Marshall Star, August 15, 2012 Edition

MARSHALL STAR

In This Week's Star ⊟ (Click to Expand)

NASA's 'Mighty Eagle' Robotic Prototype Lander Flies Again at Marshall

By Megan Davidson

The "Mighty Eagle," a NASA robotic prototype lander, is soaring high again for a series of tests being conducted at the Marshall Space Flight Center.

Image right: The "Mighty Eagle," a NASA robotic prototype lander, is undergoing a series of tests at the Marshall Center. NASA will use the Mighty Eagle to mature the technology needed to develop a new generation of small, smart, versatile robotic landers capable of achieving scientific and exploration goals on the surface of the moon, asteroids or other airless bodies. (NASA/MSFC/Dennis Olive)

Since its last round of tests in 2011, the Mighty Eagle team has made significant updates to the guidance controls on the lander's camera, furthering its autonomous capabilities.

The three-legged "green" lander is fueled by 90 percent pure hydrogen peroxide. It receives commands from an onboard computer that activates its onboard thrusters to carry it to a controlled landing using a pre-programmed flight profile. It is 4

feet tall and 8 feet in diameter and, when fueled, weighs 700 pounds.

"These lander tests provide the data necessary to expand our capabilities to go to other destinations," said Dr. Greg Chavers, engineering manager and warm gas test article lead at the Marshall Center. "It also furthers our knowledge of the engineering components needed for future human and robotic missions."

The lander is being tested near Marshall's historic Saturn-IC Static and F-1 test stands. The S-IC static test stand was originally designed to develop and test the Saturn V S-IC first stage, or booster stage, and was also used for space shuttle external tank testing. The venerable F-1 engine test stand was used to test turbopumps for Saturn first stage engines.

After two successful tethered tests, the Mighty Eagle took off for its first untethered flight Aug. 8. During the 34-second flight, it soared and hovered at 30 feet, moved sideways, looked for its target and safely landed on the launch pad. After a 30-minute cool-down period, engineers evaluated the test data, which will be used for future flights.

"This test was a big achievement, as it is the first time we've gotten real images from the flight," said Mike Hannan, a controls engineer in Marshall's Engineering Directorate. "We are looking forward to digging into the telemetry data to see exactly how well the test went. It will give us the confidence to let the new autonomous rendezvous and capture software actually guide the vehicle to the target."

The series of tests will continue through September. The lander prototype will autonomously fly and hover at 30 feet for the next test, and up to 100 feet for two additional tests, and then move sideways, to safely land 30 feet away from the launch pad. The tests demonstrate what it will take to perform the final descent of an autonomous controlled landing on the moon, asteroids or other airless bodies.

NASA will use the Mighty Eagle to mature the technology needed to develop a new generation of small, smart, versatile robotic landers capable of achieving scientific and exploration goals throughout the solar system.

The Mighty Eagle was developed by the Marshall Center and Johns Hopkins University Applied Physics Laboratory in Laurel, Md., for NASA's Planetary Sciences Division, Headquarters Science Mission Directorate. Key partners in this project include the Von Braun Center for Science and Innovation, which includes Science Applications International Corporation, Dynetics Corp., and Teledyne Brown Engineering Inc., all of Huntsville.

