

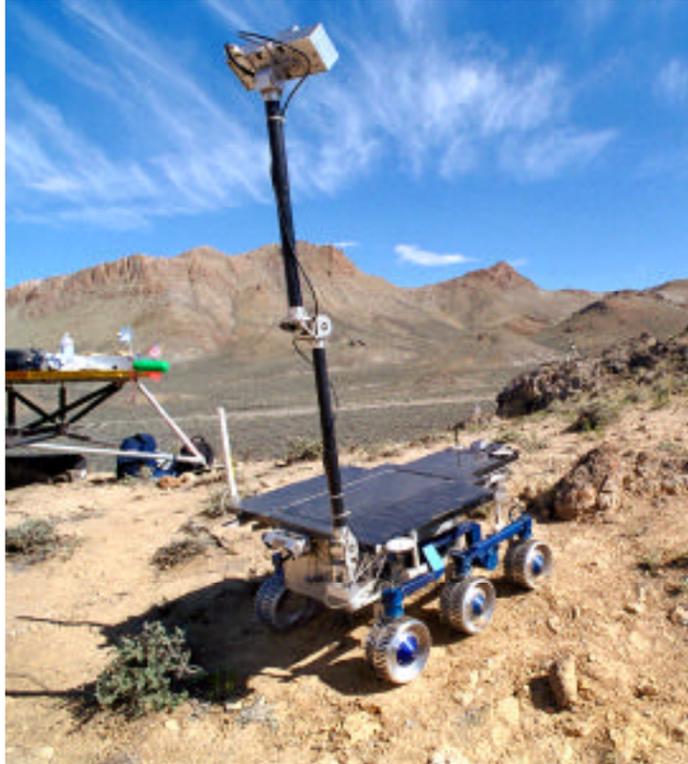
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## Mars '03 mission to deliver identical twins

*Right: FIDO (Field Integrated Design and Operation) rover waves to the camera with its retractable arm during field tests at Black Rock Summit in Nevada in May.*

*Below: JPLers involved in the field test change FIDO's batteries.*

*Lower right: At the same test site, the rover works out its wheels.*



**t**he traffic on Mars is expected to double in the near future. On August 9 NASA announced plans to send two large scientific rovers to the red planet in 2003, rather than the original plan for just one.

Both Mars rovers, to be built, managed and operated by JPL, currently are planned for launch on Delta II rockets from Cape Canaveral Air Force Station, Fla. The first mission is targeted for May 22, with the second launch slated for June 4.

"For the first time, science and technology have given us the capability to explore alien planets in ways that used to exist only in science fiction movies," said Dr. Ed Weiler, associate administrator for space science, NASA Headquarters, Washington, D.C.

After a seven-and-a-half month cruise, the first rover should enter Mars' atmosphere on January 2, 2004, with the second rover bouncing to a stop on the Martian surface January 20, according to Scott Hubbard, Mars program director at NASA Headquarters.

"The goal of both rovers will be to learn about ancient water and climate on Mars," said Prof. Steve Squyres, principal investigator for the Athena science package, Cornell University, Ithaca, N.Y.

The rovers will be based on JPL's Mars prototype FIDO (Field Integrated Design and Operation) rover, which has been tested for the past three years.

"You can think of each rover as a robotic field geologist, equipped to read the geologic record at its landing site and to learn what the conditions were like back when the rocks and soils there were formed," said Squyres.

A major factor in the decision to go with two rovers involved celestial

mechanics. Due to precise orbital distances at the time of launch, NASA will be able to send more mass using less energy, according to Firouz Naderi, Mars program manager. In addition, the planet's inclination at the time will allow for the rovers to arrive in the southern region during Mars' summer, the area that has produced so many excellent images of possible water sources.

"The scientific appeal of using an excellent launch opportunity in 2003 for two missions was weighed carefully against the resource requirements and schedule constraints," said Hubbard. "We determined that, in addition to the prospect of doubling our scientific return, this two-pronged approach adds resiliency and robustness to our exploration program."

Equipped with several cameras, 20/20 infrared vision and specialized investigative tools attached to retractable arms, these "sport utility vehicles in a bag" will be identical, but still unique.

Relatives of the highly successful 1997 Sojourner rover, these 150-kilogram (330-pound) mobile laboratories may look and act alike, but they're going to decidedly different locations, which have yet to be determined.

"To have two rovers driving over dramatically different regions of Mars at the same time, to be able to drive over and see what's on the other side of the hill — it's an incredibly exciting idea," said Weiler.

During the next two to three years, engineers and scientists will conduct an intensive search for potential touchdown sites. Using the flood of data still coming in from Mars Global Surveyor, and that expected in 2002 from the Mars 2001 Orbiter, scientists will search for compelling landing zones with the fewest hazards and select the best candidates.

"We are thinking about localities where there is evidence of surface processes involving what we might call 'past' water on Mars," said Dr. Jim Garvin, Mars program scientist at NASA Headquarters. "This includes sites where we have today mineralogical evidence that water may have produced unique chemical fingerprints, as well as places where it seems likely water 'ponded' in closed depressions for enough time to modify the regional geology."

Declared an agency priority, these 90-day missions will provide 6 months of surface science, all of which will be web cast for the public to experience. While the first rover will incur costs approaching the \$400 million mark, collectively, both missions will run approximately \$600 million. NASA proposes that Space Science cover any additional costs of the first rover mission, and that the bulk of the cost for the second lander be reallocated from programs outside Space Science.



Bob Brown / JPL Photos

## New date, target chosen for Muses-C project

By Martha Heil

The MUSES-C project, a joint effort of Japan's Institute of Space and Astronautical Sciences (ISAS) and NASA to explore an asteroid and return a sample to Earth, announced that the project's asteroid target and launch date have been changed.

