

## Microwave probe gears up for asteroid encounter

By Catherine Sum

**JPL team supporting science, software for MIRO instrument on Rosetta, on its way to July 10 flyby**

An upcoming asteroid encounter on July 10 has JPLers on the Lab-designed and -built Microwave Instrument for the Rosetta Orbiter (MIRO) team gearing up for a final pre-mission exercise before a three-year hibernation in deep space.

MIRO is one of 12 instruments onboard the European Space Agency's Rosetta spacecraft, launched on March 2, 2004. Rosetta is a mission to a comet with two close flybys of asteroids before reaching its destination.

Lutetia is the second of two asteroids Rosetta will fly by before entering comet Churyumov-Gerasimenko's orbit sometime in 2014, and will continue to orbit as the comet approaches the sun; the first was Steins in 2008. Rosetta has already completed one flyby of Mars and three flybys of Earth and its moon.

The importance of this second asteroid encounter deals with the fact that not much is known about these bodies, principal investigator Samuel Gulkis said.

As the spacecraft passes by, it will view the asteroid from many different perspectives, moving from the light to dark side, and thermal imaging will create a more defined idea of Lutetia's actual shape.

"MIRO will measure temperature distribution near the surface," Gulkis said. "And from temperature measurements we can learn about regolith (surface) properties."

The MIRO team hopes to discover if Lutetia's surface is "fluffy"; that is, if the asteroid's surface is covered with

dust that may have been kicked up by micro-asteroids hitting its surface and settled, much like the regolith on the upper few centimeters of the moon's surface. No dust was detected on Steins.

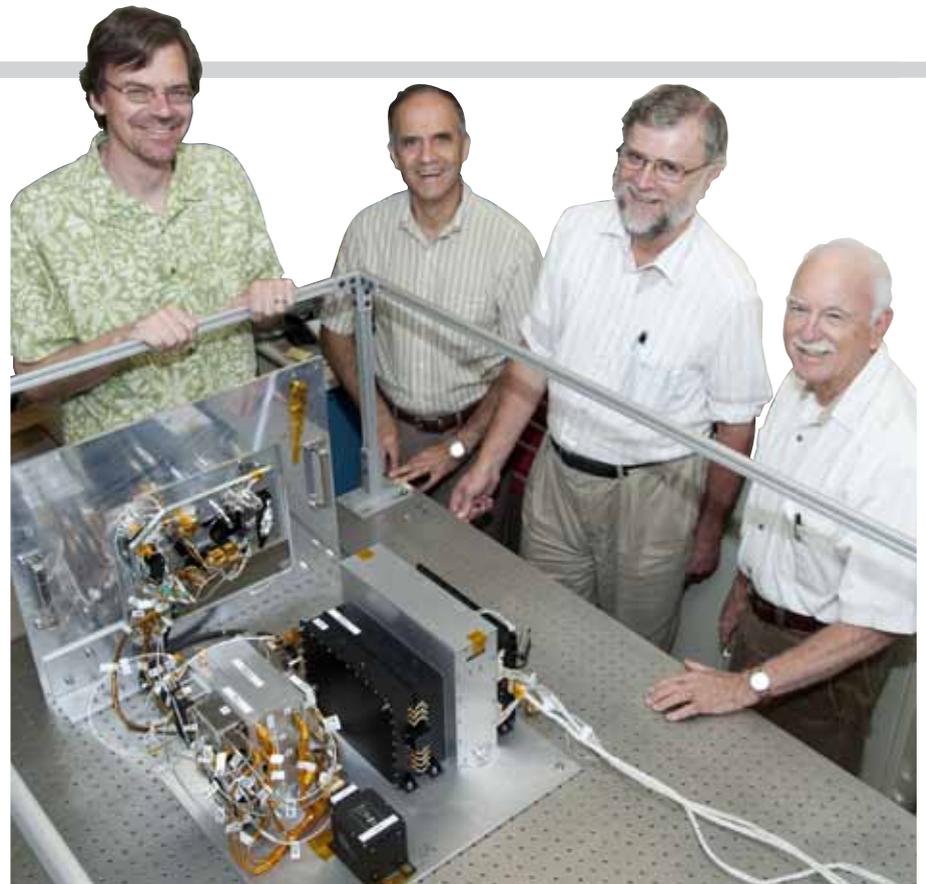
Following the encounter with Lutetia, the Rosetta spacecraft and all onboard instruments will go into a hibernation mode for three years as the solar-powered spacecraft moves away from the sun on its journey to the target comet.

