



MARSHALL STAR

Serving the Marshall Space Flight Center Community

Dec. 8, 2005

Marshall engineer's work spans from ballistics to ballet

By Bill Hubscher

The phrase "attention to detail" is something Sam Ortega lives by, both at work and at home.

During the day, Ortega — a ballistics and motor performance lead on the Reusable Solid Rocket Motor Project at the Marshall Center — ensures that the Solid Rocket Motor on each shuttle flight performs as predicted to make sure it can carry the payload assigned.

By night, he turns his attention to different kinds of details — buttons, ribbons and hemlines. Ortega creates and sews costumes for the theatre. It's not rocket science and it doesn't take a team of hundreds. But to Ortega, it's still an

important task.

"I've been sewing costumes, simple dresses and shirts for my kids since they were born," Ortega said. "I found it a good outlet for creativity. I can make what I want or what they want and I don't have to depend on current fashions in the stores."

Ortega began his latest project when asked to design and sew his daughter's costume for the Huntsville Community Ballet Association's production of "The Nutcracker." His daughter, Sierra, was cast as the main character of Clara, the little girl who is whisked away to a land of fantasy by her Christmas gift, a nutcracker.

See Nutcracker on page 2



Sam Ortega/Photo courtesy

Marshall engineer Sam Ortega, right, puts the finishing touches on a dance costume for his daughter, Sierra. She will wear the dress this weekend while performing in a local production of "The Nutcracker."

Marshall rings in the holiday season

Marshall Center employees are getting into the holiday spirit. They're wrapping up the year with two things that seem to go hand-in-hand each holiday season: tree lights and lots of good food.

Marshall Center Deputy Director Charles Chitwood officially kicked off the holiday celebration Nov. 30 in front of Building 4200. Joined by Marshall employees, Chitwood "threw the switch," lighting the holiday tree.

Next up is the annual Marshall holiday reception, giving employees a chance to come together in the spirit of the season.



David Higginbotham/MSFC

Marshall Center Deputy Director Charles Chitwood completes the lighting of the holiday tree outside Building 4200.

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Buyout opportunity ends Dec. 9

The buyout opportunity ends Dec. 9. Marshall employees with competencies that are in excess of those needed to perform current or projected assignments will be eligible to receive a separation incentive payment of up to \$25,000. In addition, employees in targeted positions may also opt to take early retirement, if eligible. Full details of the buyout program are available on Inside Marshall.

Inside: A special 8-page look at the Marshall Center realignment, new organizations and future missions



NASA/Bill Ingalls

Dale sworn in as NASA deputy administrator

Shana Dale was sworn in Dec. 1 as NASA's 12th deputy administrator at the agency's headquarters in Washington. Before coming to NASA, Dale was deputy director for Homeland and National Security for the Office of Science and Technology Policy, executive office of the president. She also served as the chief of staff and general counsel at OSTP. Earlier in her career, Dale was the staff director for the House Subcommittee on Space and Aeronautics.

Nutcracker

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Ortega credits his work at NASA with helping him hone his creative skills. Before his current position, he spent three years as nozzle sub-system manager for the Solid Rocket Motor Program. The nozzle's composition is basically layers of fabric with a resin binder. Designing and working with that fabric, said Ortega, is a lot like his work with clothing.

"It has some of the same aspects. There is the cutting, sewing and manipulation of the cloth, the weave and thread-counts," he said. "Plus, I take a lot of pride in my work at both places."

Working on theatre costumes was a natural progression for Ortega. He was first introduced to the idea a few years ago when he started making costumes for school plays. He then began volunteering to do small, odd jobs at the Community Ballet Association studios.

"Once they found out I could sew, they sucked me in," jokes Ortega. "This year I have been volunteering more in their costume room, repairing, adjusting and cutting out different costumes."

Holiday

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Festivities will be held from 1 to 3 p.m., Dec. 9, in the Center Activities Building 4316. Plenty of good food will be served. Music also will be featured to help employees get in the holiday mood.

