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, available at winter rates of \$95/nite. 626/351-9641 or bettyrs@earthlink.net.

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

FLORIDA condo, beautifully furn. 2 bd., 2 ba., 2nd 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, dhauge@yahoo.com.

GRAND TETON / YELLOWSTONE Nat'l Parks, visit in style, 2 bd. + loft townhome, totally outfitted, stunning Teton view, sleeps 6, cable, microwave, etc., borders Grand Teton. conniematt@sbcbglobal.net.

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.

LOCAL & WORLDWIDE, five-star resorts, luxurious residential-style 1-bd. villas with fully furnished kitchen and living room, starting at \$690/wk.; local resorts include Marriott/Palm Springs, Welk Resort/Escondido, Marriott/Lake Tahoe & Marriott/Colorado Rockies. 626/ 794-9579 or fivestarresorts@earthlink.net.

MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, slps. 6-8, fully equip'd kitchen incl. microvv., D/W, cable TV, VCR, phone, balcony w/mtn. vw., Jacz., sauna, streams, fishponds, close to Mammoth Creek, JPL disc't. 626/798-9222, 626/794-0455 or valerie@caltech.edu.

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

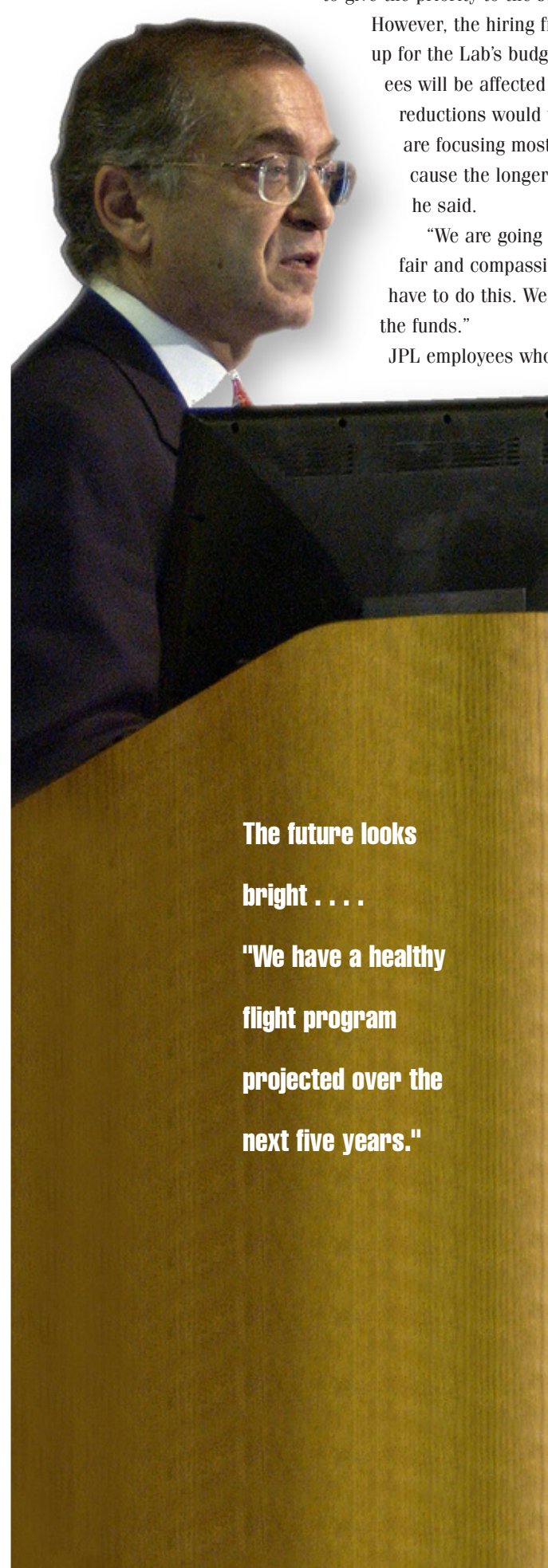
OCEANSIDE condo, on the sand, charming 1 bd., panoramic view, walk to the pier or harbor, pool, spa, game rm., sleeps 4. 949/786-6548.

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



## Elachi outlines budget impact

By Mark Whalen



The future looks bright . . . .  
"We have a healthy flight program projected over the next five years."

WITH JPL FACING BUDGET CUTS OF ABOUT 5 TO 8 PERCENT IN THE CURRENT FISCAL YEAR, JPL Director Dr. Charles Elachi outlined the implications to the Laboratory in an all-hands meeting Oct. 12.

As a result of reductions in the proposed fiscal year 2006 budget for NASA's Science Mission Directorate—from which JPL gets the majority of its budget—combined with the shift in the agency's priorities to phase out the space shuttle by 2010 and replace it with a Crew Exploration Vehicle, the Laboratory has initiated staff cuts of between 250 and 300 people. The layoffs follow a hiring freeze for the first quarter of FY '06.

In considering personnel cuts, he said the Lab is first looking at all onsite contract activities, which "by definition should be limited to two or three years. If there are areas that are absolutely critical for a project and if a change will impact the project in a significant way, we'll keep the contractor, because at the end we need to make sure we deliver. But, on the other hand, if a JPL employee can do the same function or with a small amount of training, we will have to give the priority to the JPL employee."

However, the hiring freeze and contractor cuts will not make up for the Lab's budget shortfall, so a number of JPL employees will be affected as well. Elachi said the remaining staff reductions would take place over the next few weeks. "We are focusing most of our activity in the first quarter because the longer we wait, the worse the problem gets," he said.

"We are going to work very hard to do this in a very fair and compassionate way," Elachi said. "I wish I didn't have to do this. We are doing it because we just don't have the funds."

JPL employees who are laid off will be placed on "paid leave" of a minimum of 60 calendar days, with full pay and benefits. "If people have been at JPL for a long period of time, and their severance notice is longer than 60 days, we'll give them that longer time," Elachi noted. "I felt it was a very fair approach to acknowledge the fact that people have dedicated a lot of their years for JPL."

The impact of staff cuts on JPL "is not across the board," Elachi said. "We are not going to have a 5 percent reduction in every group, section and division. There are certain areas where the funding is in very good shape and we project it to even be growing. In other areas the budget is very shaky and we don't think there will be an opportunity coming up in the next six or nine months."

