National Aeronautics and Space Administration

John C. Stennis Space Center

LAGNIAPPE

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SSC presents NASA Day at the Capitol

SSC Deputy Director Gene Goldman (center), addresses members of the Mississippi Senate.

Employees of SSC's Engineering and Science Directorate Tom Jacks (left) and Richard Kilpatrick describe NASA's new Ares I and Ares V, to Mississippi Rep. Lee Jarrell Davis (right) in the Capitol Rotunda. The engines for the crew and cargo launch vehicles will be tested at SSC.

On Feb. 28, representatives from NASA John C. Stennis Space Center traveled to the Mississippi Capitol in Jackson to present displays about the space center's work, and to tell legislators of SSC's vital role in America's space program.

During SSC Day at the Capitol, SSC Deputy Director Gene Goldman spoke to the Mississippi Senate and House of Representatives.

"This is truly an exciting time for NASA and Stennis Space Center," Goldman said. "NASA is developing a new spacecraft to replace the shuttle and planning to return to the moon with eventual travel to Mars. Stennis Space Center will be testing the engines for the new spacecraft, and the center's 125,000-acre acoustical buffer zone is critical for testing these large-scale rocket engines."

Goldman presented each chamber with a Mississippi flag that had flown aboard Space Shuttle Endeavour, displayed with a quote attributed to propulsion pioneer Dr. Wernher von Braun: "I do not yet know how we will get to the moon, but I do know we will have to go through Mississippi to get there." Goldman also presented to House Tourism Commmittee Head Diane Perenich a photo of a space shuttle main engine test. The display will be exhibited in the committee's conference room at the Capitol.

Exhibits were displayed in the Capitol's Rotunda that

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SSC's 2006 impact on the regional economy

Mississippi State University economics professor Dr. Charles Campbell compiled this information and announced his results at SSC Day at the Capitol.

- In 2006, the direct economic impact within the core 50-mile radius resulted in $488 million
- SSC maintained a stable direct impact on the global economy for two consecutive years, totaling $691 million
- Without SSC operations in 2006,
  - the area would have an estimated 19,500 fewer jobs
  - personal income would have been $811.4 million less
  - retail sales would have been reduced by $324.6 million
- SSC's estimated impact on local tax revenues is $87.6 million

From the desk of

Dr. Richard Gilbrech

Director,
Stennis Space Center

February at Stennis Space Center saw a lot of activity, including construction, test stand refurbishment, engine testing and much more.

You may have noticed excavators nibbling at the pile of dirt at the corner of Trent Lott Parkway and Saturn Drive recently. This activity signals the beginning of the construction phase of the new Emergency Operations Center. This two-year effort will culminate in a new facility that will centrally locate the fire department, medical clinic, emergency management and security services resulting in a significant enhancement of our response capabilities. This is just one part of the beehive of construction activity both on site and on Highway 607 to the north with heavy hauling traffic and the Texas Flat Road project. I encourage everyone to maintain extra awareness on the roads during these busy times and be safe.

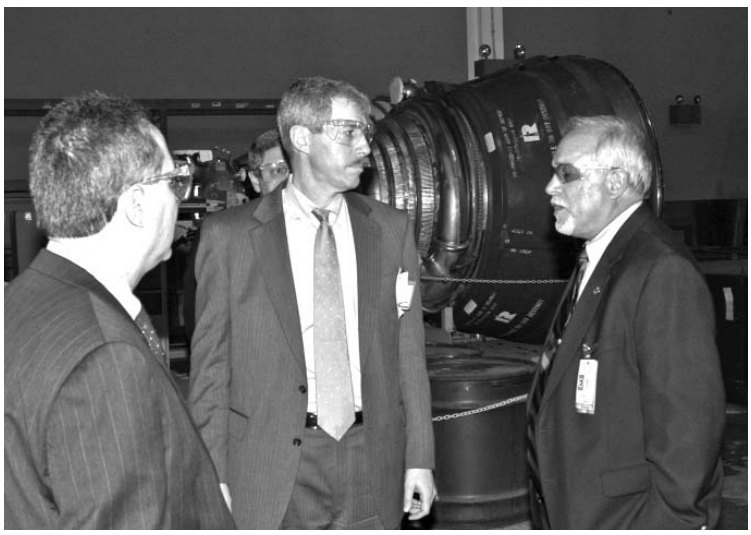
Engineers in the test complex were extremely busy with certification testing of the knife-edge seal redesign on the space shuttle main engine high pressure oxidizer turbo pump (HPOTP). This 12-test series wrapped up with a successful hot-fire test Feb. 26. This was a significant accomplishment for the Space Shuttle Program. My compliments go to the entire team from SSC, Marshall Space Flight Center and Pratt & Whitney Rocketdyne. The team pushed through many hardware and facility issues to put this important milestone behind us. The work will pave the way for a five-flight HPOTP, and opens our A-2 Test Stand schedule to begin green runs of flight hardware needed to support the shuttle manifest.