And while the science driving this mission—to study a comet's transformation from an inactive to active state, as well as explore the makeup of its nucleus, among other primary objectives—receives the bulk of the attention directed at MIRO, there are members on the team who aren't strictly involved with the research components, yet still play a large role in maintaining the instrument.

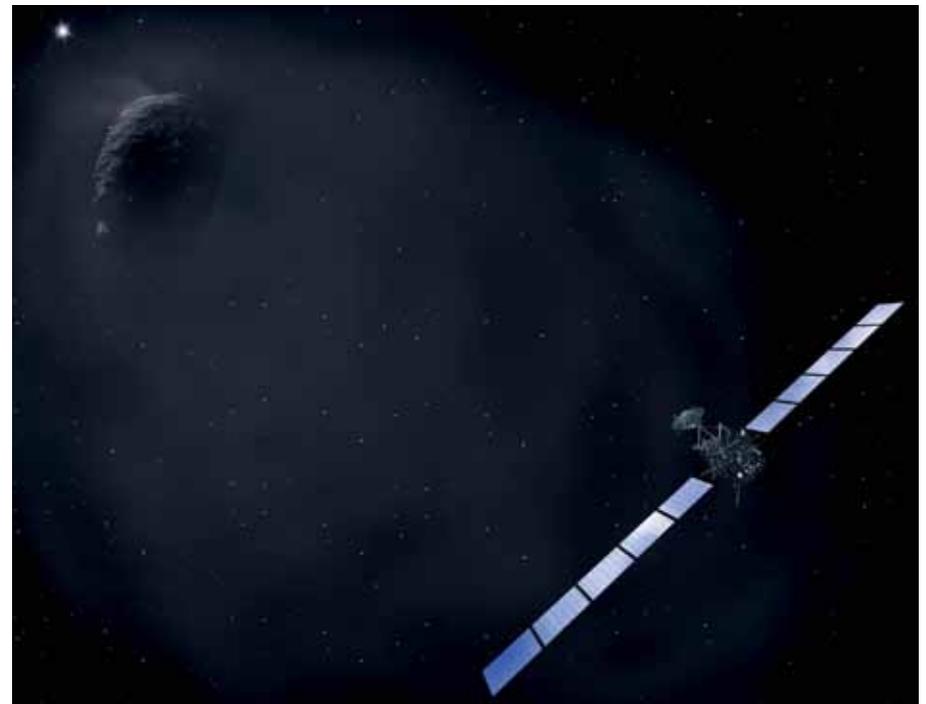
Robert Nowicki of the Instrument Flight Software and Ground Support Equipment Group wrote MIRO's software, and has been on the mission since 1997; Lucas Kamp of the Process Algorithms and Calibration Engineering Group, who joined the team after MIRO's completion, said he spends 80 percent of his time on this mission.

Their work lends to the health of MIRO in that both ensure the instrument is running smoothly.

Of the 11 members on the MIRO team at JPL, seven are primarily scientists. Nowicki handles the software associated with the flight instrument, while Kamp and Seungwon Lee (of the High Capability Computing and Model-



From left: programmer Robert Nowicki, engineer Hamid Javadi, programmer/scientist Lucas Kamp and principal investigator Sam Gulkis check out a model of the MIRO instrument.



An artist's impression of Rosetta waking from deep-space hibernation to rendezvous with Comet 67P/Churyumov-Gerasimenko in 2014. The spacecraft will first fly by asteroid Lutetia in July.

ing Group) work on telemetry, analysis software and data processing, as well as the science.

Because of the infrequent intervals at which the instrument is activated, and the short periods during which it operates, Nowicki said his job began as something of an on-call position.

"I'm kind of like the Maytag repairman," he said.

Which is not to say that his role in the upkeep of MIRO as it approaches Lutetia (and ultimately, Churyumov-Gerasimenko) is minimal. One recent day on Lab, Nowicki sits in Building 233, watching as diagnostic data—gen-

Continued on page 2

Dutch Slagter / JPL Photo Lab

European Space Agency photo

## 2 Collaboration room helps make the most of new technologies



Designs conceived by Dan Goods adorn the room.



The Information Technology Directorate (also known as the Office of the CIO) recently unveiled its new IT Projects Collaboration Room in Building 600 at the Woodbury complex, a facility that will help JPLers make the most of new and emerging technologies.

Modeled after similar innovation centers at Google and at JPL, the “IT Lab” serves as a multi-purpose facility, noted Melissa English, manager of the Application Development & Flight Project Support Division (172). “It will function as a collaboration area, break room, IT library and IT ‘petting zoo’ for our new technologies,” she said.

