



MARSHALL STAR

Serving the Marshall Space Flight Center Community

Dec. 4, 2008

Mysterious source of high-energy cosmic radiation found

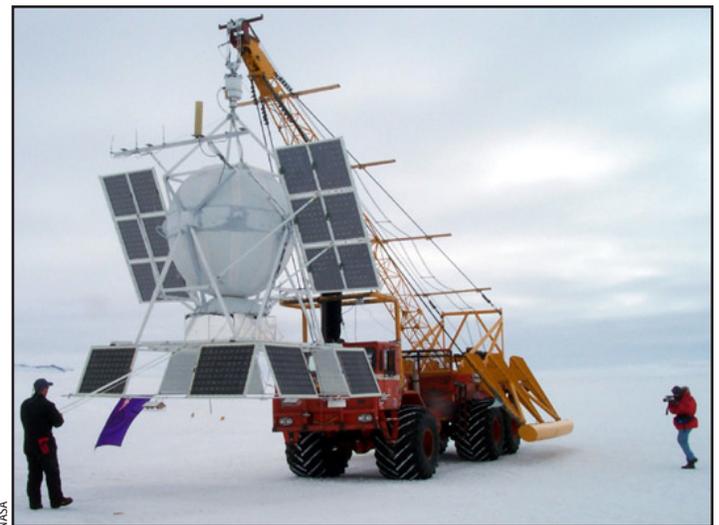
By Amie Cotton

Scientists recently announced the discovery of a previously unidentified nearby source of high-energy cosmic rays. The finding was made high over Antarctica with a NASA-funded balloon-borne instrument supported by the Marshall Space Flight Center.

The 4,300-pound ionization calorimeter experiment was designed to be carried to an altitude of about 124,000 feet above Antarctica using a helium-filled balloon about as large as the interior of the New Orleans Superdome. The goal was to study cosmic rays that otherwise would be absorbed into the atmosphere.

Researchers from the Advanced Thin Ionization Calorimeter collaboration, led by scientists at Louisiana State University in Baton Rouge, published the results in the Nov. 20 issue of the journal *Nature*. The new results show an unexpected surplus of cosmic ray electrons at very high energy — 300-800 billion electron volts — that must come from a previously unidentified source or from the annihilation of very exotic theoretical particles used to explain dark matter.

"This electron excess cannot be explained by the standard model of cosmic ray origin," said John P. Wefel, ionization calorimeter project principal investigator and a professor at Louisiana State.



NASA

Team members from the Columbia Scientific Balloon Facility ready the Advanced Thin Ionization Calorimeter experiment for launch by a large stratospheric balloon at the Ross Ice Shelf near McMurdo Station, Antarctica.

"There must be another source relatively near us that is producing these additional particles."

According to the research, this source would need to be within

See Cosmic on page 5

Deadline approaching for CFC

Donations are still needed to reach the Marshall Center's goal of \$600,000 for the Combined Federal Campaign. Civil service employees, contractors and retirees are encouraged to give before the Dec. 12 deadline.

Civil service employees can log in to WebTADS to make CFC contributions. On-site contractors may give their contributions to their organization leads, or contractors and retirees can mail them to:

David Percival
MSFC RS30
Huntsville, AL 35812



All checks should be made payable to the Combined Federal Campaign. For more information, visit <http://cfc.msfc.nasa.gov/index.html>. [Please see page 2 for photos and contribution update.]

Endeavour lands in California on Nov. 30

Marshall Center contributed to successful shuttle mission

By Sanda Martel

"We have completed a fantastic mission," said Steve Cash, manager of the Shuttle Propulsion Office at the Marshall Space Flight Center, complimenting his team on the success of the just-completed STS-126 mission.

"Our propulsion team is second to none and I'm so proud of it," Cash said. "The performance of space shuttle main engines, external tanks and solid rocket boosters on each shuttle mission

See STS-126 on page 6

Marshall CFC volunteers help brighten children's holidays

This holiday season, children will be jumping up and down with excitement Christmas Day when they open their gifts because of the help of Marshall Space Flight Center Community Service Days volunteers supporting the Combined Federal Campaign. The CFC is an annual initiative by federal and military personnel to raise money for charities.



During CFC Community Service Days, Marshall Center employees rolled up their sleeves at Christmas Charities Year Round, and washed "gently used" toys in preparation for their spot under a holiday tree. Service Days give Marshall team members the opportunity to donate their time and skills at local non-profit agencies, such as Christmas Charities. The organization provides food, clothes, toys and toiletries to those in need in Madison County.



