



# MARSHALL STAR

Serving the Marshall Space Flight Center Community

March 11, 2010

## Center Director Lightfoot holds all-hands meeting

Marshall Space Flight Center Director Robert Lightfoot held an all-hands meeting March 4 to update team members about initial planning under way on NASA's fiscal 2011 budget proposal. For a complete transcript of the meeting and to view his presentation, visit Lightfoot's blog, "Launching Conversations," at <https://conversation.msfc.nasa.gov/>.



## More than 100 student teams gearing up for annual Great Moonbuggy Race



Erie High School Team 2 of Erie, Kansas, battles through a gravel pit at the 2009 Great Moonbuggy Race. Two teams from the school will compete again in this year's race.

By Megan Norris Davidson

More than 100 student teams from around the globe will drive their specially crafted lunar rovers through a challenging course of rugged, moon-like terrain at NASA's 17th annual Great Moonbuggy Race in Huntsville on April 9-10.

The moonbuggy project has become truly international, with one-third of the participating teams coming from foreign countries. Some 1,088 high school, college and university students from 20 states and Puerto Rico, Canada, Germany, Bangladesh, Serbia, India and Romania are expected to participate in the race at the U.S. Space & Rocket Center in Huntsville.

The Web will be abuzz with moonbuggy coverage again this year, with the return of "The Buggy Blog,"

See *Moonbuggy* on page 5

## How black holes may shape galaxies

*NASA news release*

New observations from NASA's Chandra X-ray Observatory provide evidence for powerful winds blowing away from the vicinity of a supermassive black hole in a nearby galaxy. This discovery indicates that "average" supermassive black holes may play an important role in the evolution of the galaxies in which they reside.

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

For years, astronomers have known that a supermassive black hole grows in parallel with its host galaxy. And it has long been suspected that material blown away from a black hole – as opposed to the fraction of material that falls into it – alters the evolution of its host galaxy.

A key question is whether such "black hole blowback" typically delivers enough power to have a significant impact. Powerful relativistic jets shot away from the biggest supermassive black holes in large, central galaxies in clusters like Perseus are seen to shape their host galaxies, but these are rare. What about less powerful, less focused galaxy-scale winds that should be much more common?

"We're more interested here in seeing what an 'average'-sized supermassive black hole can do to its galaxy, not the few really big ones in the biggest galaxies," said Dan Evans of the Massachusetts Institute of Technology in Cambridge, Mass., who presented these results at the High Energy Astrophysics Division of the American Astronomical Society meeting in Kona, Hawaii.

Evans and his colleagues used Chandra for five days to observe NGC 1068, one of the nearest and brightest