The launch is now slated for November or December 2002, arrival at the asteroid in September 2005 and return to earth in June of 2007. Its previous schedule included launch in July 2002, arrival at its previous target in 2003, and return to Earth in June 2006.

The new target is the asteroid 1998 SF36. The NASA-built science payload is a rover that will gather and transmit science data to the Japanese spacecraft. The spacecraft will then

gather and return to Earth samples of the asteroid. The ISAS-built spacecraft will stay at the asteroid for three months.

The launch date and subsequent target asteroid changes are due to delays in the provision of the Japanese MV launch vehicle, which will carry the MUSES mission to space.

Asteroid 1998 SF36, whose orbital period is about 1.5 years, will approach to within 6.4 million kilometers (4 million miles) of the Earth on March 29, 2001 and to within about 2.09 million kilometers (1.3 million miles) on June 25, 2004. Extensive ground-based observing campaigns will be planned near these close approach times to determine the asteroid's approximate size, shape, rotation state, and

some surface characteristics.

JPL is managing the U.S. portion of the mission, which is called MUSES-CN, and includes the rover and various support services for the ISAS mission. ("MUSES-C" stands for Mu Space Engineering Spacecraft C, "N" refers to NASA.)

The JPL MUSES-CN project has also arranged for the testing of the MUSES-C reentry heat shield at NASA's Ames Research Center, Moffett Field, Calif.

JPL will also arrange for supplemental tracking of the spacecraft by NASA's Deep Space Network, and will assist in navigating the spacecraft to the asteroid. Japanese and U.S. scientists will collaborate on the investigations of the asteroid and the returned samples.

# News Briefs



After seven tries, the Bumper Wac project struck gold on July 24, 1950, becoming Cape Canaveral's first rocket launch.

### Cape Canaveral remembers first launch

Fifty years ago last month in the sandbars of Cape Canaveral, Fla., history was made as the bare-bones facility that would one day become the world's busiest spaceport launched its first rockets, a combination of captured German V-2 missiles and high-altitude rockets developed by JPL.

The golden anniversary of the historic rocket firings was observed at Cape Canaveral with a commemorative celebration on Sunday and Monday, July 23-24. Among the guests were HERMAN BANK, retired JPL project manager, who worked on the rocket design and testing, ROBERT DROZ, JPL engineer in the launching crew, and DR. WILLIAM PICKERING, JPL director from 1954 to 1976.

During the two days of festivities, guests enjoyed a lunch sponsored by the Florida Space Business Roundtable and the National Space Club, an anniversary ceremony hosted by the Air Force Space and Missile Foundation and a VIP tour of "the Cape."

Space veterans recalled the dynamic missile duo that exceeded previous rocket altitudes and velocities. The rocket pair, consisting of JPL's 4.88-meter-long WAC-B rocket mated to the nose of a 12.8-meter-long V-2 missile, was part of the U.S. Army's Bumper WAC project between 1946 and 1951.

Since the Cape's first firing, 3,245 launches have occurred at the Eastern Test Range.

### JPL part of city-wide solar system

Last month, the Planetary Society announced the winning designs for PlanetTrek, a small scale model of the solar system to extend throughout Pasadena.

Ten imaginative sculptures representing the Sun and its nine planets will be built at seven different locations throughout the city. Surrounding the celestial models will be bronze plaques with great questions of all time. When a question is ultimately answered the plaque will be ceremoniously retired and a new one installed.

DR. EDWARD STONE, JPL director; DAVID DOODY, Cassini Mission Operations Lead; and CHARLEY KOHLASE, retired JPL mission planner and PlanetTrek manager, sat with artists on the selection panels to judge the designers' proposals.

The proposed plans place Pluto just south of JPL, in between Oak Grove Park and the southern boundary of the laboratory. The Sun, Mercury, Venus, Earth and Mars will be located in Central Park. Jupiter will be near City Hall, with Saturn near Kidspace in Brookside Park, Neptune in Victory Park, and Uranus at Pasadena City College.

### JPL hosts pre-convention journalists

Twenty journalists in Los Angeles to cover the Democratic National Convention spent the afternoon at JPL on Monday, Aug. 7.

While at JPL, the journalists heard from a technology panel, comprised of JPL spinoff companies, enjoyed multiple technology displays and visited JPL's "neatest" spots, including the Mars Yard, the Microdevices Laboratory and High Bay.

The tour, one of several events sponsored by the Los Angeles Economic Development Corp., was designed to showcase Los Angeles as a technological and innovative place.

### JPL seeks volunteer engineers

Engineers are invited to take part in FIRST's (For Inspiration and Recognition of Science and Technology) upcoming robotic competition.

A national engineering contest established in 1992, FIRST was created to "inspire curiosity...in today's youth by immersing them in the world of engineering."

Every year, four regional competitions are held throughout the country in early spring, with nationals taking place on a grander scale in April.

As volunteers, JPLers will work with small groups of students preparing for the 2001 Southern California Regional event.

While students design and construct robots from a box of parts (without any directions), engineers will mentor and provide them with a real-world feel for how engineering takes place.

NASA and JPL will be sponsoring 20 teams in next year's regionals. FIRST's robotic scrimmage took place at JPL this past May. Those interested can contact Kim Lieve in the Public Services Office at ext. 4-0112.

### ACW presents this year's winners

Last month the Advisory Council for Women presented individual and team awards to their '00 winners.

Individual awards were presented to BRIGITTE BADEA, ALICE FAIRHURST, LARRY N. DUMAS and ANNA N. TAVORMINA.