The emphasis on creativity and innovation abounds throughout the design and furnishings of the room, which features brightly colored walls and furniture in order to stimulate creativity and innovation. Designs were conceived by Dan Goods of the Mission Systems Concepts Section (312), who has created a number of other works around the Lab. For this room, he has created a set of murals that contain various code snippets and examples of the work performed by IT employees. The room even possesses a stimulating puzzle on an entire wall that requires thoughtful analysis to solve.

The IT Directorate also displays new and emerging hardware in the room. The IT petting zoo of consumer electronics allows employees to evaluate the potential usefulness of items before they are offered to the JPL catalog.

Division 172 is responsible for evaluating and developing IT solutions that help the Laboratory become more effective at meeting its mission, English noted. “These solutions must be innovative, implemented quickly, and at low cost,” she said. In addition to offering ongoing mobile applications for the iPhone and BlackBerry, examples of recent IT solutions include:

- JPL Tube, the Lab’s own version of YouTube, offering high-definition and iPhone-enabled video content (<https://jpltube.jpl.nasa.gov>);
- Green IT Dashboard, which will enable energy-usage monitoring, allow comparisons with the outside temperature and readings from the previous year, and can also check the power usage for individual buildings;
- Life Size, big-screen, high-definition video conferencing available across the Lab, which is being used to communicate with other NASA centers as well as partners.

“To compete successfully in the global economy, organizations need flexible ways to team up, interact and exchange information with other employees, and are searching for ways to manage information overload and deal with the challenges of information distribution,” noted Information Technology Director Jim Rinaldi. “The collaboration capabilities of this room enable employees to effectively connect to the right people with the right information.” ■

### MIRO *Continued from page 1*

erated from software that he created more than a decade ago—scrolls by on a computer screen.

“If there’s a problem [with the software] we write up a report, and figure out what it is using the testbed [replica] model,” said Nowicki. He writes patches of new code that are later added to the instrument’s software.

“When everything is going well, no one calls,” Nowicki added. “And so when I’m away and get the call, the first feeling I get is dread—it means there’s a new emergency.”

That call more often than not comes from Gulkis after he receives information back from Kamp, who has the unique position of being the first person on the MIRO team to review the downloaded data from the instrument.

“I can tell when something is wrong,

Then I have to break the news, which is the worst part,” said Kamp, who typically reports first to Gulkis. “I’m not always the first one to discover a problem, but since I’m the first one to see the data, I usually am the first to know about it.”

Kamp’s work consists of taking the raw data packets generated by MIRO and converting them into time-sequenced science and engineering telemetry, in files with a standard format. Lee then reads these files, further processes the data, and stores the results into a local JPL database. She also calibrates the data, which turns it into temperatures.

Another task that Kamp performs is to archive the most valuable MIRO data in a standard format with full documentation, which will be delivered to the European Space Agency’s permanent archive for anyone to access. ■

## NASA Honor Awards bestowed



Bobbie Fishman of the Personnel Security Group accepts the Exceptional Administrative Achievement Medal from JPL Director Charles Elachi, left, and NASA science chief Ed Weiler at the NASA Honor Awards ceremony June 15.

In recognition of outstanding achievements and contributions by JPL employees, contractors and partners in 2009, NASA presented its annual Honor Awards ceremony on Lab June 15.

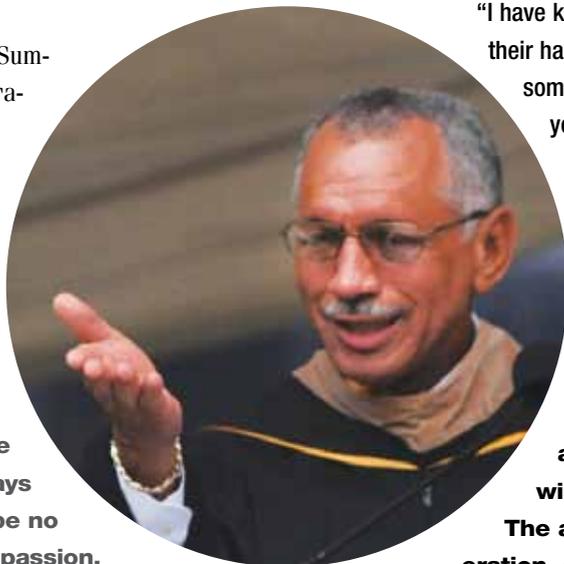
Thirteen categories of awards honored notable individual and group achievements in public service, leadership, technology, science, administration and equal opportunity.

