



"We bring people to space — We bring space to people"

Chandra images provide new vision of cosmic explosions

Images released Sept. 20 from NASA's Chandra X-ray Observatory, managed by Marshall, reveal previously unobserved features in the remnants of three different supernova explosions.

Two of the remnants, G21.5-0.9 and PSR 0540-69, show details of the prodigious production of energetic particles by a rapidly rotating, highly magnetized neutron star, as well as the enormous shell structures produced by the explosions. The image of the third remnant, E0102-72, reveals puzzling spoke-like structures in its interior.

G21.5-0.9, in the constellation of Scutum, is about 16,000 light years from Earth. One light year equals 6 trillion miles. Chandra's image shows a bright nebula surrounded by a much larger diffuse cloud. Inside the inner nebula is a bright central source that is thought to be a rapidly rotating, highly magnetized neutron star. A rotating neutron star acts like a powerful generator, creating intense electric voltages that accelerate electrons to speeds close to the velocity of light. The total output of this generator is greater than a

See Chandra on page 2



NASA/CXC/SAO

Chandra's cameras captured this image of E0102-72, a supernova remnant in the Small Magellanic Cloud, a satellite galaxy of the Milky Way. It is believed to be 1,000 years old and to have resulted from the explosion of a massive star.

Team to review Space Shuttle maintenance, refurbishment practices

Following the recent discovery of maintenance-related damage to electrical wiring in the Space Shuttle, NASA is forming a team of leading aerospace experts to review the overall safety of Shuttle maintenance and refurbishment practices.

Dr. Henry McDonald, director of NASA's Ames Research Center, Moffett Field, Calif., will chair the team. Other members will be named later this week.

"Dr. McDonald's team will include top maintenance experts

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Marshall Center employees 'give back' through Community Service Day Saturday

by Marianne Higgins

Federal employees and contractors at the Marshall Center will "give back" to local non-profit agencies during the fifth annual Community Service Day on Saturday.

This year's Marshall Center "Care Enough to Share Enough" event provides Marshall volunteers an opportunity to learn about the needs of the community while giving their time, energy, skills and old-fashioned muscle.

Volunteers for this year's event will help five local agencies.

At the Technology Assistance for Special Consumers agency, volunteers from Marshall will adapt toys for children with physical challenges or disabilities. The work site is at Teledyne Brown Engineering Building 5 on Lakeside Drive.

Christmas Charities Year Round, at 903 Cook Ave., will open "Santa's Workshop" for Marshall volunteers to refurbish toys

and select children's clothing.

Marshall employees helping at Habitat for Humanity will put final touches on three new homes on Wilson Drive, directly across the street from Terry Heights Elementary School.

Other Marshall Center volunteers will serve lunch and bus tables for The Salvation Army at 305 Seminole Drive.

Volunteers from Marshall also will paint wheelchair ramps and do basic home repairs at several homes through CASA, the Care Assurance System for the Aging and Homebound.

Agencies participating in Marshall's Community Service Day are among the recipients of the Combined Federal Campaign, a fall fund-raising effort for non-profit agencies. The campaign begins Oct. 4.

The writer, a contractor employed by ASRI, supports the Media Relations Department.

"Safety Protects People"