The outstanding contribution award for the Secretarial Mentoring Program Team went to: JOY HODGES, ALICE FAIRHURST and DONNALEE CAMPBELL. LYNN OSORNIA, LAURA WHITE and YVONNE ZIEGER received certificates in the same category.

Outstanding contribution awards for the Take Our Daughters to Work Day Teams were presented to DELLA BORLUND, ALICE FAIRHURST, TANIA GEDDES, KIM JOHANSEN, NANCY KAPPELL, KAREN LEE, BOBBI MARIN, SUSIE POCINO, ANNIE RICHARDSON, RICHARD SHOPE, KIMBERLY SIMPSON, PENNY SPEAKS, KATHLEEN SPELLMAN, TOBY SOLORZANO, THOMA VALDEZ, GAIL WATSON-ASHE and DONNA WU.

# Special Events Calendar

### Ongoing Support Groups

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

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

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

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

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

### Friday, August 18

Employee Assistance Program Lecture—Jae Weiss, outreach coordinator for Haven Hills Shelter, will discuss "Domestic Violence: Its Effect on the Community and Workplace" at noon in von Kármán Auditorium.

### Wednesday, August 23

JPL Toastmasters Club—Meeting at

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

### Thursday, August 24

Von Kármán Lecture Series—Dr. James Lambert of the Exploration Systems Autonomy Section 367 will present a lecture titled "Medical Technology: Using Technology to Improve Our Health" at 7 p.m. in von Kármán Auditorium. Open to the public.

### Friday, August 25

Von Kármán Lecture Series—Dr. James Lambert of the Exploration Systems Autonomy Section 367 will present a lecture titled "Medical Technology: Using Technology to Improve Our Health" at 7 p.m. in The Forum at Pasadena City College, 1570 E. Colorado Blvd. Open to the public.

### Thursday, August 31

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

# Service Awards

The following employees were second quarter 2000 recipients of Service Awards for 20 or more years of employment.

40 years: Dr. Frank B. Estabrook.

35 years: Paul D. Batelaan, Andre Caticchio, John H. Duxbury, Edward H. Kopf Jr., Jack W. Rhoads, David P. Rice, Barbara J. Short, Donald L. Young.

30 years: Jack B. Barengoltz, Charles Elachi, Ross V. Goodman, Robert T. Menzies, Dr. Srinivas N. Mohan, M. Kathy O'Hara, John R. Radbill, Dr. Robert A. Toth.

25 years: Alaudin M. Bhanji, Charles A. Black, Jerry L. Brown, Judith M. Castagno, Shirley Y. Chung, Roger W. Hickok, Chaw-Kwei Hung, Robert Ibaiven, Dr. Thomas B. Kuiper, Saturnino Lopez, Georgene Peralta,

E. Phillips, Karen Piggee, Virendra Sarohia, John J. Simmonds, Aurelio F. Toliver, John L. West. 20 years: Richard C. Benesh, Steven H. Benson, Dr. Scott J. Blton, Stephen H. h, Chuck G.

Derksen, Carol A. Dinolfo, Robert D. Emmons, Diane L. Evans, Kay A. Ferrari, Dennis M. Ferren, William R. Fiechter, Henry B. Garrett, Philip W. Garrison, Virginia L. Guzman, Albert S. Johnson, Cynthia L. Kahn, Michael P. Kleine, Dr. Harold R. Lang, Diane M. Mann, Dr. James J. Margitan, James W. McGregor, Mary B. Murrill, Tam T. Nguyen, Stanley R. Packard, Ben A. Parvin, Susan K. Pateracki, Jonathan D. Perret, Marilyn A. Pistoll, Elma A. Reynolds, Michael J. Rodrigues, Richard Santiago, Joseph I. Statman, Priscilla Torres, Flora Wilcox, William J. Wilson, Tsun-Yee Yan.

Continued on Page 4

# Teachers learn out-of-this-world lessons

By Gia Scafidi

Fran Banta, teacher at Longfellow Elementary in Pasadena, and Herbert Gualpa, from Camino Nuevo Charter Academy in Los Angeles, learn how to make Oobleck.



Eager to enrich their classrooms with exciting extraterrestrial knowledge, 14 local teachers took their seats at JPL's annual "Teachers Touch the Sky" workshop from July 17 to 19.

Now in its seventh year, the workshop combines hands-on activities with lectures by JPL scientists to provide elementary and middle school teachers with innovative ways to teach exobiology, astronomy and planetary science. "We try to increase the teachers' confidence

and make science comfortable and exciting for them," said Dr. Bonnie Buratti, principal investigator for the program. "We want to impart that science is not a collection of facts, but that it is a discovery process."

This year, research scientists Drs. Pamela Conrad and Gene McDonald provided the teachers-turned-students with a sneak peek into the world of astrobiology.

Conrad touched on the strategies scientists use to detect life on other planets and McDonald showed them the equipment used in the astrobiology lab.

Other great classroom ideas sparked from a lesson on the volcanic processes on Earth and Jupiter's moon Io, given by Dr. Ashley Davies, Galileo scientist; a web activity with Dr. Ralph Kahn, scientist in the Earth and Planetary Atmospheres Division, and Buratti's recipe for a solar system fruit salad.

For hands-on fun, the group built ultraviolet laser microscopes with research scientist Dr. Michael Storrie-Lombardi, which provided fluorescent images of microbial colonies under Antarctic rocks. They also investigated cratering processes by throwing stones into sand and measuring how the size and speed of the stones affected the size of craters.

Using the scientific process, the teachers also determined if "Oobleck," a colored mix of cornstarch and water, is a solid or a liquid.

Though the workshop lessons and activities are designed for fourth- through eighth-graders, some participants felt they were effective even for younger students.

