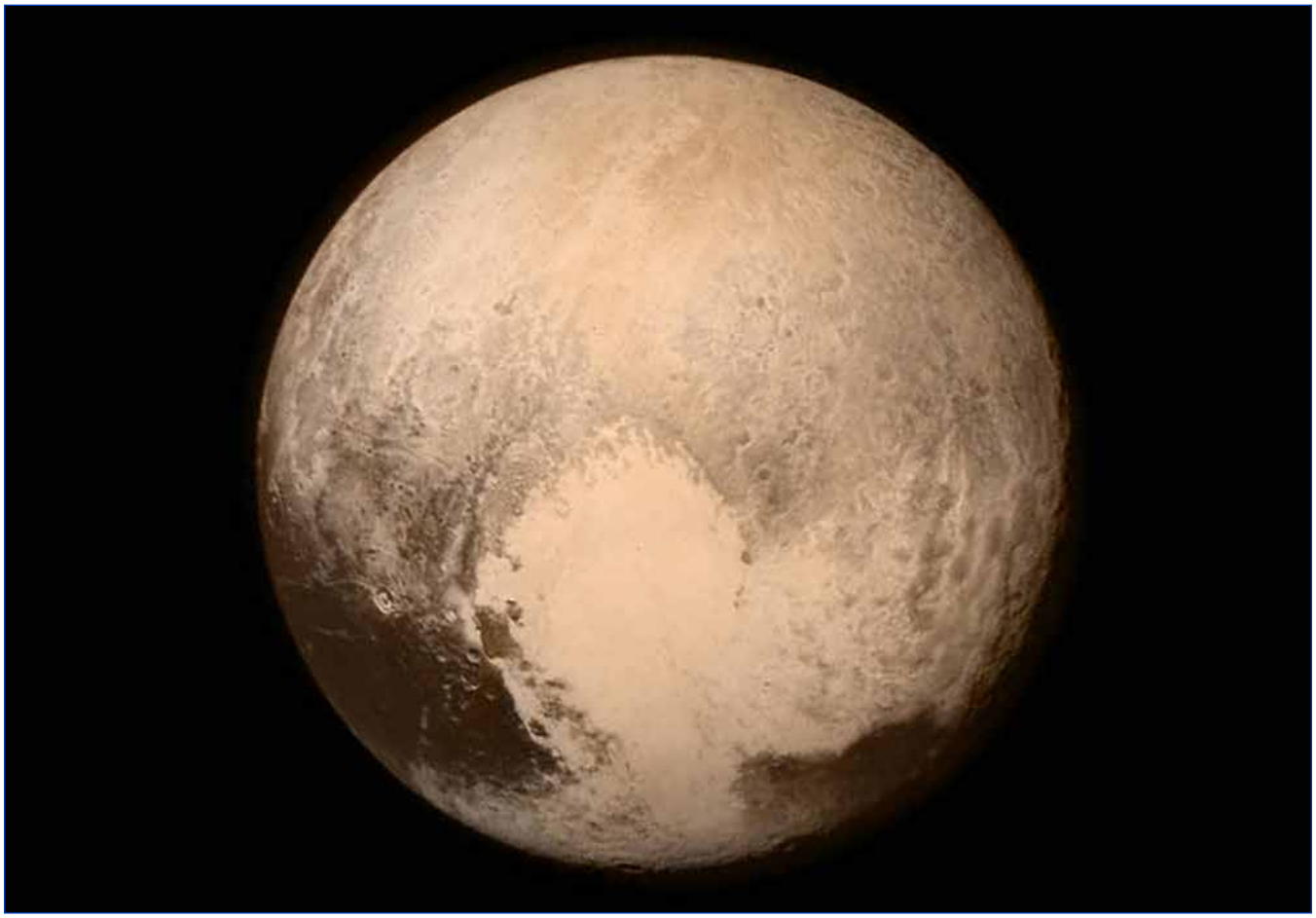
National Aeronautics and Space Administration

LAGNIAPPE

John C. Stennis Space Center

Volume 10 Issue 7 www.nasa.gov/centers/stennis July 2015



NASA's New Horizons reaches Pluto

After a decade-long journey through our solar system, New Horizons made its closest approach to Pluto on July 14, about 7,750 miles above the surface – roughly the same distance from New York to Mumbai, India – making it the first-ever space mission to explore a world so far from Earth.

"I'm delighted at this latest accomplishment by NASA, another first that demonstrates once again how the United States leads the world in space," said John Holdren, assistant to the President for Science and Technology and director of the White House Office of Science and Technology Policy. "New Horizons is the latest in a long line of scientific accomplishments at NASA, including multiple missions orbiting and exploring the surface of Mars in advance of human visits still to come; the remarkable Kepler mission to identify Earth-like planets around stars other than our own; and the DSCOVR satellite that soon will be beaming back images of the whole Earth in near real-time from a vantage point a million miles away. As New Horizons completes its flyby of Pluto and continues deeper into the Kuiper Belt, NASA's multifaceted journey of discovery continues."

"The exploration of Pluto and its moons by New Horizons represents the capstone event to 50 years of planetary exploration by NASA and the United States," said NASA Administrator Charles Bolden. "Once again we have achieved a historic first. The United States is the

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"Everyone at Stennis – regardless of his/her position in the organization – plays a valuable role in our ongoing success."

From the desk of
Jo Ann Larson
Manager, Stennis Office of Diversity and Equal Opportunity

ODEO - It's not just about complaints! Actually, only a small part of what we do in the Office of Diversity and Equal Opportunity involves processing discrimination complaints. Stennis has not had a formal Equal Employment Opportunity (EEO) complaint since fiscal year 2013. This can be attributed to the center's proactive participation in education programs offered by ODEO; to managers and supervisors meeting with employees and addressing their concerns and issues; to a robust anti-harassment program; and to the trust in ODEO by employees who contact us before a concern has escalated.

ODEO has been busy this year, and we are inspired and motivated as we move into the second half of the year! One of the major highlights of the year is the momentum of the Diversity & Inclusion (D&I) Program. Center Director Rick Gilbrech, our D&I champion, serves on the agency Diversity and Inclusion Strategic Partnership (DISP). The DISP continues to play an instrumental role in fully integrating D&I into the culture of Stennis. Deputy Director Jerry Cook continues to chair the Stennis Diversity and Inclusion Board. Three new board members were selected to serve on a stretch assignment and will definitely bring a fresh perspective to the board: NASA employees Michele Campbell, Megan Martinez and Dawn Davis.

