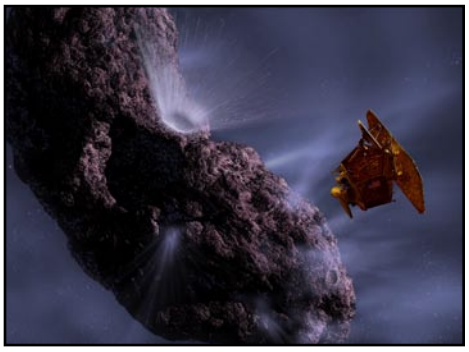
National Aeronautics and Space Administration
NASA Marshall Star: June 30, 2005 : Vol. 45/No. 40

# MARSHALL STAR

**Serving the Marshall Space Flight Center Community** **June 30, 2005**

## Deep Impact spacecraft to collide with comet July 4



NASA/JPL/UMD Artwork by Pat Rawlings

**Artist's concept of Deep Impact. The comet is one-half the size of Manhattan Island, N.Y. The mission's flyby spacecraft is nearly as large as a Volkswagen Beetle automobile, and the impactor is about the size of a coffee table.**

### *Mission managed as part of Discovery and New Frontiers Program Office at Marshall*

*By Sherrie Super*

On July 4, NASA's Deep Impact spacecraft concludes a six-month, 268-million-mile voyage to comet Tempel 1 by sending a projectile crashing into the cosmic traveler.

Deep Impact will provide a glimpse beneath the surface of a comet, where material from the solar system's formation remains relatively unchanged. Mission scientists expect the results to answer basic questions about the formation of the solar system, by offering a better look at the nature and composition of these frozen celestial travelers.

The Discovery and New Frontiers Program is managed at the Marshall Center. The Discovery Program provides opportunities for the science community to propose full scientific investigations to explore the solar system.

**See *Deep Impact* on Page 4**

## NASA to announce key decisions about Shuttle Return to Flight

*By Lynnette Madison and combined reports*

Marshall Center Space Shuttle Propulsion managers were to join NASA officials at Kennedy Space Center, Fla., late this week for the Space Shuttle Mission STS-114 Flight Readiness Review.

The review, which was scheduled Wednesday and Thursday, is a thorough assessment of preparations for Discovery's planned mission to the International Space Station scheduled with a launch window of July 13-31. The two-day review is expected to produce a number of key decisions about the mission, including an official launch date.

In preparation for the formal program review, Shuttle Propulsion managers met at Marshall Monday for a Flight Readiness Review that focused on the External Tank, Main Engines, Solid Rocket Boosters and Solid Rocket Motors.

"I see no show stoppers for us," said Space Shuttle Propulsion Manager Mike Rudolphi, earlier Monday. "We are making sure that

**See *Shuttle* on Page 6**

## *Marshall scientists part of team to study a birthplace of hurricanes, storms*

*By Rick Smith*

NASA hurricane researchers, including several from the Marshall Center, are deploying to Costa Rica in July to investigate the birthplace of eastern Pacific tropical cyclones. They will be searching for clues that could lead to a greater understanding and better predictability of one of the world's most significant weather events — the hurricane.

As scientists and residents on many coasts brace for another potentially challenging hurricane season, NASA is launching the Tropical Cloud Systems and Processes (TCSP) mission, a month-long research effort primarily intended to document "cyclogenesis," the birth of tropical storms, hurricanes and related phenomena. According to Marshall atmospheric scientist Robbie Hood, the study takes NASA's longtime hurricane research in a significant new direction.

"We will have an opportunity to take a closer look at the

**See *Hurricane* on Page 6**

# Marshall software winner CORSAIR vies for NASA award

*By Lori Johnston*

The Marshall Center's 2005 winner of the Software of the Year Award is a flexible code used to predict the flows in rotating turbo machinery components.

This software, which can run on any computer system, is called "CORSAIR Three-Dimensional Unsteady Viscous Flow Analysis." Developed by Dr. Daniel Dorney of the Marshall Center and Dr. Douglas Sondak of Boston University, it includes modeling applicable to jet-engine, rocket-engine and air-handling systems.