Joanne LaMonte, a two-time workshop attendee from Glenoaks Elementary School in Glendale, finds that when she sets high expectations for her second-grade students they rise to meet them. "When you introduce an interesting subject to youngsters they soak it up like sponges," she said. "Then when they run into it again down the road, it's like an old friend." Added Patricia Gutierrez, a fifth-grade teacher at Multnomah Elementary in Los Angeles, "Every time I get new information, I have new ideas for projects," she said.

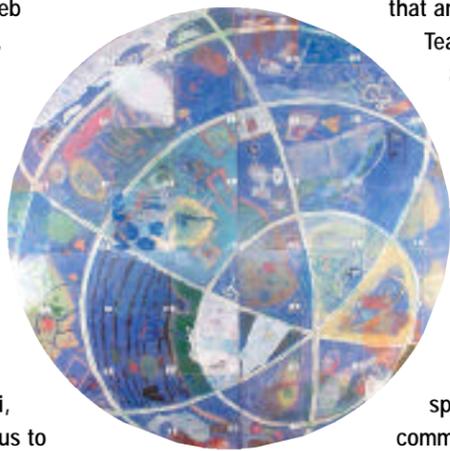
Whether they were attending the workshop for the first time or had participated in the past, one thing was clear: each one of these teachers was returning to their classrooms with fun and exciting ways to enrich their students' learning experience.

As part of the program, they all received an honorarium of \$150.

In the 2 1/2 years since the Space Place outreach project was initiated with support from the New Millennium Program, it has grown from being a program-specific web site for kids to an effort that is national in scope, encompasses several different media and caters to interested adults as well.

Since New Millennium missions fall into both NASA's space science and Earth science categories, the outreach effort has taken its cues from the enterprises' outreach guidelines, attempting to create a thematic, interdisciplinary approach in its messages to the public about the space agency's mission.

New Millennium's outreach team has also observed another important criterion. "Dr. Fuk Li, manager of the New Millennium Program, asked us to emphasize advanced technology in our efforts and its benefit to future science missions," said Nancy Leon, outreach manager. "Our challenge was to get audiences excited about technology while tying it back to science."



using other media. It supplies the International Technology Education Association with technology-focused curriculum supplements that are published in the organization's Technology Teacher magazine, which currently goes out to 8,000 technology teachers nationwide.

The Weekly Reader's fourth-grade edition, which reach 600,000 kids, also runs articles contributed by Space Place. Project team members write a monthly column for the children's pages of such leading regional newspapers as the Los Angeles Times, Denver Post, Columbus Dispatch, and the St. Louis Post-Dispatch.

One critical offshoot of the Space Place web site has been Club Space Place, a program that specifically targets girls, and inner city and rural communities. Four times a year, the club provides its 106 museums and library partners across the country with mission brochures, factsheets, posters, lithographs, and slide sets for display and use in their local communities. In addition, every three months, Club Space Place also sends its museum, library, and youth organizations partners an activity to partake in, such as the recent art competition that was organized for New Millennium's Earth Observing 1 mission, along with a newsletter.

Photo courtesy of Rochester Art Center

# WEB SITE REACHES OUT TO ALL AGES

By Suzanne D'Mello

<http://spaceplace.jpl.nasa.gov>

A direct connection with its partners is a distinguishing feature of New Millennium's Space Place outreach effort. The outreach team tries to maintain a personal relationship with its partners, allowing them to have a direct say in the outreach products or activities being developed.

"Space Place has helped me tremendously in improving my displays for the public," said Don Partain, director of the Golden Pond Planetarium in Golden Pond, Ky. "I'm very happy with the program," Partain, an astronomer, recently gave a "star show" on a river barge in New Orleans where he handed the adults on board a card game

The Space Place web site was developed in response to Li's request. Originally aimed at very young children who are not traditional outreach targets, it entertains and teaches all segments of the lay public, especially those adults who may have little knowledge about the basic principles behind the technology and science of space exploration and Earth observation.

While Space Place activities have been created as part of New Millennium's outreach goals, other NASA projects have been invited to participate as well. With 19 JPL and Goddard Space Flight Center technology and science projects participating in the Space Place web site, audiences can learn everything from how mild a force Deep Space 1's ion engine exerts in space, to why TOPEX/Poseidon images shifting bodies of warm and cold water in the oceans, to assembling board games that allow them to explore and understand black holes.

They can read the numerous fun facts about space provided by Dr. Marc Rayman, Deep Space 1's project manager, who, despite a busy schedule, has been an integral part of the Space Place web site. "Space is a topic rich in extraordinary facts, truly inspiring of awe," Rayman said. "I believe it's important to share the excitement of our work with the public."

Using the dynamic site as a springboard, New Millennium outreach has also developed partnerships with organizations around the nation



Photo courtesy of Daniel Boone Regional Library

developed by Space Place for New Millennium missions. "They were tickled to death playing it," he chuckles. The game, devised to be played by adults and older children using real strategy showcases facts and images of New Millennium missions.

Though the Space Place project continues to place a heavy emphasis on the technology of space exploration, it also shows the crucial role that technology plays in science missions of all of NASA's individual space and Earth science research themes.

Since New Millennium's technology-testing flights will benefit future missions in all of JPL's outreach thematic areas (solar system, universe, Earth, technology and Mars), the Space Place attempts to create a big picture of space exploration for the public, uniting all these themes.

"Every science mission is comprised of technology and instruments, and has individual stories to tell that can be done through Space Place," said Alice Wessen, technology outreach specialist who commissioned a Space Place activity on the Urbie robot. "It's a great way to engage people, and Space Place is so well leveraged, I can get first class outreach on a minuscule budget."

"Even research proposals for individual instruments can make use of Space Place mechanisms," Wessen added.

