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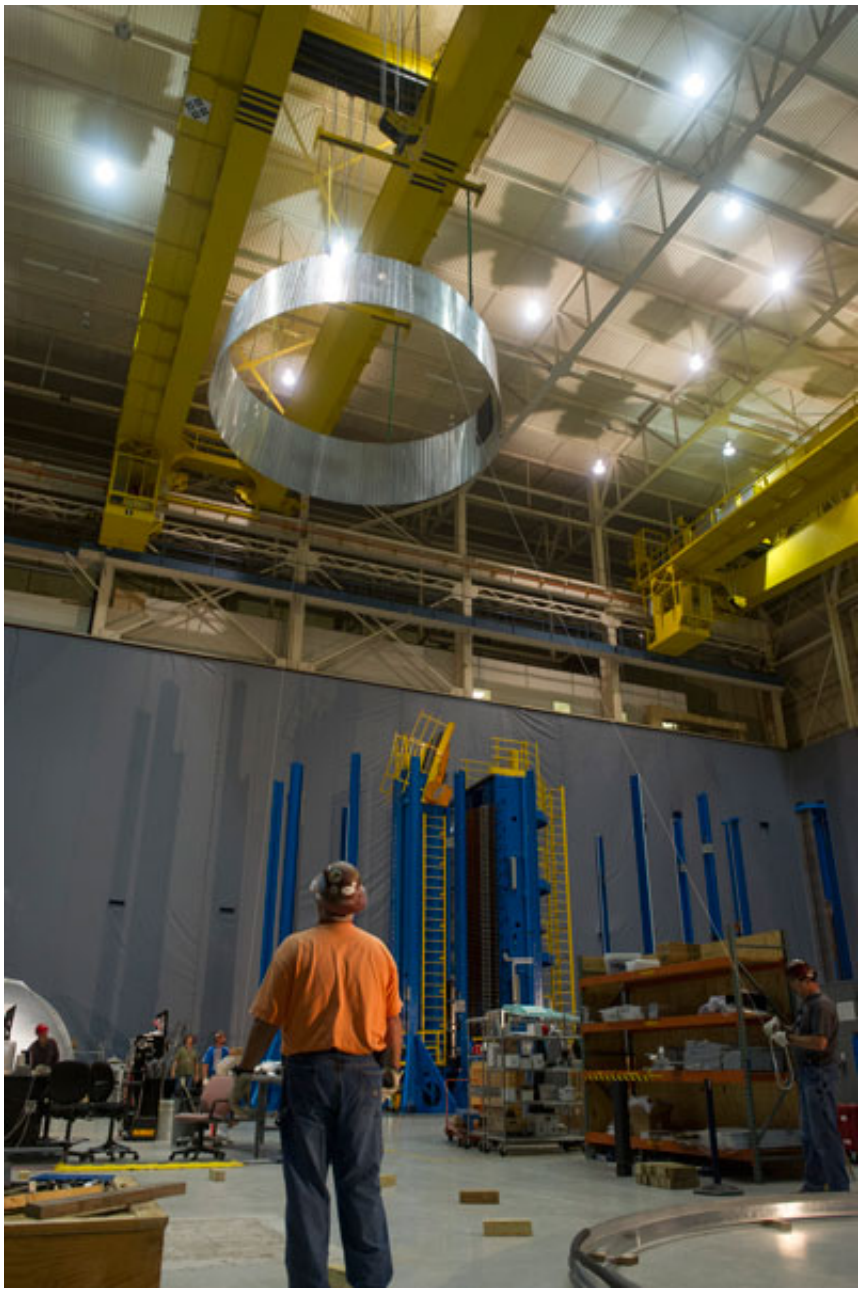
MARSHALL STAR

In This Week's Star

First Space Launch System 'Pathfinder' Hardware Nearing Completion

Engineers using a state-of-the-art vertical welding tool at the Marshall Space Flight Center move a "pathfinder" version of the adapter design that will be used on test flights of the Orion spacecraft and NASA's Space Launch System. When the Orion is flight-tested for the first time in 2014, the adapter will also be tested when it is used to mate the spacecraft to a Delta IV heavy-lift rocket. The adapter will eventually connect the Orion vehicle to the propulsion elements of the SLS. The term pathfinder refers to an early version of the hardware that is not intended to fly, but to prove the concept and feasibility of manufacturing the design. This pathfinder is 18 feet across and 5 feet tall and will be strengthened in a few weeks when specially machined end rings -- also built at the Marshall Center -- are welded to it. The SLS will launch NASA's Orion spacecraft and other payloads beyond low Earth orbit, providing an entirely new capability for human exploration. The Marshall Center manages the SLS Program for the agency and works closely with the Orion program office at NASA's Johnson Space Center and the Ground Systems Development and Operations Program, which manages the operations and launch facilities at NASA's Kennedy Space Center. (NASA/MSFC/Emmett Given)