Stennis once again received the highest possible ranking in the "Support for Diversity" category in the Employee Viewpoint Survey for 2014. This category measures the extent to which employees believe that actions and policies of leadership and management promote and respect diversity. Congratulations!

ODEO continues to provide oversight to the sitewide Stennis Diversity Council. This past year, we sponsored a multitude of programs, panels, and presentations. One of the highlights was Minnijean Brown Trickey, speaker for the Martin Luther King Jr. Day Program. Trickey was one of the "Little Rock Nine" students who desegregated Little Rock High School in Arkansas in 1957.

Stennis' first Employee Resource Group (ERG), the Extreme Ideas Team, was established this past year. Becoming an ERG allowed the once informal group to become a formal team with a charter, mission and line of communication to senior leadership. Check out their new website by visiting online at: http://ssccommunity.ssc.nasa.gov/ExtremeIdeas/. There is also interest in establishing another ERG focusing on interrelated projects among various employees. More news on this to come!

Equal opportunity, diversity and inclusion are integral to the Stennis culture. ODEO works to ensure that everyone at Stennis – regardless of his/her position in the organization – plays a valuable role in our ongoing success. We are raising the bar to become a model EEO and D&I NASA center and will continue working on ways to increase our diversity and inclusion and to leverage it as a means for innovation and mission success.

Jo Ann

Lagniappe is published monthly by the Office of Communications at NASA's John C. Stennis Space Center.
Access monthly copies at: www.nasa.gov/centers/stennis/news/publications/index.html
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PLUTO

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first nation to reach Pluto, and with this mission has completed the initial survey of our solar system, a remarkable accomplishment that no other nation can match."

Per the plan, the spacecraft was not in contact with flight controllers at the John Hopkins University Applied Physical Laboratory (APL) in Laurel, Md., during the flyby. New horizons "phoned home" later in the evening to begin transmitting status updates and collected data.

The Pluto story began only a generation ago when young Clyde Tombaugh was tasked to look for Planet X, theorized to exist beyond the orbit of Neptune. He discovered a faint point of light that we now see as a complex and fascinating world.

Guests and New Horizons team members countdown to the spacecraft's closest approach to Pluto on July 14.

"Pluto was discovered just 85 years ago by a farmer's son from Kansas, inspired by a visionary from Boston, using a telescope in Flagstaff, Arizona," said John Grunsfeld, associate administrator for NASA's Science Mission Directorate in Washington. "Today, science takes a great leap observing the Pluto system up close and flying into a new frontier that will help us better understand the origins of the solar system."

New Horizons' flyby of the dwarf planet and its five known moons is providing an up-close introduction to the solar system's Kuiper Belt, an outer region populated by icy objects ranging in size from boulders to dwarf planets. Kuiper Belt objects, such as Pluto, preserve evidence about the early formation of the solar system.

New Horizons principal investigator Alan Stern of the Southwest Research Institute (SwRI) in Boulder, Colorado, says the mission now is writing the textbook on Pluto.

"The New Horizons team is proud to have accomplished the first exploration of the Pluto system," Stern said.

"This mission has inspired people across the world with the excitement of exploration and what humankind can achieve."

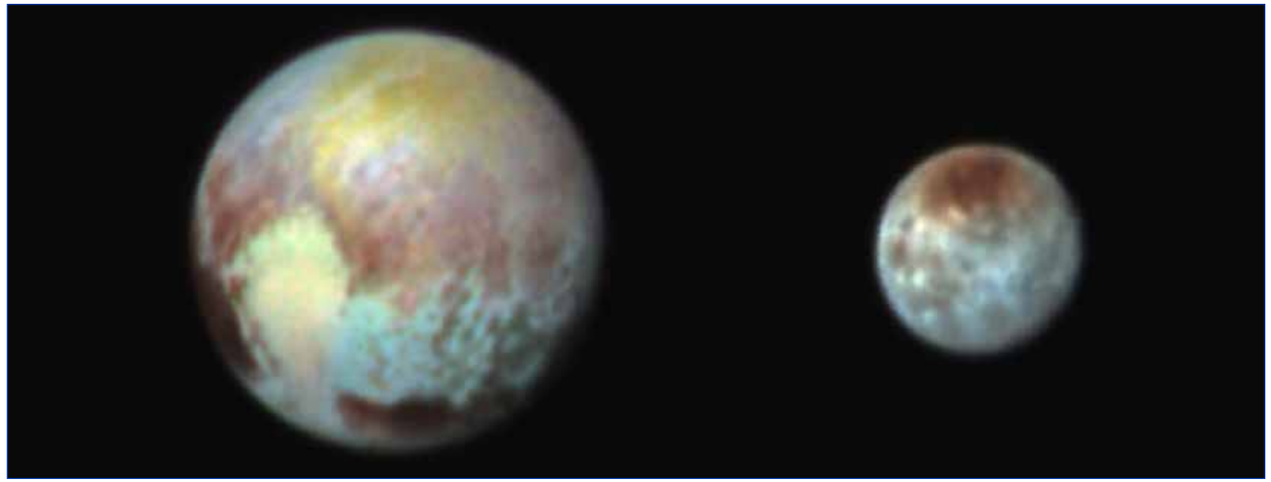
New Horizons' almost 10-year, three-billion-mile journey to closest approach at Pluto took about one minute less than predicted when the craft was launched in January 2006. The spacecraft threaded the needle through a 36-by-57 mile window in space – the equivalent of a commercial airliner arriving no more off target than the width of a tennis ball.

Because New Horizons is the fastest spacecraft ever launched – hurtling through the Pluto system at more than 30,000 mph, a collision with a particle as small as a grain of rice could incapacitate the spacecraft. With its flyby completed, it still will take 16 months for New Horizons to send its cache of data – 10 years' worth – back to Earth.