JPL projects that were cancelled as a result of agency budget cuts were the Jupiter Icy Moons Orbiter and the Mars Telecommunications Orbiter. NASA Headquarters and other some NASA centers are also facing similar workforce pressure.

Congress is still considering the FY '06 federal budget, so the total impact is unknown. Congressional "earmarks" are usually added to budget requests, and the financial impact of Hurricane Katrina has not yet been factored in.

But Elachi is bullish on JPL's projected budget of about \$1.5 billion and NASA's Science Mission

Directorate's projected \$5.5 billion, representing about one-third of the overall NASA budget.

Elachi expressed his pride over the Laboratory's 18 spacecraft that are currently operating across the solar system. In addition, CloudSat is scheduled for launch in November and the Deep Space Network has achieved more than 99 percent of its planned data acquisition.



Dutch Slager / JPL Photolab

The future looks bright as well. "We have a healthy flight program projected over the next five years," he said. Ten to 12 launches are scheduled in that period—one in 2006, two in both 2007 and 2008, five in 2009 and two more in 2010.

"Should you spend the next five to 10 years in this place?" Elachi asked. "I think they are going to be as exciting as the last five years, 10 years, 15 years."

The director also mentioned that JPL has some technology capabilities that could be of benefit to other sponsors. Elachi met with JPL technologists on Oct. 13 to discuss actions needed to support JPL's technology activities and broaden its potential funding sponsors in light of pressure on the NASA budget. He then traveled to Washington, D.C. to explore other potential sponsors, particularly the Department of Defense.

Further on the subject of JPL work garnered from the competitive process, "I have no doubt that if it's done even-handed and fairly that we would win our fair share. We have shown in the past that we have a lot of missions we have won when there is a fair competition."

Elachi also discussed some aspects of the JPL employee survey conducted earlier this year. The area providing the most feedback regarded a proposed "9/80" work schedule, where employees could work 80 hours over two weeks in nine days instead of the usual 10. Human Resources is studying the concept for possible rollout next spring.

Also under study by Human Resources is a plan for more opportunities for advancement through career path models. The Executive Council expects a recommendation on the plan in March.

The survey also revealed employees' keen interest in improved communication between employees and supervisors. "Every employee, be it technical or administrative, should be able to say what's on their mind," Elachi noted. "I think openness is extremely important. We are all a team. JPL is for all of us—not the management separate from its employees. So that's something that I'm going to keep an eye on personally to make sure that we improve in that area."

Along those lines, another key issue for employees was on the issue of better teamwork between line management and the flight projects. "I'm not surprised that there is 'tension' between line and project," Elachi said. "The key challenge is how do we work that tension to our benefit versus working to make it to our hindrance? As long as we understand those issues then we can work them in a constructive way."

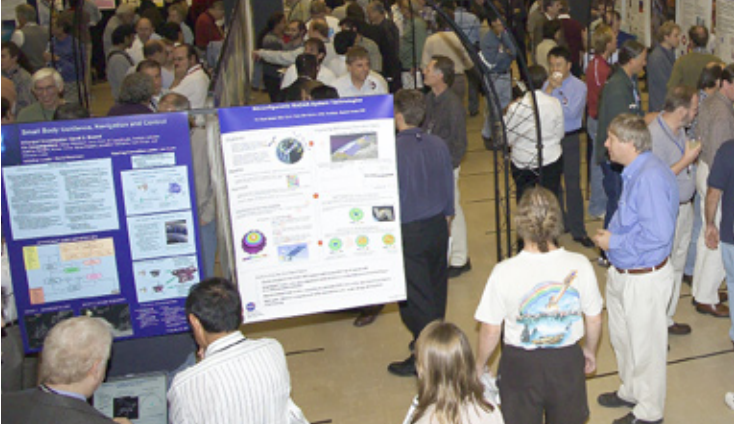
He urged JPL staff to "keep our focus on the technical and programmatic challenges that we are going to face all together."

"The missions we have in the next five years will continue to raise our passion for exploration, challenge our intellect and test our ingenuity," Elachi said. "These are the things we welcome at JPL and I think the future is as exciting and bright as it was in the past. I don't think there is any place in the world that I want to be working more than JPL over the next decade."

Elachi's talk can be viewed online at <http://dailyplanet.jpl.nasa.gov>, under Multimedia.



News  
Briefs



More than 900 attended last year's poster session.

Poster session scheduled for Oct. 26

More than 160 Research and Technology Development posters by JPL investigators will be presented at JPL on Oct. 26 from 8 a.m. to 4 p.m. Principal investigators will be present to discuss their posters on the mall in front of Building 180 and in von Kármán Auditorium from 11 a.m. to 2 p.m.

Posters will be presented from Research and Technology Development Strategic Initiatives, Research and Technology Development Topic Areas, Research and Technology Development Spontaneous Concept Awards, Lew Allen Award winners and—new this year—featured posters of past Research and Technology Development projects that have made a positive impact on JPL programs.

At 11:30 a.m., JPL Chief Engineer ERIK ANTONSSON and Chief Scientist THOMAS PRINCE will speak on how JPL's future success is directly tied to its internal investment in new and enhanced science and technology capabilities. Refreshments will be served.

The poster session is an excellent opportunity for researchers to see JPL's latest advances in science and technology and to explore collaboration possibilities with JPL investigators. "The strength and uniqueness of JPL's future technology depends on a constant interchange of information and ideas," noted event organizer JEFF ESTEFAN. More than 900 scientists and technologists attended last year's successful poster session.

The Research and Technology Development Program is JPL internal-fund administered by the offices of the Chief Scientist and Chief Technologist. Initiated in 2001, JPL's commitment to this investment will continue to grow until it reaches 3 percent of JPL's business base, Estefan said. The program funds proposals in the areas of basic research, applied research, development, systems and other concept formulation studies.

VLBI team earns international honors

The International Academy of Astronautics has bestowed its annual Laurels for Team Achievement Award for 2005 to the Space Very Long Baseline Interferometry (VLBI) Project Space Observatory Program Team. JPL and NASA played key roles in the development and operation of this international mission, and many U.S. scientists participated in the resulting radio astronomical observations.