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Representatives From CFC-Funded Organizations to Visit Marshall Center Through Nov. 8

Representatives from local nonprofit organizations will be available Tuesdays through Thursdays through Nov. 8 in Building 4203 at the Marshall Space Flight Center to provide information and answer questions from team members. The visiting organizations all benefit from Combined Federal Campaign donations and volunteerism.

Representatives from the following charities will be at the center from 11 a.m. to 1:30 p.m. on these dates:

- Oct. 25: Our Place Inc. -- an organization that helps individuals with mental illnesses in Madison County.
- Oct. 30: AGAPE of North Alabama Inc. -- a nonprofit group that provides short- or long-term foster care and adoptions for babies and children.
- Oct. 31: United Cerebral Palsy of Huntsville & Tennessee Valley Inc. -- an organization that offers physical, occupational and speech-language therapies through early intervention and outpatient programs, as well as

educational and social services to children and adults with disabilities and their families in North Alabama.

- Nov. 1: Alzheimer's Services of Marshall County -- a nonprofit, volunteer organization and resource center serving Alzheimer's patients, caregivers and professionals.
- Nov. 6: Second Mile Development Inc. -- a Christian nonprofit that supports family development and economic growth.
- Nov. 7: Health Establishments at Local Schools (HEALS) -- an organization that provides free health care to children at school-based clinics.
- Nov. 8: Christmas Charities Year Round -- a nonprofit that provides free clothes, food, school supplies, toys and household items to those in need in Madison County.

CFC is the government's annual goodwill drive to benefit charitable organizations. The Marshall Center's CFC effort is part of the Tennessee Valley Combined Federal Campaign -- a joint effort that also includes the Army's Aviation and Missile Command and other federal agencies at Redstone Arsenal and in surrounding Alabama and Tennessee counties.

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Marshall's Lisa Carr Credits CFC-Funded Ability Plus Nonprofit for Saving Her Sister's Life

By Megan Davidson

The mission of Ability Plus, a Combined Federal Campaign-funded organization, is to provide people with intellectual disabilities a loving, safe home environment that advances their quality of life. The Marshall Space Flight Center's Lisa Carr says the local nonprofit is giving her sister, Tonya Hawkins, that quality of life -- and even saved her life in 2010.

Image right: Lisa Carr, technical assistant to the chief of Marshall's Systems Engineering Division, part of the Vehicle & Spacecraft Systems Department, proudly shows off a picture of her sister, Tonya Hawkins, in the lobby of Ability Plus in Madison. Hawkins has been a resident at the facility since 2007. (NASA/MSFC/Emmett Given)

As an infant, Hawkins -- now 49 -- was diagnosed with Down syndrome, a genetic condition in which a person has 47 chromosomes rather than the common 46, which may result in physical and mental delays.

Hawkins' condition, however, didn't stop her from being an energetic, happy child. The sisters' mother, Josie Buckner, cared for Hawkins well into her adult years. They shared a passion for gardening -- even turning it into a small business.

When Buckner was diagnosed with breast cancer in 2000, Carr said Hawkins paid some of that care back to her mother.

"My mom's condition worsened to the point where she was in a wheelchair," said Carr, technical assistant to the chief of Marshall's Systems Engineering Division, part of the Vehicle & Spacecraft Systems Department. "Tonya would help with tasks around the house, like cleaning and making coffee. They had a very special bond."

In 2007, Buckner lost her battle with cancer. The sisters' father passed away less than a year earlier, so Carr became Hawkins' legal guardian. Their parents' deaths took a tremendous emotional toll on Hawkins, who Carr said became progressively violent. Increasingly worried about Hawkins' safety, as well as her own, Carr began to look into a group home

for her sister. "I researched and visited so many places, but ultimately, I decided on Ability Plus because I knew I would be happy living there," Carr said. "The staff was caring, and Tonya shared an apartment with a roommate, whom she loved so much. She still had some independence but also the care and safety she -- and I -- needed."