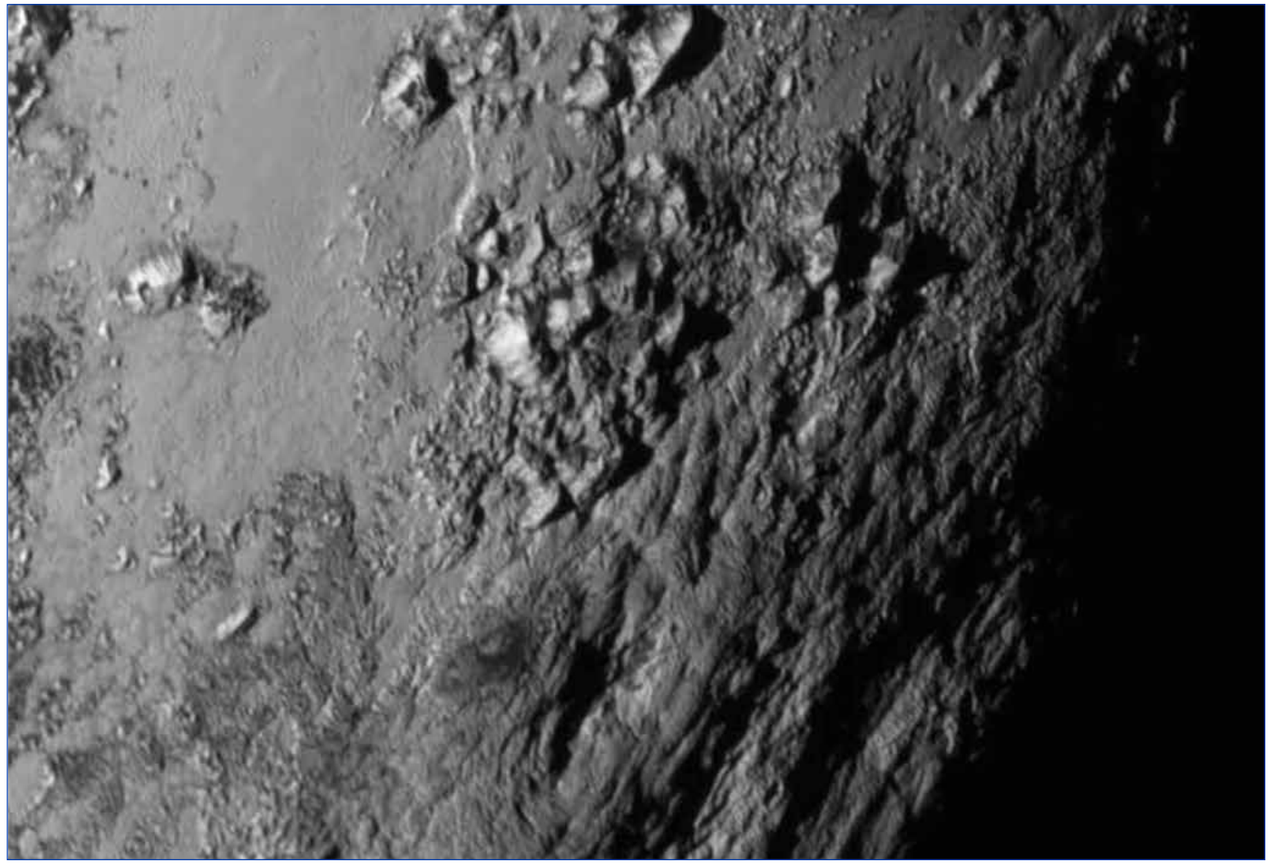
New Horizons is the latest in a long line of scientific accomplishments at NASA, including multiple rovers exploring the surface of Mars, the Cassini spacecraft that has revolutionized our understanding of Saturn and the Hubble Space Telescope, which recently celebrated its 25th anniversary. All of this scientific research and discovery is helping to inform the agency's plan to send American astronauts to Mars in the 2030's.

"After nearly 15 years of planning, building, and flying the New Horizons spacecraft across the solar system, we've reached our goal," said project manager Glen Fountain at APL "The bounty of what we've collected is about to unfold."

Follow the New Horizons mission on Twitter and use the hashtag #PlutoFlyby to join the conversation. Live updates are available on the mission Facebook page. For more information on the New Horizons mission, visit online at : http://www.nasa.gov/newhorizons or http://solarsystem.nasa.gov/planets/plutotoolkit.cfm.



(Top photo) New Horizons has obtained impressive new images of Pluto and its large moon Charon that highlight their compositional diversity.
(Bottom photo) New close-up images of a region near Pluto's equator reveal a giant surprise: a range of youthful mountains.



FULFILLING NASA'S EXPLORATION MISSION

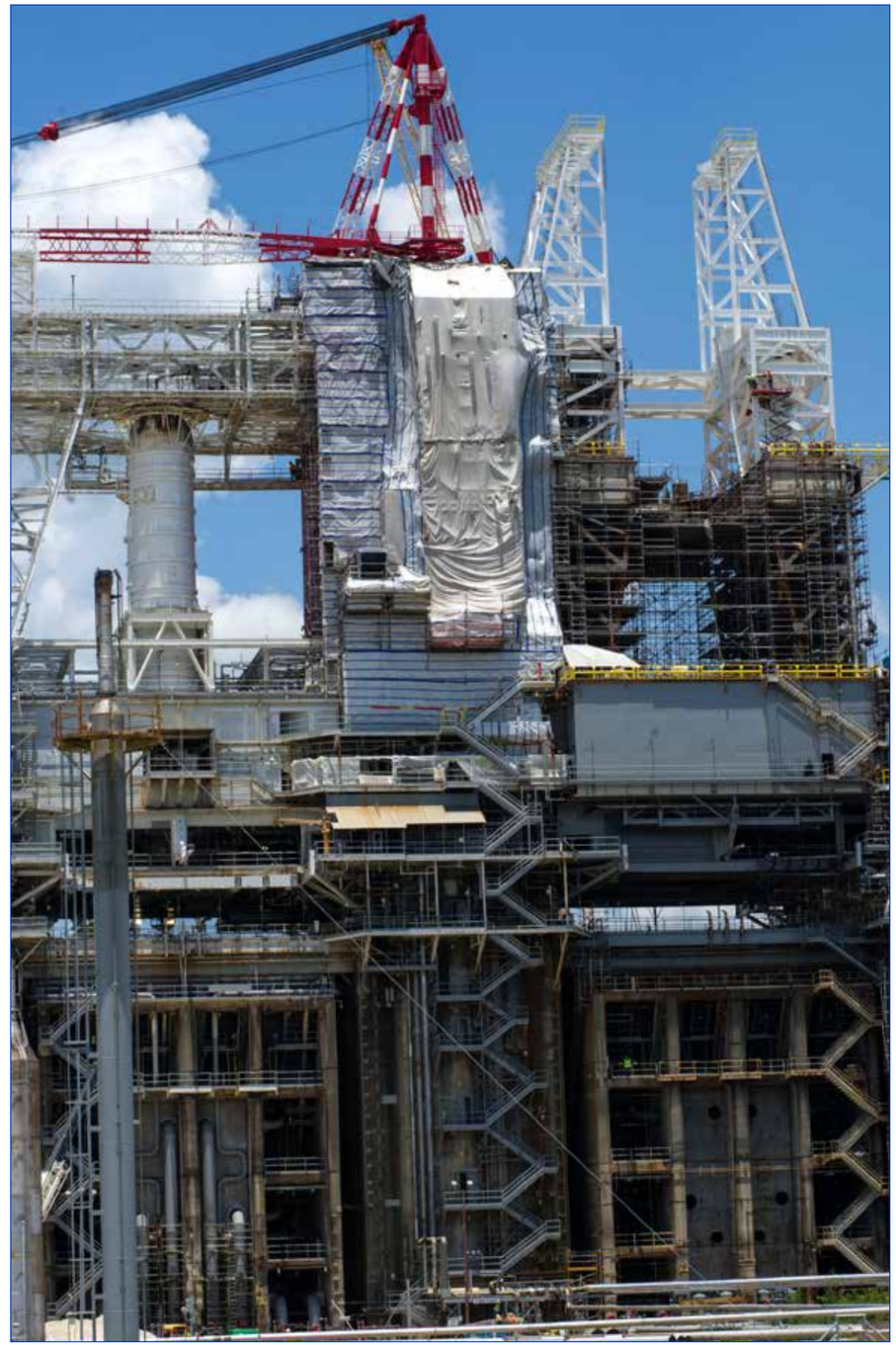
Longest SLS test yet heats up summer sky