The Marshall winner will now vie for the NASA Software of the Year Award, to be presented later in the year.

Initiated in 1994 to stimulate the creation and reporting of new innovations, the award recognizes inventions and other scientific and technical contributions to achieve NASA's goals in aeronautical and space applications. Each NASA center and component facility participates in the competition.

CORSAIR has been used for design, analysis and anomaly investigations, including main-engine candidates for a second-generation reusable launch vehicle.

**Dorney**

It is being used to design and analyze all Marshall turbine systems with rotating parts. More than 25 companies and universities are using this software.

Dorney received his bachelor's and master's degrees in aeronautical and astronautical engineering from the University of Illinois in Champaign-Urbana and a doctorate in aerospace engineering from Pennsylvania State University in University Park. He joined Marshall in 2000 and is an aerospace engineer in the Propulsion Delivery Fluids Branch.

*The writer, an ASRI employee, supports the Public and Employee Communications Office.*

# Recent NASA appointments announced by Administrator

NASA Administrator Michael Griffin recently announced a number of organizational changes.

**Rex Geveden** has been named to the newly created position of Acting Associate Administrator; **Dr. Scott Pace** has been appointed Associate Administrator for Program Analysis and Evaluation; **Joe Davis** has been appointed Chief of Strategic Communications; and **David R. Mould** has been named Assistant Administrator for Public Affairs.

**Geveden** will maintain his position as NASA Chief Engineer, but concentrate his efforts in the near term on Agency priorities from the Associate Administrator position in the Office of the Administrator. Geveden was formerly the Marshall Center deputy director. During his tenure at Marshall, he also served as deputy director of the Science Directorate and led NASA's Gravity Probe B program.

**Pace** will report directly to Griffin, providing independent analysis on all aspects of NASA program performance. His previous experience includes Chief Technologist for Space Communications, NASA's Deputy Chief of Staff and Assistant Director for Space and Aeronautics in the White House Office of Science and Technology Policy.

**Davis** is responsible for the overall communications and outreach strategy for the Agency. Before joining NASA, he was principal deputy director of Public Affairs for the U.S. Department of Energy, and also previously served as communications director and spokesperson for former U.S. Sen. Spencer Abraham of Michigan.

**Mould**, a former senior communications executive and journalist, is responsible for planning, developing and providing oversight for Agency-wide communications activities and advising the NASA Administrator and senior agency managers.

# *Procurement holds annual awards ceremony*

The Office of Procurement held its annual awards celebration recently to honor employees for outstanding accomplishments during the last year. Marshall Associate Director Robin Henderson was guest speaker at the event.

Two Marshall employees received NASA-wide procurement awards. James Bailey was named NASA's "Contract Specialist of the Year" and Bradley Niese was selected NASA's "Contracting Intern of the Year."

Among those receiving Marshall Procurement Office awards were Marianne Campbell, "Simplified Acquisition Specialist of the Year"; Katie James, "Grants Specialist of the Year"; Lisa Duncan, "Midrange Commercial Person of the Year"; Teresa Foley-Batts, "Procurement Support Person of the Year"; Poppy Dennis, "Intern of the Year"; James Bailey, "Contract Specialist of the Year"; Mike Sweigart, "Procurement Analyst of the Year"; and Harry Craig, "Contract Manager of the Year."

Other winners include David Iosco, "Procurement Supervisor of the Year"; Steve Spearman, "Contracting Officer's Technical Representative of the Year"; Amy Campbell, "Annual Peer Award"; and Terry Hamm and Melissa Vandyke, "Contracting Officer's Technical Representative Honorable Mention."

Marshall Procurement Director's Certificates and other certificates were presented to a number of employees.

## And chronicles history at home

# *Marshall's Charles Darby lives history at work*

*By Sherrie Super*

To his family, Charles Darby is known as the historian, photographing family events as a hobby. But during 22 years at NASA, he has played his own role in history — leaving his engineering mark on research facilities destined for space.

Today, Darby is the manager of the Payload and Facility Systems Engineering and Integration Office at the Marshall Center. His focus is the International Space Station — the orbiting research complex that NASA and 15 other nations are building some 200 miles above Earth.