"The holiday reception is a wonderful tradition — an occasion for workplace friends to gather and enjoy time together in a festive atmosphere," said Marshall Center Director David King. "It's also a time to reflect on the many blessings and good things in our lives. In essence, it's a celebration."

Door prizes will be given away at the reception. To be eligible for the prize drawings, team members must bring a nonperishable food item for the North Alabama Food Bank. Buses will run every fifteen minutes from noon until 3:30 p.m. for the event. For a complete bus schedule, visit http://announcements.msfc.nasa.gov/hr_120905_bus.html. Those employees not on a bus route may call the Marshall Center taxi service at 544-TAXI.

Before he knew it, he moved from fixing costumes to creating them from scratch. What makes this project so important to him is, this time, he gets to work on a specific costume for his daughter. It is something she brags about. Ortega has worked a few hours every night for nearly three weeks to get the costume right. "I had to try to find the right patterns to match the 1890s timeframe or design the different parts myself, and also make sure they match the vision of the Community Ballet's artistic director Clinton Rothwell," he said.

But the payoff is worth every stitch. "My daughter loves to perform. She gets very excited and loves getting up on that stage."

"The Nutcracker" opens at the Von Braun Center Concert Hall Friday, Dec. 9, at 7:30 p.m. and continues through Sunday, Dec. 11. The show has two performances on Saturday, Dec. 10, at 2 and 7:30 p.m., and one on Sunday at 2 p.m. Tickets can be purchased through the Von Braun Center box office or Ticketmaster.

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

Internal Communications Survey being conducted

The Office of Strategic Communications is conducting a communications survey of all center supervisors and of randomly selected employees. The survey will focus on how employees get their information, if they are receiving all they need, and which communications vehicles are the most effective in reaching the Marshall team. OSC will use the survey results to inform its planning of internal communications products and processes. If you receive an e-mail with a link to the survey, please provide your input and share your ideas for improving employee communications within Marshall.

It should take no more than 15 minutes of your time.

Marshall Center realigns

Marshall Center transformation at the enabling core of Vision

By Rita Roberts

In the two months since Marshall Center Director David King announced the realignment of center organizations, teams have worked diligently to revise the complex framework of offices and organizations at Marshall.

The challenge was to focus Marshall's resources and capabilities on the agency's new space exploration work — primarily the development of new crew and cargo launch vehicles.

"We are enhancing our organization to ensure that we successfully accomplish our new missions," King said. "This realignment will continue to focus and streamline our customer interfaces and product developments through a flexible, customer-focused organization — one specifically designed to meet the diverse needs outlined in the Vision for Space Exploration."

King charged the realignment teams to accomplish the restructuring quickly, matching the right resources with the right programs, continuing to emphasize safety and accountability in all activities, and striving to place personnel in positions that match their talents and expertise.

"The realignment teams have worked diligently to help identify the right structure for our center," said Robin Henderson, associate director of the Marshall Center. "It is essential that we have the right organizational structure, the right capabilities and the right people to sustain our commitments, make us competitive and move us successfully into the future."

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NASA crew and cargo launch vehicle projects will be managed at Marshall. The crew launch vehicle will be a single, four-segment, solid propellant rocket booster with a liquid oxygen/liquid hydrogen upper stage powered



Robin Henderson

by one shuttle main engine. Intended to lift crews and cargo into orbit, the vehicle will lift 25 metric tons. The crew launch vehicle is expected to be 10 times safer than the space shuttle, primarily due to an in-line or "stacked" stage design and a launch abort system.

The heavy-lift launch vehicle will support future lunar exploration missions. It will consist of five shuttle main engines and two, five-segment, shuttle-derived solid propellant rocket boosters. The heavy-lift vehicle will have a lift capability of 106 metric tons to low Earth orbit and 125 metric tons when incorporating an Earth-departure stage. Though primarily designed to carry cargo, it can be human-rated to carry crew into orbit.

