



Marshall Star, December 5, 2012 Edition

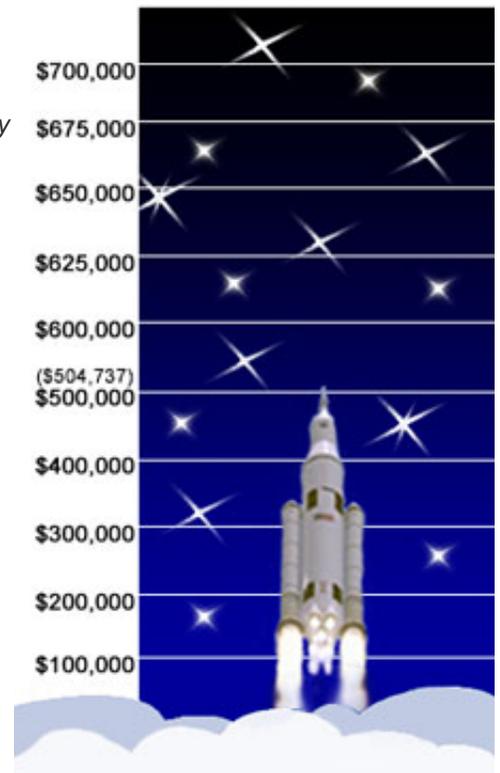
MARSHALL STAR

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Deadline is Quickly Approaching -- Only 10 More Days to Donate to CFC!

The Marshall Space Flight Center's 2012 Combined Federal Campaign runs through Dec. 15. So far, Marshall's workforce has contributed \$504,737 toward the center's \$700,000 goal. To donate, or to browse a comprehensive list of qualified charitable organizations, visit [here](#). Contractor team members also may make a one-time donation through their CFC organization leads or assigned monitors. For a complete list of organization leads, visit the CFC ExplorNet [page](#).



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CFC-Funded Organizations Supported Daughter of Marshall Employee throughout Medical Battle

By Megan Davidson



Micah Scott loved life -- and from the day she was born, she fought hard for it.

Image left: Micah Scott, daughter of Amanda and Jason Scott, the technical authority for facilities life safety in the Marshall Space Flight Center's Industrial Safety Office, was helped by many Combined Federal Campaign-funded organizations before she passed away in May 2011 at 11 years old. (Photo courtesy)

Four hours after her delivery April 24, 2000, at St. Vincent's Hospital in Birmingham, Micah -- daughter of Jason and Amanda Scott -- began to have breathing issues and was taken to the hospital's Neonatal Intensive Care Unit. She was put on a ventilator, and at just 8 days old, Micah underwent a slide tracheoplasty -- a surgery to enlarge her airway.

"Tests showed that her windpipe narrowed to under 2 millimeters in diameter for just over 2 centimeters. That is more or less like poking a hole in a sheet of paper with a straight pin," said her father, Jason Scott, the technical authority for facilities life safety in the Marshall Space Flight Center's Industrial Safety Office. "Micah was the youngest child ever to

survive that surgery. There's even an academic paper written about her experience. When we left the NICU a month later, the staff told us they never thought we'd be leaving with our baby."

The surgery was just one of the many health challenges Micah faced throughout her life. When she was born, although her initial Apgar score -- a test designed to quickly evaluate a newborn's physical condition -- was good, said her father, her parents knew something was wrong with her. "Micah just looked different. She had some malformations, like contractures of her fingers. We knew she probably had a disability of some kind from the start. We just didn't know what it was."

Through extensive testing, Micah was diagnosed with Partial Trisomy 16 q+, a rare condition in which extra genetic material on the long arm of the 16th chromosome is in every single cell in her body. The condition caused her to have significant speech and physical developmental delays. "Micah didn't walk until she was 4 years old, and she was nonverbal," said Scott. "She had trouble using a communication device, but she was good at using nonverbal communication to express herself."

"Her doctors kept telling us time and time again that we may not have her another year because of her genetic condition, or that she could eventually be in a vegetative state," Scott recalled. "The survival age for a child with her condition was maybe 6 years old, but Micah just kept going. She eventually went to school, and even spent time in a regular classroom. She loved to be rocked and to swing, and listen to stories. She was a happy, loving child."

To give her the best quality of life and medical care possible, the Scott family sought support from several CFC-funded organizations.