For a complete list of honorees and more information about the awards, visit <http://hr/compensation/reward/nasahonor.cfm>. ■

# HAPPY GRADUATION!

The day after his JPL visit to kick off the “Summer of Innovation” program, NASA Administrator Charles Bolden addressed graduates at Caltech’s commencement. Some excerpts:

**“As you ... ponder your place in the future, I suggest you think about the things in which you are passionate, things that excite you from the pit of your stomach. I hope you’ll give some consideration to a period of public service. While the quest for titles and great wealth are always noble goals, I have found there to be no more fulfilling achievement than to follow a passion. And in doing so, make life better for someone else.”**



Caltech photo

**“I have kids and grandkids who I believe, like you, are anxious to take their hard-earned educations and use them to do something great, something extraordinary. Your parents and I have faith in you, but you must have faith in yourselves. ... But your education must not end when you leave here today. Accept the challenge and responsibility of leadership in whatever you choose as your profession.”**

**“Was that historic Apollo 11 mission the end of something, or the beginning? Are we the heirs of Neil (Armstrong) and Buzz (Aldrin) and inheritors of their spirit of exploration, innovation and risk-taking? Or do we lack the courage, the wisdom and the vision to continue their journey? The answers to these questions lie not with my generation, or anyone here on the stage. The answers are for you, and your generation, to take.”**

Bolden’s address is available online at <http://pr.caltech.edu/commencement>.

## JPL kicks off NASA’s ‘Summer of Innovation’ to a rousing start



Dutch Slager / JPL Photo Lab

Former JPL engineer Stephanie Wilson, who flew in her third mission aboard the space shuttle in April, presents a commemorative plaque to JPL Director Charles Elachi at the Summer of Innovation event.

NASA’s efforts to inspire kids got off to a raucous start June 10 as JPL hosted the national kickoff for the agency’s “Summer of Innovation,” a new effort to engage middle-school students through space exploration.

Welcomed by NASA Administrator Charles Bolden, astronauts and rapper and Nickelodeon star Daniel Curtis Lee, about 250 students and their teachers from local educational venues were on hand for the event, which was overseen by JPL’s Education Office.

Bolden told the visitors about President Obama’s childhood experience of inspiration when seeing Apollo astronauts returning from a mission in his Hawaiian homeland, and noted how important it is to spark that inspiration in youth again today.

“Do things you’re passionate about, not what someone else told you to do,” Bolden urged. “Believe in yourself and work hard. Anything you put your mind to, you can do. If you believe it, you can achieve it.”

JPL engineers, scientists and outreach staff led a series of hands-on activities that included rocketry, gliders, comets, robotics arms and studying maps to look for the safest landing place on the Red Planet.

Representatives from each of the NASA centers were also on hand to assist students and teachers.

“I think the program is great,” said Tony Leavitt, an education specialist at NASA Ames Research Center. “It’s going to expose these kids to a lot of things they’ve never seen in their own lives and in their own schools. You never know when you’re going to light a spark that changes a kid’s life. Something like this could be that influence.”

The NASA-wide pilot program will utilize the summer as a time to build interest and gain knowledge in science and math, and will focus particularly on engaging students who are underrepresented, underserved and underperforming in these subjects. For more information on the program, visit <http://www.nasa.gov/soi>. ■

## Science fair projects launch summer event for local students

JPL buzzed with discussions of electromagnets, rover wheel traction and solar cells, but the presenters were not scientists or engineers. Instead, Los Angeles-area students presented and displayed their science fair projects during JPL’s Student Showcase June 12 the Lab’s local kickoff for the Summer of Innovation.

About 175 students, their parents and mentors were on hand, along with astronaut Leland Melvin and scientists, engineers and educators from other NASA centers. The guests also participated in career panel discussions and toured JPL labs.

Cassini lead propulsion engineer Todd Barber, who volunteered for the event, was more than impressed with the students’ efforts.

“I was blown away by the projects I saw,” he said. “One student had discovered a new species of sea slug, another was measuring gas mileage in a vehicle modified to run on different tree oils and still another was working on biodegradable bandages for serious wounds.

“I was humbled by the expertise and professionalism of their projects,” he said. “They were just as passionate about their work as we at JPL are about space exploration. My only regret was that we only had but two hours to see the projects, so I was unable to see the wonderful work done by every student. I have no doubt, though, that some of these young geniuses caught the space science ‘bug’ and will be joining us one day at the Lab. From what I saw, JPL will be a better place because of it!”