South Mississippi was hotter than usual on June 25 when the fire and heat produced by the longest test firing yet of a Space Launch System (SLS) RS-25 rocket engine at Stennis Space Center combined with already climbing summer temperatures. Engineers conducted a 650-second test of a RS-25 developmental engine as part of NASA's preparation for its return to deep-space missions aboard the new Space Launch System rocket. NASA is designing the SLS to carry humans deeper into space than ever before, to such destinations as an asteroid and Mars. The core stage of the new vehicle will be powered by four RS-25 engines, former space shuttles main engines operated at slightly higher power levels to provide the additional thrust needed to power the SLS. The main goal of the series is to test the engine under simulated temperature, pressure and other changes required by the SLS design. The series also supports the development of a new controller, or "brain," for the engine. The controller monitors the engine status and communicates the programmed performance needs.

FULFILLING NASA'S EXPLORATION MISSION

'Higher and higher' – B-2 Test Stand continues its climb into the Stennis sky

The skyline at Stennis Space Center continues to rise as NASA prepares to test the core stage of its new Space Launch System (SLS) on the site's B-2 Test Stand. Lifts of large structural steel sections onto the stand were under way in July to modify the Main Propulsion Test Article (MPTA) framework, which will support the SLS core stage rocket stage for testing. The existing framework was installed on the stand in the late 1970s to test the shuttle MPTA. However, that framework had to be repositioned and modified to accommodate the larger SLS stage. About 1 million pounds of structural steel is being added, extending the framework about 100 feet higher and providing a new look to the Stennis skyline. The new framework is scheduled to be "topped out" by the end of July, marking a major milestone for NASA as it prepares to return to deep-space exploration missions. SLS is being developed to carry humans deeper into space than ever before, to an asteroid and eventually Mars. Stennis will test the actual flight core stage for the first uncrewed SLS mission, scheduled for late 2018.



FULFILLING NASA'S EXPLORATION MISSION

History in the making: Powering RS-25 tests – and spaceflight

Editor's Note: The following is the second in a series of articles highlighting the A-1 Test Stand at Stennis Space Center. The articles focus on aspects of the stand and how they enable rocket engine testing that supports America's human space program. The series is presented as NASA engineers test RS-25 engines on the A-1 stand. The engines will power the core stage of NASA's new Space Launch System, which is being built to carry humans deeper into space than ever before.

When you start your car, chances are you give no thought to the fuel delivery and combustion systems that power the vehicle. Engineers and operators testing RS-25 rocket engines on the A-1 Test Stand at Stennis Space Center do not have that luxury. They have to think a lot about fuel delivery and combustion processes AN AWFUL LOT.

A liquid oxygen tank barge is delivered to a Stennis test stand to support rocket engine testing.

For one thing, they are not dealing with simple gasoline or diesel. The "fuel" for the RS-25 engine is a mix of two cryogenic fluids – liquid hydrogen (LH) and liquid oxygen (LOX). One need only recall the image of a spacecraft riding a pillar of fire into the sky to understand the potential power of mixing the two fluids together.

Liquid hydrogen is the actual fuel. It is a good choice. Remember the atomic table? Hydrogen is the first element because it has the lowest molecular weight of any known substance. It burns with extreme intensity; the thrust exhaust exiting a RS-25 engine reaches temperatures as high as 6,000 degrees Fahrenheit. Combined with an oxidizer, liquid hydrogen also is the most efficient rocket propellant available, providing more thrust per pound of fuel than any other option. In rocket science, this efficiency is referred to as specific impulse.

Liquid oxygen is actually the oxidizer for fuel. Its use represents a key difference between rocket engines and jet engines. Aircraft carry only fuel; oxygen from the atmosphere is sucked into the engine to serve as the oxidizer needed for combustion. Spacecraft must carry their own oxidizer; there is virtually no oxygen available in a space environment.

"The purity standard for liquid hydrogen used in rocket engines is very, very high, much higher than that used by other industries," A-1 Test Director Jeff Henderson explained. "Such a standard is needed to prevent damage to the engine and also to guarantee the level of performance needed. Likewise, the liquid oxygen used is the highest concentration we can get, much higher than the air we breathe every day."

While LH and LOX provide a highly desirable propellant mix, they must be handled with great care. Both are stored at extremely low temperatures – minus 297 degrees Fahrenheit for liquid oxygen and minus 423 degrees Fahrenheit for liquid hydrogen.