The award was presented Oct. 16 at the 56th International Astronautical Congress in Fukuoka, Japan. DR. JOEL SMITH (JPL project manager) and DR. ROBERT PRESTON (JPL project scientist) are among the 15 recipients of this award, which include eight members of the Japanese project team (which led the mission) and seven representatives of international organizations that supported the mission. Current JPL employees who also played key roles in the project include AL BERMAN, LARRY D'ADDARIO, DAVE MEIER, KEVIN MILLER, NEIL MOTTINGER and DAVID MURPHY.

The Laurels for Team Achievement Award was created in 2001 to recognize extraordinary performance and achievement by a team of scientists, engineers and managers in the field of astronautics.

This year's citation notes that the technique of VLBI has enabled astronomers to produce the highest angular resolution images of celestial objects. The VLBI Space Observa-

tory Program realized the long-held dream of radio astronomers to improve the resolution of these images by extending this technique into space. In the mission, celestial radio sources were simultaneously observed with the Japanese Highly Advanced Laboratory for Communications and Astronomy satellite and large arrays of ground radio telescopes around the world.

The JPL Space VLBI Project provided NASA support to the VLBI Space Observatory Program mission in the form of communications, orbit determination, radio telescope observations, and mission planning and operations. Antennas of JPL's Deep Space Network in California, Spain and Australia were key elements of this support. In the United States, the National Radio Astronomy Observatory, supported by NASA, also was an important contributor to the project.

The operational phase of the mission began with the launch of Japan's Highly Advanced Laboratory for Communications and Astronomy satellite in February 1997, which was placed in a highly elliptical Earth orbit. The international collaboration included 25 radio telescopes from 14 countries, five space tracking antennas, three data processing centers and two orbit determination teams.

The VLBI Project Space Observatory Program has participated in more than 780 scientific observations. For more information about the mission, visit <http://sgra.jpl.nasa.gov/us-space-vlbi/vsopmission/VSOP.html>.

Blood drive set for November

The next JPL/Red Cross blood drive will be held in von Kármán Auditorium on Tuesday, Nov. 8, from 10 a.m. to 4 p.m. and Wednesday, Nov. 9, from 7 a.m. to 1 p.m.

JPL Occupational Health Services says that while recent collections have been adequate to meet area patient needs, blood supplies are critically low and there is a high demand for type O blood.

Blood drive registration is available at the Red Cross' automated and secure site at [www.givelife.org/index.cfm?hcl=JPL](http://www.givelife.org/index.cfm?hcl=JPL). Click "Search" in Step 1 and the JPL blood drive dates will come up. Once you select your appointment, you will receive a confirmation via e-mail. Advance signup sheets will also be available at Occupational Health Services, Building 310-202, prior to the blood drive. For last-minute signups or to change your appointment, call the Red Cross at (213) 400-0140.

Everyone who donates in November will receive a Red Cross water-bottle holder and will be entered in a raffle to win two movie tickets.

To donate blood you must be at least 17 years old, weigh no less than 110 pounds, have lived in the United States for at least three years, and be in good health. If you have donated recently, keep in mind there must be 56 days between blood donations.

Occupational Health Services notes that during the two-day blood drive in August the Red Cross collected 218 pints of blood, from which 654 lives will benefit. This represents an increase from the 151 pints collected in the May 2005 blood drive.

For more information, visit [www.redcross.org/services/biomed/blood/supply/tse.html](http://www.redcross.org/services/biomed/blood/supply/tse.html).

2006 Lab holidays set

JPL's 2006 holiday schedule is now available online at JPL Rules! (<http://rules.jpl.nasa.gov/cgi/doc-gw.pl?DocID=34552>).

Beginning with the New Year's Day—observed holiday on Jan. 2, the 12 off days include nine regular holidays, two JPL-designated floating holidays and one personal holiday.

Calling all Viking team members

The Mars Public Engagement team would like to interview former Viking team members to create videos and web products for Viking's 30th anniversary celebration on July 20, 2006. If you have stories to share, ideas to contribute, or could speak at a museum in the United States that is hosting a Viking anniversary event, please contact CHRISTINE JOHNSON at (818) 393-2634.

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.

Saturday, October 22

Shangri-La Chinese Acrobats—This 18-member company will perform at 8 p.m. in Caltech's Beckman Auditorium. Their multifaceted and multi-cultural production features acrobatic displays, feats of daring and balance, Kung Fu, brilliant costumes and a touch of Chinese comedy. Tickets are \$25, \$21 and \$17; \$10 for high school age and younger. For more information, call (626) 395-4652 or visit [www.events.caltech.edu](http://www.events.caltech.edu).

Sunday, October 23

Chamber Music—The Endellion String Quartet will perform at 3:30 p.m. in Caltech's Beckman Auditorium. Tickets are \$32, \$27, \$22 and \$18. For more information, call (626) 395-4652 or visit [www.events.caltech.edu](http://www.events.caltech.edu).

Monday, October 24

Dava Sobel—The award-winning writer and former New York Times science reporter will talk about her new book, *The Planets*, at 8 p.m. in Caltech's Beckman Auditorium. Free admission. A book signing will follow the talk. For more information, call (626) 395-4652 or visit [www.events.caltech.edu](http://www.events.caltech.edu).

Wednesday, October 26

Finnish School—The nonprofit group meets from 6:15 to 7:45 p.m. at the Child Educational Center, 140 Foothill Blvd., La Cañada. For more information, visit [www.suomikoulula.org](http://www.suomikoulula.org).

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](http://www.jplcaltechtoastmasters.com).

Thursday, October 27

Caltech Architectural Tour—Hosted by the Caltech Women's Club, from 11 a.m. to 12:30 p.m. Free and open to the public. Meet at the Athenaeum front hall, 551 S. Hill Ave. For reservations, call Susan Lee, (626) 395-6327.

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

JPL Stories—Join Genesis Project Manager Don Sweetnam for "Genesis: What Really Happened at the Utah Test and Training Range?" at 4 p.m. in the Library, Building 111-104. If you have questions about the JPL Story series or wish to participate, call Teresa Bailey at ext. 4-9233.