— Safety slogan submitted by Sharon Carswell, TD03

SEPTEMBER				
20	21	22	23	24
			Alabama Family Rights Association, Frank Hicks, 10 a.m., Bldg. 4202, room 224 and 2:30 p.m., Bldg. 4203, room 5002	Chi-Ho, Billie Long, 10 a.m., Bldg. 4610, room 3053 Big Brothers/Big Sisters, Nampombe Taylor, 1 p.m., Bldg. 4610, room 1054
OCTOBER				
27	28	29	30	1
CASA, Ann Anderson, 10 a.m., Bldg. 4610, room 3053 American Red Cross, Dr. Al Castelli, 2 p.m., Bldg. 4203, room 6002	Habitat for Humanity, Morgan County, Linda McKinney, 10 a.m., Bldg. 4610, room 3053	American Red Cross, Barry Porter, 9 a.m., Bldg. 4200, room 600 Salvation Army, Capt. Glenn Riggs, 10 a.m., Bldg. 4610, room 1054 American Cancer Society, Laura Richardson, 1 p.m., Bldg. 4203, room 6002 AGAPE, Charles Kelly, 2 p.m., Bldg. 4203, room 3002	American Red Cross, Barry Porter, 9 a.m., Bldg. 4201, room 118 CASA, Kyle Davis, 9 a.m., Bldg. 4200, room 600 American Cancer Society, Laura Richardson, 1 p.m., Bldg. 4200, room 915	Habitat for Humanity, Madison County, Camille Solley, 9 a.m., Bldg. 4200, room 329 Friends of the Family, Marie Dunbar, 1 p.m., Bldg. 4200, room 915 St. Jude Children's Research Hospital, Lori Reed, 2 p.m., Bldg. 4200, room P110
4	5	6	7	8
Combined Federal Campaign kickoff, 9 a.m. Morris Auditorium with Liz Hurley, WAFF TV-48 as speaker	Salvation Army, Capt. Glenn Riggs, 10 a.m., Bldg. 4200, room 600 Habitat for Humanity, Madison County, Camille Solley, 1 p.m., Bldg. 4203, room 2002	American Red Cross, Barry Porter, 9 a.m., Bldg. 4202, room 326A CASA, Ann Anderson, 10 a.m., Bldg. 4203, room 6002	American Red Cross, Barry Porter, 9 a.m., Bldg. 4610, room 5025 Am. Heart Association, Kim Jimmerson, 1 p.m., Bldg. 4200, room 600	

Graphic by Kevin Woods

*Speakers, dates subject to change without notice.

Chandra

Continued from page 1

thousand suns. The fluffy appearance of the central nebula is thought to be due to magnetic field lines which constrain the motions of the high energy electrons.

"The existence of a rotating neutron star, or pulsar, in the center of G21.5-0.9 is inferred from the appearance of the nebula and the energy distribution of X-rays and radio waves from the nebula. This distribution, called non-thermal radiation, is characteristic of radiation produced by high-energy electrons in a magnetic field.

A previously known pulsar is observed directly in the Chandra image of PSR 0540-69. This pulsar, located in a 180,000-light-year-distant satellite galaxy to our Milky Way, emits pulses of radio, optical and X-ray energy at a rate of 50 per second. These pulses, which come from a neutron star rotating at this incredible rate, comprise only a few percent of the total energy output of the neutron star powerhouse.

"The Chandra image gives us a much better idea of how this energy source works," said Dr. Stephen Murray, principal investigator for the High Resolution Camera, the X-ray camera used to make this image. "You can see X-ray jets blasting out from the pulsar in both directions."

The third Chandra image is of E0102-72, in the Small Magellanic Cloud, another satellite galaxy of the Milky Way. This galaxy is 190,000 light years from Earth. This object, like G21.5-0.9 and PSR 0540-69, is believed to have resulted from the explosion of a massive star several thousand years ago. Stretching across 40 light years of space, the multi-million-degree source resembles a flaming cosmic wheel.

"To follow Chandra's progress and view additional images, visit the Chandra News Web site at:

<http://chandra.nasa.gov> and
<http://chandra.harvard.edu>

Managing projects with excellence

When I was introduced to the Center a year ago, I was asked the question: "What do you find that is most positive about Marshall when you ask around?"

My answer, without hesitation, was that Marshall is known as a NASA Center with excellent engineering and project management expertise. The successful Chandra program is a testimony to the capability of Marshall in engineering disciplines and project/program management.

When we initiated the restructure of the organization and our processes, one of the objectives was to maintain this excellence in program and project management and engineering. We are committed to doing this.

As you know, the Agency has established the policies and procedures for project management in NPD 7120.4A and NPG 7120.5A. We have developed Marshall procedures that support that direction consistent with our ISO 9001 registration. It is very important that people engaged in project management, not just the manager, understand these procedures and help continue to improve them.

With the recent failure of so many launch vehicles (six within the last year), I think about what has gone wrong with the system and what we could do at Marshall to ensure that we do not give in to changes that might degrade our ability to consistently deliver quality products and services to our customers.

