MARSHALL STAR

Marshall Space Flight Center — March 23, 2000

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

Gravitational lens helps find rare type of black hole

A team of astronomers from England and France has reported strong evidence for the existence of a rare type of black hole, called a Type 2 quasar.

Using the Marshall-managed Chandra X-ray Observatory, they have discovered a powerful source of X-rays that appears to be a giant black hole hidden from optical telescopes by a veil of obscuring material.

The latest discovery comes from a team led by British astronomers Andrew Fabian of the Institute of Astronomy in Cambridge and Ian Smail of the University of Durham. They used Chandra, NASA's Hubble Space Telescope and the James Clerk Maxwell submillimeter telescope on Mauna Kea in Hawaii. By concentrating their search near two galaxy clusters, the astronomers exploited a gravitational lensing effect that can lead to a significant brightening of distant sources.

Four new X-ray sources and seven submillimeter sources were discovered. The brightest X-ray source is concentrated in the center of a distant galaxy. The point-like source has a deficit of low energy X-rays, consistent with absorption by a thick cloud of gas. The combination of powerful X-ray emission, absorption of

*See **Chandra** on page 4*

Photo by Danny Reeves, NASA/Marshall Space Flight Center

She knows where she's going

Each year, Girls Inc. of Huntsville honors three women in the community who have established and achieved personal and professional goals. On March 9, Dr. Jan Davis, deputy director of Marshall's Flight Projects Directorate, received the "She Knows Where She's Going" award. Previous Marshall recipients include Amanda Goodson, director of the Safety and Mission Assurance Office, and Carolyn Griner, Marshall Center deputy director.

Marshall experiment to monitor gamma-ray bursts

New telescope to explore great mysteries of universe

Exploring the extreme elements of the universe is the goal of GLAST — the Gamma Ray Large Area Space Telescope, a mission planned for 2005.

On board will be the Marshall Center's own experiment, the Gamma-Ray Burst Monitor, designed to help find out what causes these violent events. This instrument will complement the primary instrument, the GLAST Large Area Telescope Flight Investigation, selected Feb. 28.

GLAST will explore the most energetic and violent events in a quest for the ultimate sources of energy in the universe. Objects explored will include distant galaxies fueled by super massive black holes at their center, neutron stars and individual black holes that are the remnants of stars that have ended their life with an explosion (supernova), and many other stars at the extremes of mass and energy.

The GLAST mission also will explore the very high-energy component of gamma-ray bursts, which is one of the greatest mysteries of astrophysics. The Gamma-Ray Burst Monitor, in conjunction with the primary telescope, will provide the broadest energy coverage ever available on a single spacecraft for gamma-ray burst studies. Based on the results of previous missions, this energy coverage will provide crucial information for determining the nature of these illusive objects.

The principal investigator is Marshall's Dr. Charles Meegan. This investigation is a collaborative international effort involving a major contribution from the Max Planck Institute for Extraterrestrial Physics (MPE) in Germany. Co-investigators include scientists from MPE and the University of Alabama in Huntsville.

Goddard Space Flight Center in Greenbelt, Md., will manage the GLAST mission for NASA's Office of Space Science in Washington, D.C. NASA's cost to develop the GLAST mission is approximately $200 million, which includes approximately $5 million for the secondary instrument.

"Safety Means Never Having to Say You're Sorry"
— Safety slogan submitted by ***Kevin Takada, ED42***

Science aboard International Space Station

Students across America help NASA test communications

by Rick Smith

As assembly of the International Space Station continues in Earth orbit, scientists the world over are vying to take part in research conducted aboard the most ambitious space research facility in human history.

But as far as a nationwide network of space-savvy students is concerned, the eggheads can just get in line.

Science and math students at 26 middle and high schools in 17 states are taking part in a unique pilot program developed by Marshall Center researchers, to test communications between Earth and the Space Station. The students are talking live with NASA astronauts over the Internet, interacting with their peers around the nation — and anticipating the day they can take part in science experiments conducted 250 miles in space.

The students' project is the brainchild of Marshall Center engineer Bob Bradford, who oversees voice and video communications between the Station, science teams throughout North America and NASA's primary Space Station science command post on Earth — the Payload Operations Center at Marshall.