Both fluids arrive at Stennis by truck and are stored on barges in well-insulated tanks to prevent evaporation and "boil off" as much as possible. Despite the insulation, about 1 percent of LH is lost each day as the fuel warms slightly and boils off. Because liquid hydrogen cannot be safely introduced into the atmosphere, this boil off is vented and burned. Liquid oxygen that boils off can be safely vented into the atmosphere without burning.

On test day, LH and LOX are supplied to the RS-25 engine via two "run" tanks on the stand – a 110,000-gallon liquid hydrogen tank and a 40,000-gallon liquid oxygen tank. For a typical test, the ratio of the mix is 5.95 parts liquid oxygen to 1 part liquid hydrogen.

At first thought, that ratio and the run tank sizes do not make sense. If six times as much LOX is used as LH, why are the tank sizes not reversed? The difference relates to the atomic table. The ratio is measured by weight, and it takes more of the lighter LH by volume to make a pound than it takes of LOX.

Fully loaded, the A-1 Test Stand run tanks can supply enough LH and LOX for a test of about 350 seconds. However, engines are tested for much longer than that; a RS-25 test at Stennis in June ran for 650 seconds.

To provide the extra LH and LOX, the run tanks are replenished during a test from barges delivered and moored at the stand docks. The process is much more complicated than simply running a supply line from barge to tank. In fact, once LH and LOX reach the test stand, every step related to them is careful and complicated.

From the run tanks, liquid hydrogen and liquid oxygen are flowed to the engine via precisely designed piping. The piping system is built to meet the supply needs of a particular engine. On the A-1 Test Stand, piping used in testing J-2X engines had to be removed and a new system designed and installed especially for the RS-25 engine.

Once installed, cryogenic liquids are run through the lines, providing what is called a "cold shock" to the system. Engineers monitor the system carefully to make sure all lines, fittings, valves and meters will hold and perform as needed under flow conditions.

On test day, cryogenics are flowed again prior to a test to properly "chill" the system and engine in preparation for full-pressure flow and hot fire. On an actual flight, the amount of cryogenics available is limited, so this step must be performed as efficiently as possible. A-1 Test Stand operators simulate the same conditions to collect data on how quickly and efficiently the chill process can be performed. This is not surprising; everything about a test is simulated as close as possible to what will – or could – happen during an actual flight.

The liquid hydrogen (r) and liquid oxygen tanks on the A-1 Test Stand at Stennis.

For the cryogenics, the simulation means maintaining LH and LOX flow and pressure to exact amounts. Each engine test requires varying flow and pressure to collect data on how the engine operates under certain conditions. For instance, requirements for one test called for the rocket engine to be operated at power levels ranging from 80 percent to 109 percent.

Meeting those exact requirements is no small feat, considering the cryogenic temperatures, the extreme flow pressures and the intricate piping system involved. LH enters the piping system at 40 psi pressure and is "spun up" to as much as 6,000 psi pressure for combustion. LOX enters the system at 100 psi and is increased to as much as 7,000 psi for combustion.

The "spin up" process is accomplished via the RS-25 engine's low-pressure and high-pressure turbopumps. NASA reports the RS-25 LH high-pressure pump is so powerful that if it were an electrical generator instead of a pump, it could power all the residential street lights in New York City.

As if these factors are not enough, operators must account for a variety of other conditions affecting flow and pressure, such as run line fluid losses, valve performance, turbopump speed and run tank levels. Every aspect is carefully monitored and controlled. For instance, gaseous nitrogen or gaseous hydrogen is introduced into the top of the run tanks to maintain the needed tank pressure levels (LH and LOX flow from the bottom of the tank). Add in the fact the tanks are also being replenished periodically, and the calculations for maintaining proper pressure at that point alone multiply quickly.

Run tank pressure is just one of many, many calculations that must be made continuously during a test. Test operators collect data on every area; no aspect of engine and test stand performance goes unexamined.

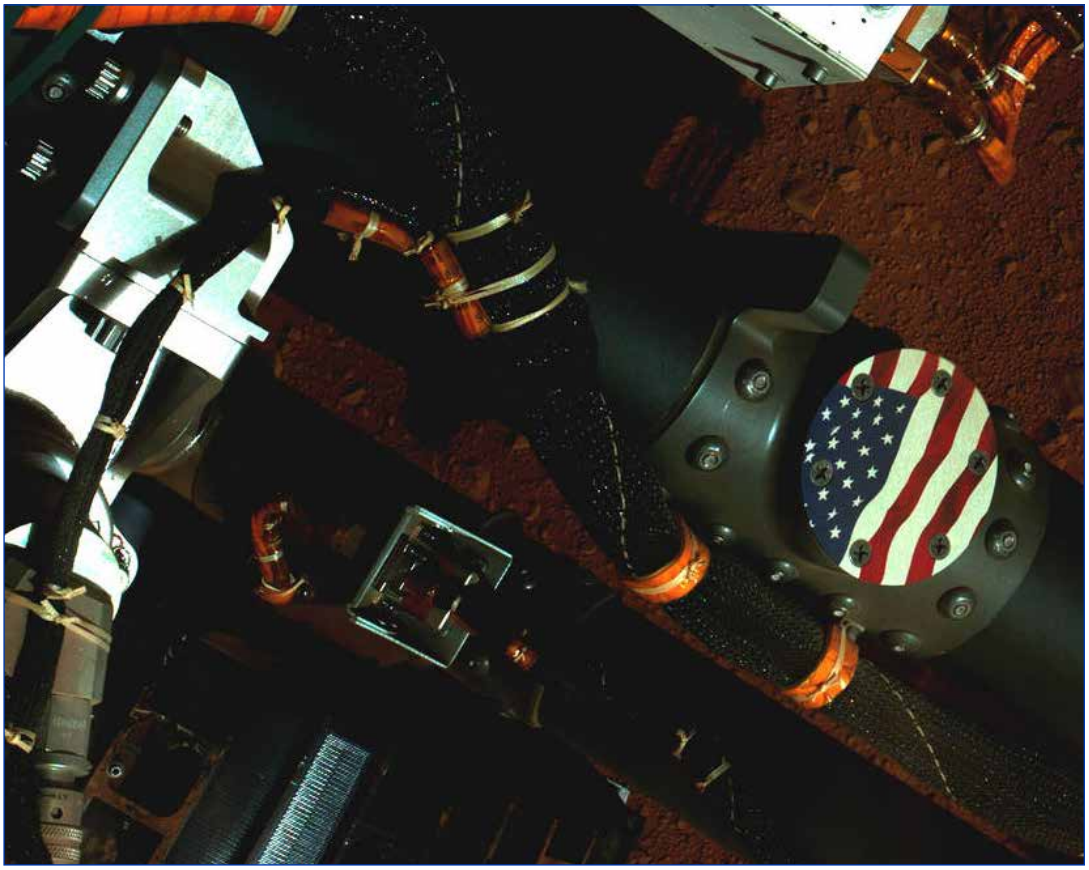
There is a reason it is called rocket science, after all. Nothing can be left to chance, because what is being tested after all is the ability of the rocket engines to carry humans safely to and from space. How much margin of error would you feel comfortable with if you were one of those humans?