Sid Saucier and David Stephenson have been participating in a national investigation called for by the president called a "Broad Area Review." This review focussed on the processes at the launch vehicle companies to understand what has changed to bring about this string of failures. Sid came to me with the list of findings and said that the lessons learned apply to all aerospace projects and not just to the launch vehicle companies.

In light of these lessons and others, it is critical that we increase our skills in program and project management. An assessment of our training program and progress to date is under way to find out where we need to improve to support you as project team members.

To keep our team members sharp, I would like to see Marshall hold regular project management forums. These forums could be held periodically to share the lessons learned from such a review, to have an invited guest or one of our project managers teach some aspect of project management, or to take time to understand the way the Agency is asking us to run projects. I am asking the new Systems Management Office to take the lead in sponsoring these forums. We will make these forums available to people who really want to learn and improve their project management performance.

I look forward to the first project management forum. Sid and David will share the results of the Broad Area Review at the first one.



Center Director
Art Stephenson

—Art Stephenson

Shuttle

Continued from page 1

from NASA, the military, the aerospace industry and the commercial aircraft industry," said Joe Rothenberg, associate administrator for space flight at NASA Headquarters in Washington, D.C. "Their experience and lessons-learned compiled over the years will be essential to our continuous improvement processes for Shuttle safety."

The team will assess NASA's standard practices for maintaining and refurbishing the Shuttle orbiters, main engines and solid rocket boosters. It also will recommend improvements.

Preliminary findings will be presented to NASA in October.

Job Opportunities

CPP 99-115-CV, AST, Mission Operations Integration, GS-801-14, Flight Projects Directorate, Flight Systems Department, Hardware Development & Integration Group. Closes Sept. 28.

CPP 99-119-JB, Emergency Preparedness Specialist, GS-301-9/11/12, Center Operations Directorate, Facilities Engineering Department, Planning & Integration Group. Closes Sept. 28.

CPP 122-CV, Technology Transfer Administrator, GS-301-13/14, Customer & Employee Relations Directorate, Technology Transfer Department. Closes Sept. 28.

CPP 99-102-CP, Program Analyst, GS-343-7, Science Directorate, Business Management & Administration Office. Closes Sept. 28.

CPP 99-126-CV, Management Support Assistant (OA), GS-303-7, Customer and Employee Relations Directorate, Media Relations Department. Closes Oct. 4.

Reassignment Bulletin: 99-19-JB, AST, Technical Management, GS-801-13, Center Operations Directorate, Logistics Services Department, Transportation & Logistics Engineering Group. Closes Oct. 5.

Obituary

Reynolds, Sherry B., 63, of Huntsville, died Aug. 26. She retired from Marshall in November 1990 where she worked as a secretary. She is survived by two daughters, Dawn R. Cleveland of Toney and Vickie Reyes of Madison; one brother, Dr. Donald Bryan of Cash Point, Tenn.; and five grandchildren.

Aerospace engineer developing system for monitoring engines

by Debra Valine

He could not have known, when his father put him to work in the family burglar alarm business at age 13, that he would one day be part of a team building rocket engines for NASA.

Luis Trevino, an aerospace engineer on the Performance and Analysis Team in the Space Transportation Directorate, has worked at Marshall for nearly 11 years. He designs and develops tools for engine propulsion health management systems and performance analysis — particularly the X-33 aerospike engine and the Space Shuttle Main Engine.

One system he has been working on, the X-33 Integrated Health Monitoring System, will be used for the upcoming aerospike engine test series that will take place later this month at Stennis Space Center, Miss.

“This project involved developing an integrated health monitoring module that utilizes a high-speed camera to monitor engine performance,” Trevino said. “The system also integrates information from a real-time vibration monitoring system. It will help assess the health of the aerospike engine.”

Trevino, who has a bachelor’s degree in electrical engineering from Texas A&M in Kingsville and a master’s degree in electrical engineering from the University of Alabama in Huntsville (UAH), said working with his father sparked his interest in electricity. “Putting things together led me to a degree in engineering,” Trevino said. He is on track to receive a doctorate in electrical engineering, specifically expert systems, from UAH either in December or mid-2000.