The complex communications network relies on the Telescience Resource Kit, or TReK, a computer system developed at the Marshall Center. TReK enables scientists working in their own laboratories on Earth to receive information from, and transmit commands to, their experiments aboard the Space Station. TReK also allows observers anywhere in the world to watch or take part in those experiments via dedicated Windows NT® workstations. The systems will display multiple on-screen windows, streaming video, scientific data and text commands to and from the Space Station. They also will employ special "Voice Over the Internet" software developed by AZ Technology, Inc., of Huntsville and White Pine Software of Nashua, N.H.

> ***'We don't get a lot of opportunities like this. It's a chance for our kids to take part in a very exclusive program. A chance for them to shine.' — Ed Roberts***

Photo by Doug Stoffer, NASA/Marshall Space Flight Center

Bob Bradford works at his personal computer with the TReK system running, illustrating Space Station communications.

The driving force behind the classroom initiative, Bradford says, was really the two dozen middle and high school teachers who visited Marshall for a two-week summer workshop in 1999, where they toured the Payload Operations Center and witnessed a TReK demonstration.

When Bradford mentioned he was seeking test sites to improve the Station-to-Earth communications system, the reaction was instantaneous. "We all got real excited and shouted, 'We'll do it, we'll do it!'" says Adele Quintana, who teaches chemistry and biology at participating Dumas High School in Dumas, Texas. "We saw a good thing and we went after it. We were relentless."

And her students thank her for it. "The program has brought a lot of enthusiasm back to our science classes," Quintana says. "Enthusiasm for current events, as well. The students are asking questions about issues related to science and the space program. They're directly involved, and they love that."

"We don't get a lot of opportunities like this," adds Ed Roberts, who teaches physics and physical science at Pottsville High School in Pottsville, Ark. — a rural community where high school enrollment is fewer than 300 students. "It's a chance for our kids to take part in a very exclusive program. A chance for them to shine."

Because on-orbit Space Station experiments are still a year away, Bradford decided to combine his system tests with a treat for participating classrooms: live question-and-answer interviews with notable NASA astronauts and scientists.

*See **Students** on page 4*

Marshall engineers undertake real-life 'mission' to protect NASA spacecraft, crews in event of damage

by Rick Smith and Miria Finckenor

When a spacecraft in the new movie "Mission to Mars" is caught in a fierce meteoroid storm, the beleaguered crew rallies to patch the damaged hull, and thrilling movie music swells over the hiss of escaping air…

Real astronauts facing actual damage to their spacecraft won't have the luxuries of stuntpeople, special effects or inspiring musical crescendos to save them from the cold vacuum of space. That's why NASA engineer Steve Hall and a team of researchers at the Marshall Center are hard at work on a real-life hull-puncture repair kit — one that will protect lives and vehicles as humans venture into space for longer periods of time.

The kit, intended for use on the International Space Station, is designed to seal punctures up to 4 inches in diameter caused by collisions with small meteoroids or space debris. With a few simple tools and a couple of extra-vehicular spacewalks, crewmembers can safely repair punctures from outside damaged modules that have lost atmospheric pressure.

"It pays to be prepared," Hall says. A hole as small as 1 inch in diameter in a vehicle the size of the Space Station could bleed off enough air in just one hour to put the crew at risk. That doesn't give them much time to locate the damage and seal the leak from inside the station — especially when bulky equipment and experiment racks may block access to many of its interior walls.

"Protecting the lives of the crew is the most important thing," Hall says. "The safest approach is for the crew to evacuate and seal off the damaged module, allow it to fully depressurize and then make repairs externally."

The patching operation would begin with a spacewalk to locate damage on the exterior of the depressurized module. The surrounding area would be cleaned and the hole measured with special tools, enabling the crew to select patch components precisely tailored to the size of the damage.

Photo by Emmett Given, NASA/Marshall Space Flight Center

Marshall engineer Steve Hall demonstrates how the patch will repair space debris damage to the International Space Station.

A second spacewalk would then deliver the patch kit to the work site. The patch consists of a clear disk that would be solidly bolted to the module's metal surface, covering the crack or puncture. A strong epoxy adhesive then would be pumped into the hollow disk

*See **Patch** on page 6*

Property protection, reporting are user's responsibility

As the user of government property, you are required to protect and report actions on that property. If you are unsure what that really means, here are some points that may help.

• Protect the government property as if it was your own personal property. After all, it is being paid for with your tax dollars.