"Children's Hospital of Alabama and Huntsville Hospital were a huge help to us -- we were at both places quite a bit for different medical issues with Micah," said Scott. "We went to a number of clinics at Children's Hospital and met with great neurologists, vision specialists, and ear, nose and throat specialists. We were able to get a lot of questions answered, and through that, Micah was able to get on different medications that helped her tremendously with some of the issues she was experiencing." Children's Hospital also was where Micah was first diagnosed with cyclic vomiting syndrome, characterized by episodes or cycles of severe nausea and vomiting that last for hours, or even days.



Since the family had to frequently travel to Birmingham to Children's Hospital, another CFC-funded organization, Ronald McDonald House Charities of Alabama, provided the Scotts a place to stay on several occasions. "Families that are going through these types of issues are under incredible amounts of stress," said Scott. "For these organizations to step in and alleviate some of that stress is a very good, needed thing when your child is sick."

In February 2011, the Huntsville Tennessee Valley Friends AMBUCS -- a nonprofit organization that reaches out to children, wounded warriors and other adults who are unable to ride a regular bike -- gave Micah an AmTryke. Designed to address the needs of children with disabilities, the bike may be "peddled" by using hands and/or feet, and can be adapted in many ways for a child's specific needs. "I never would have thought my daughter could ride a bike," said Scott. "She loved it."

Just three months after receiving her bike, Micah passed away from complications stemming from cyclic vomiting syndrome. She was 11 years old.

The family gave her bike back to the AMBUCS organization with the hope that another child could enjoy it as much as Micah did. And in loving memory of his daughter, Scott volunteered in October at AMBUCS to help assemble AmTrykes -- part of Marshall's Combined Federal Campaign Community Service Days. "It was a very emotional experience for me," Scott said.

"I'm glad I got to be a part of something that brought my daughter so much joy."

"The 11 years we had with Micah weren't promised," Scott said. "We are thankful for those years, and for the Combined Federal Campaign, and all the organizations that helped us throughout our daughter's life."

"Our lives have been richly blessed because she was here."

The CFC campaign runs through Dec. 15. To make a CFC donation to the Huntsville Hospital Foundation, CFC number 61562; Children's Hospital of Alabama, CFC number 70270; Huntsville Tennessee Valley Friends AMBUCS, CFC number 96549; Ronald McDonald House Charities of Alabama, CFC number 55099; or other charitable organizations, visit [here](#).

Davidson, an Analytical Services Inc. employee, supports the Office of Strategic Analysis & Communications.

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NASA Administrator, NASA Advisory Council Visit North Alabama



NASA Administrator Charles Bolden, left, joined Marshall Center Director Patrick Scheuermann Nov. 28 for an all-hands meeting with members of the Marshall Center workforce. Marshall team members filled Morris Auditorium in Building 4200 to listen; many more tuned in to watch on the center's desktop-TV system. Bolden also toured the [United Launch Alliance](#) facilities in Decatur -- where Atlas and Delta rockets that carry NASA satellites and other payloads to space are built -- and participated in meetings of the [NASA Advisory Council](#), which met at Marshall Nov. 28-30. (NASA/MSFC/Fred Deaton)

From left, members of the NASA Advisory Council -- council chairman Dr. Steven Squyres, Robert Hanisee, Dr. William Ballhaus and Richard Kohrs -- learn about Marshall's [Hardware-in-the-Loop Simulation Laboratory](#) from Lisa Bates, center, vector control systems integration branch chief in the Engineering Directorate's Propulsion Systems Department, and Jodi Singer, right, deputy manager of the [Space Launch System Program](#) at Marshall. The council toured the facility in Building 4205 to see where engineers are developing and testing avionics hardware for NASA's Space Launch System -- the nation's next heavy-lift launch vehicle set to take explorers to new destinations beyond Earth orbit. The Nov. 28 tour was part of a three-day visit by the council to see firsthand the vital work



Marshall is undertaking for the nation's space program. (NASA/MSFC/Emmett Given)



NASA Administrator Charles Bolden addresses United Launch Alliance workers at the company's Decatur production facility. Bolden toured the site Nov. 28, met with ULA President and CEO Michael Gass and held a town hall session to thank team members for their work to deliver Atlas and Delta rockets crucial to NASA's continuing mission in space. Bolden wrote about the visit in [his blog](#). (MSFC/Fred Deaton)