“From the work I am doing on the Space Shuttle Main Engine and the X-33, my immediate goal is to develop a reliable product that would be applicable to other engine platforms,” Trevino said.



Photo by Dennis Olive, NASA/Marshall Space Flight Center

Luis Trevino, seated, and David Seymour view computer drawings of the Space Shuttle Main Engine power head.

In his spare time, the Alice, Texas, native enjoys performing as a trumpet player and backup vocalist in a salsa band, and spending time with his wife Celia and 16-year-old daughter Celina.

“Latin Rhythms, formed in 1995, is a six-piece Latin salsa band,” Trevino said. “We get a lot of work throughout Alabama and even in Nashville.” The band members come from the Dominican Republic, Puerto Rico and Panama. Other Marshall employees who have performed with the band are Jose Matienzo, in the Space Transportation Directorate; Bryan Barley, Flight Projects Directorate; and Eric Shaw, Systems Management Office.

Playing in the band is a hobby, said Trevino, who has no plans to quit his day job to pursue a career in music. “If music gets too serious, it’s no longer fun.”

The writer, a contractor employed by ASRI, is the Marshall Star editor.



Dodging the opposition

At left, Lori Tillery carries the ball for “End Zone,” during a recent women’s flag football game against the “Silver Bullets.” Debbie Scrivner, below, scored two touchdowns for the Bullets on the way to a 12-0 trouncing of End Zone.



Photos by William

Upcoming Events

Marshall Center Safety Awareness Day — The Marshall Center Safety Awareness Day kickoff will be held at 8:30 a.m. Oct. 20 in Morris Auditorium.

Marshall Association Meeting — The next Marshall Association meeting will be held at 11:30 a.m., Sept. 30, in Bldg. 4203, room 1201. Dr. Ed Bridges, director of the Alabama Department of Archives and History will speak on "How Alabama's history influences our culture, economy, political structure and philosophy." For more information or to make reservations, e-mail: efre.hanson@msfc.nasa.gov

Lunch and Learn — A lunch and learn featuring an update on osteoporosis will be presented in Morris Auditorium on Sept. 30 from 11-11:45 a.m. Jane C. Odle, the director of the Comprehensive Osteoporosis Center and executive director of Rheumatology Associates of North Alabama, will speak on the issues surrounding osteoporosis prevention and treatment.

Windmills Training — The Equal Opportunity Office is sponsoring the "Windmills" Attitudinal training Program on Oct. 14, in Morris Auditorium. There will be three sessions: 8-10 a.m., 10:30 a.m.-12:30 p.m., and 1:30-3:30 p.m. A training form 59 is not required; however, a training roster will be available at the auditorium entrance. The training is recommended for all supervisors and managers and will be beneficial for all employees. The curriculum consists of several modules that use participation and discovery as learning vehicles. Through this process, individuals are able to recognize their own perception of persons with disabilities, where these perceptions originated, and how they affect their behavior in the workplace. The training focuses on attitudes and human factor but also addresses issues including legal requirements and accommodations. Federal laws prohibit employment discrimination against persons with disabilities; however, attitudes often remain the most significant barrier to employment. The "Windmills" program seeks to remedy attitudinal barriers and addresses issues related to the American with Disabilities Act.

Breast Cancer Awareness — The "Lunch and Learn" series will present a breast cancer awareness workshop Oct. 7 and 20, from 11 a.m.-noon in Bldg. 4200, room P110. Call Rita Evans-McCoy at 544-7507.

Veterans Day Parade — Marshall Center employees and contractors who are veterans may volunteer to participate in this year's Veterans Day parade on Nov. 11 in Huntsville. Volunteers are needed to help build a float representing the Marshall Center and also to march in the parade. To volunteer, call Shelvie Miller of the Equal Opportunity Office at 544-0090 by Oct. 29.

NASA joins Congress, U.S. Drug Control Office in deploying Internet site to fight drug use

NASA Administrator Daniel S. Goldin, astronaut Buzz Aldrin, U.S. Rep. Matt Salmon of Arizona, U.S. Sen. Chuck Grassley of Iowa, and Barry McCaffrey, director of the Office of National Drug Control Policy, recently unveiled a new World Wide Web site designed to steer children away from drugs.

