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Mars Science Lab

MOVING FORWARD

Development continues apace for JPL's Mars Science Laboratory, the most sophisticated rover ever to be sent away from Earth. The mission is scheduled for launch in September or October 2009.

A key milestone was met in July when the spacecraft's cruise stage was formally accepted into the system integration and test phase. The system was built in the Spacecraft Assembly Facility's high bay, noted Pam Hoffman, the cruise, entry, descent and landing mechanical project element manager. She said the assembly, test and launch operations team is now testing the hardware for components that include transfer harnesses, electric boxes and ground network control structures.

Another key milestone for Mars Science Laboratory was the delivery of the rover chassis from Building 18 to the Spacecraft Assembly Facility in late July, while the descent stage is on track for a late August or early September delivery. Hoffman said this is the most complex propulsion system built at JPL in 25 years and is very similar to the Viking landers' propellant and fuel-control system.

In the fall, the bridle umbilical device (which lowers the rover from the descent stage to the ground) is due in early September, the backshell is due in late September and the non-flight heat shield about a week later.

For spotlights and features on the mission, visit *http://marsprogram.jpl.nasa.gov/msl/spotlight.*

Dutch Stager / JPL Photolab

Above: NASA space science chief Ed Weiler, left, and Caltech President Jean-Lou Chameau, second from left, got a look at the Mars Science Laboratory chassis in Building 18, just before its transfer to the Spacecraft Assembly Facility. Joining them were JPL Director Charles Elachi, second from right, and JPL Associate Director for Flight Projects and Mission Success Tom Gavin.

Family fun time

Family members of Mars Science Laboratory staff view a demonstration of the prototype Scarecrow rover in the Mars Yard during the project's Family Day July 18. More than 300 visitors attended the festivities, which also included videos, stomp rockets and an entry, descent and landing demonstration.

Photo courtesy of Micki Hurtado

Busy Days of Summer

Photos by Brian Frank

De'Andre Cherry (top left), Yuri Carrillo (top right) and Victor Mejia.

By Brian Frank

Students provide valuable help to JPLers while gaining critical job experience

Paulo Younse had a problem. He was running a test on a percussive drill for Mars Science Laboratory's robotic arm. The drill spins and hammers through rock to gather samples, and all that motion will eventually wear down and ruin the internal wiring. Younse, an engineer with the Robotic Hardware Systems Group (3471), was checking to see how many times the wires could twist before breaking, but the counter outside the test chamber had stopped working.

Any number of things could have caused the malfunction and Younse didn't want to waste time, so he asked Yuri Carrillo, still outside the chamber, to check the counter. It wasn't an easy problem to diagnose, because it was intermittent, but Carrillo quickly discovered a loose wire and replaced it on the spot.

Carrillo is not a regular JPL employee. She's barely out of high school, in fact, but she's "the exact right person JPL needs—someone who'll jump in to get things done, and she's good in a team," says Ashley Stroupe, who works in the Advanced Robotic Controls Group (3475) and serves as Carrillo's official mentor.

Carrillo is one of more than 300 students who have swelled the ranks at the Lab this summer (even this reporter is a student). She is also one of more than 60 students who entered through one of the minority initiative programs run by the Education Office (Human Resources also hires students for the summer, adding to the total student population). Many of these "kids" have a lot to offer JPL despite their humble backgrounds.

Another student, well into his second summer at the Lab, is De'Andre Cherry, who works on advanced mirror development with the Structures and Configuration Group (355E). For Cherry, working at JPL is a milestone.

"It's career. It's stability. It's a change of pace for my family—something positive, at least for the males," Cherry says.

He came from a troubled home life, and after his parents divorced when Cherry was only 6, it was the women who held the family together, he says.

But he has since re-established a relationship with his father, who has turned his life around and talks openly about past mistakes. That candor makes him a positive influence, Cherry says, and the two now speak on a daily basis.