On the Constellation Program, we also are moving forward with preparations for testing the J-2X engine that will power the second stage of NASA's new crew launch vehicle, Ares I. Fabrication and assembly for the J-2X powerpack as well as refurbishment of the A-1 Test Stand both are progressing well; testing should begin later this year. Refurbishment of the B-2 Test Stand is continuing on schedule in preparation for testing the second stage of the Ares I and eventually the large first stage of the Ares V.

The month ended with a very successful SSC Day at the State Capitol in Jackson Feb. 28. Economic figures for SSC were rolled out during the event, and SSC's 2006 direct economic impact on surrounding communities was nearly half a billion dollars. My thanks to everyone at NASA, our support contractors and Partners for Stennis who participated and helped make the day a resounding success.

As we move into spring, the pace of activity at SSC will continue to increase, and we should all raise our safety awareness accordingly. Our most valuable resource has always been our talented work force, so I urge everyone to continue to focus on safety, both at work and off duty. I continue to be proud of the accomplishments of our Stennis team.

Richard D. Gilbrech



Sen. Lott staff learns of future testing role

Mitch Waldman (left), national security adviser to Sen. Trent Lott, and Lott's legislative director, Jim Sartucci, toured Pratt & Whitney Rocketdyne's RS-68 assembly facility in Stennis Space Center's Building 9101 during a visit Feb. 21. PWR's site manager, Dave Geiger, talked to them about the role RS-68 will play in NASA's Constellation Program, NASA's plan to fulfill America's Vision for Space Exploration to return to the moon and journey on to Mars. All RS-68 engines are tested at SSC's B Test Complex. They'll power the core stage of the Ares V, NASA's future cargo launch vehicle. The J-2X rocket engines, also to be tested at SSC, will power NASA's new crew launch and cargo launch vehicles.

FULFILLING THE VISION FOR SPACE EXPLORATION

Test conductors get hands-on training

Partnership with private company beefs up staff

Glenn Varner (left) and Ben Weisel, both of Jacobs Technologies, are two of the test conductors being trained in Stennis Space Center's E Complex. Under a partnership with a private company, NASA's Test Project Office is testing the company's rocket engine component and using the tests to prepare its contractor work force for upcoming work in the E Complex.

A partnership between Stennis Space Center's Test Project Office and a private company is helping prepare the site's work force for NASA's return to the moon, but more importantly utilizing a contractor work force that would be fully capable of performing component tests in the E Complex.

The E Test Complex is SSC's facility for testing developmental components. Its seven separate test cells, capable of testing with ultra high-pressure gases and cryogenic fluids, are ideally suited for proving engine components.

The E Complex also will be called on for work relating to NASA's Constellation Program, the plan for fulfilling the nation's Vision for Space Exploration: retiring the space shuttle and using new vehicles to return humans to the moon, and then travel to Mars and beyond. At its A Test Complex, SSC will test the J-2X rocket engines that will power the upper stage of the new crew launch vehicle and the Earth departure stage of the new cargo launch vehicle.

"We anticipate a large onslaught of Constellation projects," said Barry Robinson, a project manager in SSC's Test Project Office, Project Directorate, "for which we'll need our personnel familiar with test operations to support any turbomachinery or combustion projects to support NASA's return to the moon. We've got to be able to hit the ground running. We already have some J-2X support projects – such as proving concepts and designs for combustion devices, components and pumps – in formulation. We should be getting very busy, very soon.

"The principles in the private company are analysts and design engineers," Robinson said. "They are here to gather performance data and learn how we conduct test operations. The benefit for SSC is that we can use the tests to train our contractor work force on how to control test operations in the control room as test conductors. It's a more efficient use of our work force, and helps us supplement personnel."

SSC's E Complex staff has also assisted with assembly on the test article, a thrust chamber, and will test the article to gather data needed to verify the hardware's performance. Because the engine component is still in the development stage, Robinson explained, standard procedure is to assemble the article, test it, take it off the test stand, tweak the design and test again. The process may be repeated many times before a fully assembled rocket engine goes into space.