This sentiment is echoed by many of the NASA projects participating in the Space Place. They have found the benefit of the outreach effort's existing infrastructure, partnerships and reach to be of great value. "When you talk about bang for the buck, you can't beat it," said Annie Richardson, outreach specialist for the Shuttle Radar Topography Mission. "We have gotten a lot of recognition in a lot of different venues in return for our investment."

Top: A painting of Earth submitted by the Rochester Art Center in New York for a Space Place art contest. Above: Children at the Daniel Boone Regional Library in Columbia, Miss., hold up spacecraft they built from recycled materials, as part of the library's "NASA Space Place Day." Left: Visitors at Estrella-Warbird Museum in Paso Robles, Calif., learn about NASA's missions from a Space Place bulletin board.



Photo courtesy of Estrella-Warbird Museum

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#### Notice to Advertisers

Advertising is available for JPL and Caltech employees, contractors and retirees and their families. No more than two ads of up to 60 words each will be published for each advertiser. Items may be combined within one submission.

Ads must be submitted on ad cards, available at the ERC and the Universe office, Bldg. 186-118, or via e-mail to [universe@jpl.nasa.gov](mailto:universe@jpl.nasa.gov).

Ads are due at 2 p.m. on the Monday after publication for the following issue.

All housing and vehicle advertisements require that the qualifying person(s) placing the ad be listed as an owner on the ownership documents.

Awards continued from Page 2

## NOVA awards

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

**Section 233:** Danelle Uyeda.  
Section 236: Katrina H. Christian.  
Section 300: Martha H. Fredholm, Sheryl L. Rinker, Melville N. Roberts. Section 310: Katrina M. Melendez. Section 312: Paul Chodas, Alan Chamberlin, Kenneth Williams, Becky Thompson, Ron Baalke, Steve Schlaifer, Jon Giorgini, Rodica Ionasescu, James Frautnick, David L. Skinner. Section 314: Duane L. Bindschadler, James S. Carter, Sherwin S. Goo, William Krueger, Kevin R. Grazier, Stuart K. Stephens, Susan Belderian, Bridget Landry.  
**Section 335:** David H. Rogstad, Richard S. Gross, Robert L. Tjoelker, Charles E. Goodhart, Sara Katrdzhyan, Robert Hamell, James G. Williams. Section 336: James P. Lux, Gary W. Glass, Sonja D. Khatri, Hamilton D. Hill.  
**Section 344:** R. Lloyd Keith. Sec-

tion 345: Martin Gilbert, Danny Lam, Scott Peer, Scott R. Ploen, Edward Mettler, Greg Levanas, William Breckenridge, Steven C. Mikes, Dave Bayard, Abdullah Aljabri, Boris Lurie, Diana Burrows, Edward Wong, Fred Y. Hadaegh, Harry Balian, Hrand Aghazarian, Issa A. Nesnas, Marco Quadrelli, Mark Milman, Ronald Morillo, Sam Sirlin, Susan Crowe, Wafa S. Aldiwan. Section 346: Judith Podosek. Section 349: Glenn Anderson, Teresa Alonso, Paul Baca, Clemente Gutierrez, Charles Kaczinski, John Myers, Juana Reyes, Patricia Rodriguez, Patricia Westerlund, Charles J. Bodie.

**Section 350:** Patricia Detweiler. Section 351: Marc Broom, Pattie Broom, Jennifer Lafkas, Tracey Swope, Elsa Waters, Timothy J. Werner, Richard C. Musgrove, Michael G. Frantz, Michael G. Sachse, Edmund C. Baroth, Seth L. Chazanoff, J. A. Zavala, Jay E. Bondi, Kenneth R. Johnson, Frank T. Hartley, Lee H. Albers, Francisco A. Razo, Steve M. Bednarczyk. Section 357: Timothy J. Connors, Robert Scott Leland, Scott M. Premo, Jerry J. Gutierrez, Paul R. Pangburn, Kent R. Wayner, Larry F. Broms, John P.

Campanella, Robert G. Moncada, Larry D. McCain, Christopher A. O'Connor, Gary D. Keel, Patrick Olagues, Jerry Weisbaum, Nelson E. Leiva, Veronica L. Campos, Susan Ung, Charles E. Brooks, Dana D. Hawthorne, James T. Diener, Ben G. Chidester.

**Section 366:** Glenn S. Johnson, Michael W. Warner II, DJ Byrne, Carol A. Oken, Jeffrey S. Norris, Steven J. Wells, Behshad Sedighi, Bryan D. Johnson. Section 367: Vladimir Gluzman, Craig Miller, Michail Zak, Stephanie Chong, Sherri Eastman. Section 368: Liliana Novati.

Section 389: Barry Weiss, Akos J. Czikmantory, Martha Mancilla, Chris Hawley, Cindi Hall-Atkinson, Ann Bernath, Joel Wilf, Karen Kokonyan, Nasrin Hashemi.

**Section 640:** Steve Benskin, Scott Bowden, Paulette Cali-Kaviani, Robert Chandler, David Deats, Diana Meyers, Sunjay Moorthy, Sue Pateracki, Maxine Riffel, Michael Wright, Dave Fulton, Kathy Lynn, Elizabeth Tremain, Janie Schwab, Julie A. Cooper.

**Section 660:** Willy Korver, Luba Berman, Charlene Wolf, Patricia J. Reed, Michael Scott, Bernard

Bakken.

**Element 2120:** Diane Newmark.  
**Element 2121:** Colleen Miyahara.  
**Element 2500:** Carolyn Stevens.  
**Element 2510:** David Gardner, Melinda van der Geugten. **Element 2520:** Wayne M. Nishioka, Lauri Sager-Devirian, Gary Ho, Patricia A. Thiessen, Melinda Wood, Debbie Na-gaoka. **Section 2530:** Suzanne M. Oyama.  
**Element 2612:** Alice G. Tangney.  
**Element 2614:** Della Borlund.