"Survivor CMMI: The Second Season"—Join Dr. Steve Flanagan, deputy manager of the Software Quality Improvement Project, at 11:30 a.m. in the 167 conference room.



Saturday, October 29

*Walking With Dinosaurs: Giants of the Sky*—This high-definition film will be shown at 2 p.m. in Caltech's Beckman Auditorium as part of the "Science Saturdays at 2:00" series of family events. Tickets are \$5. For more information, call (626) 395-4652 or visit [www.events.caltech.edu](http://www.events.caltech.edu).

Sunday, October 30

"Hiding in the Mirror: The Mysterious Allure of Extra Dimensions, From Plato to String Theory and Beyond"—Dr. Lawrence Krauss, professor of physics at Case Western Reserve University, will speak at this Skeptics Society-sponsored lecture at 2 p.m. in Caltech's Baxter Lecture Hall. For more information, call (626) 794-3119 or e-mail [skepticmag@aol.com](mailto:skepticmag@aol.com).

Tuesday, November 1

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

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

Photography Close Up—Ansel Adams protégé Mariana Cook will discuss her book *Faces of Science* at 8 p.m. in Caltech's Sharp Lecture Hall. Free admission. A book signing will follow the talk. For more information, call (626) 395-4652 or visit [www.events.caltech.edu](http://www.events.caltech.edu).

Wednesday, November 2

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 Amigos Unidos—General meeting at noon in von Kármán Auditorium. Stop by to hear about plans for the near future and bring your ideas. For more information, call Cindy Alarcon-Rivera, ext. 3-0856.

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 Building 180-101.

"Spirit and Opportunity's Excellent Adventure in Mars Geology"—JPL's Dr. Joy Crisp, Mars Exploration Rovers project scientist, will speak at 8 p.m. in Caltech's

Beckman Auditorium. Free admission. For more information, call (626) 395-4652 or visit [www.events.caltech.edu](http://www.events.caltech.edu).



Thursday, November 3

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

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

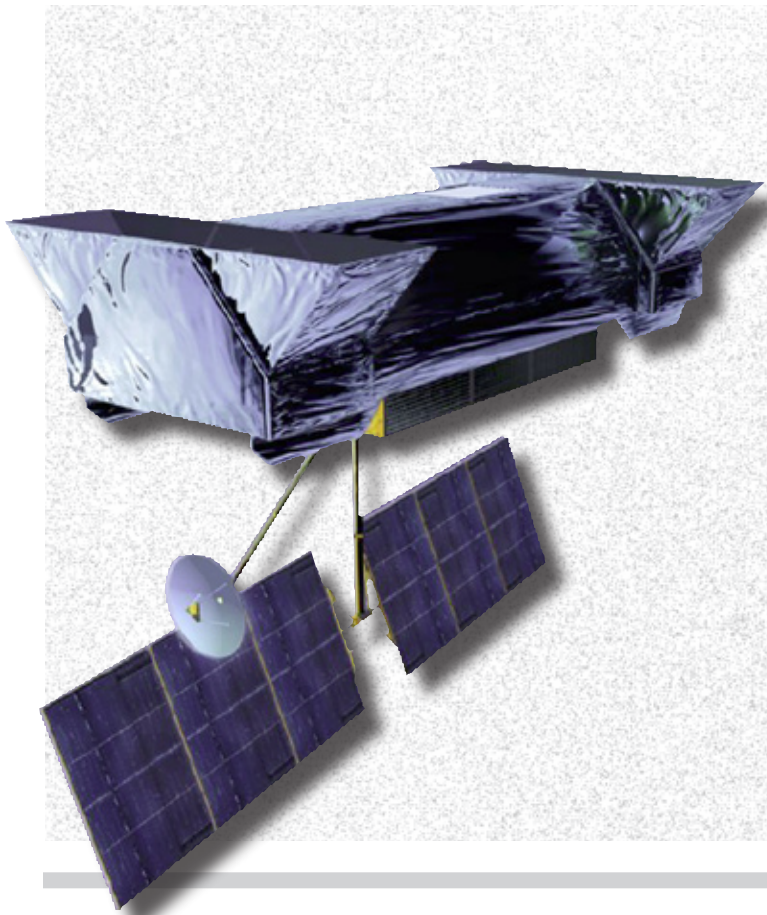
Friday, November 4

Caltech Women's Club—A "welcoming coffee" is offered from 11 a.m. to 1 p.m. in von Kármán Auditorium. New members are invited. Light snacks will be provided. For more information, contact Vilja Zmuidzinas at [vilja@caltech.edu](mailto:vilja@caltech.edu) or (626) 398-4413 or Brenda Simmons at [l.simmons@att.net](mailto:l.simmons@att.net) or (818) 790-6867. For information about the club, visit [www.cwclub.caltech.edu](http://www.cwclub.caltech.edu).

Saturday, November 5

Celtic Music—The Battlefield Band will perform at 8 p.m. in Caltech's Beckman Auditorium. Tickets are \$29, \$25 and \$21; \$10 for high school age and younger. For more information, call (626) 395-4652 or visit [www.events.caltech.edu](http://www.events.caltech.edu).





# Technology Breakthroughs Set Stage for SIM PlanetQuest

*By Randal Jackson,*

*Navigator Public Engagement Program*

In the early 1990s, a group of scientists and engineers at JPL made an extraordinary claim: They could develop a space telescope powerful enough to detect Earthlike planets around nearby stars. Now the team has delivered extraordinary proof.

Space Interferometry Mission PlanetQuest has successfully completed the last of eight seemingly impossible technology milestones required to prove that the mission can accomplish its ambitious science goals. NASA specified that the rigorous tests of the ultra-precise technologies must be finished by the end of 2005 in order for the mission to enter its next phase: construction and launch.

“By completing these milestones, we’ve convinced both ourselves and the external reviewers involved in the process that we can really do this mission,” said David Gallagher, SIM PlanetQuest project manager at JPL.

Along the road to inventing and testing the mission’s revolutionary technologies, team members have chalked up a series of firsts, including:

- Taking the smallest position measurements in human history, down to a fraction of the radius of a hydrogen atom.
- Suppressing vibrations at the nanometer level, which enables the instrument to make these incredibly precise measurements.
- Demonstrating the capability to achieve not only the instrument’s design specifications, but also a suite of more ambitious goals that will enhance the science return.