Cherry, now 19, will soon return to Atlanta for his junior year at Morehouse College, which counts among its alumni Spike Lee and Martin Luther King Jr.

At JPL, Cherry works primarily with a systems engineer to analyze schematics and crunch numbers for an advanced optics assembly.

Cherry jokes that his job entails the tedious work that engineers don't want to do, but his mentor, Paul MacNeal, disagrees.

Cherry has "a very important job, much more than you'd normally give to a summer student," MacNeal says. "He has the daunting task of bugging 14 cognizant engineers on the project" to retrieve the mass of each component, put it into a spreadsheet and calculate the center of gravity.

Cherry also became the unofficial cognizant engineer for the assembly's wiring, MacNeal says. Normally, each cognizant engineer oversees the development of a particular component, but there was no one for wiring, so Cherry was asked to take on that responsibility.

Very competent, Cherry has proven himself to be a self-starter, MacNeal says.

Barbara McGuffie in the Instrument Software and Science Data Systems Section (3880) is another JPL mentor who values self-reliance in her students. She said she was initially worried about one of her students because he was used to receiving one-on-one mentoring from his previous three summers at JPL. But with 11 interns and only two mentors in the section, that student would not get the same level of attention this year.

Victor Mejia works in the Section 388 Image Processing Lab with what McGuffie calls "the 6 o'clock news folks," so named because their animations sometimes end up on TV.

Because huge numbers of images come down the pike from JPL flight mission instruments—300 a day for Phoenix alone, according to Eric De Jong, Mejia's other mentor—scientists can be hard-pressed to review all of them. And many of the images and image mosaics are too big to view on a standard monitor or even high-definition television screen, so you first have to zoom and then pan to see any detail. The interns create customized zoom-and-pan animations to help scientists prepare for presentations and press conferences or simply scan for pertinent details.

"It's a human-intensive process," says McGuffie, because each animation has to be created manually. Interns use Apple-based software called Shake to map the points of interest in one of the large pictures. Then they create smooth camera pans across the resulting path. Mejia's job is to automate the process so that scientists can simply click the points on the picture that they want to see and let the computer do the rest.

Despite McGuffie's initial concerns, she says Mejia has done a fine job. She gives him—and her entire batch of students this year—an A or an A+.

Then there's 18-year-old Carrillo from Inglewood, the go-to student in Advanced Robotics. Now on her third summer with JPL, she's a jill-of-all-trades.

Continued on page 3

Busy Days *Continued from page 2*

"She can do anything," says Stroupe, her mentor. "Any time someone needs a hand, they ask for Yuri."

A soon-to-be sophomore studying electrical engineering at Cal Poly San Luis Obispo, she tackles anything in her path—mechanical, electrical, software. For the Mini-Corer, a drill that collects planetary samples for geological analysis, she helped integrate circuit boards. For Big Pig, another drill for sample acquisition, she helped make coils used to magnetically swap drill bits. And for CliffBot, a three-unit climbing rover system, she does everything from modifying commercial batteries to installing and testing new hardware.

Her versatility and her eagerness to learn make her stand out, Stroupe says.

Carrillo credits a lot of her success to her parents, who emigrated from Guatemala in the '80s and always pushed for their children to get what they couldn't have—an education. Third of seven children, Carrillo is also the third to attend college.

"People [tell my parents], 'Wow, you have a lot of kids, and they all go to school,'" she says.

In a town associated with significant social problems, not many students picture themselves becoming engineers, Carrillo says.

"That's what we lack a lot: expectations for students," she says. "Hopefully this story will set expectations for students in the inner city to pursue education."

For now, Carrillo and her peers are concentrating on their own education. These students have created project plans and spent the summer learning from everyone around them, helping wherever they could. Now they have to give presentations and final reports.

When they leave, they will get to keep this one-of-a-kind professional experience and perhaps even a journal-style paper with their name on it.