"The targets set for things like system pressure and temperature during a test is often plus or minus one point, and we do even better than that," Henderson said. "The test team does an amazing job. They understand the significance of what they're doing, and they're the ones who make a test successful. And that makes spaceflight possible. That's what we do here. We make spaceflight possible."

FULFILLING NASA'S EXPLORATION MISSION

Curiosity's Stars and Stripes

This view of the American flag medallion on NASA's Mars rover Curiosity was taken by the rover's Mars Hand Lens Imager (MAHLI) on Sept. 19, 2012. The flag is one of four "mobility logos" placed on the rover's mobility rocker arms. The circular medallion of the flag is made of anodized aluminum and measures 2.68 inches (68 millimeters) in diameter. The other three medallions adorning the rover's rocker arms are the NASA logo, the Jet Propulsion Laboratory logo and the Curiosity mission logo. Next month, the rover will mark its third year exploring Mars since landing on the planet Aug. 6, 2012.



NASA in the News

Battling wildfires from space – NASA adds to firefighters' toolkit

U.S. firefighters battling wildfires this year will get a clearer view of these threats with new NASA-funded satellite-based tools to better detect fires nationwide and predict their behavior. The new fire detection tool now in operation at the U.S. Department of Agriculture Forest Service uses data from the Suomi National Polar-orbiting Partnership (NPP) satellite to detect smaller fires in more detail than previous space-based products. The high-resolution data have been used with a cutting-edge computer model to predict how a fire will change direction based on weather and land conditions. Active fire maps of the United States are online at: http://activefiremaps.fs.fed.us. For more on NASA Earth science, visit: http://go.nasa.gov/earthbenefits.

Book shows how space station research offers 'benefits for humanity'

A new book from NASA is showing how research aboard the International Space Station helps improve lives on Earth while advancing NASA's ambitious human exploration goals. NASA released "Benefits for Humanity" online in early July. The book highlights benefits in a number of key areas including human health, disaster relief and education programs to inspire future scientists, engineers and space explorers. The ISS is an unprecedented success in global cooperation to build and operate a research platform in space. It has been continuously occupied since November 2000. The new book is available at: http://go.usa.gov/3f3xR. To learn more about the space station, visit: http://SpaceStationResearch.com or http://www.nasa.gov/station.

NASA takes to Kansas skies to study nighttime thunderstorms

NASA has joined a multiagency field campaign studying summer storm systems in the U.S. Great Plains to find out why they often form after the sun goes down instead of during the heat of the day. The Plains Elevated Convection at Night (PECAN) project began June 1 and was set to end in mid-July. Participants from eight research laboratories and 14 universities are collecting storm data to find out how and why they form. "If we can map the water vapor that goes into these storms, we'll be able to improve computer models that represent these conditions and better predict the storms," said Richard Ferrare, a senior research scientist at NASA's Langley Research Center.

Access all NASA news releases online at: http://go.usa.gov/3f3KW.

NASA associate administrator visits Stennis

Steve Jurczyk, associate administrator of NASA's Space Technology Mission Directorate stands beside a RS-25 rocket engine installed on the A-1 Test Stand during a visit to Stennis Space Center on June 17. Jurczyk was guest speaker for the 2015 Honor Awards Ceremony at Stennis and spent the afternoon visiting with senior managers, technology development experts and university and small business representatives. He also toured a Stennis project laboratory.

NASA deputy directors tour Stennis, view test

Stennis Deputy Director Jerry Cook (second from right) hosts deputy directors from several NASA centers during a RS-68 rocket engine test on the B-1 Test Stand on July 9. During a tour of the center, the group visited the A-1 Test Stand, where testing of NASA Space Launch System (SLS) RS-25 engines is under way, and the B-2 Test Stand, which is preparing to test the SLS core stage. Visitors included (l to r): Amy Radford (Langley Research Center), Kirk Shireman (Johnson Space Center), Patrick Stoliker (Armstrong Flight Research Center), Jeff Beyer (Kennedy Space Center), Janet Petro (Kennedy), Clayton Turner (Langley), Cook and Teresa Vanhooser (Marshall Space Flight Center).

Test site makes early impact on community

Note: For more than 50 years, NASA's John C. Stennis Space Center has played a pivotal role in the success of the nation's space program. This month's Lagniappe provides a glimpse into the history of the south Mississippi rocket engine test center.

New names were announced July 1, 1965, for NASA's Marshall Space Flight Center's facilities in Mississippi and Louisiana. NASA Administrator James E. Webb designated the Louisiana plant as the Michoud Assembly Facility and Mississippi's testing installation as the Mississippi Test Facility (MTF). The changes were made to better reflect the missions of the organizations, which were elements of the Marshall Industrial Operations. Previously, the two were known as Michoud Operations and Mississippi Test Operations.

A few days later, on the evening of July 11, two 135-foot-long barges passed through the navigation lock of the MTF. They were the first major vessels to transit the lock since June 28 when a Saturn V second stage simulator fixture arrived. The converted U.S. Army barges, under tow of the tug "Sipsey," arrived via the Mississippi Sound and the East Pearl River from Pascagoula, where the tanks were fabricated and installed by the Chicago Bridge and Iron Co. under a NASA contract.

In 1965, there were 250 contractors involved in the construction and activation of MTF.

The barges, equipped with an insulated vacuum tank of stainless steel for the transport of liquid hydrogen at super-cold temperatures, were moved to the cryogenics dock and storage area. They were acceptance checked, cleaned and prepared for use in transporting fuels to the site for testing rocket stages and engines. The barges and tug were lifted about 13 feet in the lock to the higher elevation of the canal system in the test site.