The following contractors were also awarded NOVAs as part of JPL teams:

Thomas M. Berry, Daniel Brockman, Richard L. Dees, Virinder S. Dhillon, Frank Downes, Rigoberto Falcon, Brad Figueroa, Kirk Fowler, Robert Gallego, David Goforth, LaVerne Guzman, Abdo I. Hanna, Fernando Hernandez, Michael Hines, Kent Mardis, Rebecca C. Martinez-Rocha, Richard Means, Diane Melin, Alberto Mercado, James C. Miles, Mark A. Nastro, Thomas M. Nichols, Jorge Pena, John J. Russo, Jeff Sachs, Jim Storms, William G. Vlahos, George Q. Wang.

## Letters

My family and I express our thanks to all in Section 368, the Cassini Groups and to ERC for their thoughts and kindness over my mother's passing. I would also like to thank Greg Chin, Dave Doody and the Cassini Mission Controllers for their help and shift-scheduling efforts during her year-long illness.

John Tullius

## Retirees

The following employees retired in August:  
Arthur Bouck, 44 years, Section 368;  
Eric Suggs Jr., 40 years, Section 410;  
Gary Parker, 38 years, Section 400;  
Philip Barnett, 34 years, Section 750;  
Roger Bourke, 34 years, Section 150;  
James McClure, 26 years, Section 368;  
Shyh Wang, 21 years, Section 345;  
Priscilla Torres, 20 years, Section 212;  
Michael Tyler, 12 years, Section 665;  
Freddie Gooden, 11 years, Section 665.

## Classifieds

#### For Sale

AIR CONDITIONER, GE, 13,000 BTU, win., energy saver, largest unit, 115V, hardly used, like new, cools 1,000 sq. ft., \$400. 626/289-4792.  
AMPLIFIER for guitar, Roland AC-100 acoustic, 100W, 2 ch., feedback ctrl, chorus, reverb, effects loop, \$400. 626/432-1990.  
BEANIE BABIES, lots retired, Pokemon cards. 661/251-7738 after 5:30 p.m. weekdays.  
BED, hospital, elec., w/matt., gd. cond., \$275/obo. 562/696-0837.  
BED, queen, dresser & night stands, exc. cond., \$220/obo; REFRIGERATOR, VG cond., \$195/obo., leaving country, avail. Aug. 15. 661/799-3837.  
BEDROOM SET, 1950's Danish modern, full sz., 2 dressers, 2 nt. stands, \$500/obo. 768-4436, after 6:00 p.m.  
BEDROOM SUITE: 5-piece matching, honey maple, queen/full headboard, blended shades of wood; footboard and bed rails; 2 end tables w/drawers; vanity w/glass top appointment, adjustable full-length mirror, exc. cond., all 5 pieces \$595. 368-9520.  
BIKE, Bianchi, touring, gd. cond., \$100. 626/359-7608.  
CD PLAYER, Sony C8ES, top of line, 5 disc capacity, play 1 exchange 4, 6 play & 6 repeat modes, pgm. edit, 3-mode music scan, wireless remote/programming, many more features, purchased 12/96, used about 5 times, orig. \$543, \$275/obo. 790-1410.  
CD CHANGER, JVC XL-MC334, 200 disc, works great, 1 yr. old, CD text & auto disc search, remote, pd. \$250 new, must sacrifice \$90. 661/297-0219.  
COMPUTER, 586 IBM compatible, 100 Mh, Win. 98, Ofc 97, Imeg video, 56K modem, quad CD rom, keyboard, Mag VGA color mon., full tower, \$350. 957-4770.