Erica Sykes, left, William DeHollander, center, and Carol Terrell, all employees in the Office of Procurement, dry off toys as they prepare to wrap them for children in the community.



To date, Marshall has contributed \$521,602 toward the center's \$600,000 goal. The campaign ends Dec. 12. To donate, visit <http://cfc.msfc.nasa.gov/>.



Wilhelm Raithe of von Braun team dies at 95

Dr. Wilhelm Raithe, 95, a member of the Wernher von Braun rocket team that moved from Germany to the United States after World War II, died Nov. 15 at his home in Chevy Chase, Md.

At the V-2 rocket development site at Peenemunde, Germany, Raithe designed the lightweight steel missile structures needed to

withstand extreme launch temperatures and other forces.

Along with other members of the von Braun team, he worked on U.S. Army rocket research in Fort Bliss, Texas. He then worked in Huntsville where he developed the "ablation concept" heat protection for ballistic missile nose cone re-entry.

NASA and USAID bring Earth-observation benefits to Africa

NASA news release

NASA, the U.S. Agency for International Development — known as USAID — and their international partners cut the ribbon Nov. 28 in Nairobi, Kenya, for SERVIR-Africa.

The SERVIR-Africa system integrates the satellite resources of the United States and other countries into a Web-based Earth information system. It was developed with USAID by researchers at a global coordination office and rapid prototyping facility at the Marshall Space Flight Center.

This effort puts previously inaccessible information into the hands of local scientists, government leaders and communities to help address concerns related to natural disasters, disease outbreaks, biodiversity and climate change.

SERVIR, Spanish for "to serve," has been in operation in Central America, the Caribbean and southern Mexico since 2005. Now, through the support of multiple government agencies and other organizations, NASA and USAID are expanding the system to Africa in partnership with the Regional Center for Mapping of Resources for Development in Nairobi. The center, an intergovernmental organization with 15 member states in eastern and southern Africa, is a leader in mapping in the region.

"SERVIR-Africa will benefit from the breadth and depth of valuable NASA Earth science satellite and model analyses," said Dan Irwin, SERVIR project director at the Marshall Center. "Science and technology are key, but ultimately it is the combination of local knowledge along with space-based observations that makes real time monitoring of Africa's environment effective."

SERVIR-Africa will use Earth science satellite data from many of NASA's missions and other information to better predict areas at risk for severe flooding and to map regions hit by floods. It also will develop an early warning tool to predict the distribution of vector-borne diseases such as Rift Valley Fever. By mapping the location of climate change projections, the system will allow people to see impacts on such things as Africa's diverse ecosystems.

"A satellite birds-eye view can provide an overall picture of a natural disaster, such as a flood, and its consequences," said Tesfaye Korme, director of remote sensing and geographic information systems at the center. "Using the SERVIR-Africa platform, we will be able to develop near real-time maps of flood-affected areas to estimate the number of displaced people and locate potential transportation disruptions."

SERVIR-Africa's information technology team will use the Internet to acquire and distribute satellite and ground-based Earth observations, map data and geospatial analyses

that target issues such as urbanization, biodiversity threats, and management of natural resources.

The strength of the SERVIR system is in its diverse international team of scientists, developers and researchers. SERVIR-Africa builds on existing capacity at the mapping center in Nairobi. The center, together with SERVIR's lead partner in Central America — the Water Center for the Humid Tropics of Latin America and the Caribbean — are jointly developing an integrated system. These two regional organizations are standardizing database management and evaluating common methods for predicting severe weather events, analyzing impacts from climate change and working to understand health and ecosystem interactions.

SERVIR also has been building relationships with industry.

"Public-private partnerships are critical to the success of the SERVIR system," said Jacqueline E. Schafer of USAID. "Bringing together the expertise and resources of geospatial information systems software and cell phone companies, university researchers, conservation organizations and governments, SERVIR puts science and technology into the hands of local decision-makers."

Three other NASA centers — NASA's Goddard Space Flight Center in Greenbelt, Md., NASA's Ames Research Center at Moffett Field, Calif., and NASA's Jet Propulsion Laboratory in Pasadena, Calif. — partnered with the Marshall Center on the system. Also participating in the implementation of SERVIR-Africa is the Institute for the Application of Geospatial Technology in Auburn, N.Y.

For information about SERVIR, visit <http://www.nasa.gov/servir>.



