



MARSHALL STAR

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NASA tests new propulsion system for robotic lander prototype



The robotic lander prototype's propulsion system, shown during a hot-fire test, consists of 12 small, attitude-control thrusters; three primary descent thrusters to control the vehicle's altitude; and one large "gravity-canceling" thruster which offsets a portion of the prototype's weight to simulate a lower-gravity environment, like that of the moon and asteroids.

By Kim Newton

NASA's Robotic Lunar Lander Development Project at the Marshall Space Flight Center has completed a series of hot-fire tests and taken delivery of a new propulsion system for integration into a more sophisticated free-flying autonomous robotic lander prototype.

The project is partnered with the Johns Hopkins University Applied Physics Laboratory in Laurel, Md., to develop a new generation of small, smart, versatile robotic landers to achieve scientific and exploration goals on the surface of the moon and near-Earth asteroids.

*See **Prototype** on page 3*

Deputy Center Director Gene Goldman holds all-hands meeting

Marshall Space Flight Center Deputy Center Director Gene Goldman addresses Marshall team members during an all-hands meeting Jan. 14. Goldman discussed the status of NASA's budget process and its significance to the center. The meeting, in Morris Auditorium in Building 4200, aired on Marshall TV and Desktop TV.



Astronauts Douglas Hurley, Daniel Tani present 22 Silver Snoopy Awards to Marshall team members

By Jessica Wallace Eagan

Twenty-two Marshall Space Flight Center team members were recently honored with Silver Snoopy Awards for outstanding contributions to the success of crewed spaceflight missions.

The Silver Snoopy award recipients are presented a lapel pin depicting Snoopy, the dog from the comic strip "Peanuts," as an astronaut. Each of the pins has flown on previous space shuttle missions. Honorees also receive a framed certificate and a letter signed by NASA astronauts.

The awards were presented by NASA astronauts Douglas Hurley and Daniel Tani. Hurley launched on space shuttle Endeavour's STS-127 mission to the International Space Station on July 15, 2009. Tani launched on Endeavour's STS-108 mission Dec. 5, 2001. He also served as an Expedition 16 flight engineer and worked aboard the station from

Oct. 23, 2007, until Feb. 20, 2008.

Honorees included Sigrid R. Burge, resource control specialist in the Office of Chief Financial Officer; John Fikes, an aerospace engineer in the Science & Mission Systems Office; Linda Gomez, program support specialist in the Office of Strategic Analysis & Communications; and Leslie M. McNutt, an aerospace engineer in the Shuttle Propulsion Office.

Honorees from the Office of Center Operations were Gary L. Enochs, move coordinator; and Jane Hill, facilities support specialist.

Honorees from the Engineering Directorate were Steven T. Phillips, lead materials engineer; William Greg Osburn, engineering technician; and Harold Gerrish, John M. Hanson, David L. Johnston and Peter Sulyma, all aerospace engineers.

Honorees from Ares Projects were Beth Cook, Eric Corder and Kendall

Junen, all aerospace engineers.

Contractor honorees included John A. Chan, a propulsion engineer; Brandon N. Dick, Nitrogen Oxygen Recharge System project mechanical design lead; Wade C. Geiger, express integration manager; and Phil R. Welte, a systems engineer, all employees of The Boeing Co. in Huntsville. Representing other contractors were Scott C. Anderson, digital learning network coordinator for Oklahoma State University in Stillwater; Johnny E. Busby, project manager for SAIC Inc. in Huntsville; and Douglas C. Jones, dynamics analyst for Jacobs Technology Inc. in Huntsville.

For more information about the Silver Snoopy Awards, visit <http://sfa.nasa.gov/sfaawards.cfm#snoopy>.

Eagan, an AI Signal Research Inc. employee and the Marshall Star editor, supports the Office of Strategic Analysis & Communications.



First row, from left, astronaut Daniel Tani, Greg Osburn, Beth Cook, Jane Hill, Peter Sulyma, Steven Phillips, Wade Geiger, Eric Corder, Leslie McNutt, Linda Gomez and astronaut Douglas Hurley. Second row, from left, Gary Enochs, Phil Welte, Harold

Gerrish, Brandon Dick, Sigrid Burge, Johnny Busby, Kendall Junen, Scott Anderson, David Johnston, Douglas Jones, John Chan, John Hanson, John Fikes and Marshall Center Director Robert Lightfoot.

Classified Ads

To submit a classified ad to the Marshall Star, go to Inside Marshall, to "Employee Resources," and click on "Marshall Star Ad Form." Ads are limited to 15 words, including contact numbers. No sales pitches. Deadline for the next issue, Jan. 27, is 4:30 p.m. Thursday, Jan. 20.