Hawkins lived at the facility during the week, and visited Carr every weekend. They often went to movies, a mall or to see the dogs at the Greater Huntsville Humane Society, also a CFC-funded organization. "Tonya loves dogs," Carr said, smiling -- something she does every time she talks about her sister.

In January 2010, Hawkins suffered a massive stroke, which affected more than half her brain. Doctors gave her a slim chance of survival, and advised Carr to call her sister's friends to say their goodbyes. "I called the people at Ability Plus, and several of the workers came to see Tonya in the intensive care unit," Carr said. "They brought one of her favorite people, her roommate, to see her for what we thought would be the last time. But as soon as her roommate walked up to her bedside, Tonya reached out her hand to her. It was so touching and a beginning to her recovery."

The stroke left Hawkins paralyzed on her left side. An Ability Plus nurse, who knew Hawkins' extensive medical history, helped the hospital doctors determine a plan for her medical care and adjusted her medications, which, Carr said, was a life-saving measure.

Image left: While on a tour of Ability Plus, Lisa Carr, center, gets a kiss on the cheek from the former roommate of her sister, Tonya Hawkins, right. Hawkins and the roommate are close friends, participating together in activities at the facility. (NASA/MSFC/Emmett Given)

After three weeks in the hospital, Hawkins moved to a local rehabilitation facility to begin a four-month treatment plan. But Carr said it just wasn't working. "I called Ability Plus again to see if they could help. Tonya was always so social -- I couldn't stand the thought of her being confined to a bed the rest of her life."

Ability Plus worked with Hawkins' physical therapists on a rehabilitation plan, which the organization specifically tailored for people with intellectual disabilities. "In normal therapy, they may say things like, 'move your leg left,' but my sister didn't have the mental capability to understand the difference between right and left," Carr said. "She needed something that catered not only to her physical needs, but to her special needs as well."

Now in a wheelchair, Hawkins couldn't return to her old apartment, because the facility wasn't staffed to help people with both intellectual and physical disabilities. But luckily, Carr said, Ability Plus opened a special group home just for those with disabilities similar to her sister's. Hawkins receives one-on-one care, and still gets to visit with her former roommate. She even helps tend to the facility's garden, a pasttime which she enjoyed with her mother all those years.

The organization also provides transportation for Carr and Hawkins to get out together again on weekends, since Hawkins' motorized wheelchair won't fit in a standard van. "I really believe Tonya wouldn't be here, or she'd be lying in a bed somewhere, if it weren't for Ability Plus," said Carr. "My sister is amazing. She's never once complained about losing her ability to walk. People with mental and physical disabilities need a chance to show all the special things they have to offer, and to receive good, quality care. I believe Ability Plus gives that to them. I know they have for Tonya."

Carr, with tears, adds of her sister, "I don't know what I'd do without her."

Marshall team members may donate to Ability Plus, CFC code number 48093, or other charitable organizations on the CFC ExplorNet page. Seats also are still available for the bus tour to Ability Plus on Nov. 14.

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

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CFC 2012: Bus Tours Kick Off with Visit to Ability Plus

On Oct. 18, a group of Marshall Center team members took a bus tour to Ability Plus, a nonprofit organization that maintains residential homes and day habilitation for individuals in North Alabama with intellectual disabilities. The visit provided tour participants with an inside look at how their Combined Federal Campaign contributions benefit the organization. Sonya Dillard, right, an industrial safety engineer in Marshall's Safety & Mission Assurance Directorate, looks on as an Ability Plus resident -- aided by an Ability Plus staff member -- plays a game in the facility's entertainment room. (NASA/MSFC/Emmett Given)

Lisa Carr, left, a technical assistant to the chief of Marshall's Systems Engineering Division, plays a round of air hockey with an Ability Plus resident in the entertainment room of the CFC-funded organization. The care center also has a computer room, workout area, music room and other amenities and services, all to promote independence and teach important life and social skills to people with intellectual disabilities. A feature story about Carr and her sister, Tonya Hawkins, who lives in an Ability Plus group home, is posted in this week's issue of the Marshall Star. (NASA/MSFC/Emmett Given)