Courtesy photo

SERVIR-Africa officially opened its doors at a ribbon-cutting ceremony in Nairobi, Kenya on Nov. 28.

Executive intern to the center director

Howard Soohoo sharpens management skills working alongside center director

By Jessica Wallace

What's it like to spend days with Marshall Space Flight Center Director David King and his executive staff? NASA engineer Howard Soohoo knows firsthand.

During the summer, Soohoo assumed the pivotal position of executive intern in the Office of the Director. He succeeds Baraka Truss, a software reliability engineer in the Safety & Mission Assurance Directorate. Prior to the intern position, Soohoo tested space shuttle main engines in the center's east and west test areas for the Engineering Directorate.

The yearlong internship is announced each year on Inside Marshall. It is open to all interested GS-12 to GS-14 civil service employees. The position provides an opportunity to shadow King and Marshall's management team and enhance leadership and management skills.

As the director's intern, Soohoo organizes and coordinates special tasks and events for King and Deputy Director Robert Lightfoot. He plans and facilitates executive forums and meetings for Marshall management and senior staff. He also travels with management to trade shows, conferences and NASA speaking engagements — such as Lightfoot's traveling Shuttle Transition Road Shows — to provide technical and administrative support.

Soohoo also reviews technical center goals to assess program content, and serves as a centerwide liaison to ensure initiatives are adequately staffed and communicated.

He performs fact-finding studies and reviews engineering literature, scientific research and industry studies to help Marshall teams deliver quality products and services on time and within budget.

Soohoo says the range of responsibilities gives him a strategic

perspective on how NASA and Marshall operate, and continues to educate him in successful management techniques.

"I've learned I need to be willing to step out of my comfort zone and experience different circumstances that give me a firm understanding of what it's like to be a leader," he said. "I am gaining management skills that I can incorporate into my career goals.

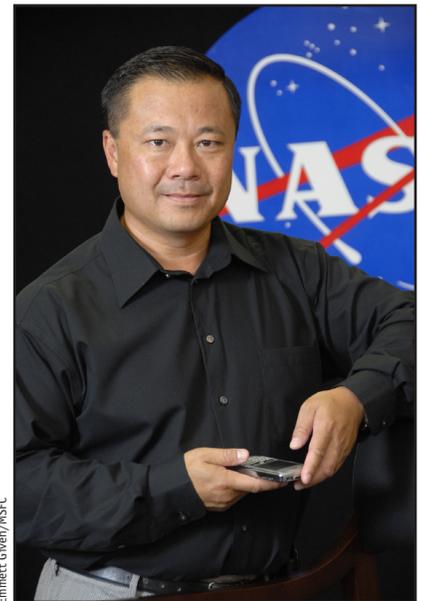
"I highly encourage qualified Marshall employees to apply for this internship," he added. "It demonstrates your work ability, opens up the door to networking and allows senior managers to get to know you. It is an incredible opportunity for individuals who demonstrate promotion potential and hope to enhance their careers."

Soohoo came to Marshall in 1987 as an electrical engineer, testing the Russian RD-180 engine for the Atlas launch vehicle, a rocket developed by Lockheed Martin Corp. in Decatur, and the space shuttle main engine. Before joining the center, he worked in the U.S. Department of the Navy's cooperative education program. As a co-op student, he was involved with sonar technology research for fast-attack submarines.

Soohoo earned his bachelor's degree in electrical engineering from New Mexico State University in Las Cruces in 1987. He earned a Certificate of Appreciation Award from the Marshall Center in 2007.

At home in Huntsville, Soohoo and his wife Stacy enjoy spending time with their son Braden, 16, and daughter Brookelyn, 4.

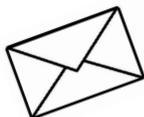
Wallace, an AI Signal Research Inc. employee and the Marshall Star editor, supports the Office of Strategic Analysis & Communications.



Howard Soohoo

Remembering our soldiers during the holidays

For those Marshall Space Flight Center team members interested in sending holiday cards to U.S. soldiers, please mail them to:



Holiday Mail For Heroes
P.O. Box 5456
Capitol Heights, Md. 20791-5456



For more information, visit the American Red Cross Web site at redcross.org/holidaymail.

Redstone Arsenal Family and Morale, Welfare and Recreation activities complement Marshall Exchange Services

In addition to the activities offered by the Marshall Exchange, did you know you can also enjoy bowling, golfing, swimming, arts and crafts, and more — without ever leaving Redstone Arsenal?