William Gerstenmaier, associate administrator for the [Human Exploration and Operations Directorate](#) at NASA Headquarters, addresses the NASA Advisory Council during its Marshall Center visit Nov. 28. Gerstenmaier spoke about NASA's plans for future [human spaceflight](#) -- the agency's core mission for which the Marshall Center plays [a number of vital roles](#). (NASA/MSFC/Emmett Given)



From left, NASA Advisory Council members Dr. Larry Smarr, Robert Hanisee and Dr. William Ballhaus, receive a tour of the [Environmental Control and Life Support System](#), or ECLSS, test facilities in Building 4755 from ECLSS Branch Chief Bob Bagdikian, right. With NASA's commitment to enhance and extend the life of the International Space Station to at least 2020 and beyond, ECLSS work remains critical to help provide fresh air and potable water for the station crew, reducing their reliance on supplies from Earth. The ECLSS team also is looking [beyond low Earth orbit](#), developing new life support and air and water recirculation/recycling systems to support a

Teresa Vanhooser Named Marshall Center Deputy Director

NASA news release

Teresa Vanhooser has been appointed deputy director of the Marshall Space Flight Center.



Teresa Vanhooser (NASA/MSFC)

In her new position, Vanhooser will work with Marshall Center Director Patrick Scheuermann to manage the center, helping to oversee a broad range of propulsion, scientific and space transportation activities which contribute to the nation's space program.

"I look forward to Teresa Vanhooser helping me lead the Marshall Center into NASA's next era of exploration and discovery," Scheuermann said. "Over the course of her career, she has led, managed and supported projects and programs that span the breadth of Marshall's mission: space systems, propulsion systems, flight hardware, science and engineering.

"Teresa remains a tireless champion of the agency's goals and the nation's interests," he added. "I'm extremely proud to call on her to serve Marshall and

NASA in this critical post."

Vanhooser previously was manager of the Marshall Center's Flight Programs & Partnerships Office from 2011 to 2012, leading implementation of the center's human exploration projects and tasks; flight mission programs and projects; and external partnerships.

She was appointed in 2000 to the Senior Executive Service, the personnel system that covers most of the top managerial, supervisory and policy positions in the executive branch of the federal government.

From 2007 to 2011, Vanhooser served as deputy manager, acting manager and manager of Ares Projects -- the launch vehicle development effort at Marshall which laid the foundation for development of NASA's Space Launch System, the heavy-lift launch vehicle set to carry human explorers to new destinations beyond Earth orbit.

From 2004 to 2007, she was co-deputy director of the Engineering Directorate at Marshall, overseeing design, testing, evaluation and operation of hardware and software associated with space transportation, spacecraft systems and science instruments and payloads at the center.

Vanhooser was deputy director of the Flight Projects Directorate in 2004. She was responsible for project management, design, development, integration, testing and operations of ground and flight systems for the International Space Station, and oversaw operations of the Chandra X-ray Observatory -- the world's most powerful X-ray telescope.

From 2000 to 2004, she was manager of the Payload Operations and Integration Department, overseeing all space station science research experiment operations, payload training and safety programs for the station crew and ground support personnel.

As manager of the Space Station Utilization Office from 1997 to 2000, she oversaw development and integration of the space station ExPRESS racks, formally named the "Expedite the Processing of Experiments to the Space Station." From 1994 to 1997, she was manager of the Microgravity Science Laboratory-1 mission, in which 29 experiments were performed

in a Spacelab module on the space shuttle. She was assistant mission manager from 1987 to 1994 of the first ATLAS mission, and later managed ATLAS-2 -- the shuttle-borne, remote-sensing laboratory that studied our atmosphere and the sun-Earth connection.

Vanhooser began her NASA career at Marshall in 1980 as an engineer in the Ground Systems Analysis Branch, where she led development and documentation of requirements for integration and testing of payloads for the Spacelab carrier, used to conduct science experiments in the shuttle's payload bay.

A native of Johnson City, Tenn., she earned a bachelor's degree in industrial engineering from Tennessee Technological University in Cookeville in 1980, and a master's degree in administrative science, with an emphasis on project management, from the University of Alabama in Huntsville in 1986.