"This company needs to build a database of information to prove their analysis," Robinson said. If their relationship with NASA remains mutually beneficial, the partnership may extend beyond its current end date, he said.

STS-117 engines carry upgrade

A sophisticated monitoring system for the space shuttle's main engine will be installed on all three engines to power NASA's STS-117 mission.

The mission, targeted for an April launch, will travel to the International Space Station and resume construction on the outpost's truss segments and install a pair of solar power arrays.

The trio of engines that will power the Space Shuttle Atlantis into orbit will be fitted with an Advanced Health Management System. The breadbox-sized combination of computer and sensors is built into the main engine controller, considered the "brain" of the SSME.

"We certified the system here last summer," said NASA's Don Beckmeyer, space shuttle main engine project manager in Stennis Space Center's Test Projects Office. "We're 'green-running' controllers now in conjunction with a separate test series on the turbopump's knife-edge seal and we will continue to green run controllers throughout the remaining year."

The AHMS reads data from sensors monitoring vibration, temperature and fuel flow and mixture, among other things. It then processes the signals into digital signals, and compares the readings with an established baseline to monitor the health and performance of the engine, making sure it operates within safe parameters.

The health management system was upgraded by making it faster, more accurate and more durable; and by giving it more memory and the capability to make internal decisions about controlling the SSME's performance. According to STS-117's mission Flight Readiness Review conducted in late February, the improvements "reduce the likelihood of catastrophic SSME turbomachinery failure."

"It's all about improving safety of flight," Beckmeyer said. "When you have pieces of machinery like the SSME's turbopumps running at such a high rate of speed (an average of 30,000 rpm), you really want to keep a close eye on the vibrations of the rotating machinery and that's what this system is designed to do."

Two of Atlantis' engines will run AHMS in monitor-only mode in which the system will receive data and use it to make "decisions" about the engine's performance; the other will operate in active mode, allowing the system to send performance-controlling signals back to the engine. On NASA's next mission, all three engines will be fitted with AHMSs running in active mode.

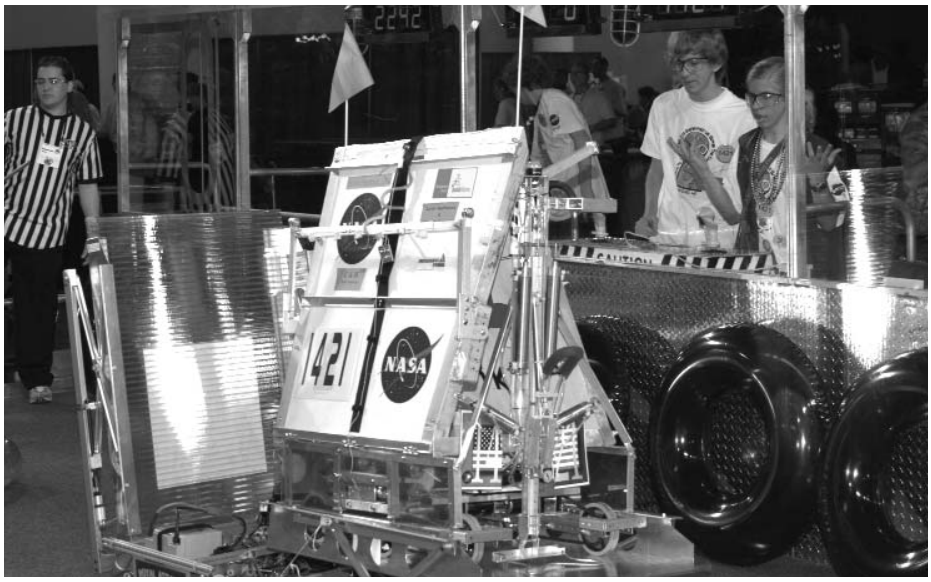
Hail delays launch; vehicle back in VAB

Space Shuttle Atlantis is in Kennedy Space Center's Vehicle Assembly Building for assessment and repairs due to a late February thunderstorm with hail.

Workers positioned platforms around the shuttle to allow for inspections and repairs to hail-damaged areas. Some foam sanding has begun in the nose cone area of the tank. Inspections are finished for the solid rocket boosters and nearly complete for the orbiter, with 20 of 28 hail-damaged areas, all on the left side of the vehicle, already repaired.