The Redstone Arsenal Family and Morale, Welfare and Recreation Directorate has many activities and events open to Team Redstone — including Marshall Space Flight Center employees, its on-site contractors and their families.

The Armed Forces offer a comprehensive network of quality-of-life services designed to enhance the lives of active duty soldiers and their families, reserve component and National Guard members, veterans, civil servants, military retirees and other eligible participants.

"Our mission is to serve the needs, interests and responsibilities of each individual in the Army community, and that extends to everyone who is a part of Team Redstone," said Derrick Gould, director of the Family and Morale, Welfare and Recreation Directorate at Redstone.

For Marshall civil service employees, access to the organization is included as an employee benefit at no extra charge. "Many Marshall employees who have worked for NASA for 20 years don't know that they are eligible to use Redstone facilities and come to all of our events," said Amelia Flanigan, marketing director for the directorate.

Contractor employees currently working on the installation in support of any Redstone program or at the Marshall Center can purchase a membership with the Redstone organization. Members receive discounts for some arsenal facilities and activities, including Child, Youth & School Services, select restaurants and golf course green fees.

For more information about the organization, including detailed membership opportunities, visit <http://www.redstonemwr.com/>. The Family and Morale, Welfare and Recreation Community Activity Guide is posted on Inside Marshall, visit http://inside.msfc.nasa.gov/announcements/mwr_cg.pdf.

Cosmic

Continued from page 1

about 3,000 light years of the sun. It could be an exotic object such as a pulsar, mini-quasar, supernova remnant or an intermediate mass black hole.

"Cosmic ray electrons lose energy during their journey through the galaxy," said Jim Adams, ionization calorimeter research lead at the Marshall Center. "These losses increase with the energy of the electrons. At the energies measured by our instrument, these energy losses suppress the flow of particles from distant sources, which help nearby sources stand out."

The scientists point out, however, that there are few such objects close to our solar system. "These results may be the first indication of a very interesting object near our solar system waiting to be studied by other instruments," Wefel said.

An alternative explanation is that the surplus of high energy electrons might result from the annihilation of very exotic particles put forward to explain dark matter. In recent decades, scientists have learned that the kind of material making up the universe around us only accounts for about 5 percent of its mass composition. Close to 70 percent of the universe is composed of dark energy (termed such because its nature is unknown). The remaining 25 percent of the mass acts gravitationally just like regular matter, but does little else, so it is normally not visible.

The nature of dark matter is not understood, but several

theories that describe how gravity works at very small, quantum distances predict exotic particles that could be good dark matter candidates.

"The annihilation of these exotic particles with each other would produce normal particles such as electrons, positrons, protons and antiprotons that can be observed by scientists," said Eun-Suk Seo, ionization calorimeter lead at the University of Maryland in College Park.

The ionization calorimeter experiment is an international collaboration of researchers from Louisiana State University, the University of Maryland, the Marshall Center, Purple Mountain Observatory in China, Moscow State University in Russia and the Max-Planck Institute for Solar System Research in Germany. Ionization calorimeter is supported in the United States by NASA and flights are conducted under the auspices of the Balloon Program Office at NASA's Wallops Flight Facility in Virginia by the staff of the Columbia Scientific Balloon Facility. Antarctic logistics are provided by the National Science Foundation.

For information on the ionization calorimeter experiment, visit <http://AdvancedThinIonizationCalorimeter.phys.lsu.edu/AdvancedThinIonizationCalorimeterweb/index.html>.

For information on NASA's scientific balloon program, visit <http://sites.wff.nasa.gov/code820/>.

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

is bringing us closer to completing construction of the International Space Station."

These propulsion elements, managed by the Marshall Center, lifted shuttle Endeavour and its seven-member crew from the launch pad at the Kennedy Space Center, Fla., Nov. 14 on a 16-day mission to the space station.

The Marshall Center propulsion team is responsible for defining requirements, design, development, manufacturing, assembly, testing and flight performance of the space shuttle propulsion elements — space shuttle main engines, reusable solid rocket boosters and external tank.

Space shuttle Endeavour docked with the space station Nov. 16. Astronauts performed important repair work during the mission's four spacewalks. Landing was Nov. 30 at Edwards Air Force Base, Calif.

Other Marshall contributions to the success of the mission included delivery and installation of the Water Recovery System and the Expedite the Processing of Experiments — EXPRESS — Rack 6, at the station.