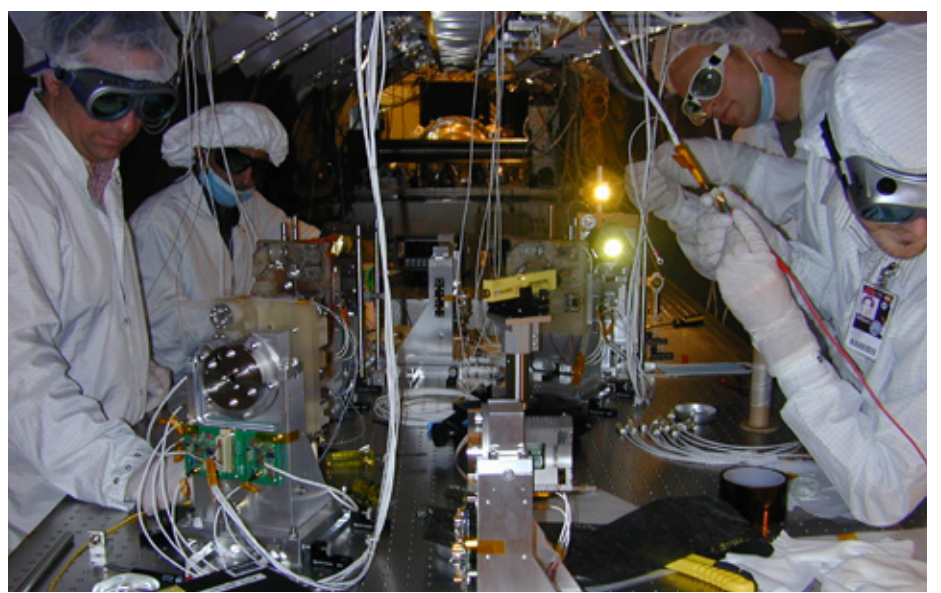
Scheduled to launch in 2011, SIM PlanetQuest will determine the orbits and masses of planets around other stars and detect nearby Earth-size planets. The mission will also determine the distances to stars throughout the galaxy with unprecedented accuracy and perform many other fundamental astrophysics investigations.

“We can now make the long-awaited statement that ‘SIM technology is in hand,’” said Steve Unwin, deputy project scientist. “We may still face the traditional hurdles that challenge all space projects—mass allocations, power allocations, reliability, tight schedules and limited budgets—but these are challenges for good engineering, not the invention of new technology.”

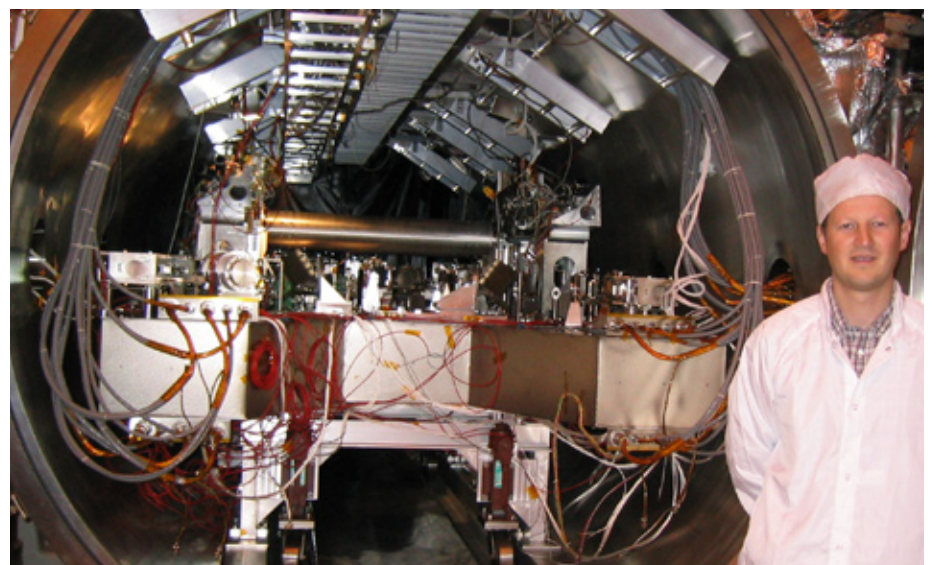
The process of developing SIM PlanetQuest’s technology involved isolating the various challenges into separate testbeds at JPL, and assigning specific teams to each problem. By using this approach, the team was able to complete within a few years a process that otherwise might have taken several decades.

“If you make extraordinary claims, you need extraordinary proof,” said Gary Blackwood, the project’s external metrology element manager. “It was actually a lot of fun to prove we could do it—to have a job that was almost impossible and then deliver on it.”

The SIM PlanetQuest survey of nearby planets will set the stage for NASA’s future Terrestrial Planet Finder observatories, which will determine which planets are warm enough for life, and analyze their atmospheres and surfaces for the chemical signatures of life.



*From left: Bijan Nemati, Ali Azizi, Tim Neville, Steve Moser.*



*Instrument Project Manager Renaud Goullioud in front of the Microarcsecond Metrology testbed.*



*From left: Frank Dekens, Clint Kwa, Bijan Nemati.*



# Cassini views Dione, a frigid ice world

By Carolina Martinez

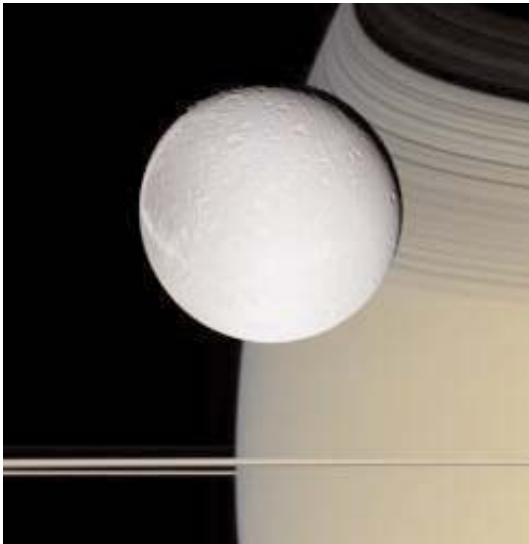
Cassini was nearly in the plane of the rings when the images of Dione were taken, thinning them by perspective and masking their awesome scale.