Lisa Carr, at upper left, and Gloria Ayers, a budget analyst in Marshall's Office of the Chief Financial Officer, standing at right, talk with Ability Plus residents and staff members in the facility's computer room. Residents spend an hour a day in the computer room, filling out job applications, listening to music or playing educational games. (NASA/MSFC/Emmett Given)

An Ability Plus resident and an Ability Plus staff member make a batch of brownies in the facility's kitchen. Everything at the care center -- including resources for activities, furnishings and equipment -- are made possible through donations. Marshall team members may contribute to Ability Plus, CFC code number 48093, or other charitable organizations on the CFC ExplorNet page. (NASA/MSFC/Emmett Given)

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Cummings Research Park Celebrates 50 Years of Milestones, Collaboration, Integration Between Government and Industry

The Marshall Space Flight Center joined the Huntsville/Madison County community Oct. 15 to commemorate the 50th anniversary of Cummings Research Park.

Image right: Huntsville Mayor Tommy Battle, left, and Marshall Center Director Patrick Scheuermann display the Cummings Research Park Proclamation during the park's 50th anniversary celebration. (NASA/MSFC/Emmett Given)

Alabama Gov. Robert Bentley, on hand to mark the occasion at ADTRAN Inc., proclaimed this significant milestone as a day to celebrate the five decades of the second largest research park in the nation.

Cummings Research Park, located next to Redstone Arsenal, is a vital component of the Huntsville community's aerospace and defense industry success. The 3,843-acre park is home to 300 companies employing 25,000 workers.

The park was initially opened to support the space exploration efforts led by NASA to land a man on the moon. Its visionary, Dr. Wernher von Braun, Marshall's first center director, imagined a research park where government, industry and academia would collaborate to support the nation's space exploration efforts and space science discoveries.

Image left: From left, Huntsville Mayor Tommy Battle, Madison Mayor Paul Finley, Madison County Commission Chairman Mike Gillespie and Marshall Center Director Patrick Scheuermann discuss the significance of Cummings Research Park during the anniversary event. (NASA/MSFC/Emmett Given)

"When it was created, the park represented a vision for Redstone Arsenal's government agencies and the city of Huntsville. A vision that came true. And one that has a bright future," said Marshall Center Director Patrick Scheuermann during a luncheon following the proclamation signing. "Today, it's not just a resource; it is what distinguishes this community. We are united in our destiny."

Many Fortune 500 companies and global technology corporations have major operations in the park. The work that goes on today is a diverse mix of aerospace and defense, computers and electronics, engineering and government services, hardware and software development, information technology, life sciences and biotechnology, modeling and simulation, and research and development.

Image right: Alabama Gov. Robert Bentley, right, congratulates Marshall Center Director Patrick Scheuermann, left, and U.S. Army Maj. Gen. Lynn Collyar, commanding general of the U.S. Army Aviation & Missile Command, for a successful 50 years of mission success and collaboration in the Huntsville community. (NASA/MSFC/Emmett Given)

The success of Cummings Research Park gives the Huntsville community one of the highest concentrations of engineers in the country and is key to supporting U.S. Army and NASA contract programs and commercial technology applications.

"The park remains critical to what we do at Marshall," said Scheuermann. "For example, the National Space Science and Technology Center is located within the park. The companies in Research Park are helping us operate International Space Station, study the Earth, the sun and the universe beyond. We cannot accomplish our mission without our industry partners. As Marshall and private industry at Cummings plan for the future, we will do so together."

Image left: Marshall Center Director Patrick Scheuermann thanks Cummings Research Park and the Huntsville community for their support to the Marshall Center. "We cannot accomplish our mission without our industry partners," he said. (NASA/MSFC/Emmett Given)

The University of Alabama in Huntsville also is located in the park and has one of the highest-rated engineering management programs in the country, according to the Aerospace/Defense Industry Profile. The collaboration of government, business and university research working makes the Huntsville area one of the premier centers for aerospace excellence.

"I am looking forward to enabling the next 50 years of exciting missions and technologies and success with current and new partners in Cummings Research Park," said Scheuermann. "Congratulations!"

To learn more about Cummings Research Park, visit here.