• As an assigned user, you have signed a NASA Form 1602 that states you are the user of that property. If you are going to relocate the property for an extended time, you should report a location change to your property support assistant. A list of property support assistants is located on "Inside Marshall" at: http://inside.msfc.nasa.gov/AD40/property/propcust.pdf

• Temporary controlled movements within a building, work area or reassignment of property responsibility of 30 days or less do not require reporting.

• Credit card purchase documentation should be processed through Marshall Receiving to ensure tagging of the property and appropriate database input.

• Contact your property support assistant to assist you in processing requests to cannibalize or modernize property before you alter any property assigned to you.

Additional property-related information is provided in the mandatory Web-based property training, which is taking place during March. The training site can be found on "Inside Marshall" at: http://eodd.msfc.nasa.gov/property/

For personnel who do not have access to a computer, a training class will be held from 2-3 p.m. March 29, in Bldg. 4200, room 409. More than 4,000 employees have completed this training in the first 13 days.

Chandra

Continued from page 1

low energy X-rays, and the relatively normal optical appearance of the galaxy led the scientists to conclude that the source is a strong contender to be a genuine Type 2 quasar.

Type 2 quasars have been predicted to exist by a popular model for quasars. Their discovery would confirm the so-called unified model for quasars, and help clarify the nature of the pervasive background glow at X-ray and submillimeter energies. Other researchers have reported evidence for Type 2 quasars, but the data were ambiguous. Now, the cloud of uncertainty is lifting, as scientists use Chandra to intensify the search.

According to the unified model of quasars, a thick doughnut of gas and dust surrounds a central black hole. The source looks different, depending on whether it is observed through the doughnut, through the hole, or at an intermediate angle. In extreme cases representing a Type 2 quasar, the optical radiation from the quasar is absorbed while the high-energy X-rays penetrate the veil. The energy absorbed by the gas and dust is re-radiated at lower energy infrared and submillimeter wavelengths.

Six of the submillimeter sources that were discovered were not detected in X-rays. This could mean that a central black hole is shrouded by an unusually thick cloud of dust and gas, or an additional source of submillimeter radiation is present, perhaps due to a burst of star formation.

A paper describing these results will be published in the Monthly Notices of the Royal Astronomical Society. The Chandra observations were made Nov. 5, 1999, using the Advanced CCD Imaging Spectrometer. The team involved scientists from the Institute of Astronomy, the University of Durham, University College London and the Observatoire Midi-Pyrenees in France.

Students

Continued from page 2

The chat series has brought participating TReK classes together via live Internet voice feeds with Space Shuttle astronauts Jan Davis and Fred Leslie and Marshall Center biologist Craig Kundrot. The schools are already clamoring for additional chats.

For one unique class, the chats may even inspire new interest in staying in school and staying out of trouble. Deb Herrick's students at the Ottawa County Juvenile Detention Center in West Olive, Mich., are often troubled, alienated 5th to 11th graders. Some show up in her class for just a few days; others stay as part of six-month treatment programs. There is often an initial resistance to the classroom setting, Herrick says. But they warm up fast when they realize they're making history.

"They recognize that they are helping to initiate communications aboard the International Space Station," Herrick says. "They see it as something special. Every one of them takes that experience away with them."

The chat sessions benefit NASA as well as the students, Bradford says. They help fine-tune the transmission network, resolving technical glitches to ensure flawless communications between Earthbound TReK users and astronauts working in a lab that crosses the night sky above them like a shooting star.

But the kids in the TReK program pay no mind to technical glitches, nor to the vast gulf between themselves and the Space Station experiments they'll one day monitor from their classrooms. Thanks to TReK, they're no longer truly Earthbound.

For them, the future of science is right here, right now. And it's go for launch.

Participating Schools

- Rainbow Middle School, Gadsden, Ala.
- Guntersville High School, Guntersville, Ala.
- Central High School, Phenix City, Ala.
- Altheimer-Sherrill High School, Altheimer, Ark.
- Pottsville High School, Pottsville, Ark.
- LaJunta Middle School, LaJunta, Colo.
- Hobart Middle School, Hobart, Ind.
- Missouri Valley High School, Missouri Valley, Iowa
- Sherwood Middle School, Baton Rouge, La.
- Mackinaw Trail Middle School, Cadillac, Mich.
- Kelloggsville Middle School, Grand Rapids, Mich.
- Ottawa County Juvenile Detention Center, West Olive, Mich.
- Lewis & Clark Middle School, Jefferson City, Mo.
- Lexington High School, Lexington, Neb.
- C.W. Stanford Middle School, Hillsborough, N.C.
- South Iredell High School, Statesville, N.C.
- Seven Hills School, Cincinnati, Ohio
- Upper Sandusky High School, Upper Sandusky, Ohio
- Redbank Valley High School, New Bethlehem, Pa.
- Ruffin High School, Ruffin, S.C.
- Dumas High School, Dumas, Texas
- Klein Oak High School, Spring, Texas
- Providence Middle School, Richmond, Va.
- National Cathedral School, Washington, D.C.
- Appleton North High School, Appleton, Wis.
- Fox River Middle School, Waterford, Wis.