Miscellaneous

UAH books for sale, new when bought, will sell below used prices. 256 489-6143

Blue Heeler puppies, wormed, shots, starter food, health record, parents on premises, \$125. 256-498-0309

Legion Peace five-piece drum set, navy blue, \$230 obo. 256-651-5847

Two men's ski jackets, large, \$50 each; men's shell jacket, medium, \$15. 256-882-3983

Large white couch, \$100; Frigidaire washer & dryer, \$100; GE microwave, \$20; pictures available. 256-684-1513

Misses clothing sizes 10-12, most new with tags, each piece \$5. 256-345-1454

Black-masked Shih Tzu puppy, male, 12 weeks old, three sets of shots, \$500. 256-721-2447

Toshiba satellite P105-S6197 1.6GHz, 320GB, 4GB Ram, XP&Ubuntu, \$300 obo. 256-457-5823

Playstation 3 game, Little BIG Planet, Game of the Year edition, rated Everyone, \$25. 256-828-1234

Bronze storm door/frame, \$50; Craftsman garage door openers, three remote units, \$20; radar detector, \$25. 256-527-0110

Kasson pool table, fruitwood, Queen Anne feet, leather pockets, \$1,950. 256-880-6563 leave message

Antique furniture and furnishings, e-mail Lpeterson107@gmail.com for complete list.

Non-drop crib and mattress, \$200 obo; Graco stroller/car seats, \$50 obo. 256-797-2653

Extra large dog crate, \$25 obo. 256-642-6140

Vehicles

2008 Toyota Highlander Sport, white, third row

seating, 2WD, 19" wheels, 38.5k miles, \$22,000. 256-698-2619

1998 Stingray RS180, fish/ski, new 140hp, vests and other new equipment, \$9,500 obo. 256-640-6427

1998 GMC pickup truck, V-6, white, long-wheel base, 200k miles, \$4,000. 256-468-9377

Wanted

Portable, adjustable basketball goal. 256-880-9025

Queen-size mattress and box springs. 256-665-3422

Five-drawer file cabinet(s), good condition. 256-883-2757

Shuttle Buddies to meet Jan. 24

The Shuttle Buddies will meet at 8:30 a.m., Jan. 24, at Mullins Restaurant on Andrew Jackson Way. For more information, call Deemer Self at 881-7757.

Prototype *Continued from page 1*

The new robotic lander prototype will continue to mature the development of a robotic lander capability by bringing online an autonomous flying test lander that will be capable of flying up to 60 seconds, testing the guidance, navigation and control system by demonstrating a controlled landing in a simulated, low-gravity environment.

By the spring of 2011, the new prototype lander will begin flight tests at the U.S. Army's Redstone Arsenal Test Center.

The prototype's new propulsion system consists of 12 small, attitude-control thrusters; three primary descent thrusters to control the vehicle's altitude; and one large "gravity-canceling" thruster which offsets a portion of the prototype's weight to simulate a lower-gravity environment, like that of the moon and asteroids. The prototype uses a green propellant, hydrogen peroxide, in a stronger concentration of a solution commonly used in homes as a

disinfectant. The by-products' after use are water and oxygen.

"The propulsion hardware acceptance test consisted of a series of tests that verified the performance of each thruster in the propulsion system," said Julie Bassler, Robotic Lunar Lander Development Project manager. "The series culminated in a test that characterized the entire system by running a scripted set of thruster firings based on a flight scenario simulation."

The propulsion system is currently at Teledyne Brown's manufacturing facility in Huntsville for integration with the structure and avionics to complete the new robotic lander prototype. Dynetics Corp. developed the robotic lander prototype propulsion system under the management of the Von Braun Center for Science and Innovation, both located in Huntsville.

"This is the second phase of a robotic lander prototype development program," said Bassler. "Our initial

'cold gas' prototype was built, delivered and successfully flight tested at the Marshall Center in a record nine months, providing a physical and tangible demonstration of capabilities related to the critical terminal descent and landing phases for an airless body mission."

The first robotic lander prototype has a record flight time of 10 seconds and descended from 3 meters altitude. This first robotic lander prototype began flight tests in September 2009 and has completed 142 flight tests, providing a platform to develop and test algorithms, sensors, avionics, ground and flight software, and ground systems to support autonomous landings on airless bodies, where aero-braking and parachutes are not options.

For more photos of the hardware, visit <http://www.nasa.gov/roboticlander>.

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

Alabama 4th graders soon to learn more about Marshall



Fourteen-year-old actress Lauren Bakke, center, and Marshall Space Flight Center engineer Chris Randall, rear left, await their cue from a crew of videographers from Pearson Education, a national textbook publishing company. Pearson, of Upper Saddle River, N.J., filmed at Marshall Jan. 7. The company is rewriting 4th-grade social studies textbooks for all Alabama schools, including a new section on technology and the impact of the Marshall Center on Alabama's culture and economy. Huntsville native Bakke will host a DVD supplement to be packaged with every textbook delivered to Alabama elementary schools in 2013. She toured science and engineering facilities in Building 4755, and spoke at length with Randall, Marshall engineer Erika Alvarez and center historian Mike Wright.

David Higginbotham/MSFC



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