COMPUTER, Palm Pilot VII, never used, \$350/obo. 341-6240, Ben.  
ESTATE SALE, moving, must sell: furniture, appliances, dishware, tools, Kenmore 15.6 cu. ft., upright freezer, Aug. 19, 8 a.m.-2 p.m., Studio City. 766-5354.  
FURNITURE, Oak: computer DESK, 2-pc. L-shape w/butcher block top, keyboard drawer, 5 drawers (2 for files, 1 w/lock); CABINET file, vertical, 4 drawers (1 w/lock); SHELF UNIT w/8 shelves, 50Wx60Hx12D, all in VG cond., \$500/obo. 626/791-6101.  
FUTON, plain, unfinished wood frame, no arms, thick matt., pale SW design on one side (colors: sand/sage/off white), covers to full sz. bed, \$50. 626/836-4960.  
GO KART, 5 HP Honda motor, padded roll bar, single adjustable seat, plenty of leg room, runs great, exc. cond., like new, fun for adults & kids, pd. \$1,098, sell \$950/obo. 661/251-7738, after 5:30 p.m. weekdays.  
HONEY, fresh, home grown, pure comb, chunk or liquid gold in honey bear bottles, jars. 626/584-9632.  
LABEL MAKER, Brother, model PT-530, 3/8 to 1-1/2" tape, tons of features, see at <http://www.brother.com/us-label/lineup-us/pt-530.html>, new cond., \$85 (\$200 1 yr. ago). 352-0075.  
MATTRESS, Sealy, queen sz., exc. cond., \$190; FOOD PROCESSOR, QuisineArt food processor, gd. cond., w/blades, \$75. 626/798-8071.  
MONITOR, Sony Triniton, 15", color, computer, \$129; BATTERY, for Nokia cell 5100/6100 series, pd. \$60, sell \$20; BATTERY, new, Nokia, vibrating, paid \$94, sell \$59; BATTERY, Sony, camcorder, \$10; BATTERY, new, Sony Mavica, paid \$65, sell \$25; COVER PLATE, Disney Goofy, for Nokia 5100 series, \$15; AUTO SWITCH, new, 4:1, Belkin, paid \$100, sell \$35, 366-6134.  
ORGAN, Yamaha 415 elect. console, 13 pedals, 3 keyboards, 144 rhythm patterns, pd. \$7,500, sacrifice \$3,000. 790-3899.  
PLANTS, huge moving sale, over 100 roses (some AARS winners), irises, some dahlias, etc., all in pots, good prices, Sat. 8/19, 8:00 a.m.-5:00 p.m., 328 N. Encinitas Ave., Monrovia, call Jan before Sat. a.m. 626/359-3561.  
PRINTER, Canon BJC 5000, color, still in the box, \$100. 957-8614, Mina or Greg.  
PRINTER, Cannon 5500, color, fax/scan/copy, exc. cond., in box w/manuals, \$200; SOFA/sleeper, beige/Santa Fe style, gd. cond., \$100. 626/359-7608.  
PRINTER, Epson 740, color, brand new, in the box, \$75; DIET TAPES, Jenny Craig, set of 14, \$50; POWER CONTROL CTR, computer, 5 pwr. + 1 master switch, 5 surge-protected outlets + 2 modem/fax/phone jacks, new, \$20; ADAPTERS, Lawn Genie sprinkler valve, model 756LG 3/4, new, \$10 ea.; CD CASES, 50, Jewel, \$10. 790-3899.  
TABLE dinette, square, glass top, 5'x5', metal feet, 4 matching chairs, \$800/obo.  
BARSTOOLS, 4, matching, metal frame, \$400/obo, all exc. cond. 626/398-3480.  
TOOL BOX, Jenson, like new, \$250/obo; PRINTER, HP, color, \$75; BIKES, 2-Free Sprit, men's, like new, \$75 ea.; LAMP, lg. 3-way, pd., \$700, sell \$300; DESK, sm., solid teak, \$450; POTS, hanging, 2-white, \$4.50 ea.; TOOLS, dog grooming misc., \$75/obo. (626) 355-1109, Ottenfelds.  
WARDROBE, antique English-designed, 2-dr., solid wood, orig. shelving/lining/hardware, key, exc. cond., potentially 20-30's, \$225. 368-9520.  
WEIGHT SET, BodySmith, bench press, adjusts to flat, incline & military, separate dip station, 8' olympic bar & curl bar, olympic plates: 2x45, 2x35, 2x25, 2x10, 2x5, extras: high density rubber mat, 2x spring collars, \$300/obo. 626/356-0834, Mike.

#### Vehicles / Accessories

'95 ACURA Legend LS coupe, black, auto, 106K mi. mostly fwy., mint cond., black leather, s/r, heated seats, alloy whls., CD

changer, remote keyless entry, \$16,000/obo. 626/584-3204 days, 909/592-0780 eves/wk-ends.  
'91 CHEVY S10 pick-up truck, gd. cond, short bed, manual trans., V6, 2wd, CD changer, custom rims, 150K \$2,500, 323/259-8604, Traci or Howard.  
'93 FORD F150 XL pickup truck, exc. cond., 36K mi., red, stick shift, a/c, am/fm, bedliner, etc., Blue Book \$9,800 retail, sell \$8,700. 248-1909.  
'85 OLDSMOBILE Cutlass supreme, white ext./blue int., V6, air, am/fm/cass., 87K mi., new tires, \$2,500/obo. 661/297-8108.  
'92 PONTIAC Trans Am, convertible, dark green, tan leather int., 78K mi., V8, auto, mag whls., CD, air, pwr./w/d, \$9,000/obo. 626/794-9153 eves.  
'97 VOLKSWAGEN Jetta GT sedan, red, exc. cond., auto, 42K mi., tinted wins., am/fm/stereo/cass., alloy wheels, rear spoiler, dual airbags, pwr. steer., new tires, \$14,000/obo. 626/359-5200.

#### Wanted

BUNGALOW or small guest house, by single male & 2 indoor cats, location not important, private & quiet. 626/397-7224, Charlie.  
ACCOMMODATIONS, overnight 2-4 nts/wk., JPL retiree living out of area and teaching afternoons & eves. at GCC seeks quiet, comfortable & reasonable local lodgings, kitch. privileges desirable but not essential. 261-6096, Joan, after 3:00 p.m.  
SPACE INFORMATION/memorabilia from U.S. & other countries, past & present. 790-8523, Marc Rayman.  
VOLLEYBALL PLAYERS, coed, all levels of play, Tues. nights, 8-10, Eagle Rock H.S., \$3/nt. 956-1744, Barbara.

#### Free

DOG, Irish Setter X, neutered male, approx. 1 yr. old, rescued from near JPL in Angeles Forest, calm and gentle. 626/798-3235.  
DOG named "cera", free to good home, lab/cocker spaniel, black, spayed, all shots, in good health, very friendly, owner moving. 952-0047.  
FIREWOOD, woodpile that includes some large logs. 626/398-3649.