Sitting in the tranquility of space is the pale moon Dione, looking as if it's posing for a painter. The moon is set against the stunning backdrop of Saturn, adorned in gold and draped with hues of blue.

Breathtaking views and a movie of the icy world are now available at <http://saturn.jpl.nasa.gov> and <http://www.nasa.gov/cassini>.

During the Cassini spacecraft's only close flyby of the grayish moon, on Oct. 11, the spacecraft came within 500 kilometers (310 miles) of the surface.

Like most of its counterparts in the Saturnian system, Dione shows a heavily cratered surface. It has a signature style all its own that includes streaky terrains dominating one whole side of the moon. The fine latitudinal streaks appear to crosscut everything and appear to be the youngest feature type in this region of Dione. These striking cracks and fractures are caused by tectonic activity.



"Dione seems to be an older sibling of Enceladus," said Dr. Bonnie Buratti, scientist on the Cassini visual and infrared mapping spectrometer team at JPL. "We think that the cracked features of Dione may be the older version of the tiger stripes on Ence-

## Passings

**RUSSELL CAPLETTE**, retired from the former Section 348 after 47 years, died Sept. 17.

He is survived by his wife, Zelma, daughters Michele Shaw (Mark) and Karen Tucker (Sandy), sons Geoffrey (Pat) and Gregory Caplette and six grandchildren.

Retiree **DORIS GENSEL**, 97, died Sept. 29.

Gensel joined JPL in 1962 and retired in 1973. She is survived by daughter Elenor, sons Gene and Gerald and 11 grandchildren.

Services were held Oct. 7 at Oakdale Mortuary in Glendora.

## Letters

Thank you to all of you wonderful JPL people who remembered, contributed and wrote of your remembrances, times and contacts with my husband, Russell K. Caplette. My family and I were very touched by your thoughts of him and his impact on your lives. He would be very happy and pleased to know so many of you kept him in your memory.

Zelma Caplette and family

To my JPL colleagues: my family and I sincerely appreciate your condolences and sympathy shown to us after the passing of my brother. The memorial plant is beautiful.

José Macias and family

## Classifieds

### For Sale

BABY CRIB, includes mattress, can be converted to a day bed, bought 2 years ago, value \$250, will sell for \$100. 626/574-7431.

BASSINET, Pottery Barn Kids, less than 1 year old, vg condition, with green bumper, skirt, sheets and mattress, \$175. 951-3532.

BED, twin, bookcase headboard, drawers underneath, dark wood color, with mattress, vg condition, leave e-mail address to see picture, \$100. 626/345-1715.

BED, California King with a thick over-stuffed pillow top, perfect for "big & tall," includes mattress and box spring set, call for pictures, sheet sets also available, bed too big for new house, must sell, \$350/obo. 626/345-0915.

BREEZE AIR PURIFIER by Ecoquest, used very little, quiet, 12 L x 8 H x 10 D, black with dark brown (walnut) wood grain shell, remote control, and spare glass plate (internal part); paid \$600, will sell for \$400. 626/289-2795.

CRIB, light colored wood, lg, drawer underneath, with mattress, vg cond., leave e-mail address to see picture, \$75. 626/245-1715.

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

DOG HOUSE, Igloo style, size large, newer cushion, can deliver locally, \$50. 726-1270.

FURNITURE: oak hutch, lighted, \$450; oak TV stand w/storage, \$375; 5-pc. lt. oak bedroom set, \$2,000; spinet piano, maple, \$600; patio table w/glass top + 4 chairs, \$300; tools of all sorts, various prices, much more; estate sale scheduled for 11/12, all items to be sold by then, available now. 248-0491.

FURNITURE, living/family room, perfect cond.,

hardly used: couch, loveseat, chair, coffee and end tables, lamps & wall unit; see [http://www.srl.caltech.edu/personnel/ace/for\\_sale.htm](http://www.srl.caltech.edu/personnel/ace/for_sale.htm). 626/355-2706 or [ace@srl.caltech.edu](mailto:ace@srl.caltech.edu).

GENERATOR, Honda, super quiet, 3300 watt, \$1,000/obo; GAS RANGE, GE, white, used, \$150/obo. 661/722-6067, Darrol or Debi.

JEWELRY: diamond anniversary ring (1 ct tw) w/gift box, \$750/obo; diamond ring (10K YG) w/gift box, \$99; Suunto S6 wrist-top computer, great for the extreme sports enthusiast, \$250/obo. 364-1283.

LOVESEAT COUCH, dark blue w/beige specks, \$75/obo; DINING TABLE w/6 armchairs, \$100/obo; no reasonable offer refused. 626/359-8017.

MINING EQUIPMENT, miscellaneous, used; includes a 3,000-lb. jaw crusher, steel ladders, Ingersoll-Rand air compressor, high-pressure hoses, jackhammers, jackhammer rods w/bits, winches, steel cables and heavy-duty bearings; was used by deceased father who was a serious mining hobbyist; also various sizes & shapes of angle iron and I-beams, & assorted lumber and timbers. 626/355-4475, JLesch@keyway.net.

MISC.: desk, parch wood, excellent condition, four legs, \$95; big-screen TV, exc. cond., \$850; BBQ grill w/rotisserie, stainless steel, propane, \$375; round glass-top table, brand new, parch wood leg, blk. Base, \$35; chandelier, gold and crystal, \$75. 626/653-9613.

MISC.: child's wooden table & 2-chair set, \$25; Little Tykes big toy box, \$25; Little Tykes picnic table/bench, \$10; girl's vanity, \$5; new Stride Rite hiking boots, 8 1/2, \$15; new sandals, \$10; girls bike, clothes, med. dog house, \$25; Durcraft Hepa air purifier, \$50. 249-6248.

PLAY SET, redwood Playwell, 2 swings and trapeze bar, monkey bars, fort with slide, refinished last year, \$1,500 includes delivery and setup by Playwell. 790-6491.