Vanhooser has received numerous NASA awards, including a NASA Outstanding Leadership Medal in 2011 for her leadership during the transition of the Ares launch vehicle development effort; a Presidential Rank Award for Meritorious Executives -- the highest honor for career federal employees -- in 2006; and a NASA Exceptional Achievement Medal in 1994 for her management of ATLAS-2. In 1992, she was presented a Silver Snoopy award by the Astronaut Corps for her support of ATLAS-1. In 2007, she was presented the Engineer of Distinction Award -- the highest award offered to alumni from the College of Engineering at Tennessee Technological University.

She and her husband Mike reside in Madison, Ala. They have two adult children, Heather and Holly, who reside in Nashville, Tenn., and Auburn, Ala., respectively.

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J-2X: Back in the Saddle Again



A J-2X power pack assembly burns brightly during a hot fire test Nov. 27 at the Stennis Space Center. Engineers pulled the assembly from the test stand in September to install additional instrumentation in the fuel turbopump. The test, which ran for 278 seconds, verified the newly installed strain gauges designed to measure the turbine structural strain when the turbopump is spinning at high speeds that vary between 25,000 and 30,000 rotations-per-minute. The J-2X engine -- built by Pratt & Whitney Rocketdyne of Canoga Park, Calif. -- will power the upper stage of NASA's Space Launch System, managed at the Marshall Space Flight

Center. The new heavy-lift rocket system will launch the Orion spacecraft and enable humans to explore new destinations beyond low Earth orbit. (NASA/SSC)

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SLS Model 'Flies' Through Langley Wind Tunnel Testing

NASA news release

At NASA facilities around the country, engineers are developing America's first exploration-class rocket since the Saturn V launched astronauts to the moon. The Space Launch System, or SLS, managed by the Marshall Space Flight Center, will provide an entirely new capability for science and human exploration beyond Earth's orbit to destinations such as an asteroid and eventually Mars.

Image right: NASA's Space Launch System buffet model in the Langley Research Center's Transonic Dynamics Tunnel. The SLS is America's next heavy-lift launch vehicle that will provide an entirely new capability for science and human exploration beyond Earth's orbit. (NASA/LaRC)



To enable some of these new capabilities, members of the Aeroelasticity Branch of the Langley Research Center tested a 10-foot-long buffet model of the Space Launch System in Langley's Transonic Dynamics Tunnel, or TDT.

"This is a critical milestone for the design of the vehicle," said Langley engineer Dave Piatak.

Data retrieved will help prepare SLS for its first mission in 2017, Exploration Mission-1, or EM-1, which will deliver an uncrewed Orion spacecraft to lunar orbit to check out the vehicle's systems.

But before SLS's first flight, the safety vehicle must be demonstrated through analysis and testing. An important step in ensuring a safe flight to orbit is buffet wind tunnel testing to help determine launch vehicle structural margins.

To do this, a wind-tunnel model is put through its paces at transonic and low supersonic speeds reaching up to Mach 1.2. Testing aerodynamics at these speeds is essential to understanding the structural interaction to the flow field around the vehicle and determining loads on the flight vehicle.

"The test includes the largest integrated vehicle model to be tested in a wind tunnel for SLS," said John Blevins, SLS lead engineer for aerodynamics and acoustics. "It will simulate the environment of transonic flight that the SLS rocket will navigate during its flight. The Transonic Dynamics Tunnel at Langley affords a unique simulation capability among national facilities."



The amount of data acquired from the SLS model is enormous. To be exact, 360 miniature, unsteady pressure transducers on the model's surface are measured using a data acquisition system scanning at 13,000 scans-per-second.

Image left: Members of the Aeroelasticity Branch of the Langley Research Center who tested the 10-foot-long buffet model of the Space Launch System in Langley's Transonic Dynamics Tunnel. (NASA/LaRC)

That's a lot of scans.

These transducers are like tiny microphones, which allow engineers to measure the unsteady flow that exposes the vehicle to rapidly changing forces during its flight through the atmosphere.

Unlike the rigid SLS buffet wind-tunnel model, the real launch vehicle is quite flexible. The rocket will bend and shake in response to forces during flight, and engineers use tests like this to determine that the resulting bending loads and vibrations are within the launch vehicle's safe limits.

They will use the data from this test to determine the structural safety margins of the vehicle. Buffet forces measured during wind tunnel testing will be applied to a computational structural model of the launch vehicle to determine what kind of bending forces and accelerations the vehicle can handle.