A new target launch date has not been determined, but teams will focus on preparing Atlantis for liftoff in late April for NASA's Mission STS-117 to the International Space Station. It will be scheduled sometime after a Russian Soyuz spacecraft, delivering new station crew members and returning others to Earth, returns from the station in late April.

On an upper level of high bay 1 of Kennedy Space Center's Vehicle Assembly Building, technicians move protective material toward the nose cone of Atlantis' external tank.



Members of Team 1421 of Pearl River County, Miss., watch their robot, 'Katastrophic,' successfully complete a point-scoring move on the playing field at New Orleans' inaugural FIRST Robotics Bayou Regional Competition on March 9. A regional winner in 2006, NASA-sponsored Team 1421 this year snagged the prestigious Motorola Quality Award.

NASA sponsors FIRST Robotics Bayou Regional

The Bayou Regional FIRST (For Inspiration and Recognition of Science and Technology) Robotics Competition was held March 8-10 at the Morial Convention Center in New Orleans.

Delana Lorance, 7, of Slidell, La., greets Dean Kamen (right), founder of FIRST (For Inspiration and Recognition of Science and Technology) at the Bayou Regional Competition in New Orleans on March 11. Delana's father, David Lorance (left) of NASA, works at Stennis Space Center and volunteered with Northshore High School's Team 1912, 'Nuts and Volts.'

NASA Stennis Space Center Deputy Director Gene Goldman and NASA Program Executive for Solar System Exploration Dave Lavery were guest speakers for the opening ceremony.

NASA's sponsorship of the inaugural regional competition – including school sponsorships and other contributions to the regional competition – this year will total more than $500,000. NASA and SSC support FIRST by providing team coaches, mentors and training, as well as competition event judges, referees, audio-visual and other volunteer staff personnel.

"NASA sponsors hundreds of FIRST teams across the country and many NASA engineers mentor teams. Engineers are eager to participate because they know they are helping to inspire the next generation of explorers," said Goldman. "They are witnessing the creation of future engineers, and possibly future NASA employees who will help design robots for missions to worlds beyond our own."

Award Winners

Regional Chairman's Award
Provine High School, Jackson, Miss.
Engineering Inspiration Award
Gulfport (Miss.) High School Technology Center
Regional Woodie Flowers Award
Upper Darby High School, Drexel Hill, Pa.
Regional Autodesk Visualization Award
Gulfport High School
DaimlerChrysler Team Spirit Award
McMain Secondary High School, New Orleans, La.
Delphi "Driving Tomorrow's Technology" Award
Upper Darby High School
General Motors Industrial Design Award
Clear Creek ISD, League City, Texas
Highest Rookie Seed Award
Slidell High School, Slidell, La.
Imagery Award
Robert M. Shoemaker High School, Killeen, Texas
Johnson & Johnson Sportsmanship Award
Limestone County Technical Career Center, Huntsville, Ala.
Judges' Awards
Lee High School & New Century Technology High School, Huntsville, Ala.
Kleiner Perkins Caufield & Byers Entrepreneurship Award
Gulfport High School
Motorola Quality Award
Picayune (Miss.) High School & Pearl River Central High School
Outstanding Volunteer of the Year Award
Joe Daschbach
Regional Finalist (alliance)
Clear Creek ISD
Gulfport High School
St. Paul's High School &
Pope John Paul High School, Covington, La.
Hahnville High School, Boutte, La.
Regional Winner (alliance)
Provine High School
Northview High School, Duluth, Ga.
Northshore High School, Slidell, La.
Rockwell Automation Innovation in Control Award
Northshore High School
Rookie All-Star Award
Slidell High School
Rookie Inspiration Award
Sarah T. Reed Senior High School, New Orleans, La.
Underwriters Laboratories Industrial Safety Award
Mercy Cross High School, Biloxi, Miss.
Website Award
Upper Darby High School
Xerox Creativity Award
Galena Park (Texas) High School

Education committee meets at SSC

Education Coordinating Committee members from across NASA met at Stennis Space Center March 7-8 to focus on aligning NASA's education portfolio of projects with education outcomes in NASA's strategic plan. Members who attended the planning session are (from left): front row, Dr. Dewey Herring, SSC's Education officer; Miriam Rodon, Dryden Flight Research Center; Joyce Winterton, NASA's Associate Administrator for Education; Susan White, Johnson Space Flight Center; John Hairston, Glenn Research Center; Jo Ann Charleston, GRC; Tammy Rowan, Marshall Space Flight Center; back row, Bill Anderson, NASA's Aeronautics Mission Directorate; Gregg Buckingham, Kennedy Space Center; Bob Gabrys, Goddard Space Flight Center; Alotta Taylor, NASA's Space Operations Mission Directorate; Jerry Hartman, NASA's Exploration Systems Mission Directorate; Ming Ying Wei, NASA's Science Mission Directorate; Roger Hathaway, Langley Research Center; Jackie Mackall, NASA Headquarters; and Astronaut Ricky Arnold.