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

Employee participation required for VPP Star site

Editor's note: This is the third in a series of articles to address frequently asked questions on the 19 elements in the Voluntary Protection Program (VPP).

Q: What does the Occupational Safety and Health Administration (OSHA) mean by employee participation?
A: Participants in VPP involve all their employees in safety and health daily. Marshall employees have many opportunities to make an impact on their safety and health. Any activity that is performed to improve safety and health at Marshall and reduce risk to employees, hardware or facilities is considered employee participation.

Q: How can I participate in the Marshall Safety and Health Program?
A: You probably already are! When you submit a safety concern on the Web or to your building manager, participate in the Marshall safety action team or sit on a test readiness review, you are participating in the program. Volunteers for Safety Day help all Center employees participate. Accompanying your supervisor on a safety walk-through or preparing a safety moment for your monthly safety meeting are other ways to learn and have a positive impact on safety and health. Safety procedures are reviewed on the Web, and anyone may submit comments. Hazard analyses and mishap investigations benefit from input from workers who know the activities being examined. Job hazard analyses should be prepared for all tasks performed, and discussed with employees — this is another form of participation. Employees should be familiar with them and submit recommended updates when changes occur in the task. Ask for safety training or new personal protective equipment when needed. Let the VPP team know if you have other ideas or examples of Marshall safety and health employee participation.

Q: What will OSHA look for to ensure Marshall employees participate?
A: Evidence of participation includes safety committee activities, safety meeting attendance lists and minutes, walk-through documentation and training/certification records. Marshall's awards programs, which include the Silver Snoopy and the Safety Excellence Award, show recognition for employee participation. The Safety Concerns Reporting System shows direct input and feedback.

For more information, contact your management or Kristie French at 544-7474 or Jimmy Hill at 544-0974.

Charlie Holliman celebrates 20 years with NASA

by Vanessa Suggs

Charles D. Holliman Jr. of the Employee and Organizational Development Department in the Customer and Employee Relations Directorate is celebrating a milestone — his 20th anniversary with the Marshall Center.

Holliman's career began in January 1980 and he has looked forward to all of his longevity pins. This 20th anniversary pin is special, he said, because it reminds him of his many years of dedicated service.

Charlie just loves his job. Just about everyone knows him, particularly those who frequent the 4200 complex where Holliman works as a messenger and facilities support manager. He is especially known for his loyalty to Alabama football.

A close friend, retired Marshall employee Don Chafin, said he and Charlie have shared their love of the "Tide" since they met in 1986. "Charlie would visit me on a daily basis and cheer me up when I was having a particularly tough day," Chafin said. "Charlie has an honest and straightforward quality about him that is refreshing." Chafin recalled how Charlie blossomed from shyness in the early part of his career to reveal a special and unique individual.

Sometimes Charlie's enthusiasm for Alabama football overshadows something else he is passionate about. His supervisor, Greg Walker, manager of the Employee and Organizational Development Department, said Charlie is a "big space buff." He knows the names of the crewmembers of every Shuttle mission and has a room at home dedicated to space history. "He is NASA's No. 1 fan," Walker said.

Walker also has gotten to know just how special Charlie is. He frequently chats with him about what's going on at NASA, current events and the latest football scores. "You just can't admit to being a fan of any team other than Alabama around Charlie," Walker said. "If you do, be prepared for some ribbing if your team loses."

Charlie has a lot to be proud of besides his loyalty to football and his keen knowledge of NASA history. Charlie has taken it upon himself to help keep all Marshall employees safe, although it is not part of his job assignment.

Tereasa Washington, left, director of the Customer and Employee Relations Directorate, presents Charlie Holliman with his 20-year of service award.

He is very serious about reminding employees to wear their badges, and saves many employees from getting reminders from security. If you pass Charlie and do not have a proper badge, get ready for him to remind you to put it on. He doesn't miss much.