In July, NASA became the first federal agency to include anti-drug messages on its Web site. Since then, the Office of National Drug Control Policy has worked with 18 agencies and departments to add similar messages to their sites.

The new Web site, a joint project of NASA and the Office of National Drug Control Policy, includes messages from astronauts about the dangers of drug use and a place for students to register their names for a CD-ROM that may eventually fly aboard the International Space Station. The site will be accessible from the NASA Web site: <http://www.nasa.gov>



Photo by Dennis Olive, NASA/Marshall Space Flight Center

Amnesty Day

Brent Brinkman, left, and Chuck Payne, contractors with EG&G, unload materials collected during Marshall's Amnesty Day on Aug. 18. Marshall's Environmental Engineering Department collected nearly 18,000 pounds of materials. That included 40 percent ignitable material, 12 percent acids, 6 percent caustics, 40 percent non-regulated materials such as resins, adhesives and sealants, and 2 percent unknown. The total collected over the eight Amnesty Days is approaching 100,000 pounds. The next Amnesty Day at Marshall will be Oct. 19 on the south side of Bldg. 4705.

Employee Ads

Miscellaneous

- ★ Pyramid stereo, graphic equalizer, 2 line, 1 tape input, black, \$40. 722-0417
- ★ Propane water heater, 30 gallon, used 3 months, \$175. 828-4564
- ★ Wooden jungle gym, \$100; GE electric clothes dryer, white, \$95. 881-6040
- ★ Custom-made drapes, 1 pair, 81"x95," beige w/ navy & rust trim. 883-1686
- ★ Panasonic upright 12-amp vacuum cleaner, attachments, six new disposable bags, \$30. 880-6267
- ★ Pioneer VSX-5600 Dolby Pro-Logic receiver, 1000W channel, in box w/remote & all accessories, \$120 obo. 880-1544
- ★ Upright freezer, \$75; coffee/end tables, \$65; boy's bike, \$30; radio/cassette player w/speakers, \$50. 464-5911/evening
- ★ Antique dresser w/mirror, \$350; iron and glass coffee table, \$200. 837-0085
- ★ Bedliner for Ford F150 shortbox, new, \$100; Uniden cellular phone, 1900A, hands-off microphone, \$25. 534-7791
- ★ Wetbike personal watercraft, no trailer, 2-seater pulled out of 3-year storage, \$150 firm. 753-2278
- ★ Girl's bedroom suite: canopy bed (full), desk, chair, dresser w/mirror, dresser w/hutch, white w/ blue, \$400 obo. 880-0159
- ★ New National Safety Association, Inc. bacteriostatic water treatment units (2), \$150 each. 852-9263
- ★ Spring Air back supporter elite king mattress, box spring, frame, extra firm, \$400 obo. 880-5182
- ★ Virginia House trestle, four heavy wood chairs and bench, \$400. 593-5892
- ★ Aluminum mobile home windows, smaller than 3x5's, six at \$15 ea. or all for \$75; two 3x3's (approx.) \$9 ea. 461-8369
- ★ 1997 Kawasaki Concourse 1000cc touring motorcycle, many extras, perfect condition, 16K miles, \$6,250 obo. 882-9407

Vehicles

- ★ 1982 Chevy step-side, black, built 350, 240W, CD, most new parts, \$3,900. 859-6522
- ★ 1994 Nissan Sentra-XE, 90K miles, white, auto, a/c, AM/FM cassette, \$4,000 obo. 772-9930
- ★ 1992 Mazda 929, loaded, silver/gray leather, \$6,700. 539-5042