SSC DAY

Continued from Page 1

explained SSC's role in the Constellation Program and NASA's plan for fulfilling America's Vision for Space Exploration. The NASA Shared Services Center was represented, along with information about other agencies at SSC. Besides an overview of the space center's work and mission, there was information about NASA's education investments in the state. The University of Southern Mississippi's Visualization Laboratory also had a display.

During the day, the center's 2006 economic impact figures were released, detailing the space center's vital role in the region's economy.

In his remarks to state legislators, Goldman expressed appreciation for their continuing support.

"The great state of Mississippi has been a staunch supporter of NASA Stennis Space Center since its beginnings more than 40 years ago, and that support remains very evident today," said Goldman.

Koch family letters offer peek into early Logtown life

Editor's Note: *Archaeologist Dr. Marco Giardino of NASA's New Business Development Office at SSC provides this LAGNIAPPE column dedicated to the history of Stennis Space Center and the surrounding area.*

Readers were introduced to the Christian Koch family of Logtown through an earlier article in this series. We thought it interesting to publish some excerpts from their letters. Their words provide a very personal account of the history of Hancock County during the mid-19th century. The original letters are part of the Koch Collection housed at the Hill Memorial Library on the Baton Rouge campus of Louisiana State University.

Stennis Space Center HISTORY

In June 1849, Christian Koch was in Denmark, his homeland, conducting business when he received a letter from his wife Annette. The news from their home, the Bogue Homa Plantation in Logtown, was that Annette's grandmother had died unexpectedly in May, during a cholera epidemic.

In his response, Christian states: "It is... a terrible lot of people there dead since I left you, if they continue to die thus, will there be nobody left in Pearlington when I get back." But disease was not the only danger to the local population. In the same letter, Christian refers to an apparent attack by a wild animal resulting in the death of a child: "It was a terrible history, that about the [illegible], I have never heard of such a thing before. What kind of animall [sic] can it have been? It could not have been a panther because it would have killed the baby with one stroke of the paw."

Early settlers along the Pearl River were constantly concerned about the health and safety of their families. In September 1849, Christian wrote to Annette from Hamburg, Germany, this time specifically about the health of their first born child Elers, who would have been age 5: "I am quite anxious about poor Elers... I know you will send for a doctor is you find anything serious the matter with him, although I expect you are as good a Doctor.. Oh if I could only fly home."

Education is power, carries responsibility

Editor's Note: *Patricia Johnson of NASA's Office of Diversity and Equal Opportunity at SSC provides this LAGNIAPPE column on topics promoting cross-cultural and interracial understanding.*

Horace Mann referred to education as "the great equalizer of the conditions of men... the balance wheel of social machinery." Education allows men to be responsible for their own lives and prepares them to live to the fullest. To succeed, men must exercise control over their lives. Education is power.

A strong back, willingness to work and high-school diploma were once all that were needed to make a start. Now, a well-developed mind, passion to keep learning and ability to put learned knowledge to work are keys to the future. Basic skills – reading, writing and communication – are minimums for even a low-skill job. Basics will not guarantee a career or access to college, however; absence will ensure the door to opportunity remains closed. Thinking skills permit men to analyze and solve problems. A good education teaches responsibility and self-management, and enhances self-esteem, integrity and social skills. These foundations support possibilities and potentials young people sense in themselves.

From the **Office of Diversity and Equal Opportunity**

Men must realize once they have the education, responsibility comes with it; responsibility to share the wealth and encourage others to follow. Empowerment comes from a body of well-educated men who owe it to others to help them excel. Society must emphasize a well-developed mind, a passion to learn and ability to put knowledge to work are keys to the future.

Men gain power in knowledge of their history. Understanding the connection between past and present is critical to understanding the future. It allows them to realize bridges were crossed to permit them to soar. They gain knowledge into laying bricks to paths of opportunity.

Education frees the mind by developing knowledge, thinking, skill and character. It is the great equalizer and brings power to make good decisions and to eliminate the need to be led. With education, men never again will be condemned to repression. Education earned can never be taken away and can never be given to someone who has not earned it.