As the test site entered its final phase of construction 50 years ago, the Laboratory and Engineering Complex was near completion and the Central Control Building, the nerve center of the site, was soon to be occupied. Employment at the facility surpassed 5,000 about 26 months after the first tree was cut. In a July 15, 1965, speech titled, "Economic Impact of the MTF," an unknown noted speaker, representing NASA and the private industries at MTF, told the Jaycee Coast Council in Biloxi:

The Mississippi Test Facility has already had a profound impact, economic and otherwise, on the state of Mississippi. The full effect will not be felt until full operational status is achieved in late 1966.

For instance, there are 30 prime contractors and 250 subcontractors now working at the site whose 3,000 employees receive an annual payroll of $27,300,000. These contractors are not only using predominately local labor, they are also buying Mississippi products such as concrete, pipe, plywood, paint, aggregates and metals. Over $5 million worth of materials have been bought from Mississippi suppliers since the project began. Goods and services worth an estimated $6,258,000 will be bought in Mississippi this year.

During the construction phase, there are several hundred government personnel at the site with NASA and the U.S. Army Corps of Engineers. These have an annual payroll of $2,266,700. The approximately 2,200 employees of General Electric, our support contractor, of GE subcontractors and of the Boeing Company and North American Aviation, the stage contractors, now engaged in activation and operational tasks at MTF earn salaries and wages of over $16 million annually. Some 71 percent of the permanent employees live in Mississippi, the great majority in this area from Biloxi to Picayune.

We are proud that men and women graduates of 11 Mississippi colleges and universities are working at MTF. Here are some of the types: secretaries, draftsmen, test support technicians, financial analysts, engineering designers, clerk typists, personnel specialists, electrical technicians, engineers and mathematicians. The need for these and similar skills will continue.

Employees at MTF, both old and new residents of South Mississippi, are making active and, in many cases, leading contributions to their growing communities.

Office of Diversity and Equal Opportunity

Countering unconscious bias key to diversity

The following article was provided by Michele Beisler, an engineer in the Rocket Propulsion Test Program office and a certified coach for NASA.

What is unconscious bias? Biases are unconscious drivers that influence how we see the world. They are created and reinforced by our experiences, culture, and lifestyles. Bias exists everywhere and is a normal part of human behavior. They are mental shortcuts that help us make quick, efficient judgments and decisions with minimal effort. Biases help us use previous knowledge to form new decisions, but they can also hinder by making us blind to new information or keeping us from considering a broad range of options when making important decisions.

Diversity and equality are worthy goals but can be challenging to achieve when unconscious bias is so pervasive in the workplace. We all have different views and unique ways of navigating our environments, and our biases can come up unexpectedly at any moment towards anyone or anything. Examples that can trigger bias are age, gender, race, religion, sexual orientation, disability, education level, other organizations, center cultures and even contractor-versus-government employee status. What can be done to counter a bias we often do not even realize exists?

Make the unconscious conscious. In a May 2014 NeuroLeadership Journal article titled, *"Breaking Bias,"* authors Matthew Lieberman, David Rock and Christine Cox present a detailed framework that lays out three steps organizations can follow to "break bias." For more information, download the entire article online at: www.scn.ucla.edu/pdf/Lieberman(2014)NLI.pdf.

Step 1: Accept that we are biased. The journey to overcoming bias begins by accepting that we all have biases. Challenging our unconscious biases is difficult, because our biases make us feel right, which is why we are motivated to overlook our own biases and the errors we make.

Step 2: Label. There are four major types of biases the authors identified that affect major business decisions. They have developed the **COST^{tm} Model of Bias** for an easy-to-remember framework. Each category has defining features as well as category-specific mitigation strategies that can be applied to reduce the effect of the bias:

- **Corner-Cutting** – Mental shortcuts that help us make quick and efficient decisions.
- **Objectivism** – The implicit belief that our perceptions, beliefs, and experiences are objectively true.
- **Self-Protection** – We are motivated to feel good about ourselves and the group(s) we belong to, so we may believe that we are better than average or act more favorably to those who are more similar to us.
- **Time and Money** – We are more driven by negative than by positive, and we value things that are closer to us in space and time than those that are farther away.

Step 3: Mitigate. Each major type of bias has mitigation strategies designed to address the effects of these biases by targeting the root cause:

- **Corner-Cutting Biases** – Increase motivation to engage mental effort and consider all information.
- **Objectivism Biases** – Request objective, outside opinions from others.
- **Self-Protection Biases** – Reduce self-defensiveness through thinking of shared goals and values.
- **Time and Money Biases** – Make decisions less attached to the self by imagining that you are making the decision for someone else.

Biases are a significant issue in organizations. Creating a diverse workplace is essential to achieve our challenging mission at NASA. Tackling unconscious bias at work is just one piece of making NASA a diverse workplace.

The RPT Program is built upon several not-so-obvious levels of diversity to help align individual centers' interests with NASA's overall mission and objectives. These levels of diversity include representatives from multiple test centers, including those with competing interests and those not tied to the RPT budget, collaborating with the Department of Defense test sites through the National Rocket Propulsion Test Alliance, as well as working with commercial customers who may have different points of view than government programs.

Hail & Farewell

NASA bids farewell to the following:

Robert Reis	AST, Electrical Experimental Equipment	Engineering and Test Directorate
Kenneth Kimbrough	Contract Specialist	Office of Procurement

And welcomes the following:

Glen Guzik	AST, Mechanical Experimental Equipment	Engineering and Test Directorate