The Water Recovery System — the second part of a comprehensive life support system — will recycle crew urine, wastewater and cabin humidity condensate, creating water clean enough to drink.

Marshall engineers were part of a ground team that worked with the shuttle and space station astronauts when the Urine Processor Assembly inside the Water Recovery System experienced several premature shutdowns after installation and testing. Engineers believe motion of the centrifuge caused physical interference within the assembly, resulting in increased power draw and temperatures.

After assessments by the ground team and troubleshooting by astronauts, the assembly was restarted and ran without shutting down. Astronauts removed grommets from the assembly and hard-mounted it into the Water Recovery System rack. The grommets were serving as isolators to dampen vibrations from the centrifuge, and they possibly allowed too much motion and caused interference.

The assembly ran three successful cycles after modifications and based on that success, program managers decided to leave the distillation assembly on orbit instead of being returned with the STS-126 crew. Samples were processed through the assembly and dispensed and returned on Endeavour. Samples will continue to be collected during the next several months to ensure the assembly is working properly before being used for crew consumption.

"The Marshall Water Recovery System team did a fantastic job working with mission flight controllers and the space station program engineers during the mission," said Bob Bagdigian, project manager of Regenerative Environmental Control and Life Support System. "They worked through challenges to activate the system and get it up and running smoothly.

"Their efforts in the midst of the holiday season showed



Bob Bagdigian, project manager of Regenerative Environmental Control and Life Support System at the Marshall Center, speaks to the news media Nov. 12 at the Kennedy Space Center, Fla., about the Water Recovery System. In the background is a mockup of the two racks that will be used to provide drinking-quality water on the International Space Station.

outstanding commitment to getting the job done," said Bagdigian.

EXPRESS Rack 6 is the sixth in a series of standardized payload racks that transport, store and support experiments aboard the space station.

The successful spacewalks to repair and service the station's Solar Alpha Rotary Joints during STS-126 were due in part to the contributions of another group of Marshall engineers. The Tribology Team, in the Engineering Directorate's Materials and Processes Laboratory, helped define the root cause of difficulties experienced with solar array hardware. The arrays track the sun and provide power to the space station. Tribology is the science and technology of interacting surfaces in relative motion, including the study of friction, lubrication and wear.

The starboard Solar Alpha Rotary Joint experienced problems with the bearings soon after installation last year. Engineers noticed an increase in vibration to the station, and that it was requiring more power to rotate the joint. A spacewalk by station crew members found the bearings were contaminated with debris. The Tribology Team performed unique exams on 30 trundle bearing assemblies. After reviewing photographs of the damaged bearings, the team suggested to a NASA-led industry investigation team that the debris was coming from the bearing itself. The NASA-led team concluded that the most probable cause of the damage was a lack of adequate lubrication between the trundle bearings and the race ring surface that connects the bearings to the joints.

The bulk of all four spacewalks during the mission was devoted to cleaning and lubricating the rotary joints.

"Seeing the magnitude of work completed on these spacewalks is really a career highlight for those of us who helped," said Chip Moore, the senior tribologist and team leader.

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



50 years of holiday cheer

Marshall team, retirees invited to 'rock around the tree' at Center Director's Holiday Reception on Dec. 11

Marshall Space Flight Center team members and retirees are invited to the annual Center Director's Holiday Reception on Dec. 11, where "winter wonderland" decorations will light up Activities Building 4316. Festivities will be from 1-3 p.m. The theme for the occasion is "50 years of holiday cheer" in celebration of NASA's 50th anniversary.

Team members will be entertained with "yuletide carols," hearty hors d'oeuvres and sweet treats. Gather with friends for a photo in front of the NASA anniversary logo to commemorate five decades of the agency's legacy.

Buses to and from the event will begin continuous loops at 12:45 p.m., and run until 3:15 p.m. For the bus schedule, visit Inside Marshall. For more information, contact Linda Gomez at 544-0594.



Classified Ads

To submit a classified ad to the Marshall Star, go to Inside Marshall, to "Employee Resources," and click on "Marshall Star Ad Form." Ads are limited to 15 words, including contact numbers. No sales pitches. Deadline for the next issue, Dec. 11, is 4:30 p.m. Thursday, Dec. 4.