POSTER PRINT, Monet's Artist's Garden at Vetheuil, professionally framed, 27.5 L x 39 H, \$50. 626/289-2795.

TROPICAL PLANTS, plumerias, variety of colors and sizes; shell gingers. 626/444-6156.

WOODWORKING MACHINES: DeWalt 10" radial arm saw & stand, 1970s, exc. cond., 110V, incl. 8" dado set, other blades & manual, \$250; Skil 10" table saw, recent make, 110V compact and lightweight, \$75; older Harbor Freight (Taiwan) wood lathe, 12" x 48" with centers, 1/2 HP, 110V, no tooling, \$70; Montgomery Ward air compressor, belt drive, 1.5 HP, 110/220V, 12-gallon tank, 4.75 CFM @ 90 PSI, old unit but runs well, \$40. 626/296-1298.

### Vehicles / Accessories

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

'68 CHEVY Camaro SS, 350 hp, 49,000 miles, clean int., engine runs great, a restoration/ street rod project I am 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](http://www.sassybee.com/camaro), \$13,000/obo. 310/445-6625, Steve.

'55 CHEVY Bel Air-HT sport coupe, 350 eng./350 trans, w/shift kit, 10-bolt rear end, many new parts, inc. PS, frt pwr disc brakes, rear drums, brakes, shocks, exhaust, wiring harness w/GM fusebox, alternator, weather stripping; custom paint & interior, gd cond., mech. sound, daily driver, \$24,000/obo. 661/ 993-9239.

'99 DODGE Durango, runs great, 2 WD, 71,200 miles, chili pepper red, 1 owner, tow package, 3rd seat, 5.2L V8 auto, rear a/c, \$10,500. 626/794-8877.

'94 FORD Tempo, 4 dr., auto, air, cruise control, power door locks, white with blue interior, runs good, will pass smog, newer tires, looks good, 120K miles, \$1,500/obo. 324-6757.

'49 FORD F3 pickup, includes winch, has recently run, currently licensed but with a non-op tag, body in good condition, photos avail., \$3,000; 2 Corvair engines and miscellaneous older auto engine parts (including flathead motors), JLesch@keyway.net, 626/355-4475.

'96 HARLEY Custom Rigid, rigid frame by Atlas, 80CI S&S, 3" drivebelt, 5-spd, trans, 180 rear tire, 21" front wheel, custom forward controls, a great bike, lots of attention, is registered and I have pink, \$13,000/obo. 626/497-9591, Gene or [guido576@yahoo.com](mailto:guido576@yahoo.com).

'01 HONDA Accord EX 4-dr. sedan, automatic, gold, power windows/locks, alloy wheels, moonroof, CD player, a/c, 85K miles, clean

ladus. Enceladus is the up-and-coming moon, complete with a recently active history, while Dione is the older, more mature moon."

The Cassini infrared spectrometer team is working on compositional maps of the moon's surface.

Multiple generations of fractures are visible on Dione. Numerous fine, roughly parallel grooves run across the terrain and are interrupted by the larger, irregular, bright fractures. In several places, fractures postdate some deposits in the bottoms of craters.

The Cassini ultraviolet imaging spectrograph team reports the detection of water ice on the surface of Dione and also finds striking brightness variations across the surface. This could be the result of cracks and fractures in the ice. "The ice in the fractures appears to be different than in the surrounding terrain. This may be due to the grain size variations," said Dr. Amanda Hendrix, Cassini scientist at JPL.

As on other Saturnian moons, rockslides on Dione may reveal cleaner ice, while the darker materials accumulate in areas of lower topography, such as crater floors and the bases of scarps.

Scientists on the Cassini fields and particles instruments note that early results do not support the presence of an atmosphere. Dione orbits Saturn within the broad, tenuous E-ring. Hence, scientists will be looking to see if Dione, like Enceladus, is a source of material in the E-ring. They also seek to learn whether the E-ring is affecting Dione's surface. Over the coming months, scientists will begin to piece together a more detailed story of Dione.

Following the rendezvous with Dione, Cassini captured its best views ever of the tiny moon Telesto. "Telesto was too small in Voyager images to see detail on the surface," said Dr. Candice Hansen, Cassini scientist at JPL. "Cassini has given us the best views of the potato-shaped chunk of ice." Early results indicate the entire moon, roughly 24 kilometers across (15 miles), is ice.

Next up for Cassini, on Oct. 28, is a close pass of Titan, Saturn's largest moon. During this pass Cassini's powerful radar will be pointed to image the Huygens probe landing site and surrounding terrain.

int./ext., exc. cond., \$9,500. [ando.shigemasa@sbcglobal.net](mailto:ando.shigemasa@sbcglobal.net). Ando or 626/792-8587.

'95 LAND ROVER Range Rover SE V8 4.0 L, auto, 4WD, 138K, tan, leather seats, CD, ps, pv, dual airbags, moonroof, runs great, good condition, \$6,300/obo. 626/296-9073 or 818/515-2461.

'89 LAZY DAZE RV, 26.5', 30K miles, sleeps 6-8, a/c, awning, microwave, oven, refridge, loaded with extras, no accidents, looks/runs great, \$15,250/obo. 248-0491.

'02 LEXUS IS 300, loaded, auto, 6-CD changer, GPS navigation system, everything power, moonroof, leather power seats, spoiler, 36.5K miles, good cond., \$22,000. 909/599-3230.

'02 NISSAN Frontier desert runner, 80K miles, vg cond., 20 mpg, KBB value \$9,500, sell for \$9,000/obo; '03 CHEVY Suburban LS 1500, 54K miles, KBB value \$19,760, sell for \$18,000/obo. 661/722-6067, Darrol or Debi.

'97 NISSAN Maxima, white, auto, full power, 4 door, 90K mi., in perfect shape, \$5,200/obo. 249-7946, Greg.

'88 PLYMOUTH Colt Vista wagon, 7 passenger, light metallic blue, FWD, air, roof rack, 143K miles, original owner, new clutch, new tires, \$1,200/obo. 626/351-0129.

'02 TOYOTA Corolla CE, black with gray interi-or, 63,000 miles, automatic, a/c, CD player, good cond., \$7,200. 731-1493.