***'I cannot remember what triggered my interest in engineering, but I've wanted to be an engineer since I was in middle school.'***

***— Charles Darby***

Darby leads the team that ensures research equipment and facilities work within the framework of the Space Station's specifications and physical dimensions. This can be as simple as verifying research equipment will fit in its designated space, or as complicated as ensuring an instrument's electrical and cooling requirements don't consume more than their allocated Space Station resources.

He previously led the team that developed and built the First Materials Science Research Rack, the Space Station's primary facility for materials science investigations. Materials science uses the laws of physics to understand how physical influences — such as the near-weightless environment of space — impact the behavior of materials. A collaborative activity with the European Space Agency is scheduled for launch in 2008 aboard the Space Shuttle.

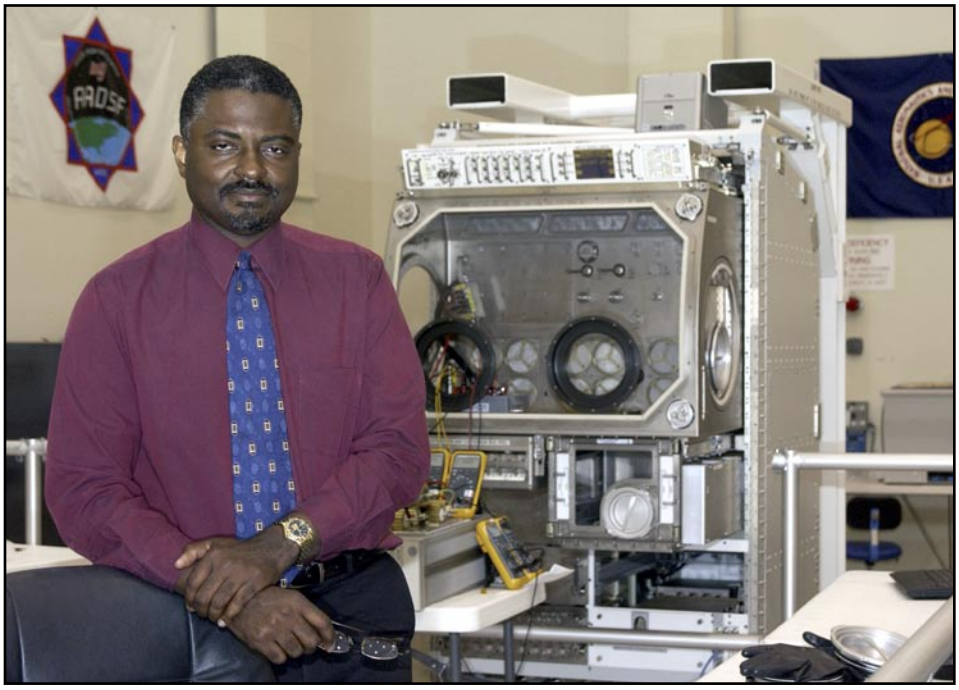


Photo by Emmett L. Given NASA/Marshall Center

**Darby leads the team that ensures research equipment and facilities work within the specifications of the International Space Station. One such facility is the Microgravity Science Glovebox. A glovebox, similar to the one behind Darby, was delivered to the Space Station in 2002.**

"I cannot remember what triggered my interest in engineering, but I've wanted to be an engineer since I was in middle school," says Darby. "And I followed through on it, getting to work with some of the newest innovations in space exploration."

Another small piece of history confirms that fact. A native of Opelika, Ala., Darby looks back at his 1978 senior yearbook from Beauregard High School where he noted he wanted to become an electrical engineer.

This led to a 1982 bachelor's degree in electrical engineering from the University of Alabama in Tuscaloosa, and in 1990, a master's degree in electrical and computer engineering from the University of Alabama in Huntsville.

He joined the Marshall Center in 1983. His early assignments included providing engineering support for systems aboard the Space Shuttle and for Spacelab science missions carried to space within the Space Shuttle's cargo bay. Developed by the European Space Agency, Spacelab was the focal point for experiments conducted from 1982 through 1998 by Americans in space.