So next time you see Charlie, thank him and congratulate him on 20 years with a big, "Roll Tide!" and he'll be sure to give you a thumbs up and a big grin.

The writer works in the Employee and Organizational Development Department.

Web site features women's contributions to Microgravity Research

by Tracy McMahan

A new NASA Web site features women who are making history with their contributions to NASA's Microgravity Research Program, managed at the Marshall Center.

Women with diverse expertise, from all parts of the United States and abroad, are profiled on the site. To learn about the exciting and often inspiring accomplishments and lives of these women — as well as their advice to young women — go to: http://microgravity.msfc.nasa.gov/WOMEN

Women are helping to forge the relatively new field of microgravity science — the study of many important natural processes in the near-weightless environment of spacecraft orbiting Earth. Women profiled on the Web site play many roles in microgravity research. They range from astronauts who design experiments and conduct them in space — to scientists who have made ground-breaking discoveries — to engineers who are designing major facilities for the International Space Station, the first permanent, international space laboratory.

The featured women include Marshall Center Deputy Director Carolyn S. Griner, who helps manage the Center's myriad activities. She started her career with pioneering studies in modeling metals and exploring the best way to conduct a variety of experiments at the same time inside space-based laboratories.

"When I was 15 years old, I witnessed John Glenn's first launch into space from my high school yard in Cocoa Beach, Fla., and I knew where I wanted to apply my love of science and math," said Griner.

Marshall Center scientist Dr. Sharon Cobb is working on a project that brings people together from several countries designing and building equipment for materials science experiments on the International Space Station.

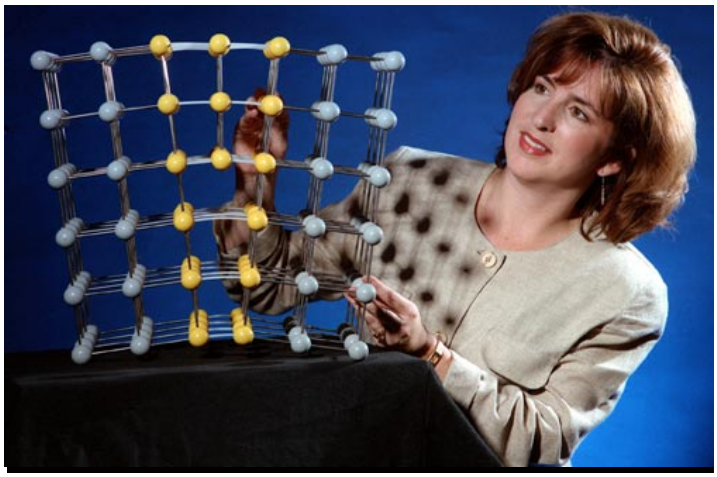

Photo by Emmett Given, NASA/Marshall Space Flight Center

Dr. Sharon Cobb, a materials scientist at Marshall, examines a model of a crystal lattice.

"It is fascinating for me to explore the effects of gravity on the processing of materials we use in our everyday lives," said Cobb.

Cobb and the other women featured on the site work at or with the Marshall Center — NASA's Lead Center for Microgravity Research and Space Product Development. Scientists and engineers at Marshall manage and develop experiments and equipment for materials science and biotechnology research.

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

Patch

Continued from page 3

by an injector that looks like a double-barreled caulking gun. Once this adhesive cures — a process that takes two to seven days — it forms a cast plug that would completely seal the hole. Then the module would be gradually repressurized to verify proper function of the seal.

The patch is designed to last for at least six months, Hall says, giving the crew ample time to make permanent repairs as needed.

Engineers and technicians in the Engineering Directorate have supported the development and testing of the repair kit. The Structures, Mechanics and Thermal Department developed the manned spacecraft survivability computer code, which predicts the depressurization rate for an impact and the likelihood of a critical component being damaged.

The Materials, Processes and Manufacturing Department assisted with material selection, performed extensive testing of adhesive injection systems and provided test samples with debris impact penetrations. A two-stage light gas gun in the Hypervelocity Impact Facility fired titanium particles 1 cm in diameter and larger into aluminum panels, producing various size holes and cracks for testing of the patches.

