



MARSHALL STAR

Serving the Marshall Space Flight Center Community

Feb. 25, 2010

Endeavour safely lands in Florida after 'flawless' mission

By Sanda Martel

Space shuttle Endeavour is home after two weeks in space, having delivered the final U.S. module and a seven-window cupola to the International Space Station.

STS-130 Commander George Zamka landed Endeavour at the Kennedy Space Center Feb. 21. Shuttle Launch Integration Manager Mike Moses said that Endeavour's landing capped off a flawless mission. "The crew did an outstanding job," Moses said, referring to the complex task of installing Tranquility and its cupola to the station. "The landing went as smooth as you can hope for – by the numbers."

The mission included three spacewalks and the installation of Tranquility, a module that provides additional room for crew members and many of the space station's life support and environmental control systems. Also delivered and installed was the cupola – a robotic observation and control station that will be used for viewing celestial objects and visiting spacecraft. Tranquility and its cupola are the final major U.S. portions of the station. The orbiting laboratory now is approximately 90 percent complete in terms of mass.

The Node Integration Office at the Marshall Space Flight Center



Endeavour lands at Kennedy Space Center on Feb. 21.

provided technical assistance and coordination on Tranquility, as well as support for Mission Control Center at Johnson Space Center in Houston during on-orbit operations and activation activities.

Zamka was joined on the mission by Pilot Terry Virts and Mission Specialists Kathryn Hire, Stephen Robinson,

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Final ground test of shuttle solid rocket motor to be conducted Feb. 25

The Space Shuttle Program will conduct the final ground test of a space shuttle solid rocket motor Feb. 25 at ATK Launch Systems facilities in Promontory, Utah. Test time is 12:55 p.m. CST.

The two-minute static test of a full-scale solid rocket flight support motor is being conducted to ensure the safe flight of the four remaining space shuttle missions.

Watch for details about the test in next week's Marshall Star.

NASA studies recent storms to improve space-based global weather monitoring

By Kim Newton

The evening sky above Huntsville held an eerie look Jan. 21 but few knew looming overhead was an EF-2 tornado waiting to descend on a downtown neighborhood. The Huntsville storm system didn't produce an abnormally large amount of lightning, typically a key indicator of severe weather, and the weather community was focused on larger, hail-producing thunderstorms moving through southern Tennessee that appeared more threatening.

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Director's Corner

It is simply about the people...

Inclusion, collaboration and safety are at the heart of our ability to perform effectively as a team. For that reason, improvement in these three areas tops the list of my 2010 non-programmatic initiatives. As I have told you before, my belief is it is all about the people.

Inclusion

One thing we'd like to achieve is a more inclusive workplace. Our research says that people feel like less than half here "get the good work." That means that people feel that a majority are effectively sitting on the bench. Inclusion is about appreciating the value of diverse backgrounds, skills and points of view, and it's an area we need to work on. To be successful, we need to create an environment where every individual feels valued. When people's skills and knowledge are recognized and appreciated, they are more willing to share information and more engaged in the success of the organization. I am committed to creating an environment at Marshall that benefits the entire team and encourages the input of all employees.

Collaboration

We'd also like to improve collaboration across organizations. When we did the Denison survey last year, you gave us some great feedback. We learned that each organization, by itself, does a great job of collaborating. The difficulty comes when we start trying to collaborate across organizations. Jonathan Pettus has been leading a team that is working on ways to improve collaboration. They've recommended several actions to our leadership team, and implementation is already underway on many of these. They're based on feedback we received from you. You'll hear more about what we're doing in coming months.

Injury-free workplace

We also want to improve our safety culture. That's saying a lot, because Marshall actually has a world-class safety record. Even so, 50 people got hurt at Marshall last year. That impacts the people who got hurt. It impacts co-workers, and it impacts the families of the people who got hurt. I recognize how daunting the notion of an injury-free workplace is, but I also believe that aspiring to a workplace where it is okay for even one employee

to get hurt is simply unacceptable. So what will be different this time is that we'll approach safety not from the



Robert Lightfoot

standpoint of numbers and checklists, but from the standpoint of people. In the final analysis, safety is not about metrics. It is about people and caring about each and every one of you. We are not doing these things because of numbers. We are doing them because of people. I am committed to having a workplace where nobody gets hurt.