AROUND NASA

■ **Team's sensor will check for signs of life:** NASA-funded researchers are refining a tool that could not only check for the faintest traces of life's molecular building blocks on Mars, but could also determine whether they have been produced by anything alive. The instrument, called Urey: Mars Organic and Oxidant Detector, has already shown its capabilities in one of the most barren climes on Earth, the Atacama Desert in Chile. The European Space Agency has chosen this tool from the United States as part of the science payload for the ExoMars rover planned for launch in 2013. Last month, NASA selected Urey for an instrument-development investment of $750,000. Much of the development work on the instrument has been funded by the NASA Astrobiology Program.

■ **NASA looking to team up with Hawaii:** NASA officials announced March 7 they have agreed to explore future collaborations with the state of Hawaii in commercial space initiatives and programs supporting research, education and workforce development. Under the terms of a memorandum of understanding signed in Hawaii, NASA Ames Research Center will explore opportunities for future collaborations with the state of Hawaii in support of the Vision for Space Exploration, NASA's plan to return humans to the moon and later travel to Mars. The agreement was negotiated through NASA's Space Portal, a newly formed organization in NASA Research Park at Ames that seeks to engage new partnerships with NASA to promote the development of commercial space exploration.

■ **Ice sheet's hidden lakes may disrupt climate:** Scientists are searching Antarctica for its hidden lakes and waterways that can barely be detected at the surface of the ice sheet. In a new study, researchers have unearthed how water from this vast subglacial system contributes to the formation of ice streams, and how it plays a crucial role in transporting ice from the remote interior of Antarctica toward the surrounding ocean. Water flowing from this network of under-ice lakes, they say, ultimately affects climate and global sea level. A research team including scientists from NASA discovered four large, subglacial lakes miles beneath the Antarctic ice sheet's surface. The team was able to link these lakes for the first time to a fast-flowing ice stream above and establish that within this 170-mile wide area the lakes contribute to the creation of a major ice stream.

Hail & Farewell

NASA bids farewell to the following:

Mike Dawson – Associate Director, Office of the Director

Dr. Ed Johnson – Engineering and Science Directorate

James Riser – Rocket Propulsion Test Program Office

Astro Camp filling up 2007 summer sessions

"My Place in Space" will be the theme of Astro Camp's seven summer sessions at NASA Stennis Space Center. Each weeklong session will take children ages 7 to 12 on an exciting adventure, learning about the variety of skills and talents it takes to voyage into space.

Astro Camp

Sessions will begin on June 4, 11, 18 and 25 for children ages 7 to 9; and July 9, 16 and 23 for children ages 10 to 12.

Two sessions of Astro Camp Plus will be held for teens ages 13 to 15. They begin June 25 and July 9. For fees and information, call 688-7623.

William Johnston (left) of Diamondhead and Devin Lockett of New Orleans build 'balloon rockets' with the help of Counselor Rachel Selzer during the 'Rocketry 101' Astro Camp Saturday session held March 3 at StenniSphere, the visitor center at NASA Stennis Space Center. The popular one-day camp for children ages 7 to 12 teaches principles of space travel through hands-on activities and experiments.

DEVELOP students learn new software

Students participating in the spring session of NASA's DEVELOP program recently attended a training session at NASA Stennis Space Center. They are (from left): front, Carryl Waite and Sadaf Malik; back, Jo Kemper, leader Jason Jones and Lauren Childs. They learned how a new software package, ERDAS (Earth Resources Data Analysis Systems) Imagine, helps run land classifications on satellite image data. The students use ERDAS Imagine on data captured by NASA's Landsat instrument over the Mississippi Sandhill Crane Refuge in Jackson County. Under the guidance of SSC scientists, the students aim to better understand and interpret data to see changes in wetlands and other wildlife habitats, and how those changes affect their communities. DEVELOP is a national, year-round internship program with NASA Science Mission Directorate Applied Sciences. For information, contact SSC's DEVELOP program manager, Cheri Miller, at 688-3802.

Special Olympics volunteers needed

NASA Stennis Space Center will again be the site for the Area III Special Olympics, scheduled to take place Saturday, March 31.

Volunteers are needed to escort athletes and assist with events. They must be at least 16 years old to escort athletes. Information and registration forms are available online at

http://specialolympics.goldinc.com.

For more information, contact Susan Starke, 688-2788.

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