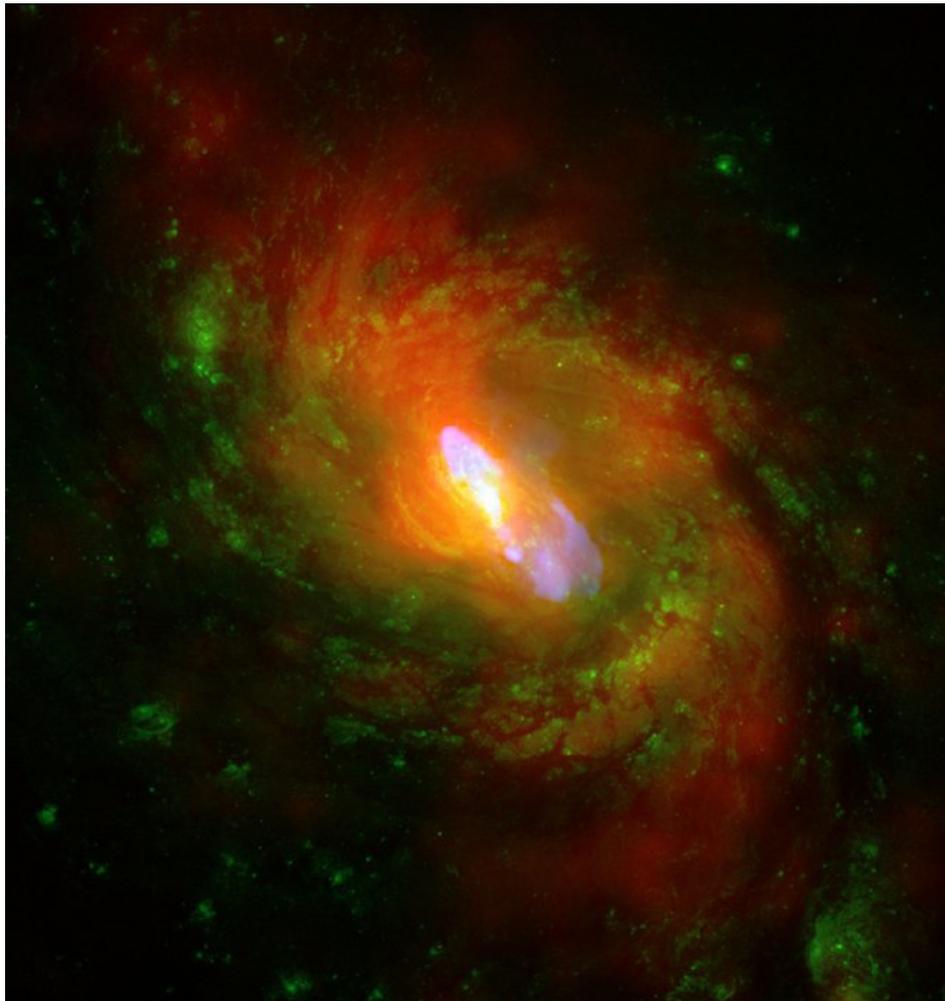
galaxies containing a rapidly growing supermassive black hole. This black hole is only about twice as massive as the one in the center of our galaxy, which is considered to be a rather ordinary size.

The X-ray images and spectra obtained using Chandra's High Energy Transmission Grating Spectrometer showed that a strong wind is being driven away from the center of NGC 1068 at a rate of about a million mph. This wind is likely generated as surrounding gas is accelerated and heated as it swirls toward the black hole. A portion of

the gas is pulled into the black hole, but some of it is blown away. High energy X-rays produced by the gas near the black hole heat the outflowing gas, causing it to glow at lower X-ray energies.

This study by Evans and his colleagues represents the first X-ray observation that is deep enough to make a high-quality map of the cone-shaped volume lit up by the black hole and its winds. By combining measurement of the velocity of the clouds with estimates of the density of the gas, Evans and his colleagues

*See Chandra on page 3*



This is a composite image of NGC 1068, one of the nearest and brightest galaxies containing a rapidly growing supermassive black hole. NGC 1068 is located about 50 million light years from Earth and contains a black hole about twice as massive as the one in the middle of the Milky Way Galaxy.

# Ombudsman Program lets your mission-related concerns be heard privately

By Jessica Wallace Eagan

Have a concern about a mission-related issue? Want to address it before it becomes a problem? The Marshall Space Flight Center has a program in place to let you voice your concern – privately.

Established in 2005, the NASA Ombudsman Program was created to provide civil service employees and contractors with an informal, independent and neutral means of communicating and facilitating the resolution of issues and concerns related to safety, organizational performance or mission success without retribution.

Team members can turn to Susan Cloud, center ombudsman and special assistant to the director of the Office of Human Capital, and Barry Musick, alternate ombudsman and assistant to the director of the Engineering Directorate.

"All discussions are strictly confidential," said Cloud. "Barry and I are committed to helping with issues that are of concern to you. We welcome meeting with anyone who calls on us for our assistance."

An ombudsman can serve as a link, when appropriate, between a team member and management to resolve an issue by listening to and discussing concerns



Susan Cloud



Barry Musick

while advocating for a fair resolution process. At the discretion of the ombudsman and in keeping with the confidentiality principle, an issue can be taken to the center director.