Mike Terry and Larry Foreman of Materials, Processes and Manufacturing and Glen Gooch of Sverdrup Technology Inc. invented and built an experimental platform to de-gas the two-part epoxy adhesive and load it into cartridges. Steve Benefield and Grover Willoughby of Materials, Processes and Manufacturing completed the design and the manufacture of breadboard parts. Benefield also has produced a design for a delivery system that will be used to produce flight cartridges of de-gassed epoxy. Jeff Lawson and Brian Adams of Sverdrup have incorporated the cartridges into their overall flight design. The Rapid Prototyping Laboratory assisted in the design process by providing models for fit-checks and process validation.

The kit is scheduled for delivery to the International Space Station program office in September.

Smith, employed by ASRI, supports the Media Relations Department. Finckenor is a materials engineer in the Materials, Processes and Manufacturing Department.

MARS Golf Club announces tournaments set for 2000

The Mars Golf Club will hold seven tournaments this year in a variety of formats. Some have limited entries. The club is open to all NASA employees, onsite contractor personnel and NASA retirees.

Upcoming tournaments include:

• A skins tournament at 9 a.m., April 8 at Colonial. Deadline to register is March 31.

• A two-person best score tournament at 9 a.m., May 6 at Guntersville State Park. Deadline for registration is April 28.

• A two-person best score tournament at 8 a.m., June 3 at Chesley Oaks. Deadline to register is May 26.

• A two-person best score at 8:04 a.m., June 24 at Goose Pond. Deadline to register is June 16.

• A championship tournament at 9 a.m., July 22-23 at Colonial. Deadline to register is July 14.

• A four-person scramble at 10 a.m., Aug. 19 at Gunter's Landing. Deadline to register is Aug. 11.

• A two-person best score tournament at 7:30 a.m., Sept. 16 at Point Mallard. Deadline to register is Sept. 8.

For more information or to enter a tournament, call Lee Foster at 544-1589, Joey Butler at 544-3808 or Robert Rutherford at 544-8117. Entry Fees are $5.

Job Opportunities

Reassignment Bulletin, AST, Aerospace Flight Systems, GS-861-14, Flight Projects Directorate, Payload Operations and Integration Dept., Multi-Use Payload Group. Closes March 29.

CPP-00-43-CP; Program Analyst, GS-343-11, Center Operations Directorate, Information Services Dept. Closes March 31.

CPP 00-49-CP, Financial Program Specialist, GS-501-7 (2 vacancies), Office of Chief Financial Officer. Closes April 3.

CPP 00-39-CL, AST, Structural Materials, GS-806-11, Engineering Directorate, Materials, Processes & Mfg. Dept., Nonmetallic Materials & Processes Group. Closes April 3.

Obituaries

Haney, Gwen G. Wood, 53, of Athens, died March 19. She worked as a security assistant in the Protective Services Department. She is survived by one daughter, Tracy Flanagan; one son, Allen Haney; one grandson; and her mother, Vera Wood, all of Athens.

Herndon, Ralph H., 70, of Huntsville, died March 5. He retired from Marshall in 1976 where he worked as an AST, Experimental Manufacturing Techniques. He is survived by his wife, Jean Herndon.

Upcoming Events

"Great Moonbuggy Race" — NASA's 7th annual "Great Moonbuggy Race" will be held April 7-8 at the U.S. Space & Rocket Center. More than 40 teams, representing colleges and high schools from across the country and Puerto Rico will participate. For more information, call Frank Brannon at 544-5920. To volunteer, call Dan Ellis at 544-2319.

"NASA Goes to the Stars" — The NASA Exchange and the Customer and Employee Relations Directorate are sponsoring "NASA Goes to the Stars" Buyout Baseball game with the Huntsville Stars vs. the Chattanooga Lookouts on April 6. Center Director Art Stephenson will throw out the first ball at 7:05 p.m. Tickets are available through administrative officers. Each ticket admits four people.

Women's History Month — Dr. Emily Walker Cook will discuss perspectives in women's history during a "lunch and learn" session from 11 a.m.-12:30 p.m. Monday in Bldg. 4200, room G-13. Pizza and drink will be furnished.

Program/Project Management — The next Program/Project Management Forum will be from 1-3 p.m. March 29 in Morris Auditorium. Program and project managers are invited to attend this forum, as well as all interested employees. Center Director Art Stephenson will discuss the report of the Mars Climate Orbiter Investigation Team and the implications for program and project managers.