Cherry finished his work in July. Carrillo and Mejia are set to give their final presentations Aug. 20 or 21, locations to be determined. If you are interested in attending, contact Catherine Moore in the Education Office at ext. 4-8252 or via e-mail.

Dutch Slager / JPL Photolab

JPL's NASA Software of the Year Award recipients and guests at ceremonies. Seated, from left: Joseph Green, Siddarayappa Bikkannavar, David Redding, Chris Jaggers (NASA Space Act Awards Liaison Officer at JPL). Standing, from left: JPL Director Charles Elachi, Scott Basinger, Magalene Powell-Meeks (Office of the Chief Information Officer), Catherine Ohara, David Cohen, Fang Shi, John Lou, Thomas Soderstrom (Office of the Chief Technology Officer), Tom Renfrow (Office of the CIO).

Top software honors to JPLers

By Rhea Borja

An eight-person team from JPL has been selected as co-winners of NASA's 2007 Software of the Year Award for its development of software to help detect planets outside our solar system.

The JPL winners are Scott Basinger, Siddarayappa Bikkannavar, David Cohen, Joseph Green, John Lou, Catherine Ohara, David Redding and Fang Shi.

JPL's software, called Adaptive Modified Gerchberg-Saxton Phase Retrieval, characterizes the optical errors in a telescope system using innovative and robust algorithms. The software may be integrated into a telescope's calibration control loops to correct those errors and markedly improve optical resolution. JPL's software can be applied to other sciences and systems that use light, such as laser communications and extrasolar planet detection.

JPL's software is already used at Caltech's Palomar Observatory in northern San Diego County. The software played a significant role in designing next-generation telescopes such as NASA's James Webb Space Telescope, scheduled to launch in 2013.

Early work for the software was based on efforts to correct the vision of NASA's Hubble Space Telescope. After initial images came back blurry, engineers worked for months to determine the problem. Eventually, astronauts traveled to the telescope to install a corrective lens based on telescope-imaging errors.

"Several years ago, it took teams of experts months to agree on a correct prescription for telescope lens," said team member Bikkannavar. "Our software can do all of that in just a few minutes."

Redding said he and his team have worked since the mid-1990s to develop the innovative software, and they are gratified to receive recognition for it.

The other Software of the Year Award went to engineers at NASA's Ames Research Center, who developed the Data-Parallel Line Relaxation, which is used to analyze and predict the extreme environments human and robotic spacecraft experience during super high-speed entries into planetary atmospheres. The software simulates the intense heating, shear stresses and pressures a spacecraft endures as it travels through atmospheres to land on Earth or other planets.

The NASA Software of the Year Award was initiated in 1994. Since then, both JPL and Ames have won or have been co-winner of the award seven times, including three out of the past four years.

A NASA software advisory panel reviews entries and recommends winners to NASA's Inventions and Contributions Board for confirmation. Entries are nominated for developing innovative technologies that significantly improve the agency's exploration of space and maximize scientific discovery.

For more information about NASA's Inventions and Contributions Board, visit *http://icb.nasa.gov.*

News Briefs

Willis Chapman

Chapman leads Pasadena board

Willis Chapman, manager of the Logistics and Technical Information Division, has been named chairman of the Pasadena Chamber of Commerce.

Chapman has been a member of the chamber's Board of Directors for nearly 10 years. He said he has focused on youth-oriented programs, including the initiation of the Youth Motivational Task Force, which brought together 60 community leaders who go into Pasadena schools and discuss issues such as education, motivation and employment.

Chairmanship is a rotating position among sitting Executive Board members, Chapman said. His three-year commitment includes one year in preparation as the chair-elect, then one year as the chairman, followed by one year as the immediate past chairman.

In this role, Chapman will serve as spokesman for the greater Chamber of Commerce membership, which comprises business and community leaders from across the Pasadena community. He said he will ensure that the chamber is responding to members' needs and concerns and will give greater voice to membership through tools such as the chamber portal-website and user surveys.