Inclusion, collaboration and a renewed emphasis on safety are very important to our success going forward, and you will be hearing a lot more about them. In the meantime, thank you for your patience and your professionalism as we work through the implications of the FY2011 budget submit. I'll see you next week at the all-hands!

A handwritten signature in black ink that reads "Robert Lightfoot".

Robert Lightfoot
Marshall Center Director

Landing *Continued from page 1*

Nicholas Patrick and Robert Behnken. Just after space shuttle Endeavour made its way back to its Orbiter Processing Facility hangar at Kennedy on Feb. 21, crews prepared to roll space shuttle Discovery from the facility to the nearby Vehicle Assembly Building.

The move paves the way for Discovery's rollout to the launch pad, scheduled for early March. The STS-131 mission is targeted to launch April 5.

For more information about the STS-130 mission, visit <http://www.nasa.gov/shuttle>.

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

Marshall Director Lightfoot inducted into Alabama Engineering Hall of Fame for engineering, technological contributions

By Amie Cotton

Marshall Space Flight Center Director Robert Lightfoot was one of eight individuals inducted into the State of Alabama Engineering Hall of Fame in ceremonies Feb. 20. He joins 130 other Alabamians inducted into the Hall.

Lightfoot was recognized for his service as a model leader at NASA for 20 years and his dedication and contributions to NASA's mission pioneering the future in space exploration and scientific discovery. Recipients are honored for their engineering and technological contributions that have significantly added to the engineering profession and to the technological and economic development in Alabama, the region, the nation or the world.

Receiving the award, Lightfoot thanked his family and his "incredible team" at Marshall. Without them, he added, this award would not have been possible.

A native of Montevallo, Ala., Lightfoot received a bachelor's degree in mechanical engineering in 1986 from the University of Alabama in Tuscaloosa.

Lightfoot began his NASA career at the Marshall Center in

1989 as a test engineer and program manager for the space shuttle main engine technology testbed program and the Russian RD-180 engine testing program for the Atlas launch vehicle program.

From 1999 to 2005, he worked at NASA's Stennis Space Center near Bay St. Louis, Miss., and NASA Headquarters in Washington before returning to Marshall as manager of the Space Shuttle Propulsion Office from 2005 to 2007. In 2007, Lightfoot was named deputy director of the Marshall Center and shared responsibility for managing the center until his appointment as center director in August 2009.

This year's Alabama Engineering Hall of Fame induction ceremony was held at the Grand Hotel in Point Clear, Ala. The organization was founded in 1987 in recognition of the sesquicentennial of formal engineering education in the state. It honors the outstanding accomplishments and contributions of individuals, projects, corporations and institutions that have brought – and continue to bring – significant recognition to Alabama.

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

Tornado *Continued from page 1*

Scientists at the Marshall Space Flight Center are studying these recent storms by looking at data from three unique weather monitoring tools to gain a better picture of how storms evolve to produce both heavy rain or large hail, and subsequent strong winds or tornadoes. Researchers are using observations from the Advanced Radar for Meteorological and Operational Research, or ARMOR, operated by the University of Alabama in Huntsville, and the NASA Lightning-Mapping Array System and disdrometer data to understand storm precipitation types – rain, snow or hail – and how those amounts relate to the amount of lightning produced. This early storm research supports the development of future weather monitoring systems like the Geostationary Operational Environmental Satellite, or GOES-R, that will observe Earth's weather from space.

A better understanding of these storm systems could be the difference in more accurate and timely prediction and would have been useful Jan. 21.