'90 TOYOTA Corolla sedan, 4 dr., pwr. S, a/c, radio/cassette, 150K miles, \$1,500. 653-9509.

'85 TOYOTA Cressida V6, 4 dr., runs well, luxury, moonroof, power everything, automatic, new a/c, 160K mi., burgundy, \$2,000/obo. 626/585-0799, Anton.

### Free

LOVE SEAT SOFA, needs new slipcover. 957-1043.

### Wanted

MATH TUTOR, Jr. & Sr. high school level classes (geometry, pre-algebra, algebra I & II, SAT math, etc.), eves and/or weekends, also English tutors. 888/784-1639, David, leave msg.

MISC.: copy machine, box trailer, sound system with microphone and lapel. 248-3912.

RENTAL HOME in Glendale area (missionary parents w/3 young children, no pets). 248-3912.

ROOMMATE to share large Altadena back house (2,200 sq. ft.); your own bedroom, bathroom, office space (Internet ready, cable) and garage parking; share laundry room, kitchen, lots of space, central air/heat; non-smoker, clean, no pets, month-to-month-lease, \$1,100 + 1/2 utilities; applicant must be approved by house owners. 626/398-6564, Brenda.

ROOMMATE for female postdoc at Spitzer Science Centre, Caltech; 2-bd. apt., great location, is back off the street in a small complex w/sunny courtyard; new carpets throughout, walls freshly painted; all new kitchen appliances (stove, fridge, dishwasher); massive bedrooms and spacious living areas; only blocks away from S. Lake shops & Caltech; water, trash and gardening included, but electricity is not; \$750. [mhyunh@ipac.caltech.edu](mailto:mhyunh@ipac.caltech.edu).

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

WEIGHT TRAINING EQUIPMENT to donate to rehab. center, will pick up. 626/483-5538, Ana.

### For Rent

ALHAMBRA, private home, separate entrance to 3 large spacious rms. and common area, quiet neighborhood, 20 minutes from JPL, short-term leases OK, garage space negotiable, \$500/\$700/\$700. 626/297-5412.

ALTADENA room, very nice area, all necessities furnished: laundry, sheets, towels, dishes, TV, VCR; parking & small enclosed patio; close to JPL, next to Christmas Tree Lane; very quiet and clean; \$600. 626/798-4821.

ALTADENA, 2350 N. Windsor Ave., beautiful, 2 bd., 2 ba., hardwood floors, new carpet, living room, kitchen w/breakfast nook, utility room w/washer and dryer hookup, 2-car gar., central air & heat; quiet neighborhood, walking/biking distance to JPL + Rose Bowl, minutes from Old Town; water/trash/gardener included; \$1,800. 626/797-7305, Samuel or Dorothy La Mothe.

ALTADENA, fully furnished 1 bd., 1 ba, guest

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

ALTADENA, room in cute 3 bd., 2 ba. home; close to JPL; must be OK with cats and dogs; \$600 + \$600 deposit, utilities not included. 626/798-4907.

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

ARCADIA apt., 2 bd.+den/1 ba., garage, upstairs unit, clean, spacious; washer/dryer in unit, a/c, stove; walking distance to shops, near SA Fashion Park; quiet residential neighborhood close to JPL; no pets; water/gardener/ trash included; \$1,450 + utility, security deposit. 626/576-7333 or [clin@mcw.edu](mailto:clin@mcw.edu).

CHATSWORTH, 3 bd., 1.75 ba., nice area & yd., nr. schools & shops, a/c, \$1,775, incl. garden-er. 885-6317, Peter\_Peng\_888@hotmail.com.

LA CANADA apt. in 4-plex, upper unit, 1 bd., 1 ba., 10 min. to JPL, La Cañada schools, avail. Nov. 626/798-4134.

PASADENA home for lease, 2 bd., 2 ba., enclosed back yd, huge 2-car garage (+ space for shop), gardener, nr. Caltech & vicinity, no pets, avail. Nov. 1, \$1,500. 626/794-0455, eves.

PASADENA, room in a 2 bd., 2.5 ba. town-house, 2-car garage, tree-lined, lots of storage space; quiet, 6 miles from JPL, across from PCC; rm. has own bath w/priv. entrance and can be partially furn.; washer/dryer, patio, a/c, fireplace, cable modem, WiFi, DirecTV, HiDef Tivo, phone in unit; no pets or smokers. \$850 + 1-mo. deposit, include. all util. except long-dist. Phone; exc. credit report req.; mo.-to-mo. lease approved by external landlord. 626/844-9286, Dave.

NORTHEAST PASADENA, cute fully furnished sabbatical house, 2 bd., 1 ba., fireplace, spa, 2-car garage, all util, paid, linens, dishes, just bring your toothbrush, \$2,500. 626/422-8119.

SOUTH PASADENA, 621 Park Ave., 2 bd./1 ba. apt.; ideal location, corner apt., priv. garage & storage, on-site laundry, very private, 1 block from park & shopping ctr., Gold Line access, 10 min./downtown; new: stove, refrig., carpet, floors, paint; no pets, no smoking; \$1,450 + security deposit. 626/799-9623, Eleanor.

### Vacation Rentals

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

FLORIDA condo, beautifully furn. 2 bd., 2 ba., 2nd 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, [dfhaug@yahoo.com](mailto:dfhaug@yahoo.com).

MARRIOTT TETON / YELLOWSTONE Nat'l Parks, visit in style, 2 bd. + loft townhome, totally outfitted, stunning Teton view, sleeps 6, cable, microwave, etc., borders Grand Teton. [conliematt@sbcglobal.net](mailto:conliematt@sbcglobal.net).

LOCAL & WORLDWIDE, five-star resorts, luxurious residential-style 1-bd. villas w/fully furn. kitchen + liv. room, starting at \$690/wk.; local resorts include Marriott/Palm Springs, Welk Resort/Escondido, Marriott/Lake Tahoe and Marriott/Colorado Rockies. 626/794-9579 or [fivestarresorts@earthlink.net](http://fivestarresorts@earthlink.net).

MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, slps. 6-8, fully equip'd kitchen incl. microw., 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](mailto:valeriee@caltech.edu).

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

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

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

### Editor

Mark Whalen

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David Hinkle, Audrey Steffan/  
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