"Marshall offers a number of quality programs that enable employees to resolve workplace issues, and the Ombudsman Program is just one option," said Musick. "Our mission is to serve as a neutral moderator in helping resolve conflict so we as a team can work in unison toward Marshall's mission."

The preferred method of contacting an ombudsman is a personal visit or by phone.

To contact Cloud, call 544-5377. Musick can be reached at 544-1002.

Additional information about the program can be found in NASA Policy Directive 2025.1 at <http://nodis3.gsfc.nasa.gov/>.

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

## Chandra *Continued from page 2*

showed that each year several times the mass of the sun is being deposited out to large distances, about 3,000 light years from the black hole. The wind may carry enough energy to heat the surrounding gas and suppress extra star formation.

"We have shown that even these middle-of-the-road black holes can pack a punch," said Evans. "I think the upshot is that these black holes are anything but ordinary."

Further studies of other nearby

galaxies will examine the impact of other Active Galactic Nuclei outflows, leading to improvements in our understanding of the evolution of both galaxies and black holes.

"In the future, our own galaxy's black hole may undergo similar activity, helping to shut down the growth of new stars in the central region of the Milky Way," said Evans.

These new results provide a key comparison to previous work performed at Georgia State University in Atlanta

and the Catholic University of America in Washington with the Hubble Space Telescope's Space Telescope Imaging Spectrograph, known as STIS, instrument.

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

More information, including images and other multimedia, can be found at <http://chandra.harvard.edu> and <http://chandra.nasa.gov>.

# 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>.

## 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 18, is 4:30 p.m. Thursday, March 11.

### Miscellaneous

Two sofas, two love seats, dining table, four chairs, TV, wall decorations, more. 603-0894 or 852-8325

Fender guitar amp, MIDI cable, software, \$250; Seagull S6 Original acoustic guitar, case, \$325. 550-0511

Whole house attic fan with shutter, 22X26, 3.3 amp, \$40. 527-0110

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

Round table, dark wood, four captain chairs, glass cut to fit top of table, \$250. 233-5599

Daniel Moore's "The Tradition Continues," unframed, 2621/19920, signed by Stallings, \$500. 682-1644

Bauer F-4 Inline skates, men's size 9, \$25. 288-6301

52-inch Sony Bravia, KDL52W5150 HD, 1080p, 120Mhz, \$1,300. 508-0509

LA Spa hot tub, cover, AM/FM radio, CD player, five seats, \$900. 230-0907

CKC Yorkies, ready, one girl, \$400, two boys, \$350 each. 425-8381

Lily Flagg pool membership, includes 2010 dues paid, \$750. 656-2951

Broadway's "The Color Purple," VBC Concert Hall, three orchestra seats, May 2, 2 p.m. 772-3303

Sherrill sofa, photo available, \$100; GE dryer, \$100. 651-5570

Aluminum 24-foot extension ladder, All American brand, \$100. 655-6348

Two 10-inch subwoofers and bandpass box, amplifier, \$200 firm. 505-9263

Cherry entertainment center, \$100. 527-3486

Kohler sink, white porcelain, double bowl, white Delta pull-out faucet, \$100 obo. 679-6676

LA Spa 40 jet hot tub, 7 feet by 7 feet, \$2,000. 541-8030

Husqvarna Z4824 zero-turn mower, 48-inch cut, 24HP, full warranty, 74.5 hours, \$1,900 obo. 684-1143

32-inch Sanyo TV. 975-9803 after 6 p.m.

