

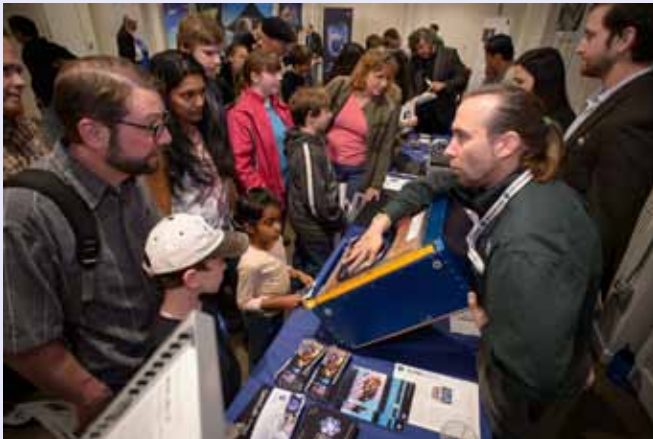
April 2016 - A Quarterly Publication

## Ames hosts public viewing of successful CRS-8 launch

The eighth contracted mission with SpaceX under NASA's Commercial Resupply Services (CRS) contract launched April 8, 2016, on a Falcon

9 rocket from Space Launch Complex 40 at Cape Canaveral Air Force Station (CCAFS) in Florida. The flight carried five Ames science payloads as well as other science research, crew supplies and hardware to the International Space Station (ISS) in support of the Expedition 47 and 48 crews.

NASA photos by Dominic Hart



9 rocket from Space Launch Complex 40 at Cape Canaveral Air Force Station (CCAFS) in Florida. The flight carried five Ames science payloads as well as other science research, crew supplies and hardware to the International Space Station (ISS) in support of the Expedition 47 and 48 crews.

The Ames Office of Education and Public Outreach



Visitors speak with Ames scientists about the science payloads that were launched on SpaceX, April 8, 2016 (photo left) and eagerly watched the launch live on a big screen (right photo) in the Ames Visitor Center.

specialists and information booths on Ames bioscience research.

Ames life science experiments on CRS-8 included: Micro-9 a study of specific mechanisms of yeast cell signaling and response to micro-gravity; Micro-10, a study of the effects of spaceflight on the growth, gene expression and physiological responses of fungal cells; Microbial Tracking-1C, the third in a series of three studies that investigates the airborne and surface bound populations of microorganisms aboard

the space station; Rodent Research-3, a commercial investigation that evaluates during spaceflight a countermeasure against muscle weakening; and the validation flight of Wetlab-2, a new system for conducting quantitative, real-time gene expression analysis aboard the ISS.

Data from some of the life science investigations will be shared with the scientific community via NASA's open-access GeneLab data system.

## Did the "man in the moon" look different from ancient Earth?

BY KIMBERLY WILLIAMS

New NASA-funded research provides evidence that the spin axis of Earth's moon shifted by about five degrees roughly three billion years ago. The evidence of this motion is recorded in the distribution of ancient lunar ice, evidence of delivery of water to the early solar system.

"The same face of the moon has not always pointed towards Earth," said Matthew Siegler of the Planetary Science Institute in Tucson, Arizona, lead author of a paper in today's journal Nature. "As the axis moved, so did the face of the 'man in the moon.' He sort of turned his nose up at the Earth."

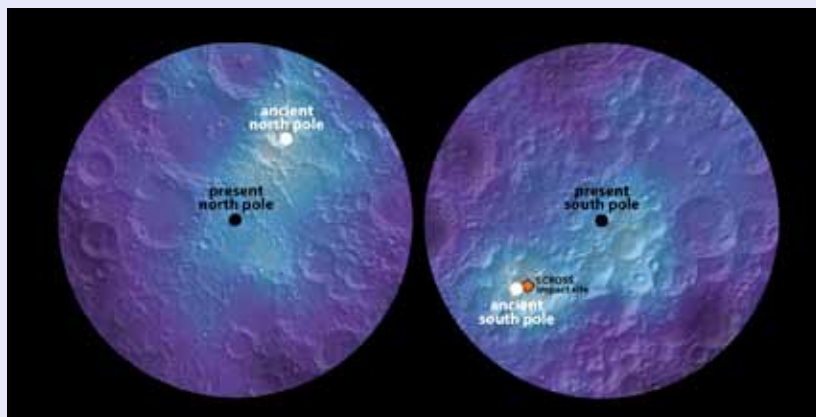


photo credit: James Keane, University of Arizona; Richard Miller, University of Alabama at Huntsville