Parts Management Workshop — "Mission Success on the Information Highway" will be presented April 4-5 in Bldgs. 4200 and 4203. Anyone involved in parts specification, evaluation, procurement, analysis, or maintenance is encouraged to participate. For more information or registration, call Sandy Haraway at 544-4264.

Project Management Conference — A project management shared experiences conference will be held May 7-11 at The Sheraton Oceanfront Hotel in Virginia Beach, Va. The conference provides a forum to understand key initiatives influencing NASA project management and for project people to share knowledge, experiences and creative approaches to project management. For more information, call Renee Higgins at 544-8864.

Marshall Open House — Join in the excitement of America's future in space at Marshall's Open House from 9 a.m.-6 p.m., May 20. Admission is free. See out-of-this world space flight technology demonstrations, appearances by NASA astronauts and space experts, and enjoy games, family activities and entertainment. Get a first-hand look at the Marshall Center's laboratories and sophisticated test facilities. For more information, call Angela Storey at 544-0632. Volunteers — Marshall employees, retirees and contractors — are needed. Sign up on the "Inside Marshall" Web site or go to: http://ntf-1.msfc.nasa.gov/ohvols.nsf/

Employee Ads

Miscellaneous

★ GE electric motor, 3/4HP, 208-230V, ball-bearing, for heat pump, new, $140. 837-6109
★ Carpet, 9'x8' piece, new, very light neutral color, $100. 828-4817 after 6 p.m.
★ Tiller, MTD, rear tine, used 2 times, $500. 585-7424
★ Rotary lawn mower, 1 yr. old, 4.0HP, 20" rear discharge, $50. 533-3912
★ Bernoulli Box with 8-20mb disks and SCSI card, $35. 828-6213
★ Pier One Medici glass top table and chairs, $125; Kodak Advantix camera, new, $15. 864-3133
★ 1987 Stratos bass boat, 19'3" w/200 Mercury, 12/24 TM, 2 depth finders, $7,500 obo. 233-5032
★ Apple G3 "Blue & White" computer, 350MHz, 6.0GB HD, 64MB, RAM, DVD-CD, 56K Internal Modem, keyboard & mouse, no monitor, $1,200. 858-9535
★ Baby bed w/mattress, used 1 year, white, $100. 534-8176
★ HP 6MP LaserJet printer, 600dpi @ 8/page min., 3MB RAM, postscript module, IrDA, parallel ports, cable, $350 obo. 658-3238
★ Antique oak dresser w/large ornate beveled mirror, $575; 1860s chest of drawers, $375. 881-0551
★ Cedar chest w/full length drawer and claw feet, $245. 881-8648
★ Grading blade for lawn tractor w/sleeve hitch, $85 or trade for towable aerator. 464-5819
★ Antique bed w/mattress (full) $800; baby items, call for list. 837-6274/leave message
★ Racing go-karts completely rebuilt, new engines, $750 each; Suzuki 230 4-wheeler, new tires, $1,500. 830-5783
★ Murray riding lawnmower, 30", 10HP, bagger, $400. 883-5168

Vehicles

★ 1980 Ford Courier, red, $1,000 obo. 828-5246
★ 1989 Chevy van, conversion, rear a/c, 4 captains chairs, folding rear seat, $3,200. 882-6446
★ 1995 Saturn SL2, 86K miles, 35mpg, blue-green, automatic, cruise, a/c, AM/FM cassette, alloys, $6,900. 464-9664
★ 1999 Explorer Sport, white, CD, 2WD, automatic, 40K miles, warranty to 75K miles, $19,900. 828-9861
★ 1976 Mercedes 300D sedan, green, 150K miles, auto, $3,250. 858-9535
★ 1998 Toyota Tacoma SR5, extended cab, tan, 16K miles, 4-cyl., 5-speed, AM/FM cassette, 26-mpg. 461-6337
★ 1990 Acura Legend, 4-door L, white, one-owner, 186K miles, $6,250. 536-6295
★ 1972 Chevy truck, SWB, orange/white, 350 engine, 350 transmission, many new parts, $7,500 obo. 851-2929
★ 1986 Saab 900, good engine, new tires, drives but needs new steering rack, $600. 650-5427
★ 1993 Chevy Cavalier station wagon, red, ABS, a/c, power locks, 109K miles, $3,300 obo. 533-3912
★ 1985 Mazda 626 LX, 151K miles, runs but needs ring job, $500. 883-9875
★ 1987 Porsche 924S, white w/black interior, 5-speed, sunroof, 74K miles, $8,000. 828-6213
★ 1996 Mazda 626 LX, V-6, 60K miles, 5-speed, 25 mpg, white sunroof, all power, $10,250 obo. 574-5098
★ 1996 Honda Civic, silver, 59K miles, 5-speed, a/c, upgraded Pioneer stereo, $11,000. 882-5363