Reese weight distribution hitch, Eaz-lift Antisway bar for travel trailer, 1,000/10,000 lb, \$170. 783-9918

Crib mattress, plastic coated, \$30. 617-1822

55-inch Mitsubishi WS-55311 rear projection TV, full 1080HD, \$350. 658-7615

Playstation 3 game, Little BIG Planet, Game of the Year edition, \$40. 828-1234

David's Bridal wedding dress, size 0, white, \$450. 516-528-3371

F-style Weber Gallatin model mandolin, hard case, \$1,750. 509-5340

### Vehicles

2009 Honda Shadow Aero 750, black, many accessories, extended warranty available, 2,080 miles, \$5,400. 883-5479

2009 Chevy Colorado Z71, crew cab, chrome wheels step rails, auto, cruise, 18k miles, \$20,995. 759-0478

2007 Kawasaki Brute Force 650 4X4i, camo, 80hrs, 489 miles, \$4,700 obo. 615-417-3157

2007 tracker 10-foot flatbottom boat, \$250. 468-3134

2005 Honda Accord Hybrid, gray, 255HP, V6-IMA, navigation, loaded, full warranty, 31/42MPH, \$16,400. 464-9871 or 850-496-7329

2004 Monte Carlo SS Supercharged, Dale Earnhart Jr. Special Edition, loaded, red, 55k miles. 652-2978

2004 28-foot Rockwood travel trailer, ducted AC/heat, dinette slideout, equalizer hitch, \$13,750. 738-0302

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

1992 GMC diesel pickup, white, 150k miles, \$3,300 or will trade for tractor. 379-4010

1985 Ford F-150, 4X4, SW-base, hunter green, tan interior, chrome wheels, new engine/tires, \$2,950. 259-1523

14-foot aluminum boat, 20 HP outboard, trailer, \$900 obo. 205-260-6703

### Wanted

Farm helper, bush-hogging, fencing, etc., New Hope area; paddle boat. 509-7907

English Springer Spaniel puppy. 974-9657

Houses/offices to clean, available evenings and weekends. 777-8595 leave message

Rope halter for large horse, 12' and 20' lead ropes, other tack in good condition. 468-8177

### Carpool

Cullman area to Arsenal/MSFC. 205-602-6868

### Free

Female Weimaraner, fixed, up to date on all shots. 882-0461

AKC Lhasa Apso, male, 10 years old, housetrained. 585-0882

Two tabby cats, 6 and 3 years old, spayed, all shots, food and accessories. 642-6140

## Moonbuggy *Continued from page 1*

<http://blogs.nasa.gov/cm/blog/moonbuggy>, featuring pre-race news from teams. Moonbuggy enthusiasts also can get frequent race-day updates via the Moonbuggy Facebook page, <http://www.facebook.com/#!/Moonbuggyrace?ref=mf>, and Twitter, <http://twitter.com/MOONBUGGYRACE>.

Each year, students begin to prepare for the event during the fall semester. They must design, build and test a sturdy, collapsible, lightweight vehicle that addresses engineering problems similar to those overcome by the original Apollo-era lunar rover development team at the Marshall Space Flight Center in the late 1960s.

The buggies are based on the design of those classic rovers, which American astronauts drove across the moon's surface during the Apollo 15, 16 and 17 missions in the early 1970s.

Teams of students build their vehicles using trail bike tires, aluminum or composite-metal struts and parts, and the best drive trains, gears, suspension, steering and braking systems they can find or construct.

Each moonbuggy must be human powered and piloted by two students – one female and one male. There's no official weight limit. But, just as pairs of Apollo moonwalkers had to unload and prepare their lunar rover for travel, race drivers must be able to carry their collapsed vehicle – with no help from other teammates – some 20

feet to demonstrate their buggy is not too massive, and then assemble it. The half-mile course includes sand and gravel pits, simulated lunar craters, humps, crevices, ridges and other obstacles.

Top prizes are awarded to the three teams in both the high school and college/university divisions that post the fastest race times – which include assembly and penalty times. A variety of other prizes, including "rookie of the year" and the "featherweight" award – presented to the team with the lightest, fastest buggy – are given by the corporate race sponsors.