Miscellaneous

- Antique oak china cabinet, claw feet, half-mirrored back, \$1,150. 693-4280
- Conference tables, chairs, dry erase boards, more; used home furniture; also will buy used furniture. 931-2740
- Bama Crimson Lane reclining sofa, oversized chair, \$1,800 obo. 536-5132
- Paradigm Reference Studio Series ADP-450 surround speakers, black, left, right, center, \$500 obo. 843-513-7939
- 85 Disney, Barbie Dolls, new in boxes, full list with prices. leighsfinds@yahoo.com or 874-6886
- Nintendo Wii with Wii Sports, controller, all cables, \$200. 931-703-5385
- Carter Brothers go kart, 6.5HP, two seater, 1WD, lights, cage, low hours, \$575. 345-7250
- Ventless cast-iron gas logs, propane, manual, heats 1,000 square feet, \$550. 655-6348
- Aerosonic by Baldwin piano, \$295. 652-1234
- Two tickets to "Sweeney Todd," Jan. 11, 2 p.m., Row

- K, center, face value. 772-3140
- Maternity clothes, sizes large, extra large. 759-3009
- Ashley sofas, one sofa/bench table with drawers, one couch table, two end tables, \$3,200. 652-2241
- Kenmore washer/dryer, heavy duty, all hoses, white, \$400 for pair. 975-1667
- Broyhill kitchen hutch, glass sides/doors/shelves, \$500; wood kitchen table, four chairs, \$375. 975-1667
- Garbage compactor, residential, brown, \$300 obo. 852-5595
- Dodge Dakota camper shell, \$50. 461-9894
- Antique wooden cylindrical churn, \$125. 891-1073
- Vintage tobacco tins, lot of 14, leave message. 891-1073
- Peavey Mark VIII bass amp head, 210TX, 410TX bass enclosures, \$600; Fender guitar, \$500. 636-2978
- Daniel Moore prints, "Desperation Block," \$145; "The Tradition Continues," signed by Gene Stallings, \$295. 883-8257
- 2003 Ford F-150 crew cab factory bedliner, \$100. 880-6335
- Oak table, chairs; Winterthur silver plate. 347-1674

Vehicles

- 2007 Mitsubishi Eclipse, red, black interior, 30 mpg, sunroof, Rockford Phosgate stereo, \$15,415. 776-8785
- 2006 Nissan Frontier, crew cab, 2WD, V6, automatic, silver, charcoal interior, 50,900 miles, \$17,850. 614-3333
- 2006 BMW 325i, white/tan, loaded, 40k miles, \$22,900. 883-6894 or 468-6894
- 2004 CR85R, riding gear. 656-4085
- 2003 Mitsubishi Montero Sport; 1999 Mercedes C230 Kompressor. 347-1674

- 2002 Honda XR80, four stroke, riding time less than 100 hours, \$950. 565-3022
- 2000 Mercury Cougar, loaded, leather. 890-0799 or 479-5953
- 1999 GMC Suburban SLT, loaded, 81k miles, \$6,500. 682-3828
- 1997 Lincoln Town Car, 68k miles, \$4,900. 883-7695
- 1996 LT-1 Corvette, black on black, new tires/transmission, 25 mpg, 72k miles, \$10,500. 723-8877

Wanted

- Information needed on changing combinations on filing cabinet safes, will pay. 506-8153
- Electrical work to do, wiring houses, detached garage, adding/removing lights, switches, plugs. 468-8906
- Yard vacuum system for maintaining/cleaning leaves. 508-5250
- Wood bunk bed. 881-4419
- American Girl 18-inch doll, Kit or Julie, like new condition. 931-703-6935
- Houses to clean, ironing, pet care. 651-4723

Found

- One large gold loop earring, Building 4200 lobby, Nov. 20; U.S. currency, ground hallway, Building 4200, Nov. 24. 544-4680

Free

- Puppies, will be big dogs, two males, two females. 586-2994
- Cocker Spaniel puppy, 3 months old, male, butterscotch, white socks. 759-3495

Lost

- London Fog red short trench coat. 544-4680

Holiday tree shines brightly at Building 4200

Something is now shining brightly in front of Building 4200 at the Marshall Space Flight Center: the holiday tree. The center officially began the season Dec. 1 with the annual Holiday Tree Lighting Ceremony. And not only did the tree help ring in the holiday spirit – snow showers and a surprise visit from Santa Claus added to the festivities.



The holiday tree adorns the lawn of Building 4200.



Emmett O'Brien/MSFC

Marshall Deputy Director Robert Lightfoot and Santa Claus push the big, red button to light the holiday tree, as children from the Marshall Child Development Center enjoy the spectacle. The children performed "Jingle Bells" as part of the festive event.



MARSHALL STAR

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