This polar hydrogen map of the moon's northern and southern hemispheres identifies the location of the moon's ancient and present day poles. In this image, the lighter areas show higher concentrations of hydrogen and the darker areas show lower concentrations.

continued on page 9

## The Owls share their wisdom during visit, tour of Ames

At the invitation of Ames Center Director Eugene Tu, a group from the Owl Feathers Society visited here March 22, 2016, to present thoughts about NASA at this historical moment. As a 30-year employee at NASA Ames, Tu appreciates the mentoring and advice that previous generations of Ames leaders provided to him.

The Owls are a group of Ames retirees who began meeting in 1983, at quarterly lunches with technical presentations by current Ames researchers. They take their name from the final research project of Harvey Allen, in which he moved an owl feather through a bathtub to discover that owls flew upon their prey so silently because of small protruding feathers on the leading edge of their wings. The Owls have no formal leader, though Tom Snyder and Vic Peterson these days send out most of the emails.

After a center overview given by Tu, they were escorted on a short tour to see the NASA Advanced Supercomputing Facility to see the hyperwall. Afterwards, there was a briefing by the deputy center director Tom Edwards about Ames' vision for the future and



Left to right: Vic Peterson, Tom Gregory, Irv Statler, Victor LeBacqz, Bill Berry, Tom Snyder, Henry Lum, Bob Yee during their visit to the NASA Ames on March 22, 2016.

NASA photo by Dominic Hart

our activities towards that goal. They were then given a briefing and demonstration about SmallSats by Scott Richey. From there, it was lunch at Mega Bites to share their thoughts about what they had just seen and

heard, and a question-and-answer period with Krisstina Wilmoth to ascertain where they thought Ames should be in the future. There are plans for them to return and be interviewed on camera, for posterity.

## NASA Ames team meets Silicon Valley's future engineers

BY MARIA LOPEZ

MESA Day is an annual science Olympics type competition event where more than 750 Mathematics, Engineering, Science Achievement (MESA) middle school and high school students from Santa Clara County showcase their Science, Technology, Engineering and Math (STEM) projects. The 2016 San Jose State University MESA Day was held on March 5, 2016, and NASA Ames volunteers judged the balsawood glider competition. The judging scored longest flight time in seconds for middle school students and longest flight time in seconds and a three-view drawing for high school students.

Ames African American Advisory Group member Alex Langford served as the lead judge and stated, "Seeing the students so enthusiastic when their gliders flew was inspiring. Everyone had fun no matter how well their glider flew." Most notably, former NASA Ames intern and MESA alumnus, Gabriel Alvarez, who now works as a thermal R&D engineer with Space Systems Loral, also served as a balsawood glider judge. Alvarez



Balsawood Glider Judges and Competition Winner: Left to Right: Alex Langford (Code RE), Anjan Chakrabarty (Code TI), Gabriel Alvarez, Jay Singh (Code BT), Balsawood Glider Competition Winner, Eduardo Chavez (Code TSM), Jose Chavez-Garcia (Code TSM), Thomas Stucky (Code TI) and Maria C. Lopez (Code JSG).

was an intern within the Ames Engineering Systems Division and was involved with environmental testing for TechEdSat, engineering support for SPHERES and thermal analysis and design for the Mission Design Center. Alvarez credited his NASA experience, "My NASA internship helped give me a hands-on experience of actual flight hardware and design. By working on small satellites at Ames, I was exposed to many engineering subsystems and their integration. I now focus

specifically on the thermal subsystem, but the design of the thermal subsystem is contingent from inputs from other subsystems, like electrical, structural and orbits. Having the opportunity with NASA definitely helped give me the big picture philosophy to do thermal analysis and design."