At NASA, Darby has earned nearly two-dozen awards. Most recently, he earned a 2004 Certificate of Appreciation for exemplary leadership of the First Materials Science Research Rack Team, a 2004 Special Service Award for leadership in developing the Materials Science Research Facility, and a 2003 Special Service Award for outstanding project management in developing the Materials Science Research Rack payload.

Darby and his wife, the former Stephania Pierce of Gadsden, Ala., and their three children Brianna, Jared and Deidre, reside in Huntsville.

*The writer, an ASRI employee, supports the Public and Employee Communications Office.*


### *Space Transportation employees honored*

**Dr. John Horack, left, acting deputy director of the Space Transportation Programs and Projects Office, presents a Group Achievement Award to the STPPO Exploration Systems Mission Directorate Configuration and Data Management team. Thad Henry accepted the honor on behalf of the team during a recent awards ceremony. Thirteen Group Achievement Awards and three Certificates of Appreciation were awarded to employees in recognition of outstanding efforts which contributed substantially to NASA's space transportation missions.**

## Deep Impact

*Continued from page 1*

"It's a privilege to be part of such a groundbreaking mission," said Marshall's Todd Holloway, Discovery Program Office mission manager for the Deep Impact Mission. "Besides the tremendous technical challenge, we're looking forward to exposing — for the first time — what lies inside a comet."

During the early morning hours on July 3, at approximately 12:52 a.m. CDT, the Deep Impact "flyby" spacecraft will deploy a second spacecraft — a 39-inch, cubic-shaped projectile, or "impactor" — into the path of the comet, which has an orbit located between the orbits of Mars and Jupiter. Over the next 22 hours, Deep Impact navigators and the mission team, more than 83-million miles away at the Jet Propulsion Laboratory in Pasadena, Calif., will steer the impactor toward the comet, and position the flyby spacecraft to observe the collision.

Two hours before impact, the impactor will kick into an autonomous navigation mode to fine-tune its trajectory to ensure contact with the optimal location on Tempel 1 for observing the crater formed and the material ejected. The flyby spacecraft will have approximately 13 minutes to gather information on the collision and its results before it must endure a potential blizzard of particles from the comet's nucleus.

The Deep Impact spacecraft, as well as an extensive network of ground and space-based observatories, will observe the collision. The impact should create a stadium-sized crater, allowing scientists to study pristine material inside the comet dating back to the formation of our solar system.

### *TV coverage of Deep Impact Mission*

Deep Impact will collide with the comet Temple 1 Monday, July 4, at approximately 12:52 a.m. CDT. Live NASA coverage of the mission will begin Sunday, July 3, at 10:30 p.m. and end July 4 at 4 a.m. Coverage will include commentary and a post-impact news conference.

The Deep Impact spacecraft launched Jan. 12 from Cape Canaveral in Florida. Assessing the planned collision with the comet, Dr. Don Yeomans, a Deep Impact mission scientist at the Jet Propulsion Laboratory, said, "In the world of science, this is the astronomical equivalent of a 767 airliner running into a mosquito. The impact simply will not appreciably modify the comet's orbital path. Comet Tempel 1 poses no threat to the Earth now or in the foreseeable future."

The principal investigator, Dr. Michael A'Hearn of the University of Maryland in College Park, is responsible for the Deep Impact mission, and project management is handled by the Jet Propulsion Laboratory. The Marshall program office assists the Science Mission Directorate at NASA Headquarters in Washington with program management, technology planning, systems assessment, flight assurance and public outreach. The spacecraft was built for NASA by Ball Aerospace & Technologies Corporation of Boulder, Colo.

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# Marshall's Noneman, Tinker elected to AIAA positions

*By Sheri Bechtel*

Two Marshall employees, Steve Noneman and Mike Tinker, have been elected to positions in the American Institute of Aeronautics and Astronautics.