The day also included a talk by David Levy, director of financial aid at Scripps College, which was attended by more than 50 of the adults on hand.

“We had a wonderful day,” noted David Seidel, supervisor of the Elementary and Secondary Education Group in JPL’s Education Office. “I think the students really valued their interactions with JPLers and NASA staff, and all the adults were really impressed by what our kids are capable of. It is reassuring to know that properly mentored students are capable of tremendous creativity and excellent research.” ■



From left: Astronaut Leland Melvin, JPLers Todd Barber and Amalaye Oyake of the Flight Software Applications Group on a career panel.



Students display their project at the science fair.

# News Briefs



William Green

## Book on NASA images goes behind the scenes

Former JPLer William Green, who directed teams that processed images from exploration programs spanning from Mariner 9 through the Spitzer Space Telescope, has authored a book that offers a behind-the-scenes look into some of the most unforgettable and historic images to ever be captured.

"My Life in Space, The Story Behind NASA's Amazing Pictures of the Planets" offers the little-known story of the men, women and organizations responsible for producing iconic images of Mariner 9, Mariner 10, Viking, Voyager, Magellan, Galileo, Mars Pathfinder, Cassini and Spitzer.

Green managed JPL's image processing lab during much of his 20-year JPL career, then transferred to Caltech to manage the Spitzer Science Center and the Infrared Processing and Analysis Center, where he managed development, integration and test of the science operations system used to process infrared astrophysics data returned from Spitzer.

The book will be available at the JPL Store. For more information, visit <http://www.mylifeinspace.com>.

## Mission will screen clouds for Glory

Anthony Davis of JPL's Aerosol and Cloud Group has been named princi-

pal investigator for a proposal funded through the NASA Science Mission Directorate's Research Opportunities in Space and Earth Sciences Program.

The proposal, "Disentangling Aerosols and Clouds within the Aerosol Polarimetry Sensor Footprint," will perform cloud screening using the two high-spatial-resolution cloud cameras on NASA's Glory satellite as well as the simultaneous retrieval of aerosol and cloud component properties within partially cloudy aerosol polarimetry sensor footprints.

The science objectives for Glory, scheduled for launch in November 2010, include the determination of the global distribution, microphysical properties and chemical composition of natural and anthropogenic aerosols and clouds with accuracy and coverage sufficient for a reliable quantification of the aerosol direct and indirect effects on climate; and the continued measurement of the total solar irradiance to determine the sun's direct and indirect effect on Earth's climate.

The Glory mission will respond to the U.S. Climate Change Science Program by continuing and improving upon NASA's research of the forcings influencing climate change in the atmosphere. Measurements produced by this mission and the scientific knowledge such observations will

provide are essential to predicting future climate change, and to making sound, scientifically based economic and policy decisions related to environmental change.

The proposing team has extensive experience in both 3-D radiative transfer modeling and cloud and aerosol satellite remote sensing, which will facilitate the development of the modeling testbed within the limited timeframe and budget of this Glory science team program.

## Library transforms to 'information commons'

The JPL Library is currently undergoing a two-month renovation that will create a Beacon Information Commons aimed at a Labwide audience, with 24/7 open badge access. During construction, all circulation, interlibrary loan and reference services will still be available, as well as the online resources.

The commons will be located in the space formerly occupied by the public service area and reference stacks. In its place will, quite literally, be a little bit of something for everyone—a self-serve coffee station, several HDTV screening booths, vending machines, a consultation booth, current publications rack, reconfigurable sofas and table/chair combinations that may be moved around by occupants as they please.

"The idea is that food will help people think, relax and stay longer; it will also draw them to the library," said Barbara Amago, supervisor of the Library and Archives Group.

The new commons, Amago said, will first and foremost be a collaboration space and meeting point for discussion, informal meetings and small-scale presentations in a more relaxed setting.

In addition to the JPL Stories series (and a shorter, punchier version that will be called "Flash Talks"), the space can be used for programs sponsored by various on-Lab organizations, like those held by Multi-generational Exchange Starts Here (MESH) and other diversity groups. The OCIO, she added, has also expressed interest in using it for demos, such as the IT "petting zoo."

The Team X facility—where teams converge to hammer out mission proposals and work in real time, with the entire group present in the same room—was a model for the Information Commons, Amago said, in that it will be an "inspiring space in that way, but not as formal."

"It's a place for people to exchange information," Chiang added. "People can bump into others they don't usually meet to talk and chat."