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Wernher von Braun Memorial Symposium Features Panel Discussions, Guest Speakers on Space Exploration

NASA Associate Administrator Robert Lightfoot gives the keynote speech during the fifth annual Wernher von Braun Memorial Symposium held at the University of Alabama in Huntsville on Oct. 15-18. The four-day event featured a welcome and Marshall Space Flight Center update by Center Director Patrick Scheuermann, and opening remarks from the American Astronautical Society President Frank Slazer. Panel discussion topics included NASA's human space exploration plans, industry perspectives on space exploration, space commerce and commercial initiatives, challenges and solutions for national space security, trends in engineering education and the likely direction of space policy. The symposium was organized by the American Astronautical Society in conjunction with UAHuntsville, Marshall and the National Space Club of Huntsville. (NASA/MSFC/Emmett Given)

Dan Dumbacher, left, NASA deputy associate administrator for Exploration Systems Development, moderates the human space exploration plans and updates panel discussion during the symposium. Todd May, right, manager of Marshall's Space Launch System Program, updates on the progress of the SLS. (NASA/MSFC/Emmett Given)

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New Crew Headed to the International Space Station

NASA news release

NASA astronaut Kevin Ford and Russian cosmonauts Evgeny Tarelkin and Oleg Novitskiy launched aboard a Russian Soyuz rocket on their mission to the International Space Station on Oct. 23 at 5:51 a.m. CDT. The trio lifted off from Site 31 at the Baikonur Cosmodrome in Kazakhstan. This is the first time in 28 years the pad has been used for human spaceflight.

Image right: Expedition 33 crew members, Soyuz Commander Oleg Novitskiy, bottom, Flight Engineer Kevin Ford of NASA, and Flight Engineer Evgeny Tarelkin of Roscosmos, top, wave farewell before boarding their Soyuz rocket just a few hours before their launch to the International Space Station on Oct. 23 in Baikonur, Kazakhstan. (NASA/Bill Ingalls)

Novitskiy is serving as the commander of the Soyuz and will be at the controls when the spacecraft docks with the Poisk module of the station Oct. 25. The three will join Expedition 33 Commander Sunita Williams of NASA and Flight Engineers Aki Hoshide of the Japan Aerospace Exploration Agency and Yuri Malenchenko of the Russian Federal Space Agency, who have been living aboard the orbiting laboratory since July.

Ford, Novitskiy and Tarelkin will remain aboard the station until March 2013. Williams, Malenchenko and Hoshide will return to Earth Nov. 19. When Williams, Malenchenko and Hoshide undock from the station, it will signal the end of Expedition 33 and the beginning of Expedition 34 with Ford as commander.

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NASA FIRST Engineers Partner with Centennial Challenges to Host HELIOS Technology 3-D Printing Challenge
By Janet Sudnik

Space is critical when traveling to, well, space. Not the galaxy-studded universe itself, but the limited variety within the bounds of the spacecraft.

Image left: HELIOS Technology Challenge team member Carlos-Andres Velez, right, interviews Centennial Challenges Program Manager Sam Ortega for a vodcast episode while team member Alayna Devineni operates the camera and listens to the audio feed. The HELIOS challenge team created five episodes to partner with their upcoming 3-D printing challenge. (NASA/MSFC/Janet Sudnik)

One of the many barriers to deep-space flight capability is the transport and maintenance of physical resources aboard the spacecraft. Only so many necessities can be carried, and the farther the trip, the more that are needed. Life-sustaining provisions like food and water take precedent, but tools and components can be no less vital in the event of an equipment failure or damage.

What, then, to do? Why not pack a 3-D printer that can recreate a broken wrench, laptop screen or bracket and keep the mission on track? Better yet, why not repurpose garbage already taking up valuable space as media for these products?

This is the premise of the upcoming HELIOS Technology Challenge, a competition designed by a group of young engineers from the Marshall Space Flight Center. HELIOS — Hardware Engineering Launchpad Inspired by Open Source — is the brainchild of Nick Benjamin, Alayna Devineni, Jay Hollenbeck, Alex Sobey and Carlos-Andrés Vélez, who have come together through the NASA FIRST program to host the 3-D printing competition, with the Marshall-based Centennial Challenges program acting as a support lead.

NASA FIRST is the agency's leadership development program for GS 11 and 12 engineers, scientists and administrative professionals. The program requires that participants complete a one-year, part-time program, including four training modules, shadowing of senior leaders, group projects and individual development.