"A structural dynamic analysis will predict the response of the launch vehicle due to dynamic events such as liftoff, buffet, wind gusts at high altitudes, staging, and engine start up and shut down," Piatak explained. "It is an important process for ensuring a safe flight for not only the launch vehicle but also any payload that it carries to orbit."

Once the data is retrieved and analyzed, NASA engineers can refine the design of the SLS vehicle using the buffet model before the full-size rocket is built for flight tests. After completing EM-1, SLS will perform its second mission in 2021, Exploration Mission-2, launching Orion with its first crew of astronauts to demonstrate orbit around the moon.

"This is the greatest job," Piatak said. "To be working on rockets that will launch the next era of exploration is very exciting and the stuff of children's dreams. I can't wait to see this fly."

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NASA's First Minisatellite Mission Comes to Successful End

By Janet Anderson

After two successful years of on-orbit operations, NASA's Fast, Affordable, Science and Technology Satellite, or FASTSAT, mission is coming to an end. FASTSAT successfully demonstrated a sustainable capability to build, deploy and operate a science and technology flight mission at lower costs than previously possible.

Image right: FASTSAT was NASA's first minisatellite-class spacecraft bus that carried six experiment payloads to low Earth orbit. NASA/MSFC/Doug Stoffer)

The satellite was designed, developed and tested over a period of 14 months at the Marshall Space Flight Center in partnership with the Von Braun Center for Science & Innovation and Dynetics Inc., both of Huntsville, and the U.S. Department of Defense's Space Test Program.

FASTSAT used off-the-shelf commercial hardware provided by NASA and a group of industry partners. Weighing slightly less than 400 pounds and carrying six technology and atmospheric science experiments, FASTSAT provided an opportunity to conduct innovative research and mature the readiness of new technologies for future missions.

"FASTSAT demonstrated that an 'outside-the-box' solution afforded a highly synergistic concept which satisfied experiment, payload and launch schedule requirements," said Mark Boudreaux, FASTSAT project manager at the Marshall Center. "This successful mission brings us closer to realizing a unique, small-satellite platform and the environment needed to perform low-cost research in space."

FASTSAT was launched by the Department of Defense Space Test Program from Kodiak, Alaska, in November 2010, and completed two years on orbit. It served as an autonomous research laboratory in low Earth orbit, containing all the necessary resources to conduct scientific and technology research operations for all onboard experiments.

Among the NASA innovations enabled by FASTSAT during its mission to test low-technology-readiness experiments were the Miniature Imager for Neutral Ionospheric Atoms and Magnetospheric Electrons, or MINI-ME; the Plasma Impedance Spectrum Analyzer, or PISA; and FASTSAT's ability to eject a nanosatellite, NanoSail-D, from a minisatellite.

MINI-ME, managed by NASA's Goddard Space Flight Center, continues to collect data on neutral atoms and electrons from Earth's magnetosphere in a variety of conditions. The data collected from MINI-ME is helping NASA scientists and engineers design two similar instruments for a suborbital mission planned for early 2013. That mission, dubbed VISIONS for "visualizing ion outflow via neutral atom imaging during a substorm," aids researchers in better understanding space weather.

"Among the MINI-ME science results are the first observations of neutral molecular outflow," said Mike Collier, principal investigator for MINI-ME. "Data from MINI-ME are helping the VISIONS investigators optimize the mission science return."



PISA, also managed by Goddard, has completed 15,000 hours of observations and gathered more than 15 gigabytes of raw data captured in a variety of locations and environments during the mission.

"FASTSAT has been a great opportunity to test the PISA instrument concept, while gathering valuable data about how the ionosphere changes over time as the sun gets closer to its 11-year peak of activity," said Doug Rowland, principal investigator for PISA. "We've seen the ionosphere go from being 'depressed' close to launch, to a more 'inflated' state over the last two years.

"With the strong need for improved understanding of our space environment, platforms such as FASTSAT and instruments such as PISA are going to become more important, providing low-cost, flexible platforms for space environment monitoring and scientific measurements," added Rowland.