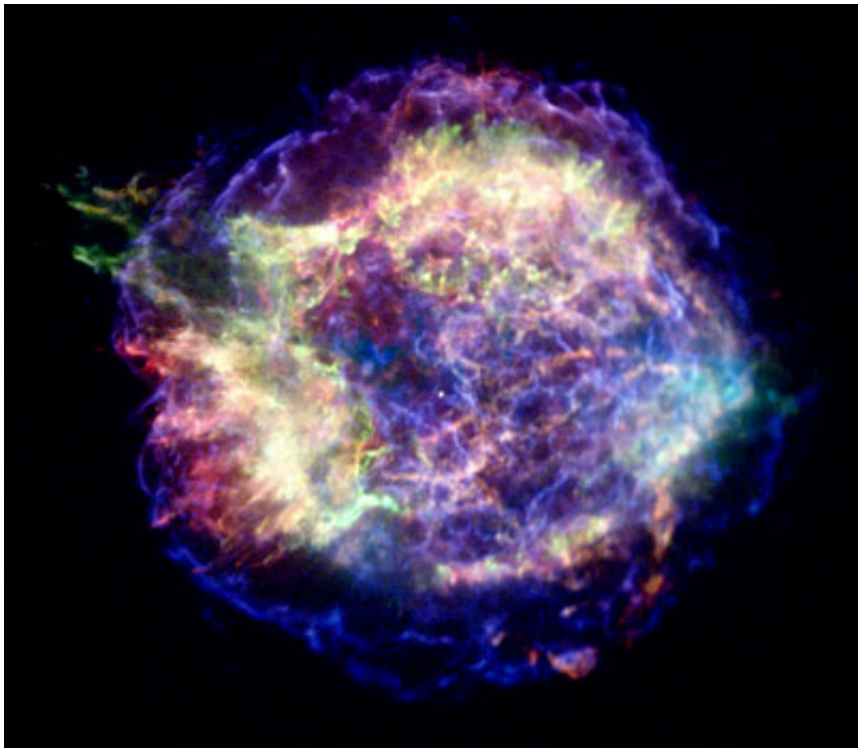
For more information on NASA's robotic landers, visit http://www.nasa.gov/mission_pages/lunarquest/robotic/index.html.

Davidson, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.

› Back to Top

Chandra Celebrates 13 Years of Amazing Advancements in X-Ray Astronomy

From combined reports



In July 1999, NASA launched the Chandra X-ray Observatory, the world's most powerful X-ray telescope, packed with the strength and accuracy to read a newspaper from half-a-mile away or to see the letters of a stop sign from 12 miles.

Image left: Cas A: the supernova remnant that was Chandra's "First Light" image. (NASA/CXC/SAO/ D.Patnaude et al.)

A month later, Chandra released its spectacular first celestial images.

Unlike other telescopes in NASA's "Great Observatories" series, Chandra was designed to study X-rays rather than visible light or gamma rays. Since X-rays are absorbed by Earth's atmosphere, space-based observatories are necessary to study these phenomena. By capturing images created by these invisible rays, the observatory has allowed scientists to analyze some of the greatest mysteries of the universe. Chandra has provided unprecedented glimpses into the inner workings, providing astronomers with the opportunity to conduct detailed studies of black holes, supernovas, comets and dark matter.

During the 13 years, Chandra has provided 8,681 science-related observations and has made 8,112 science-related observations available to the public. Most science observations have a proprietary period of one year. Once the proprietary period is expired, the data is available to the general public.

The Chandra mirrors -- the largest, most precisely shaped and aligned -- enable the telescope to detect and image X-ray sources that are billions of light years away. It was initially thought the observatory would provide five years of viewing opportunity; however Aug. 12 marked the 13th anniversary of continuing science.

"Our confidence in the observatory's performance and in its future remains strong," said Keith Hefner, program manager for Chandra at the Marshall Space Flight Center. "With recent extensions, Chandra could operate to 2019 and beyond."

The Marshall Center manages the Chandra program for NASA's Science Mission Directorate in Washington. The Smithsonian Astrophysical Observatory controls Chandra's science and flight operations from Cambridge, Mass.

› Back to Top

Pass the Torch Lecture, 'Snoozeum' Events Celebrate Curiosity's Big Day

The Marshall Space Flight Center and the U.S. Space & Rocket Center teamed up for several events leading up to the highly successful Aug. 6 landing of NASA's Curiosity rover on Mars. On Aug. 2, Dr. Barbara Cohen, a planetary scientist at the Marshall Center, spoke to more than 200 people about the history and future of NASA's exploration of Mars. The presentation was part of the U.S. Space & Rocket Center's Pass the Torch Inspiration Lecture Series. It is available for viewing on Ustream. (NASA/MSFC/Emmett Given)