"To provide reliable and timely predictions, scientists need to understand the entire storm system by observing and measuring the physics of each process and how they are related," said Dr. Walt Petersen, a physical scientist at the Marshall Center. "We are attempting to do this by combining radar, lightning and disdrometer data for analysis. By studying all these data points together, we're able to connect the dots between precipitation formation, properties and movement, and the development of dangerous weather



An EF-2 tornado forms over Huntsville on Jan. 21.

phenomena such as large hail, lightning and tornadoes."

Scientists need to know what's happening inside the storm systems as they are taking place. NASA currently is working to develop new instruments and techniques to support weather and climate studies for the GOES-R satellite's Geostationary Lightning Mapper, a joint effort with the National Oceanic and Atmospheric Administration that will launch in 2015, and the NASA/JAXA Global Precipitation Measurement mission that will launch in 2013.

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

NASA College Scholarship Fund now accepting applications from NASA dependents

The NASA College Scholarship Fund Inc., a nonprofit organization managed by Johnson Space Center in Houston, will award six scholarships to qualified NASA dependents pursuing studies in science and engineering

fields. Packets can be picked up at the Exchange Wellness Center in Building 4315 or the Space Shop in Building 4203, or may be downloaded at <http://nasapeople.nasa.gov/nasascholarship/index.htm>.

The deadline to apply is March 19. For more information and eligibility requirements, contact Bill Mayo at 544-7220 or visit <http://nasapeople.nasa.gov/nasascholarship/index.htm>.



MARS Tennis Club membership drive fees due Feb. 26

The 2010 MARS Tennis Club is holding its membership drive, and fees are due Feb. 26.

Membership is available to anyone who works on Redstone Arsenal, and to off-site contractors and family members. Annual single dues are \$25 and family dues are \$30.

To join, contact club president Ronda Moyers at



544-6809, vice president Rhonda Lash at 544-9137 or secretary/treasurer Linda Brewster at 544-0169. To drop off dues or arrange for a pickup, call 682-1628. Checks should be made payable to MARS Tennis Club.

For more information, visit <http://home.comcast.net/~mtc120/site/>.

Classified Ads

To submit a classified ad to the Marshall Star, go to Inside Marshall, to "Employee Resources," and click on "Employee Ads — Submit Ad." Ads are limited to 15 words, including contact numbers. No sales pitches. Deadline for the next issue, March 4, is 4:30 p.m. Thursday, Feb. 25.

Miscellaneous

Four prom dresses, size 4, \$40-\$75. 652-9594 or 922-9294

Two-person sauna, teak wood, CD/radio, 5-IR heaters, \$850 obo. 337-2450

Cipriani bowl chandelier, golden nickel, 6-plus-3 lights, 33"Wx 24.5"H, pic available, \$100. 777-1810

Yamaha Clavinova CLP-110, 88 keys, \$1,200 obo. 461-7411

Navy leather La-Z-Boy rocker recliner, \$250. 489-9788 or 773-2774

Microfiber sectional sofa, \$300 obo. 464-0590

La-Z-Boy burgundy oversized recliner; extra-large stainless steel double bowl kitchen sink with gooseneck faucet. 461-4196

Barber chair, \$400; Thule bike racks, \$250; Thule Moab basket, \$235. 658-8241

Seagull S6 Original, hardshell case, \$350. 550-0511

1982 Winterthur silverplate, shell design, Reed & Barton, 16 place settings, serving pieces, \$1,500 obo. 347-1674

Cherry entertainment center, \$100; 27" Toshiba TV, \$40. 527-3486

Three-diamond pendant necklace, 1/2-karat diamond, 14-karat gold chain, \$350 obo. 931-309-9309