All in all, the NASA team enjoyed the day spent with the potential rising aerospace engineers and sharing their experience at NASA with the engaged and excited students.



## Brazilian Secretaries of Education examine program supported by HACE

BY MARIA C. LOPEZ

The Hispanic Advisory Committee for Employees (HACE) has promoted Science, Technology, Engineering, and Mathematics (STEM) exploration and careers amongst the Latino community, including a recent summit, presented by the Statewide Mathematics, Engineering, Science Achievement (MESA) Program, with Brazilian Secretaries of Education.

The United States Department of Education requested MESA to host the Brazilian Secretaries of Education, since MESA is nationally recognized for its innovative and effective academic development program for STEM fields and is exactly the type of STEM program Brazil is aspiring to implement.

Three Brazilian state secretaries of education visited the MESA Program at San Jose State University (SJSU) on Jan. 27, 2016, to explore replicating the program in their country. The summit included MESA program leaders; SJSU officials; MESA middle school and high school students; and Industry Advisory Board members, who obtain resources and volunteers within their companies in support of MESA initiatives. Maria Lopez, the NASA Ames liaison to the SJSU MESA Schools program, spoke about HACE's association with MESA in alignment with



photo by Danielle McNamara, MESA Strategic Communications assistant director

Front Row (right to left): Megan Ellis, Brazilian U.S. Embassy Cultural Affairs Officer; Júlio Gregório Filho, Federal District State Secretary of Education; Marco Antônio Brandão Lopes, Acre State Secretary of Education; Maria C. Lopez, NASA Ames - HACE Member; Christina Ramos, SJSU MESA Schools Program Director; Tzel Ramos, Oracle Program Manager; Juanita Muñiz-Torres, MESA Statewide Interim Executive Director; Joanna Guerrero, VMware Senior DevOps Engineer; Marcia Mizuno, Brazilian U.S. Embassy Senior Cultural Affairs Specialist. Back Row (right to left): Blanca Sanchez-Cruz, SJSU MESA Engineering program director; Marcos Herrera, Community Liaison; Charlotte Belsick, Lockheed Martin Terminal High Altitude Area Defense Interceptor Engineering Manager; Carlos Eduardo Vieira da Cunha, Rio Grande do Sul State Secretary of Education at the recent summit education held Jan. 27, 2016.

the Federal STEM Education five-Year Strategic Plan, which includes increasing and sustaining youth and public engagement in STEM.

The MESA Program provides educationally and economically disadvantaged students with the skills and resources to be successful in school and careers in STEM disciplines. MESA provides a unique combination of enrichment activities, hands-on competitions, academic support, and industry involvement for students from

the middle school level through college graduation. HACE has organized NASA participation from the advisory group members and the Center benefiting MESA via industry shadow days, judges for science Olympics, and motivational STEM career speakers for local MESA middle school and high school students. The summit validated HACE's efforts to contribute to the success of MESA and the next generation of scientists, engineers, and entrepreneurs.

## Ames female scientists, researchers discuss their careers

In collaboration with the Smithsonian's Museum Day Live celebration, Colleen Carroll, Arwen Dave, Ali Guarneros Luna, Leedjia Svec and Elizabeth Wagstaff spoke about the accomplishments and dedication of women at NASA working in fields relating to science, technology, engineering and mathematics. The event was held March 12, 2016, in the Ames Visitor Center, and was open to the public, especially women and girls, to enjoy and share in the personal histories and career development journeys of NASA Ames women scientists and researchers. Leedjia Svec, is a director for military programs; Ali Guarneros Luna, is an aerospace and systems engineer; Arwen Dave, is a scientist on the Lunar Plant Growth Habitat team; and Colleen Carroll and Elizabeth Wagstaff, are both researchers in Human Computer Interaction projects focused on user-centered design.



photo by Matt Buffington