



The Marshall Star

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Teams Announced for NASA's New Human Exploration Rover Challenge, Inviting Next Generation of Engineers to Explore New Worlds

By Bill Hubscher

Nearly 90 high school and college
teams from around the globe will test
their engineering skills in a brand
new competition for future engineers
-- NASA's Human Exploration Rover
Challenge at the U.S. Space & Rocket
Center April 11-12.



This new event evolves NASA's
original design competition -- the

Great Moonbuggy Race. During
its 20-year run, the race engaged
thousands of students, challenging

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Marshall Atmospheric Scientist Timothy Lang Follows Floods to Improve Global Precipitation Measurement Quality

By Molly Porter

Timothy Lang keeps two snapshots
tacked to the wall facing his desk
at the National Space Science
Technology Center. One shows a
river lapping at the deck of a one-
lane, steel truss bridge. The other
shows the same swollen river looking
ready to sweep a home and carry it
downstream.

Lang grew up in Downieville, Calif., a

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*Timothy Lang at his NSSTC office. (NASA/
MSFC/Molly Porter)*

Marshall Center Windows 7 Users Soon to be Rid of System Login Woes

By Jena Rowe

In response to the [February 2011 Office of Management and Budget Memorandum 11-11](#), the agency is moving toward the use of the NASA Personal Identity Verification smartcard -- the NASA "badge" -- for login and other authentication to systems, networks and applications in 2014.

Each NASA center is implementing its own adoption program.

NASA's Marshall Space Flight Center is starting with Windows 7 users.

"The benefits of using this type of login credential system make the effort of implementation worthwhile," said Linda Rawlins, I3P center integration lead for Marshall. "It not only makes things easier for the system user, but improves IT security as well."

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Rover Challenge *Continued from page 1*

them to solve scientific design problems just like NASA engineers. The success and popularity of the race demonstrated these budding scientists and engineers were ready to build more complex designs.

In the Human Exploration Rover Challenge, students will design and build vehicles to power around a rugged course at the U.S. Space & Rocket Center, much like they did for the Moonbuggy Race. However, the Marshall Space Flight Center's Academic Affairs Office, which manages the event, designed the challenge to encourage students to look beyond the moon by creating obstacles to mimic some of the terrain challenges of solar system exploration. Students must design robust and durable rovers with the traction to scale obstacles and meet other challenges.

"NASA's Human Exploration Rover Challenge will provide students with an authentic engineering experience," says Tammy Rowan, manager of Academic Affairs at Marshall. "The student teams will design, build and test technologies that enable vehicles to perform in a wide variety of environments."

The challenge will go beyond the spirit of competition, as the students' creations could potentially inform the design process for NASA's next generation space transportation systems. It also continues NASA's effort to use the appeal and intrigue of its space missions and programs as catalysts for engaging students in hands-on STEM –

science, technology, engineering and mathematics.

Some of the new course challenges include a simulated field of asteroid debris -- boulders from 5 to 15 inches across; an ancient stream bed filled with pebbles about 6 inches deep; and erosion ruts and crevasses in varying widths and depths. Co-ed teams will race against the clock for the best time in the high school and college divisions, but also can rack up penalties based on how their rover handles the obstacles and how the team solves a myriad of problems along the way. Prizes will be awarded for best times, but also for teams that effectively address safety concerns, find creative ways to fix any problems with their rover, build the lightest vehicle and other accomplishments.

Details about all prizes to be awarded, a complete list of teams competing this year, and the "rules of the road" can be found at [NASA's Human Exploration Rover Challenge website](#).

Fans and family members can follow the action during the weekend by visiting Marshall's Rover Challenge social media channels, including [Facebook](#), [Twitter](#) (#roverchallenge) and [Instagram](#) (#rovergram). Marshall Television also will provide a high-definition [video stream and live commentary of the event](#) from the U.S. Space & Rocket Center.

Hubscher, an ASRC Federal / Analytical Services employee, supports the Office of Strategic Analysis & Communications.

Leadership, Teamwork Highlighted in Women's History Month Program



Dana Theus, founder of InPower Coaching, talked about “The Power of Soft Skills Leadership” and other issues during Women’s History Month presentations at NASA’s Marshall Space Flight Center on March 20. Theus held two morning sessions in Morris Auditorium for Marshall team members -- “Becoming an Authentic Leader” and “Teamwork Across Genders.” (NASA/MSFC/Emmett Given)

Timothy Lang *Continued from page 1*

famous mountain-biking spot in northern California’s Sierra Nevada. It sits at the confluence of the Downie and North Yuba rivers in Sierra County.

He took the photographs on New Year’s Day, 1997, after an atmospheric river, or “pineapple express,” dumped close to 30 inches of rain over the already saturated watersheds of the Sierras. Heavy runoff hit surrounding valleys hard. Levees broke. Rivers and creeks spilled over their banks.