The five have taken this on in addition to their daily responsibilities, but agree their involvement has been worth the extra effort. "When I looked into the program objectives, I realized that it would be a very beneficial tool in expanding my understanding of NASA, our vision and all of the different organizations that strive to advance exploration, technology and community engagement," said Devineni, an engineer in the Systems Analysis Branch of Marshall's Engineering Directorate.

The group, none of whom had met before taking part in the NASA FIRST program, capitalizes on its unique blend of skills and backgrounds, said Jay Hollenbeck, project manager for the Operations & Maintenance Office of the Office of Center Operations. "Our team is diverse in multiple ways — personality, race, career path, gender — and we all bring a critical piece to the puzzle."

The premise of the challenge is for teams to take space garbage -- empty food packaging, for example -- that is inevitably aboard the spacecraft, and find a way to convert it into 3-D printing media, and to demonstrate the creation of something from that media. Teams may also break down the challenge into creation of a 3-D printer itself, or complete both. Unique to this challenge, collaboration is encouraged and will be rewarded, and teams will be required to post solutions and progress online as they work toward a common goal.

"Three-D printing is very important to the future of long-duration flights," said engineer and flight controller Nick Benjamin, an engineer in the Planning, Operations and Analysis Branch of the Engineering Directorate. "If we are able to accomplish this task, there are unlimited capabilities that can be achieved."

"HELIOS is less of a competition and more of a collaborative effort, where top collaborators are rewarded as opposed to just the top competitors," said Carlos-Andrés Vélez, a structural and mechanical engineer in the Structural and Mechanical Branch. "Collaboration and information sharing are key components of the program. Competition results in one winner, but collaboration results in multiple winners."

Throughout the planning of this project, the group has gained exposure to many facets of Marshall and the agency, including working with legal and communications personnel. In addition to creating and acquiring approvals for their rules and objectives, they've had to create a marketing strategy, using a vodcast series, posters, a website and handout materials. Along the way, they have partnered with the Centennial Challenges program, which is acting as a mentor and guiding force.

The Centennial Challenges program facilitates technology competitions among citizen inventors to solve NASA-based problems that benefit the agency and the nation.

Centennial Challenges Program Manager Sam Ortega has been meeting with the NASA FIRST group to support their mission. "It's a natural fit between the HELIOS Technology Challenge and the Centennial Challenges objectives," Ortega said. "The goals of both programs are to advance technologies that benefit NASA and the nation by tapping the creativity of the public. A success story from a challenge often leads to real-world application and implementation."

The group decided to angle this particular challenge toward hacker- and makerspaces, groups of like-minded folks with diverse skill sets who collaborate on projects in generally informal environments. "Hackerspaces are an existing community of very talented and organized individuals," said Alex Sobey, an aerospace design engineer in the Structural & Mechanical Design Branch of the Engineering Directorate.

Hollenbeck agrees: "These guys are all over the country, and have the passion for solving big problems with little or no resources. NASA has resources, so we are just pairing the two in what we hope is a successful partnership. If the relationship proves to be successful and the HELIOS program is continued beyond its pilot stage, the NASA community would have an avenue that would enable it to tap into a subculture of technology savvy individuals, enabling the cost-effective exploration of ideas for future technologies as well as the collaborative solving of space-related problems beneficial to all."

The challenge is tentatively scheduled for the first quarter of 2013. The team has created http://www.helioschallenge.org as their home site for information, updates and a forum for competitors. Several vodcast episodes are also available on the site, offering background information and a chance to meet the NASA FIRST group.

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

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Hans Joachim Fichtner, Former Chief of Marshall's Space Vehicle and Ground Support Equipment Division, Dies

Hans Joachim Fichtner, a member of the original German rocket team that came to Huntsville in 1950 and helped build the Saturn V in the 1960s, died Oct. 21 at age 95.

Fichtner served as the chief of the Space Vehicle and Ground Support Equipment Division at the Marshall Space Flight Center. He led the design of the Saturn V electrical systems and the development of the first automated computerized checkout system used at the Cape Canaveral launch site to ensure the Saturn's guidance and control, power systems, and emergency detection systems would work during launch and space operations. This was the first automated checkout system developed for large space vehicles.

His team designed, built and operated the Automated Development Facility, a Marshall ground-based facility that tested Saturn electrical systems. Fichtner assisted with the design of the guidance and control systems for Explorer satellites developed at Marshall.

He is survived by his daughters, Sigrid Scott of Carrollton, Ga., and Monica Bell of Huntsville.

Find this article at:

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