There wasn't a whole lot of sleeping going on for these excited kids and their parents at the "snoozeum" -- an overnight sleepover Aug. 5 under the Saturn V rocket at the U.S. Space & Rocket Center's Davidson Center for Space Exploration. Dr. Steve Williams, left, planetary science division education/public outreach lead at NASA Headquarters, shows the group a poster about how far the Apollo astronauts and NASA's Spirit and Opportunity rovers might have roamed had they landed in a familiar place -- like Washington or Disney World -- instead of the moon or Mars. More than 100 participants took part in Mars-themed activities, which included a digital movie, a homemade parachute drop and celebratory pancake breakfast the next morning. (NASA/MSFC/Emmett Given)

Dr. Bill Cooke, left, lead of Marshall's Meteoroid Environments Office, takes "snoozeum" participants on a twinkling tour of the United States via an inflatable planetarium. (NASA/MSFC/Emmett Given)

› Back to Top

Marshall Intern Jesus Trillo Demonstrates 'Passion for How Things Work'

By Rick Smith

Jesus Trillo. (NASA/MSFC)

NASA summer interns are a special breed: disciplined, inquisitive, career-oriented. For Jesus Trillo, a college junior who interned this summer at the Marshall Space Flight Center, those descriptors barely do justice to his focus and aspirations.

Born in El Paso, Texas, and raised in Juárez, Mexico, until he was 15, Trillo studies mechanical engineering at the University of Texas at El Paso. He spent the summer in the Propulsion Systems Department of the Marshall Center's Engineering Directorate, helping NASA engineers disassemble and test components of massive F1 engines -- the most powerful liquid-fueled rocket engine ever built. His work will help NASA pick the right engines and engine configurations to provide extra boosting power to the Space Launch System, the heavy-lift vehicle now being developed to usher in a new era of exploration and discovery beyond Earth orbit.

That's heady work for an aspiring young engineer, but so is the next portion of Trillo's professional education. As the recipient of a 2012 scholarship from the Benjamin A. Gilman International Scholarship Program, which helps American undergraduate students pursue semesters of study abroad, he'll continue his engineering studies this fall -- in the United Arab Emirates.

He'll attend the American University of Sharjah, where he also plans to study Middle Eastern culture and learn Arabic. Right now, he doesn't know a soul in the teeming coastal city of Sharjah, and he doesn't yet speak enough Arabic to order a meal.

That's part of the allure, Trillo said. "I always knew I wanted to study abroad. What excites me most is the idea of experiencing a completely different culture -- different languages, customs, foods, everything," he said.

That means making the most of every minute outside the classroom. "I plan to travel while I'm there, to learn as much as I can," he added.

Fast learner, early achiever

Learning as much as possible has always been Trillo's motto, he said. He fell in love with building things at an early age, fashioning complex structures out of Legos and meticulously assembling model airplanes. If a machine rattled, he was compelled to investigate why; if a mechanism could be opened, he wanted to take it apart, see how it functioned.

"I've always had a passion to find out how things work," he said.

He was in middle school in Juárez when he realized he wanted to be an engineer. "We went to visit NASA's Johnson Space Center in Houston," he said. "I fell in love with engineering and spaceflight. I realized I'd need to maintain a strong math and science background to pursue a career like that."

When Trillo was a sophomore in high school, still adjusting to his family's move to the United States, his parents enrolled him in the New Mexico Military Institute in Roswell. He finished high school there, graduating with highest honors. It was a challenge at first, he recalled, "but I learned a lot about discipline, leadership and self-reliance. It was one of the best experiences of my life."

It also helped him secure his first internship -- at General Motors in Arlington, Texas -- while he was just a freshman at the

University of Texas. While other students were still acclimating to college life, he was already pursuing his career ambitions.

And he still is. Trillo said his NASA internship was a welcome and rewarding challenge, and reaffirmed his desire to work for the space agency full-time after graduation.