His plans including optimizing the chamber's governance structure by ensuring that the various committees are appropriately focused, staffed; and supported; and continuing to focus on youth initiatives by expanding partnerships with the Pasadena Unified School District, the Workforce Investment Board, the Flintridge Foundation, Women at Work and others.

"Being chairman gives me the opportunity to give back to the city that has been my home for 20 years, as well as present a professional and positive JPL model to the public," said Chapman.

NASA Honor Awards bestowed

JPL employees, contractors and partners from universities and industry were honored for their outstanding achievements and contributions to the NASA mission at the Lab's annual NASA Honor Awards ceremony July 23.

A total of 149 awards in nine different categories were handed out.

For a list of the honorees, visit *http://dailyplanet/onlab.*

Spitzer scientist earns honors

Spitzer Space Telescope science team member Giovanni Fazio has won the Royal Society of London/ Committee On Space Research Massey Award, which recognizes outstanding contributions to the development of space research in which a leadership role is of particular importance.

Fazio received the award July 14 at the Committee On Space Research's Scientific Assembly event in Montreal. Past winners of the award include JPL Director Charles Elachi. For more information, visit *http://cfa-www.harvard.edu/features/fazio_massey_award.html.*

Artists sought for poster contest

"Human Factors: Relieving Stress and Fatigue" is the theme for an Occupational Safety Program Office-sponsored poster contest that starts Aug. 1.

Artists must convey a clear and positive message based on the contest theme. First- and second-place prizes will be awarded to three groups: adults (18 and over), children 13–17 and children 12 and under. Winners in each age group will receive gift certificates/cards, valued at $50 for first place and $25 for second place.

Posters must be original content (no copying and pasting). Media such as watercolor, pen and ink, crayon, chalk, markers, etc., are acceptable for entries. Final submissions must measure 8 1/2 inches by 11 inches. The back of the poster should include the artist's name and age (if under 18), as well as a JPL contact person, mail stop and phone number.

Entries must be received by Sunday, Sept. 21. Mail entries to Robin Precie, mail stop 200-122.

The Occupational Safety Program Office will select the best 10 from each age group, based on originality, content accuracy and visual communication of topic. The semi-finalists' entries will be displayed on the mall during JPL Safety Day on Thursday, Oct. 2, from 9 a.m. to 1 p.m. JPL staff will be able to vote for their favorite in each age group.

The winning posters will be displayed Labwide. For more information, call Precie, ext. 4-9834.

Elachi on Rose Bowl walk

JPL Director Charles Elachi is scheduled to participate Wednesday, Aug. 6, as a guest co-host of Pasadena's monthly "Walk with the Mayor" event at the Rose Bowl.

The walk is scheduled for 7:45 a.m. and is open to the public.

Change for Blue Cross members

The JPL Benefits Office notes that Blue Cross of California is now known as Anthem Blue Cross. This is a name change only. There are no changes to current 2008 benefits and costs.

Within the next few weeks, all Blue Cross members will receive new identification cards with the Anthem Blue Cross logo. Members' identification numbers will not change and old cards may continue to be used until new cards are received. Members age 65 and over in the participating provider organization plan will receive both a medical identification card and a prescription drug card.

The JPL Benefits Office advises members to check new identification cards for accuracy. If any corrections are needed, contact Anthem Blue Cross at the member services number on the back of the card.