Noneman, project manager for Prometheus Advanced Systems Technologies in the Nuclear Systems Office of Marshall's Space Transportation Programs and Projects Office, was elected to the national board of directors of AIAA. As the Region 2 director, he will serve some 4,500 members in eight Southeastern states — North Carolina, South Carolina, Georgia, Florida, Louisiana, Alabama, Mississippi and Tennessee.

**Noneman**

At Marshall, Noneman is responsible for managing advanced nuclear systems technology development efforts.

Tinker, a systems engineer in the Engineering Directorate's Project Integration and Requirements Branch of the Spacecraft and Vehicle Systems Department, was elected secretary of the Alabama-Mississippi Section of AIAA.

**Tinker**

As secretary, Tinker will serve on the section board of directors, and assist in planning and implementing meetings and activities for the Alabama-Mississippi Section, one of the largest AIAA chapters, with more than 1,000 members.

At Marshall, Tinker is responsible for project integration efforts for the Shuttle External Tank. He serves on the Chief Engineer's Board, provides engineering support to the project and assists in the resolution of technical and hardware issues.

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# *One NASA e-mail for contractors is here!*

One NASA e-mail for contractors is here! The Office of the Chief Information Officer is currently supporting one of the major areas of emphasis associated with the Agency's One NASA initiative, our e-mail system. Marshall Center has been working alongside the other NASA centers to develop the plan for moving the Agency to a more unified structure for our e-mail services.

Contractors at Marshall have now been assigned One NASA addresses. As of July 6, all personnel will have the following address:

***firstname.middleinitial.lastname@nasa.gov***
(example: ***jane.a.doe@nasa.gov)***
instead of ***firstname.lastname@msfc.nasa.gov.***

Headquarters has already implemented this change for its contractors. Please note that ***firstname.lastname@msfc.nasa.gov*** will remain active for now, but eventually will be phased out. This should minimize the impacts of this change and allow us to transition smartly as we move to develop a unified Agency-wide e-mail system. Contractors also will be allowed to select one alias if desired. Please note that the One NASA e-mail Web page has been changed and you can search on One NASA e-mail addresses and select an alias at:

***https://onenasa.ndc.nasa.gov/***

Please see the Frequently Asked Questions (FAQ) and the Alias FAQ at the above Web site concerning One NASA e-mail for answers to common questions concerning this activity.

Instructions for selecting an alias can be found in the Alias FAQ. Any additional questions can be directed to 4-HELP (544-4357), Option 7.

# *New space book features astronaut drama, humor, bonus DVD*

A new book by Ed Buckbee with Wally Schrirra, "The Real Space Cowboys," reflects on the early days of the space program and tells of the challenges, good-natured humor and practical jokes shared by the first astronauts.

Buckbee, a former NASA public affairs officer, was the first executive director of the U.S. Space & Rocket Center in Huntsville.

Schirra is the only astronaut to fly in all three of the early human space flight programs — Mercury, Gemini and Apollo.

The DVD features rare film footage, interviews with Dr. Wernher von Braun and astronaut panel discussions.

It also includes a video — "Skylab: An Oral History of America's First Space Station" — written and produced by Marshall Television Services for the 30th anniversary celebration of Skylab in 2003.

For more information visit:
http://www.cgpublishing.com/Books/SpaceCowboys.html
or http://www.air-space.com/TRSC.htm

## Hurricane

*Continued from page 1*

factors contributing to the initiation and intensification of tropical cyclones which are still somewhat mysterious processes for researchers and operational forecasters," said Hood, one of three lead researchers in Costa Rica. Nearly a dozen participants come from the Marshall Center and the University of Alabama in Huntsville.

Researchers will monitor oceanic thunderstorms to study why some systems develop into tropical cyclones and some do not -- data vital to understanding how such weather systems evolve and travel. The information also could support development of a more accurate and timely warning system to help safeguard property and lives.

The team of atmospheric scientists, engineers and aircraft personnel will take up residence in San Jose, Costa Rica, during July. The NASA team will work with the National Oceanic and Atmospheric Administration (NOAA) and Costa Rican Centro Nacional de Alta Tecnologia. The team will conduct ground-based and airborne studies to measure the buildup and behavior of tropical storm systems on Costa Rica's east and west coasts.