Lost

★ Government equipment: Fujitsu printer, ECN G084367; HP printer, ECN 1286446; HP printer, ECN 1153476; Omega data recorder, ECN 176563; contact Jerry Oakley/ED27. 544-1118

Found

★ Beeper. Call 544-4758 to identify
★ Paper currency. Call 544-4758 to identify
★ Umbrella. Call 544-4758 to identify
★ Key (appears to be house key). Call 544-4758 to identify

Free

★ Moving/packing boxes, you pick up. 430-3184

Center Announcements

☛ ***Avionics Open House —*** Marshall's Avionics Department is hosting an open house from noon-4 p.m. April 20. The event starts in the main lobby on the south side of Bldg. 4487. Reserved visitor parking will be provided in the south parking lot, across from the main lobby of Bldg. 4487. New and innovative as well as historic avionics capabilities, products and facilities will be featured in Bldgs. 4487, 4190 and 4194 (by bus only), 4436, 4475, 4476, 4619, 4656 and 4663.

☛ ***Annual Retiree Dinner —*** The 2000 Retirement Dinner has been scheduled for June 22 at the Von Braun Center.

☛ ***Shuttle Buddies —*** The Shuttle Buddies will meet for breakfast at 9 a.m. March 27 at Mullins Restaurant on Andrew Jackson Way. For more information, call Deemer Self at 881-7757 or Gail Wynn at 852-8189.

☛ ***MOO Meets —*** The Management Operations Office (MOO) retirees will meet for breakfast/lunch at 10 a.m. on Thursday at the Cracker Barrel Restaurant in Madison. For more information, call 539-0042.

☛ ***MESA Meets —*** Marshall Engineers and Scientists Association (MESA) will meet at 11:30 a.m. Thursday in Bldg. 4471, room C-105. Refreshments will be served.

☛ ***Easter Egg Hunt Volunteers —*** Volunteers needed to help with the annual Easter Egg Hunt sponsored by the NASA Exchange. The hunt will be held at 2 p.m. April 9 at the Marshall Picnic Area. The rain date will be 2 p.m. April 16. To volunteer, call Gena Marsh at 544-0128 or Donna Mahieux at 544-7511.

☛ ***MARS Ballroom Dance Club —*** Rumba and samba lessons begin at 7 p.m. April 3, 10, 17 and 24 in the Parish Hall of St. Stephen's Episcopal Church at 8020 Whitesburg Dr. The lessons will be taught by Don Worrell and will cost $6 per person per night. For more information, call Woody Bombara at 650-0200.

☛ ***MARS Skeet Club —*** The MARS Skeet Club will begin its annual skeet league at 3:30 p.m. on April 5. All Marshall employees or on-site contractors interested in shooting skeet are encouraged to attend. The cost to each participant will be a $5 registration fee plus the actual cost of targets shot. The league will shoot every Wednesday for the next 12 weeks. For more information or to register, call Matt Bucca at 882-9798.

Letter of thanks

My family and I would like to thank everyone for their thoughts and prayers and for the donated leave, which has allowed me to take care of my daughter, Sara. We were greatly moved by your outpouring of support. Your thoughtfulness will not be forgotten.

—Sharon Wiegmann, TD11

MARSHALL STAR
Vol. 40/No. 28

Marshall Space Flight Center, Alabama 35812
(256) 544-0030
http://www1.msfc.nasa.gov

The Marshall Star is published every Thursday by the Internal Relations and Communications Department at the George C. Marshall Space Flight Center, National Aeronautics and Space Administration. Contributions should be submitted no later than Monday noon to the Marshall Internal Relations and Communications Department (CD40), Bldg. 4200, room 101. Submissions should be written legibly and include the originator's name. Send electronic mail submissions to: intercom@msfc.nasa.gov The Marshall Star does not publish commercial advertising of any kind.

Manager of Internal Relations and Communications — Norman Brown
Editor — Debra Valine

U.S. Government Printing Office 1999-533-127-80103

BULK RATE
Postage & Fees PAID
NASA
Permit No. G-27