- ★ 1992 Toyota 4Runner, SR5, 4WD, V6, 13K miles, hood scoop, CD/cassette, PL/PW, excellent condition. 753-2187
- ★ 1999 Cadillac Sedan Deville, 16.5K miles, V-8, silver, leather, must sell for estate, \$31,500. 828-3633
- ★ 1995 Pontiac Bonneville SE, silver, charcoal leather, CD, auto leveler, loaded, one-owner, ltd. warranty, \$9,995. 883-4677
- ★ 1993 Nissan 300zx, 2 2, 41K miles, T-tops, CD Bose system, all power, leather seats, \$14,500 obo. 883-6496
- ★ 1995 Mercury Villager, 65K miles, blue/gray interior, V6, \$11,000. 533-0038
- ★ 1993 Dodge Caravan LE, loaded, well maintained, \$5,500; Burley Lite bicycle trailer, \$125. 721-9005
- ★ 1991 Mazda Miata, 5-speed, new top, great mechanical, 117K miles, \$4,750 obo. 895-2959
- ★ 1993 Ford Taurus GL, new transmission, all power, automatic, excellent condition, \$4,375. 880-7204

Free

- ★ Plywood box (Duck Hunters) for trailer, 4'x8'x3'h, separate compartments for dogs, decoys, sleeping. 881-0278
- ★ Chow/lab mix dog, all shots, neutered. 883-6496
- ★ Female puppy, black, approx. 4 months old, mixed. 895-8385

Lost

- ★ Heirloom wedding band, gold w/mother's and mother-in-law's bands attached, reward if found. 232-8555
- ★ Sunglasses in or around Bldg. 4471. Call 544-4877 if found

Found

- ★ Ring in ladies restroom, Bldg. 4200. Call 4-4758 to identify

Wanted

- ★ Roommate, 3BR/2 bath home, Monte Sano area, utilities, cable TV, phone included. Call 551-0276/Lisa
- ★ Saxophone for student. 883-2757

Center Announcements

- ☛ **MARS Fishing Club** — Results of the Guntersville Lake/Browns Creek tournament on Sept. 18 are: first place — Joe Glover with fish weighing 3.57 lbs.; second place — Ross Evans and Bill McPeak with fish weighing 2.06 lbs. Big fish honors went to Joe Glover with a 3.57-pound bass. The next tournament is the MARS Fishing Club Classic scheduled for Saturday, Oct. 9 at a lake yet to be named. For more information, call Charles Kilgore at 544-9437, Don McQueen at 544-9073 or Charlie Nola at 544-6367.
- ☛ **MARS Harvest Ball** — Tickets for the Oct. 16 Harvest Ball are available through the MARS Ballroom Dance Club. The semi-formal event will be held at the Von Braun Center's West Exhibit Hall and will feature ballroom music by the Paul Chambers Combo. Socializing will begin at 6:30 p.m., followed by a buffet dinner at 7 p.m. and dancing from 8-11 p.m. Tickets, at \$19 per person with a \$3 discount for members, can be purchased from Tamara Landers at 544-6818, Pat Sage at 544-5427, Ed Ogozalek at 837-1486, Linda Kinney at 544-0563, Bob Williams at 544-3998, or Hugo Berry at 544-3525. To reserve a table for eight, call Woody Bombara at 650-0200.
- ☛ **Black History Month Volunteers** — Volunteers are being accepted to chair or serve on various committees for the Year 2000 Black History Month activities. The committees include, but are not limited to, poster-essay contest, educational activities, jazz café and seminars. To volunteer, call Dawn Cross at 544-1835 or James Bailey at 544-2523 by Sept. 30.
- ☛ **Shuttle Buddies Breakfast** — The Shuttle Buddies will meet for breakfast at 9 a.m., Monday, at Shoney's on University Drive West. For more information, call Deemer Self at 881-7757 or Gail Wynn at 852-8189.
- ☛ **MESA Meeting** — The Marshall Engineers and Scientists Association (MESA) will meet Thursday at 11:30 a.m. in Bldg. 4471, room C-105.
- ☛ **MARS Ballroom Dance Club** — Tango and waltz lessons are being offered on Monday and Oct. 4 in the Parish Hall of St. Stephen's Episcopal Church at 8020 Whitesburg Drive. For more information, call Linda Kinney at 544-0563.
- ☛ **Rocket City Rowing Club** — A rowing clinic for adult beginners will be held Saturday and Oct. 2, from 10 a.m.-noon. Cost is \$60. To sign up, call Halley Little at (256) 539-8841.

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