**Marshall's Robbie Hood**

Missions will be flown over the region using NASA's ER-2 and NOAA's WP-3D Orion aircraft and unmanned aerial vehicles, or aerosondes. The unmanned flights will be managed in conjunction with the University of Colorado at Boulder. The airborne experiments will collect temperature, humidity, precipitation and wind information related to tropical cyclones and other phenomena that often lead to development of more powerful storms at sea. NASA and the Instituto Meteorologico Nacional of Costa Rica will launch a series of RS-92 series, balloon-borne probes, or sondes, to measure humidity and other data related to tropical storm origins. The operation also will pull information from several NASA and NOAA satellites.

A vast number of tropical storms and hurricanes impacting the eastern Pacific are spawned near the western coast of Costa Rica, making it an ideal location for the research. There, it is possible to study the genesis process from the initial disturbance until, in some cases, it grows into a hurricane.

The new study continues NASA's successful Convection and Moisture Experiment (CAMEX) research series, conducted from 1998 to 2001 with NOAA. TCSP participants include NOAA's Hurricane Research Division, five NASA centers, 10 American universities and partner agencies in Costa Rica. For more information about TCSP, visit: http://tcsp.nsstc.nasa.gov/tcsp

*The writer, an ASRI employee, supports the Public and Employee Communications Office.*

## Shuttle

*Continued from page 1*

we are ready for the meeting at KSC."

Last week, technicians completed the final steps to prepare the Space Shuttle Discovery for a launch to the International Space Station. Loading of hypergolic propellants began June 22 and is scheduled to be completed this week. This process includes loading the propellants, monomethyl hydrazine and nitrogen tetroxide, into the Orbiter Maneuvering System and the Forward Reaction Control System.

The cargo, including NASA's Italian-built Multi-Purpose Logistics Module Raffaello, was installed in the payload bay June 17, followed by payload connections and payload/orbiter interface testing. This week, the payload bay sharp-edge inspection will be performed and the payload bay doors will be closed for flight.

On June 23, Marshall propulsion managers and leaders from Marshall's Safety and Mission Assurance and Engineering Directorate joined in the Space Shuttle Program's Design Certification Review, held to ensure that major program baseline changes have been properly integrated and certified for flight.

On June 24, Marshall leaders joined Space Shuttle program leaders at Kennedy Space Center for the Debris Verification Review to summarize the extensive debris assessment effort that has been completed, and to present the flight rationale for the debris. Shuttle leaders reached the conclusion that the potential for debris had been reduced to an acceptable level of risk, a recommendation accepted by the Shuttle Program Manager.

Technicians continue processing Space Shuttle Atlantis in the Orbiter Processing Facility Bay 1 for its mission to the International Space Station. The landing gear functional test was successfully completed. The landing gear was cycled several times prior to the test to checkout compression of the new thermal barrier seals that were added for Return to Flight.

In the Vehicle Assembly Building at Kennedy Space Center, the External Tank 102 and Solid Rocket Boosters originally scheduled to fly with Space Shuttle Discovery are being readied to fly with Atlantis. A Crawler Transporter will move the stack to high bay 3 this week.

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# Classified Ads

*To submit a classified ad to the Marshall Star, go to Inside Marshall, then go to "Employee Resources," and click on "Employee Ads — Submit Ad." Ads are limited to 15 words, including contact numbers. No sales pitch, i.e., "like new" or "excellent condition." Deadline for submissions for the next issue is 4:30 p.m. Thursday.*

## Miscellaneous

Alfred Angelo 2-piece formal, color raisin, halter/back, size 16, fits normal size 12, $140. 256-379-4427

Medical lift chair, purchased December 2004, hunter green, $400. 256-773-9273

Sony Vidimagic video projector, 72"x40", silver screens & carry case, $295. 797-8895

Electric 2-wheel red scooter w/battery charger, $75. 828-0756

Sleeper sectional sofa w/recliners, 5 piece, $200; Century infant-to-toddler car seat, $80. 534-3948