The NanoSail-D satellite was jointly designed and built by NASA engineers from the Marshall Center and NASA's Ames Research Center. Key sail design support was provided by ManTech/NeXolve Corp. of Huntsville. The NanoSail-D experiment was managed by Marshall and was jointly sponsored as a Department of Defense Space Test Program payload by the U.S. Army Space and Missile Defense Command and the Von Braun Center for Science & Innovation.

The deployment of Nanosail-D from FASTSAT was the first time NASA deployed a solar sail in low Earth orbit. "The NanoSail-D mission produced a wealth of data that will be useful in understanding how these types of passive deorbit devices react to the upper atmosphere," said Joe Casas, FASTSAT project scientist at the Marshall Center.

"The data collected from the mission is intended to study and better understand the drag influences of Earth's upper atmosphere on satellite orbital re-entry," Casas said.

Thirteen Huntsville-area firms and the University of Alabama in Huntsville were part of the project team.

For more information about FASTSAT, visit [here](#).

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

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Marshall's David Brock Receives 2012 Employee of Year Award from Huntsville Area Governor's Committee on Employment of People with Disabilities



Small Business Specialist David Brock, right, of the Marshall Space Flight Center's Office of Procurement, recently accepted the Employee of the Year award from Tim Strickley, chairperson for the Huntsville Area Governor's Committee on Employment of People with Disabilities. Brock was nominated by Office of Procurement managers for demonstrating personal courage, motivation and outstanding performance in overcoming challenges, and for dedication shown in productive employment. In 1973, Brock was diagnosed with the hereditary eye disease Retinitis Pigmentosa, which gradually robbed him of his vision. "Since joining the center in 1984, I have had to perform my job duties without the use of my sight," Brock said in an Oct. 31 Marshall Star

Face of Mission Success article. "It has been a challenge, but the journey has been incredible." To read more about Brock, visit [here](#). To read more about the committee -- Huntsville's designated leadership and coordination group on issues related to employment of people with disabilities -- visit [here](#). (Photo courtesy/Nick Conway)

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Marshall Center Holiday Reception to be Held Dec. 13

The Marshall Center will hold its annual holiday reception from 2:30-4:30 p.m. Dec. 13 at Activities Building 4316. Guests will enjoy heavy hors d'oeuvres, drinks and desserts provided by Kathleen's Catering & Chocolate Gallery of Huntsville. Concert pianist Christopher-Joel Carter will play throughout the event, and a special performance will be given by this year's Marshall Exchange talent show winner, Jennifer Simmons. Door prizes, including \$50-\$300 gift cards, will be awarded.

Transportation will be provided. A bus schedule is forthcoming and will be posted for Marshall team members on [ExplorNet](#).

The event is sponsored by the Marshall Exchange.

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Marshall Center Gets Festive in Community Holiday Events

*Marshall Space Flight Center Director Patrick Scheuermann, right, and his daughter, Christina, wave to people lined up along the streets of downtown Huntsville Dec. 1 for the WAAY 31 Christmas Parade. Accompanying Scheuermann is his wife, Sarah, in the front passenger seat. The center director served as grand marshal for the event.
(NASA/MSFC/Jennifer Stanfield)*



Astronaut TJ Creamer was a special guest in the WAAY 31 Christmas Parade. Marshall Center team members also took part in the holiday fun, walking behind Creamer's car, greeting parade goers. (NASA/MSFC/Jennifer Stanfield)

For the second year, Marshall Center team members decorated a live Christmas tree for the Downtown 47 Tinsel Trail in Big Spring International Park in Huntsville. The display, which features more than 200 festive trees, is open for free viewing by the public until Jan. 2, 2013. (NASA/MSFC/Jennifer Stanfield)



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Spreading a Little Holiday Cheer



Santa and one of his merry elves hand out candy canes to children at the Marshall Space Flight Center's rocket-lighting ceremony Nov. 30. Dozens of people from Team Redstone -- which includes the Marshall Center and U.S. Army organizations on Redstone Arsenal -- came out to Marshall's Rocket Park to enjoy cookies, hot chocolate and music sung by children from the Marshall Child Development Center. Special guests included Lt. Gen. Patricia McQuiston, deputy commanding general of the U.S. Army Materiel Command at Redstone Arsenal. (NASA/MSFC/Emmett Given)

Marshall Center Director Patrick Scheuermann and Santa officially light the Saturn I rocket at the ceremony. The event was sponsored by the Marshall Exchange. (NASA/MSFC/Emmett Given)

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