Stanley solid wood bunk beds, light maple, can e-mail photos, \$300. 837-2426

AKC Cavalier King Charles Spaniel. 508-9360

Bowflex Pro XL, \$200. 430-0110

360 Games, Grand Theft Auto IV, Prototype, Armored Core, Assassin's Creed II, \$30 each. 777-7746

Vehicles

2009 Honda Shadow VT750, black, accessories, factory extended warranty available, 2,100 miles, \$5,500. 883-5479

2008 Acura TL, 3.2, black, navigation, backup camera, Acura

service, 15k miles, \$28,000. 468-3749

2005 Honda Rebel motorcycle, 250cc, 1,700 miles, \$2,000 or make offer. 361-9796

2005 Chrysler Crossfire Coupe, auto, 50k miles, \$12,200. 542-8179

2001 Ford Taurus SES, \$3,200 obo. 895-2959

2000 Dodge Durango, loaded, backseat air/heat, 154k miles vehicle, 85k miles engine. 747-3015

1998 Stingray, RS180, new 140hp engine, extras, fish/ski, seats seven, \$9,500. 640-6427

1992 GM diesel pickup, white, 150k miles, \$3,400 or will trade for tractor. 379-4010

1982 Landcruiser, \$3,000. 658-8241

Wanted

Carpoolers wanted from Cullman area to Arsenal/MSFC. 205-602-6868

Used youth/teen soccer jerseys, shorts or shoes for mission trip to Central America. 828-1234

Chandra reveals origin of key cosmic explosions

NASA news release

New findings from NASA's Chandra X-ray Observatory have provided a major advance in understanding a type of supernova critical for studying the dark energy that astronomers think pervades the universe. The results show mergers of two dense stellar remnants are the likely cause of many of the supernovae that have been used to measure the accelerated expansion of the universe.

The Marshall Space Flight Center manages the Chandra program for NASA's Science Mission Directorate in Washington.

These supernovae, called Type 1a, serve as cosmic mile markers to measure expansion of the universe because they can be seen at large distances, and they follow a reliable pattern of brightness. However, until now, scientists have been unsure what actually causes the explosions.

"These are such critical objects in understanding the universe," said Marat Gilfanov of the Max Planck Institute for Astrophysics in Germany and lead author of the study that appears in the Feb. 18 edition of the journal *Nature*. "It was a major embarrassment that we did not know how they worked. Now we are beginning to understand what lights the fuse of these explosions."

Most scientists agree a Type 1a supernova occurs when a white dwarf star – a collapsed remnant of an elderly star – exceeds its weight limit, becomes unstable and explodes. Scientists have identified two main possibilities for pushing the white dwarf over the edge: two white dwarfs merging or accretion, a process in which the white dwarf pulls material from a sun-like companion star until it exceeds its weight limit.

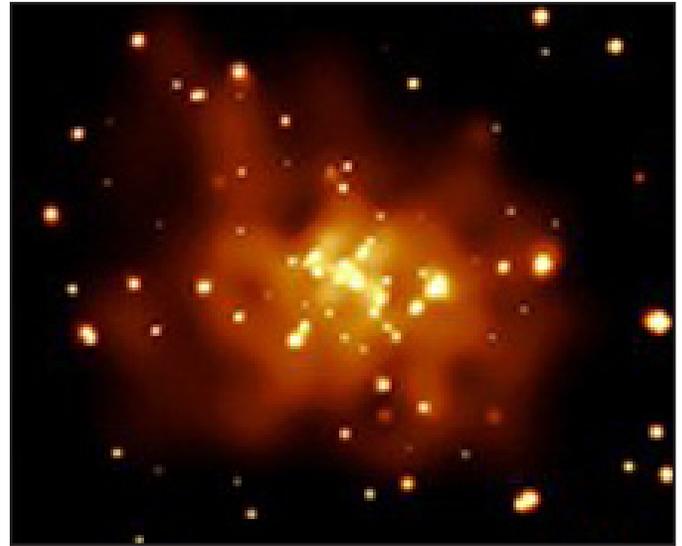
"Our results suggest the supernovae in the galaxies we studied almost all come from two white dwarfs merging," said co-author Akos Bogdan, also of Max Planck. "This is probably not what many astronomers would expect."