Wooden sky fort, $40; black metal Futon w/black mattress, $75. 837-0996

Two solid hand-crafted Indonesian high-back teak chairs, $120. 539-1316

Baby Grand piano, natural wood, $1,200. 356-603-3698

Daybed, wood frame w/trundle unit and mattress, $30. 885-2448

Wiggles tickets, three, for July 10, 1:30 p.m., Section 13S, Row CC, seats 1-3, $116. 682-6325

American Idol Tour tickets, Birmingham, July 15, two floor seats near stage, $200. 837-7334

Exercise equipment: treadmill, upper-body workout, height adjustable, storage collapsible, Weider stepper. 233-0705

Remington 522 Viper .22LR rifle, 10-round clip, composite stock, 100 rounds fired, $75. 256-797-1012

Baldwin acrosonic piano, older model, blonde, needs to be tuned, $400. 881-8176

iPOD 2-MB with FM transmitter, $175. 656-7997

Camper shell for long-bed GMC truck, $200. 539-5570

Epson Stylus Photo R200 Model printer, unopened in box, $60. 895-9520

Dark wood chest, $75; hanging lamps, $50; electric appliances, $5 to $10; computer desk, $50. 256-534-0939

Pennsylvania House video cabinet, holds up to 30" TV, VCR/DVD, $750. 931-427-2059

Buzz Aldrin "Classic Collection" GI Joe, spacesuit, all accessories, unopened box, $100. 303-3702/Decatur

AKC/CKC Maltese, 3F/1M, ready 07/07/05, 6 weeks old, first shots, deposits accepted, $500. 256-797-0408/ Kesia

Walker, height adjustable, w/handle-operated brakes, basket and seat, $150; bedside potty chair, $60. 883-9509

Lawnmower w/Tecumseh, 5HP, manual, extra blade/filter, $50; fertilizer drop-feeder, $10; microwave, $35. 828-6213

Ram FX oversize irons, graphite, 3-pw, $100; Titleist DCI oversize irons, steel, 3-pw, $150. 604-0207

Six cemetery plots side-by-side, Crestview Cemetery, Guntersville, AL, make offer. 256-728-4942

Ping Hoofer 3 golf bag, carry bag w/strap & hood, 2-tone black and tan, new. 256-656-8544

## Vehicles

2001 BMW 325i, 5-speed, gray, Sport package, leather, CD, new tires, 56K miles, $19,500. 658-5506

2000 Chevrolet,S10 ZR2, 4x4, extended cab, red, automatic, 92K miles. 256-593-7207

1999 BMW 328iC, white, gray leather, power top, 5-speed, Premium/Sport & H-K, 86K miles, $18,000. 837-1035

2000 Corvette coupe, metallic magnetic red, 6-speed, 40K miles, $26,000. 256-874-7773

1997 Chevy Silverado LS X-cab pickup, 5.7L/auto, all power, sprayed bedliner, bed topper, $9,000. 971-1634

2004 Honda Shadow Spirit 1100, 650 miles, windshield, tank bib and more, $7,000. 476-4858

2000 Cavalier, automatic, 2.2L, power windows/doors, AC. 828-4055 after 5 p.m.

1998 BMW 740IL, hunter green, tan leather, 105K miles, new tires, $15,000. 682-0888

2003 Nissan Pathfinder, V6/auto, 2WD, tow package, 4-door, 26K miles, CD, silver/charcoal leather, $22,500. 880-3337

1993 Dodge Ram B350 15-passenger van, 126.3K miles, 5.9L/V8 engine, $1,650. 426-7580

1999 Saturn SC2, manual 5-speed, a/c, 89K miles, $4,100. 864-2889

1996 Seadoo GTX, green & white, low hours, trailer, new cover, new battery, $2,500. 256-520-3684

1964 Chevy Biscayne, 327/V8, runs, needs work, one rust spot, $2,500. 256-990-1842

1996 Honda XR100 motorcycle, garage kept, $800. 830-2806

## Wanted

Stationary bike; pint canning jars. 256-656-5552

Used newer model treadmill in very good condition, preferably in Morgan County area. 256-784-5299

Infant car seat; baby swing; must be like new condition. 256-498-2028

## Free

To good home, Black Lab & Chow mix, I yr. old, w/dog house. 430-1774

To good home, puppies, German Shepherd, Dalmatian and Sheltie mix, bottle fed. 508-7527

## Found

Disc, key ring w/belt clip and numerous keys, ladies, watch. Call 544-3623 to claim/identify

## Lost

Eyeglasses between Bldg. 4203 and 4202 on June 22, 2005. Call Irvin at 544-8146 if found.