NASA's Great Moonbuggy Race is one of dozens of educational projects and initiatives led by the Marshall Center each year to attract and engage America's next generation of scientists, engineers and explorers – those who will carry on the nation's mission of exploration to uncharted destinations in the solar system.

"NASA is committed to inspiring young people in science, technology, engineering and math, and the Great Moonbuggy Race is a great way for us to reach out to young people and get them excited and involved in technical opportunities available to them," said Mike Selby, an avionics technical assistant in the Marshall Center's Engineering Directorate. While completing his engineering degree at the University of Alabama in

Huntsville, Selby was a member of the school's moonbuggy teams, helping them to a second-place finish in 1995 and to first place in 1996. Since 2001, he has served each year as a volunteer scorekeeper.

The race is hosted by the U.S. Space & Rocket Center, and sponsored by Lockheed Martin Corp., The Boeing Company, Northrop Grumman Corp. and Jacobs Engineering ESTS Group, all of Huntsville.

For a list of this year's competitors, visit: <http://moonbuggy.msfc.nasa.gov/email.html>.

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



The Huntsville Center for Technology Team 2 tied for first place in the high school division at the 2009 Great Moonbuggy Race. Two teams from the school will return to defend their title at this year's race.

## Marshall's ISS Vehicle Office supports installation of final station hardware

The Marshall Space Flight Center's ISS Vehicle Office supported the installation of Node 3 – also known as Tranquility – on the International Space Station during the STS-130 mission last month. Jimmy Grisham, Node 3 lead in Marshall's Node Integration Office, in foreground, monitors installation activities, along with Andrea Geraci, ground and flight operations engineer for Thales Alenia Space, Italy. The nodes are interconnecting elements between the various pressurized modules on the space station, allowing passage of crew members and equipment to other station elements, while providing vital functions and resources. Node 3 marked the completion of Marshall's efforts in construction and delivery of major space station elements. To read about Marshall's final station hardware, visit <http://marshallstar.msfc.nasa.gov/2-4-10.pdf>.



Lauren Hammett

## Obituaries

**Cowles M. McMahan III**, 87, of Huntsville died Jan. 28. He retired from the Marshall Center in 1978 as an aerospace engineer. He is survived by his wife, Helen Crain McMahan.

**Nancy Milly**, 81, of Huntsville died Jan. 28. She retired from the Marshall Center in 1979 as a flight systems engineer. She is survived by her husband, John Milly.

**John Hilchey**, 87, of Huntsville died Feb. 23. He retired from the Marshall Center in 1994 as an engineer. He is survived by his wife, Dorothy Brooks Hilchey.

**Reuben Fryer**, 69, of Guntersville died Feb. 25. He retired from the Marshall Center in 1994 as a personnel management specialist supervisor. He is survived by his wife, JoAnn Fryer.

**Emmett Nash**, 78, of Rogersville died March 1. He retired from the Marshall Center in 1988 as an engineer. He is survived by his wife, Ruby Jean Nash.

**Richard Thompson**, 76, of Huntsville died March 1. He retired from the Marshall Center in 1998 as an aerospace engineer. He is survived by his wife, Shirley McPherson Thompson.

## MARSHALL STAR

Vol. 50/No. 24

Marshall Space Flight Center, Alabama 35812  
256-544-0030  
<http://www.nasa.gov/centers/marshall>

The Marshall Star is published every Thursday by the Public and Employee Communications Office at the George C. Marshall Space Flight Center, National Aeronautics and Space Administration. Classified ads must be submitted no later than 4:30 p.m. Thursday to the Marshall Public and Employee Communications Office (CS20), Bldg. 4200, Room 102. Submissions should be written legibly and include the originator's name. Send e-mail submissions to: [intercom@msfc.nasa.gov](mailto:intercom@msfc.nasa.gov). The Star does not publish commercial advertising of any kind.

Manager of Public and Employee Communications: Dom Amatore  
Editor: Jessica Wallace Eagan

U.S. Government Printing Office 2010-623-044-00039

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