His mentor at the Marshall Center, NASA propulsion systems engineer Nick Case, is confident Trillo can do just that. "I've been very impressed with Jesus's passion, his work ethic and his ability to handle very difficult tasks," Case said. "I expect to hear a lot more about him in the near future, and hopefully he'll help lead us in accomplishing the bold goals NASA is pursuing."

What's Trillo's advice for achieving one's career goals? "Be very, very dedicated in school," he said. "Work as hard as you can, and look for every opportunity."

Even ones waiting halfway around the world.

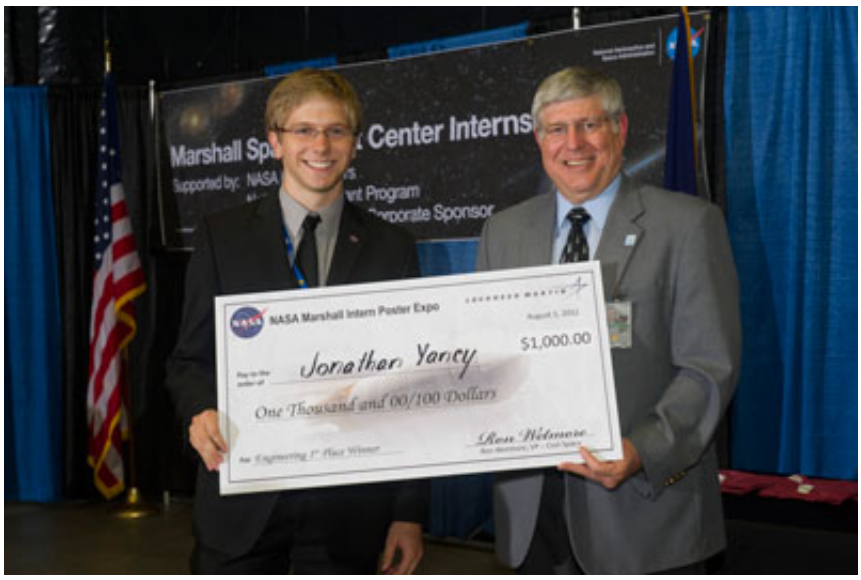
Smith, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.

› Back to Top

Marshall Interns Show Off Their Work During Poster Expo

While a lot of students took a break for summer vacation, many were seen at the Marshall Space Flight Center where they spent the past few months engaging in science, engineering, mathematics and technology, or STEM, research and interactive opportunities. Right, a group of interns joins more than 150 other interns during the Intern Poster Expo on Aug. 1, where they showcased the research work they supported at Marshall over the summer. Marshall's Academic Affairs Office, part of the Office of Human Capital, organizes the event annually and manages the internships. (NASA/MSFC/Emmett Given)

May the best posters win. Left, judges review each presentation by the Marshall summer interns before announcing winners in four categories: engineering, science, design and team. Lockheed Martin of Huntsville, the corporate sponsor for the event, provided the cash prizes. (NASA/MSFC/Emmett Given)



*Taking first place in the engineering category is Jonathan Yancey, left, a chemical engineering student at West Virginia University in Morgantown, for his presentation on the Development of Life Support Adsorption Technologies for Future Exploration Spacecraft. Yancey receives a check from Ron Wetmore, right, vice president of Lockheed Martin Space Systems Company. (NASA/MSFC/Emmett Given)**Taking first place in the engineering category is Jonathan Yancey, left, a chemical engineering student at West Virginia University in Morgantown, for his presentation on the Development of Life Support Adsorption Technologies for Future Exploration Spacecraft. Yancey receives a check from Ron Wetmore, right, vice president of Lockheed Martin Space Systems Company. (NASA/MSFC/Emmett Given)*

First-place winner of the science category is Danielle Gurgew, left, a physics major at Emory University in Atlanta, for her presentation on Experimental Stress Measurements of Nickel Thin Films and Associated X-ray Optic Applications. Wetmore, right, presents a check to Gurgew. (NASA/MSFC/Emmett Given)

The first-place winner of the design category is Luke Peterson, left, an aerospace engineering student at Mississippi State University in Starkville, for his presentation on Coverage Analysis of the Wide Field X-ray Telescope. Wetmore, right, presents a check to Peterson. (NASA/MSFC/Emmett Given)