# Obituaries

**Joy J. Knight**, 91, formerly of Huntsville, died June 15. He retired from the Marshall Center in 1968. He was also a World War II veteran.

Survivors include his son, Joy Jerome Knight Jr.

**Ernst Lange**, 89, of Huntsville, died June 17. He was a member of the original Wernher Von Braun rocket team. He retired from the Marshall Center in 1972 as an electrical engineer.

Survivors include his wife, Anneliese Lange; daughter, Linda L. Lange; and son, Volker F. Siekiersky.

**William H. Lucero**, 79, of Huntsville, died June 17. He retired from the Marshall Center in 1978 as an aerospace engineer. He was also a Navy veteran.

Survivors include his wife, Barbara Lucero; daughter, Linda Lucero; and sons, Robert Lucero and David Lucero.

**Rebecca C. McCaleb**, 54, of Lacey's Spring, died June 21. She retired from the Marshall Center in 2003 as a manager in the Environmental Engineering Department.

Survivors include her husband, John McCaleb; daughter, Rebecca McCaleb; and son, Hugh McDonald.

# *Marshall's Linda Clark looks through walls to ensure Shuttle safety*

*By Rick Smith*

NASA engineer Linda Clark can see through walls, but don't call her a superhero. After all, the rest of her team can do it, too.

Clark works in the Marshall Center's Safety and Mission Assurance Directorate. Her team has spent two years developing non-invasive technologies to evaluate the Shuttle External Tank's thermal protection system. Their goal? To help make STS-114, the Space Shuttle's Return to Flight, the safest mission possible.

The technologies, backscatter radiography and Terahertz imaging, are used to evaluate the integrity of the spray-on foam insulation in a non-destructive manner. Instead of cutting apart materials for study, Clark's team uses the techniques to simply look inside, through the wall of foam — probing for internal anomalies without raising blade or blowtorch.

"If you break your arm, you get an X-ray. If you're pregnant, you get an ultrasound," she says. "Such common medical procedures are closely related to our work. We're using state-of-the-art technologies to help ensure the safety and integrity of the External Tank."

The non-destructive evaluation team first studied the foam-covered tank using backscatter radiography, which involves exposing a component to X-rays and collecting the electromagnetic waves that "scatter" or bounce back from the part. This technique is more useful for NASA's purposes than conventional X-ray systems, which require access to both sides of the subject. That's not possible with foam applied to a Shuttle External Tank. Originally developed by the University of Florida in Gainesville to detect landmines, backscatter radiography is being further developed by Lockheed Martin and NASA.

NASA also is exploring Terahertz imaging for this purpose. Developed by Picometrix of Ann Arbor, Mich., the technique uses lightning-quick laser pulses to generate high-frequency radio waves. Clark's team has matured and industrialized both technologies, delivering field-ready systems to support factory inspections at NASA's Michoud Assembly Facility in New Orleans. Their goal now is to evolve both technologies into certified inspection techniques. In coming months, they will perform rigorous testing to meet Shuttle certification requirements — helping to assure the safety of the Shuttle and its crew.

A native of Birmingham, Ala., Clark was a math whiz in her youth. Mentored by her brother Johnnie, also a Marshall engineer, Clark became a co-op student in 1986. Three years later, she obtained a bachelor's degree in materials engineering from the University of Alabama in Birmingham, and went to work full-time in the Engineering Directorate. For more than 12 years, Clark has supported non-destructive research and engineering efforts at Marshall, Michoud and Kennedy Space Center.

*The writer, an ASRI employee, supports the Public and Employee Communications Office.*

NASA/MSFC

**Marshall engineer Linda Clark**


# MARSHALL STAR

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