For more information on the commons, call Chiang at ext. 4-8260.

## Passings



Fred Felberg

**Fred Felberg**, 89, a retired engineer and former assistant Laboratory director, died June 27.

A Caltech graduate, Felberg taught aerodynamics at the institute's Graduate School of Aeronautics and was chief of wind tunnel operations at the campus before joining JPL in 1960 as deputy chief of the Engineering Mechanics Division.

He later served as assistant Laboratory director for technical divisions, where he was responsible for all technical operations in support of the Lab's flight projects, the Deep Space Network, and supporting research and development. He later served as assistant Laboratory director for plans and programs and as associate director for institutional programs.

Felberg retired from JPL in 1987 and served as a senior advisor until 1995. He served on the board of directors of the Pasadena Foundation, the Pasadena Chamber of Commerce, and the Parsons Corp., and was also active with the Rotary Club of Pasadena, serving as president in 1970. Services were pending.

Retiree **Daniel Kerrisk**, 76, died March 27.

Kerrisk joined JPL in 1961 and retired in 1997. Upon retirement he served as a Peace Corps volunteer, teaching math and English in underdeveloped countries.

He is survived by daughters Sharon and Robyn, granddaughter Alexandra and grandson Ryan. A memorial was held April 10 at Descanso Gardens.

Retiree **Richard Price**, 79, died April 17.

Price worked at the Lab from 1979 to 1993. He is survived by his wife, Ann, and children Peggy, Jan, Richard Jr. (and wife Jennifer), and grandsons Zachery and Nathan.

**Steven B. Patrick**, 59, a former JPL senior design engineer, died April 23.

Patrick joined JPL in 2001 as an affiliate for three years and later as a JPL employee. He left the Lab in 2007.

Patrick worked on sampling systems for Mars Science Laboratory and testing for the Aquarius project. He developed and designed mechanisms, new technology and flight instruments for various projects, and contributed to the Space Technology 7's Disturbance Reduction System to be tested in the upcoming LISA Pathfinder mission, flown by the European Space Agency. Among his honors was JPL's Team Bonus Award from the Solar System Exploration Directorate.

He is survived by his wife, Debbi Swanson Patrick, sons David and Christopher and a previous marriage, mother Haruko Ouellette, sisters Angelique Ilo and Trish Jacobs.

A memorial service is scheduled for Sunday, July 18, noon to 5 p.m., at Farnsworth Park, 568 E. Mt. Curve

Ave., Altadena. Patrick's family requests that donations in his name be considered to <http://www.socalhospicefoundation.com>.

**George Zetlmaier**, 96, a retired shipping and receiving supervisor, died May 7.

Zetlmaier worked at the Lab from 1958 to 1978. He is survived by son Thomas and daughters Mary Fox and Ruth Devine. Services were held in Bainbridge Island, Wash.

Retiree **Jay Garcia**, 78, died May 20.

Garcia joined JPL in 1967 and retired in 1996. He is survived by his wife, Eleanor, and four children. Services were held at Del Angel Mortuary in Pico Rivera.

daughter and son-in-law LaRue and Mark Throckmorton, stepson Tony and stepdaughter Andrene Scott. Services were held May 29 at Kingdom Hall of Jehovah's Witnesses in Altadena.

**Victoria Lairmore**, 91, retired manager of JPL's Office of Legislative and International Affairs, died June 8.

Lairmore joined JPL in 1964 and retired in 1985. A celebration of her life will be held July 23 at St. Bedes, 215 Foothill Blvd., La Cañada. Luncheon will follow the service at Caltech's Athenaeum. For more information, call 818-949-4300.

## Letters

My family and I would like to thank the many JPLers for their thoughts and prayers on the passing of my mother, and to thank the ERC for the beautiful Anthurium, which was one of her favorite plants.

Steve Wall

## Retirees

The following JPL employees retired in June:

**Victor Chen**, 41 years, Section 333E; **Margery Fea**, 39 years, Section 2746; **Chester Sasaki**, 33 years, Section 1600; **Christopher Stevens**, 31 years, Section 4020; **Edward Luers**, 17 years, Section 9021; **Ronald Pogorzelski**, 17 years, Section 337E.



Marthella Greene

**Marthella Greene**, 78, a retired contract management supervisor, died May 24.

Greene worked at the Lab from 1977 to 1997. She also served as a member of the board of directors of the Caltech Employees Federal Credit Union from 1981 to 2004.

She is survived by son Jonathan,



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