Blood drive in August

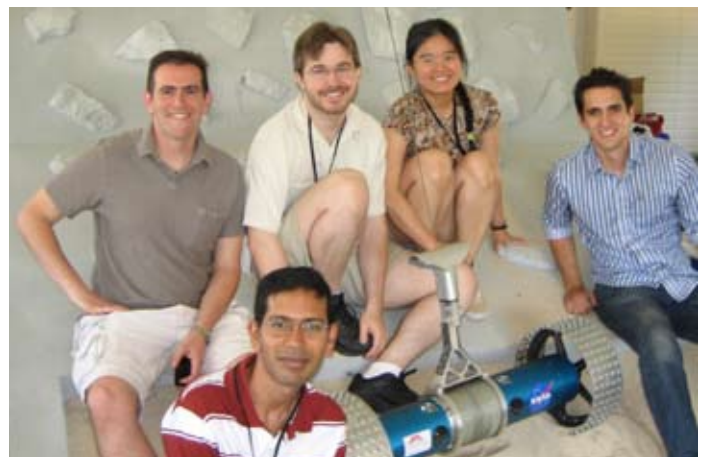
A JPL/Red Cross blood drive will be held in von Kármán Auditorium Tuesday, Aug. 12 from 9 a.m. to 4 p.m. and Wednesday, Aug. 13 from 7 a.m. to 1 p.m.

JPL Occupational Health Services says there is a severe blood shortage, especially with the high demand for type O blood.

Sign up on the confidential Red Cross website at *http://www.givelife.org/index.cfm?hcl=JPL.* Enter "JPL" instead of a zip code or sponsor code, click "search" and the JPL blood drive dates will come up. Confirmations will be sent via e-mail. Advance signup sheets will also be available at Occupational Health Services in 310-202 prior to the blood drive. For last-minute signups, or to change your appointment, call the Red Cross at 213-400-0140. Blood donors will receive a coupon for Baskin Robbins ice cream.

For more information, visit *http://www.redcross.org/services/biomed/blood/supply/tse.html.*

New rover shown at Smithsonian festival



Photos courtesy of Michele Judd

From left: Issa Nesnas, Srikanth Saripalli, Jeffrey Edlund (Caltech Ph.D. student), Jian Yuan (Edlund's wife and a Caltech employee), Pablo Abad-Manterola (Caltech Ph.D. student).

A joint JPL/Caltech project to provide versatile mobility for scientific access and human-oriented exploration of planetary surfaces was presented at the Smithsonian Folklife Festival in late June and early July in Washington, DC, part of NASA's 50th anniversary celebration.

Members of JPL's Robotic Software Systems Group showed a live demonstration of the Axel rover descending into a simulated crater, collecting a sand sample and returning the sample to the top of the crater.

Passings

Ahmed Khatib, 72, retired from Section 312, died May 23.

Khatib joined JPL in 1967 and retired in 2005.

Jose L. Fernandez, a retired facilities construction manager in the former Telecommunications and Mission Operations Directorate's Engineering Program Office, died June 1.

Fernandez joined JPL in 1981. He was station director for two Deep Space Station facilities near Madrid, Spain, part of the JPL-managed Deep Space Network. He retired in 1999 as a member of the Deep Space Mission Systems Operations Program Office.

Fernandez is survived by his wife, Carmen.

Maxine Riffel, 69, retired from the Technical Information Section, died June 14.

Riffel joined the Lab in 1972 as a contractor, then was a JPL employee from 1983 to 2005, supporting reprographics and duplicating services. She is survived by her sister Deanna; brother Robert; daughters Vicky, Kellie and Stephanie; son-in-law and JPL employee Bob Downer; five grandchildren and four great grandchildren.

Edith Cox, 89, retired from the former Section 6434, died June 6.

Cox worked at JPL from 1977 to 1993. She is survived by daughters Sharon Decker and Louise Eder and granddaughter Amanda Eder.

Letters

I truly appreciate the various expressions of sympathy I have received upon the passing of my mother. I also want to thank JPL for the beautiful plant that I received. My mother was an avid fan of space exploration and was always interested in what the Lab was doing. Thank you again for your thoughtfulness.

Belinda M. Wilkinson

Retirees

The following JPL employees retired in August:

Arvydas Vaisnys, 46 years, Section 337; Richard Lovick, 25 years, Section 330; Robert Bowman Jr., 11 years, Section 3543; Erdin Erginsoy, 10 years, Section 5140.

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