“I was home visiting from grad school and had to help sand bag and help my parents evacuate medical supplies out of the town’s clinic, which was in danger,” said Lang.

Today, Lang works as an atmospheric scientist at NASA’s Marshall Space Flight Center. His research helps us understand extreme changes in Earth’s water and energy cycles that lead to natural disasters like the flood that threatened his parents’ clinic.

Lang described an atmospheric river as a narrow tunnel of moisture-laden wind from the tropics. A moderate-sized atmospheric river carries as much water as the Mississippi River dumps into the Gulf of Mexico in an average week. When the river comes ashore and stalls over higher terrain, the water falls as snow or rain.

Researchers need accurate and timely rainfall information to better understand and model where and when extreme events like atmospheric rivers may

occur. Satellites fill in the gaps because there are not enough facilities on the ground to give us a global picture.

“But first we need to make sure the satellite is accurately measuring precipitation,” explained Lang. “We do that by improving our understanding of precipitation physics and by comparing measurements made by satellites and aircraft instruments that simulate satellite observations to measurements taken from ground-based rain gauges, disdrometers and radars.”

As a part of Global Precipitation Measurement’s (GPM) ground validation team, Lang has helped organize remote field campaigns in various places in the world to improve the quality of GPM satellite measurements.

Better satellite data improves environmental prediction. Improved forecasting helps us make decisions about managing our water resources and mitigating the impact of floods, droughts, snowstorms, hurricanes and cyclones. That keeps us all safer down here on Earth, right now and in the future.

Later this year, the ground validation team will be heading to North Carolina’s Blue Ridge mountains to study warm season rainfall over complex topography.

Porter is a NASA Pathways Intern in the Office of Strategic Analysis & Communication.

Marshall Center Engineers to Discuss Space Exploration At Film Screening

By Tracy McMahan

Forty-five years ago on July 20, 1969, American astronauts Neil Armstrong and Buzz Aldrin became the first men to land on the moon. On March 31, at 7 p.m., engineers from NASA's Marshall Space Flight Center will share the historical context of the Apollo missions with a Tennessee audience during a panel discussion following a screening of the 1989 film, *For All Mankind*.

The event is part of Science on Screen activities that connect film to science at the Belcourt Theatre -- a non-profit theater in Nashville, Tenn. Director Al Reinert's film tells the story of the Apollo missions from the perspective of the men and women who made this momentous occasion possible. The story is told through first-person narration by those involved and the 8mm home movies shot by Apollo astronauts.

As NASA prepares for deep space exploration with the Space Launch System (SLS) and Orion, it is interesting to reflect on these first steps on a foreign world. Orion's first uncrewed test flight, Exploration Test Flight 1 (ETF-1) is scheduled for later this year and the first SLS/Orion flight is slated for 2017.

After the film viewing, a panel discussion will be

moderated by Tracie Prater, an aerospace engineer in Marshall's Materials and Processes Laboratory, who received a doctorate in mechanical engineering from Vanderbilt University in Nashville in 2012.

The panel includes space shuttle astronauts Dr. Rhea Seddon and Capt. Robert "Hoot" Gibson; former Marshall Center engineers Brooks Moore and Al Reisz, who worked on the Apollo missions; and Vanderbilt history professor Tom Schwartz, who specializes in 1960s America. The panel will discuss the scientific and cultural context that made the Apollo mission a success, and the key scientific benchmarks that led to the moon landing, the expected and unexpected challenges, and space exploration in the post-Apollo era.

Science on Screen is a national initiative funded by a grant from the Coolidge Corner Theatre with support from the Alfred P. Sloan Foundation and is part of Belcourt's education and engagement program. To find out more about attending the screening, visit www.belcourt.org

McMahan is a public affairs officer in the Office of Strategic Analysis & Communications.

Windows 7 *Continued from page 2*

Benefits include:

- You never have to change your pin.
- Marshall supports the use of badges for Virtual Private Network (VPN) access, which means there will no longer be a need to apply for or use an RSA token.
- The NASA badge also can be registered at any federal department/agency to be used as a login credential.
- If your badge is lost or stolen, once reported, all access using the card can be revoked within minutes, improving IT security.

"We are progressing at a rate of 700-800 employee systems per month and have 750 scheduled for April," said Rawlins. "We plan to complete the rollout at

Marshall and the Michoud Assembly Facility by Sept. 30."

How do you know when you are scheduled to transition to logging into your system with your NASA badge? Check out the [PIV smartcard login page on Explornet](#). A schedule is posted through April, and will be updated monthly. Users will also be notified of when they will be required to use their NASA badge by email and when logging into their system.

For questions, contact a member of the support team: [Linda Rawlins](#), [Jamie Payne](#), or [Steve Deutschendorf](#).

Rowe, an ASRC Federal/Analytical Services employee and Marshall Star editor, supports the Office of Strategic Analysis & Communications.