Placing first in the team category are, from left, Zachary Grunder, Megan Sung, Bryce Schaefer and Vanessa Dorado. Wetmore, right, presents a check to the students. The students' presentation was on Tri-Gas Thruster Performance Characterization. Dorado is a mechanical engineering student at the University of Texas at El Paso. Sung is a mechanical and aerospace engineering student at the University of California, Irvine. Grunder and Schaefer are aerospace engineering students from the University of Colorado Boulder. Learn more about NASA education opportunities, including internships, here. (NASA/MSFC/Emmett Given)

› Back to Top

Marshall to Recognize Outstanding Team Members at Annual Honor Awards Ceremonies Aug. 16

The Marshall Space Flight Center will honor more than 300 employees and contractors during its Annual Honor Awards ceremonies in Morris Auditorium on Aug. 16. Marshall team members are invited to attend.

Awards presentations will be made during two ceremonies -- agency-level honor awards at 10 a.m. and center-level honor awards at 2 p.m. The morning ceremony will recognize those who have made significant achievements to NASA's mission at an agency level. The afternoon ceremony will recognize those who have made outstanding mission contributions to the center.

NASA Acting Associate Administrator Robert Lightfoot will be the keynote speaker and award presenter at both ceremonies.

Announcing the agency-level awards will be Tereasa H. Washington, director of the Office of Human Capital; Todd May, manager of the Space Launch System Program; and Stephen Doering, director of the Office of Center Operations.

The center-level awards will be announced by Kim Whitson, director of the Office of Procurement; Audrey Robinson, chief counsel in the Office of the Chief Counsel; and Paul Gilbert, deputy manager of the Flight Programs & Partnerships Office.

Acting Marshall Director Robin Henderson will host the events, and Nelson Parker, deputy director of the Chief Engineers Office in the Engineering Directorate, will emcee.

For a list of the NASA Honor Awards, click here.
For a list of the Marshall Honor Awards, click here.
To view photos of individual NASA-level recipients, visit here.

› Back to Top

Expedition 27/28 Astronaut Ron Garan Gets Plaque on the Wall at Payload Operations Center

Mark Roberts, right, a data management coordinator with Arcata Associates Inc., in NASA's Payload Operations Center at the Marshall Space Flight Center, hangs the Expedition 27 plaque in the control room in Building 4663. Expedition 27/28 astronaut Ron Garan, left, signed the plaque during his visit to Marshall on Aug. 7. It is a tradition for each mission plaque to be hung by a flight control team member who has made a significant contribution to the success of the expedition. While at Marshall, Garan shared highlights of his 164-day mission aboard the International Space Station from April through September 2011. He also thanked the Payload Operations Center team for its dedication to executing day-to-day research activities on the station. (Emmett Given/MSFC)

› Back to Top

Low-Emission Vehicle Parking Spaces Coming to Marshall

The Marshall Space Flight Center is in the process of designating motorcycle and Low-Emission Vehicle, or LEV, parking spaces. At present, these spaces will be limited to the 4200 and 4600 complexes.

To answer questions about what qualifies for an LEV, please read the following from J.D. Power and Associates.

For Marshall purposes, LEV parking applies only to the following LEV vehicles:

- Advanced Technology Partial Zero Emissions Vehicle, or AT PZEV, compressed natural gas or hybrid vehicles that meet super ultra LEV standards for tailpipe emissions, have a 15-year/150,000-mile warranty, zero evaporative emissions, as well as include advanced technology components.
- Zero-Emissions Vehicle, or ZEV, electric and hydrogen-fuel-cell vehicles that have zero harmful tailpipe emissions, and are 98 percent cleaner than the average new model-year vehicle.

If you are still unsure if your vehicle meets this requirement, contact Michael Bradford at 544-0876.

Marshall team members can visit ExplorNet here to view maps of the new parking spaces.

Find this article at:

http://www.nasa.gov/centers/marshall/about/star/index.html