#### For Rent

ALTADENA, lg. furn. rm., cable, also share 3 bd., 3 ba. quiet hilltop house, pool, patios, view (incl. JPL), c/a/h., all amen., kitch., d/w, laundry, priv. off-st. pkg. spot, 11 min./JPL, smoking OK (owner smokes), \$500, incl. all util. + dep. 626/795-1050, Harry, after 7 p.m.  
BURBANK, detached guest house, private, f/p, a/c, kitchen, bath, indoor gar., quiet, by Castaway restaurant & golf courses, good for students, \$600, util. inc. 845-4064 or tnloufar@hotmail.com.  
LA CANADA, walk to JPL, 3 bd., 2 ba. home w/pool, LC schools, built in stove, mcrwv., trash compactor, gardener, pool serv. pd., avail. 9/01, 2,200. 952-1538.  
LA CRESCENTIA, 3 bd., 1 ba. house on private cul de sac, central a/c, 2 car gar., \$1,850, incl. water/gardener/trash. 248-3546.  
MT. WASHINGTON house/rooms, lg. custom 3 bd., 2 1/2 ba., 2 car gar., exc. elem. schools, 12 min./JPL, view, quiet neighborhood, avail. end of Sept. 323/255-1474.  
SOUTH PASADENA house, spacious 4 bd., 2 1/2 ba., 2 car gar. exc. schools, 8 min./JPL, avail. end of Sept. 323/255-1474.  
SOUTH PASADENA, fully furn., 1 ba. apt., nice area at 1718 Huntington Dr., btwn. Marengo & Milan Sts, garage, laundry facility on premises, util. pd. except elec., no smoke/pets, \$1,000 + \$1,000 sec. dep. 626/792-9053, Marilyn.

#### Real Estate

ALTADENA, 2 bd., 1.75 ba., deck, 2 car gar., 3 mi./JPL, \$215,000. 310/390-1807, David.  
SHADOW HILLS horse property w/hillside pasture, over 1 acre, 14 mi.- JPL, 1,100 sq. ft., c/a, 3 bd., 1 ba., recent roof, modern kitch., master bath remodel, wiring upgrades, new carpet, \$267,500. 353-1851.  
LA CANADA, 4 bd., 3 full ba., 1 study, family room, living room with sky lights, big front yard, 2 car garage, equipped w/ satellite and Brinks security. Remodeled and expanded in 1992. 5 min. from JPL. Reduced to \$450,000. 626/744-3243.

#### Vacation Rentals

BIG BEAR cabin, quiet area near village, 2 bd., slps. 8, compl. furn., f/p, TV/VCR, \$75/nt 249-8515.  
BIG BEAR LAKE cabin, near lake, shops, village, forest trails; 2 bd., sleeps up to 6, f/p, TV, VCR, phone, mcrwv., BBQ & more, JPL disc. from \$65/nt. 909/210-9182.  
BIG BEAR LAKEFRONT, lux. townhome, 2 decks, tennis, pool/spa, beaut. master bd., suite, sleeps 6. 949/786-6548.  
HAWAII, Kona, on 166 ft. ocean front on Keauhou Bay, priv. house & guest house comfortably sleeps 6; 3 bd., 2 ba., rustic, relaxing & beautiful, swim/snorkel/fish, spectacular views, near restaurants/golf/other attractions. 626/584-9632.  
HAWAII, Maui condo, NW coast, on beach w/ocean view, 25 ft. fr. surf, 1 bd. w/loft, compl. furn., phone, color TV, VCR, mcrwv., d/w, pool, priv. lanai, slps. 4, 4/15-12/14, \$100/nt./2, 12/15-4/14, \$115/nt./2, \$10/nt. add'l. person. 949/348-8047.

LAKE TAHOE, north shore, 2 bd., 2-1/2 ba. condo, slps. 6-7, private sandy beach, pool, great loc., all amens., hike/golf/fish, 2 mi. to casinos, special JPL disc. rates after Labor Day. 626-355-3886, Rosemary or Ed.  
LAKE TAHOE, west shore @ Homewood in Chamberlands, full amen., assoc pool, tennis, private beach club, 3 bd. + loft, 2 ba., slps. 8, linens provided, full kitch. & laundry, TV/VCR, wood stove, 2-day min., \$700/wk., \$75 cleaning fee. 626/585-0321, Bob or Nicole.  
MAMMOTH, Chamonix condo, 2 bd., 2 full ba., slps. 6, fully equip. elec. kitch. w/mcrrwv. & extras, f/p & wood, color TV, VCR, cable, FM stereo, pool & sun area, d/d Jacuzzi, sauna, game, rec. & laundry rms., play & BBQ areas, convenient to hiking, shops, summer events, daily/weekly rates, summer rates thru Oct. 249-8524.  
MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, sleeps 6-8, fully equip. kitch. incl. mcrwv., d/w, cable TV, VCR, phone, balcony w/view to mtns., Jacuzzi, sauna, streams, fishponds, close to Mammoth Creek, JPL disc. 626/798-9222 or 626/794-0455.

OCEANSIDE, on the sand, charming 1-bd. condo, panoramic view, walk to pier & harbor, pool/spa, game rm., slps. 4. 949/786-6548.  
PACIFIC GROVE house, 3 bd., 2 ba., f/p, cable TV/VCR, stereo/CD, well-eqpd. kitch. w/microw, beaut. furn. close to golf, beaches, 17 Mile Dr., Aquarium, Cannery Row, JPL disc. 626/441-3265.  
ROSARITO BEACH condo, 2 bd., 2 ba., ocean view, pool, tennis, short walk to beach on private rd., 18-hole golf course 6 mi. away, private secure pkg. 626/794-3906.  
SAN FRANCISCO, Nob Hill honeymoon suite (sleeps 2 max), full kitch., maid service, concierge, \$125/nite; \$750/wk., reserve early. 626/254-1550.  
SOUTH LAKE TAHOE KEYS waterfront, 4 bd., 3 ba., 1 bd. & liv. rm. upstairs, hcp. access fair, slps. 12+, f/p's, decks, gourmet kitch., boats, TV's, VCR, stereo, assn. in & o/d pools, bch., tennis/ski/casinos/golf, 3-day min., \$1,195/wk. [1 June-15 Sept. 22 Nov-1 April], \$595/wk. low seas., + \$90 clean fee. 949/515-5812.