The difference between these two scenarios may have implications for how these supernovae can be used as "standard candles" – objects of a known brightness – to track vast cosmic distances. Because white dwarfs can come in a range of masses, the merger of two could result in explosions that vary somewhat in brightness.

Because these two scenarios would generate different amounts of X-ray emission, Gilfanov and Bogdan used Chandra to observe five nearby elliptical galaxies and the central region of the Andromeda galaxy. A Type 1a supernova caused by accreting material produces significant X-ray emission prior to the explosion. A supernova from a merger of two white dwarfs, on the other hand, would create significantly less X-ray emission than the accretion scenario.

The scientists found the observed X-ray emission was a factor of 30 to 50 times smaller than expected from the accretion scenario, effectively ruling it out. This implies that white dwarf mergers dominate in these galaxies.

An open question remains whether



Composite image of M31, also known as the Andromeda galaxy.

these white dwarf mergers are the primary catalyst for Type 1a supernovae in spiral galaxies. Further studies are required to know if supernovae in spiral galaxies are caused by mergers or a mixture of the two processes. Another intriguing consequence of this result is that a pair of white dwarfs is relatively hard to spot, even with the best telescopes.

"To many astrophysicists, the merger scenario seemed to be less likely because too few double-white-dwarf systems appeared to exist," said Gilfanov. "Now this path to supernovae will have to be investigated in more detail."

In addition to the X-rays observed with Chandra, other data critical for this result came from NASA's Spitzer Space Telescope and the ground-based, infrared Two Micron All Sky Survey. The infrared brightness of the galaxies allowed the team to estimate how many supernovae should occur.

The Smithsonian Astrophysical Observatory controls Chandra's science and flight operations from Cambridge, Mass.

Obituaries

Coy Mattox, 79, of Athens died Jan. 4. He retired from the Marshall Center in 1985 as an electronics technician. He is survived by his wife, Marie Mattox.

Amos Crisp, 78, of Fort Smith, Ark., died Jan. 23. He retired from the Marshall Center in 1988 as a supervisor public affairs specialist. He is survived by his wife, Ruth Crisp.

'Focus on Marshall' sails with NASA's external tank and highlights FASTSAT

By Lori Meggs

Travel with the external tank and see one of the fastest satellites ever built by NASA on the February episode of "Focus on Marshall" – the Marshall Space Flight Center's video program.

The "Focus on Marshall" team traveled with the external tank on its journey from the Michoud Assembly Facility near New Orleans to the Kennedy Space Center, Fla. Marshall Public Affairs Officer Steve Roy chronicles the trip from the Liberty Star ship.



The other segment of the program features the Fast, Affordable, Science and Technology Satellite, or FASTSAT. The satellite, a unique platform that will carry six small experiments to low-Earth orbit, is being tested at Marshall before its launch, targeted for May. FASTSAT is a collaborative effort between Marshall, the Goddard Space Flight Center in Greenbelt, Md., industry and the Department of Defense.

Viewers will learn about the "fast" development of the satellite and the experiments planned.

"Focus on Marshall" airs on Marshall TV Feb. 25, and March 2 and 4 at 11 a.m., noon and 1 p.m. The series is available each month on NASA TV, Inside Marshall and on the NASA Portal.

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

Tennessee Valley CFC accepting applications from charities until March 26

The Tennessee Valley Combined Federal Campaign is now accepting applications from local nonprofit charitable human health and welfare organizations for its 2010 fundraising effort. The application period concludes March 26.

The Combined Federal Campaign is an annual initiative responsible for overall management, collection and disbursement of donated funds

from federal, military and postal service donors in the Tennessee Valley area. The campaign includes government agencies in Madison, Morgan, Marshall, Limestone, Cullman and Lawrence counties in Alabama and Lincoln County, Tenn.



Under federal law, all eligible charities must be current 501(c)(3) organizations. To receive an application, call the Combined Federal Campaign office at 876-

9143; the Principal Combined Fund Organization at 536-0745, ext. 118; or visit <https://ams8.redstone.army.mil/cfc>.

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