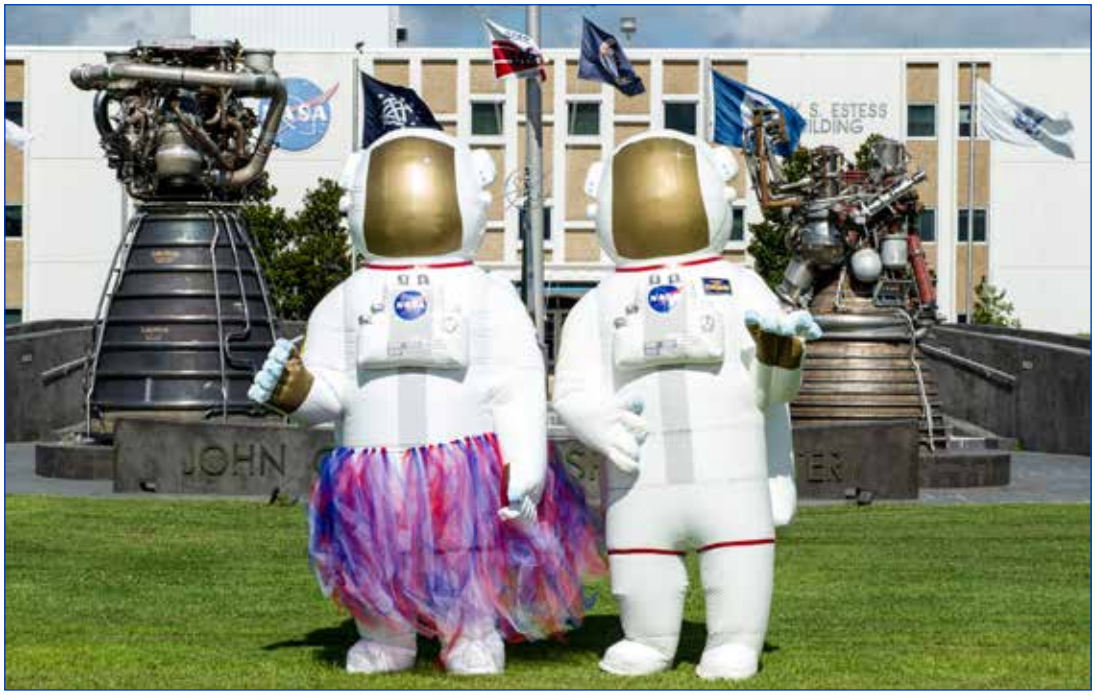
NASA Week in NOLA

Stennis hosts variety of activities in conjunction with 2015 New Orleans Essence Music Festival

Stennis Space Center, in conjunction with other NASA centers, hosted a variety of outreach and education activities during the recent New Orleans Essence Music Festival in early July. Activities were conducted June 30 through July 5. Offerings included displays and information on a variety of space topics at the Morial Convention Center, site of daily Essence Fest activities; a NASA Night film viewing at the Entergy IMAX Theatre; hands-on exhibits at the Audubon Aquarium of the Americas; a photo-and-autograph session with astronaut Stephanie Wilson; workshop presentations for 4th-8th grade educators; and NASA's *Journey to Tomorrow* traveling exhibit, a 53-foot-long trailer exhibit featuring hands-on activities and digital learning stations, at the Audubon Zoo.

Stennis introduces new mascot

Stennis Space Center introduced a new inflatable astronaut mascot during activities at the New Orleans Essence Music Festival on June 30. In this photo, Starla (l) is shown in front of the Roy S. Estess Building at Stennis Space Center with her brother and co-mascot Orbie. During Essence Fest activities, Stennis recognized the Jennifer Bourgeois family of Louisiana for submitting the Starla name during a recent naming competition.



Haise visits with NASA leadership participants

Apollo 13 astronaut Fred Haise (seated, center) joined Stennis Associate Director Ken Human (seated, right) and NASA engineer John Stealey (seated, left) on June 25 to present lessons learned from Apollo and Space Shuttle programs to NASA leadership program participants. They included members of NASA's Mid-Level Leader Program and Stennis' Foundations of Influence, Relationships, Success and Teamwork group.

Leaders lunch with interns

Stennis Director Rick Gilbrech (seated, center), Stennis Engineering and Test Directorate Director Randy Galloway (seated, right) and Stennis Chief Counsel Monica Ceruti (seated, left) held a brown-bag-lunch session with Stennis summer interns on July 9. Stennis annually hosts interns through a variety of NASA programs.

Community college students attend STEM workshop

Educators at Stennis Space Center recently hosted 38 community college students for a three-day workshop focused on promoting STEM (science, technology, engineering and mathematics) education.

Stennis and other NASA center education specialists conducted the May 17-19 workshop at INFINITY Science Center. Participants were community college students interested in pursuing a NASA-related STEM career. Students achieved a 70 percent or higher score on an online NASA Community College Aerospace Scholars Program session to qualify for the workshop.

Once at Stennis, students worked in teams to create a fictitious company competing to win a NASA contract for the next Mars mission. Students worked side-by-side with mentor-engineers to compete in an engineering design challenge to build, program and operate a LEGO® MINDSTORMS™ NXT robot. Teams also developed a presentation to showcase the team's work and to keep in contact by social media.

A special workshop presentation was provided by Apollo 13 astronaut Fred Haise, a Biloxi native. Several NASA engineers and a former intern spoke to students to motivate and encourage them to pursue STEM-related careers.

(Top right photo) Apollo 13 astronaut Fred Haise talks about his mission experience during a Stennis-hosted workshop for community college students interested in STEM careers.

(Bottom right photo) Participating students earned the privilege of attending the workshop through scores on a NASA online scholars program.

Stennis hosts equipping workshops for area educators

Stennis education specialists hosted a pair of recent workshops for area educators, focused on equipping teachers for classroom presentations.

Education specialists conducted a two-day NASA Beginning Engineering, Science and Technology (BEST) workshop June 10-11 for 11 kindergarten-through-sixth-grade educators. The workshop focused on engineering design projects using BEST materials and curriculum. Educators used scientific facts to solve real-life problems. Hands-on activities included designing, building and launching a satellite and egg vehicle, as well as programming a human robot for a mock space challenge.

Stennis specialists, a pre-college lead from NASA's Armstrong Flight Research Center in Palmdale, Calif., and a faculty member from California State College-Bakersfield conducted a two-day Weather Academy on June 16-17.

Twenty-one educators for grades 4-12 were introduced to engineering design process and computer programming. The workshop explored NASA's role in understanding and forecasting of weather, climate, climate changes and their effects on Earth's systems. Educators participated in classroom hands-on activities and learning strategies.

Workshop presenters included two members of the U.S. Air Force Reserve "Hurricane Hunters" team, who shared their experiences in the study of hurricanes and other major storms. A distance-learning session was held by a NASA Hurricane and Severe Storm Sentinel (HS3) scientist to examine HS3-related science questions, including how storms form, what causes rapid changes in storm intensity and how much intensity change is controlled by the environment versus internal processes. A grant writing presentation was delivered, as well as information on learning tools in support of NASA STEM curricula.