Marshall will lead the design and development of the new launch systems. These responsibilities include the first stage and upper stage design and engine development, systems engineering, full vehicle stack integration, and safety and mission assurance.

The realignment features the creation of two new development offices. Under the leadership of Steve Cook, the Exploration

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Message from the Center Director

The Marshall Space Flight Center has been awarded the honor of designing and building the new Crew Launch Vehicle. This vehicle, along with the Crew Exploration Vehicle, will enable humans to travel and explore beyond low-Earth orbit. In addition, the Marshall Center won a proposal to design and build the lunar lander spacecraft as part of the Robotic Lunar Exploration Program. The lander will be the forerunner

to human exploration, and its importance cannot be overstated. The exploration responsibilities we now carry



David King

for the Agency require a realignment of portions of our organizational structure. It will add value; it will add strength. It will allow us to be better integrated, effectively disciplined and more accountable, which in turn will keep us moving forward and doing important work for NASA. The Center's capabilities will help the Agency realize the Vision for Space Exploration. After many weeks of hard work and deliberation, the realignment teams and I have completed the planning, and we are ready to implement it. I want to extend my personal thanks to all who were involved.

Aligning the Center with the goals and objectives of the Agency and creating a new foundation of excellence by ensuring that value is added to everything we do is the right direction for Marshall. The center's leadership

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The Future of Space Exploration is 'Riding on Us'

By Sheri Bechtel

NASA's Exploration Launch Office is a new development office at Marshall that is playing a key role in the Vision for Space Exploration — for more ambitious exploration of the moon, Mars and destinations beyond.

The office has been given the critical role of managing the agency's crew and cargo launch vehicle projects. This includes leading propulsion design, development, systems engineering, full integration of elements, and safety and mission assurance activities. The launch vehicle projects build NASA's space shuttle heritage, advancing these technologies to develop a rocket system that is affordable, reliable and safe.



Steve Cook

The Exploration Launch Office's No. 1 responsibility is



A concept image of NASA's crew launch vehicle, right, as it carries a payload out of low Earth orbit, and the agency's follow-on cargo heavy lift launch vehicle and Earth departure stage as it sits on the launch pad.

development and overall integration of the launch vehicle system, called the crew launch vehicle, that will provide the propulsion necessary to deliver the crew exploration vehicle into space. This effort includes development of a first stage and a new upper stage.

The crew launch vehicle is being executed as an integrated

partnership between Marshall's Exploration Launch Office, Engineering Directorate, and Safety and Mission Directorate and NASA's Johnson Space Center, Kennedy Space Center and Stennis Space Center. Ames Research Center, Glenn Research Center and Langley Research Center are providing critical support.

The Marshall launch office also is responsible for near-term planning and future development of NASA's follow-on heavy-lift launch vehicle and Earth departure stage, needed to leave Earth's orbit to travel to the moon and beyond. The purpose of the heavy-lift vehicle is to carry cargo and components into space to support future lunar exploration missions. The heavy-lift system also can be modified to carry crew.

Steve Cook, director of the Exploration Launch Office at Marshall, is responsible for overall management and direction of the office and its crew launch vehicle development efforts. Dan Dumbacher serves as deputy director.

The first stage element is managed by Rick Burt. Tom Williams serves as deputy, and Andy Schorr is associate manager. The team is responsible for modifying the current space shuttle solid rocket motor/booster, leveraging its technologies to develop the first stage element for the crew launch vehicle.

This effort includes advancing the recovery and roll control systems, which help steer or maneuver a vehicle, for the new design.

Leading development of the upper stage element are project manager Danny Davis and deputy manager Jerry Cook. The project is responsible for developing an all new upper stage, including interstage and tank structures, and the main propulsion and avionics systems.

Powering the upper stage will be a single shuttle main engine. Modifying the engine for "altitude start," or mid-flight ignition, is the responsibility of the upper stage engine project, managed by Mike Kynard and deputy Craig McArthur. Kynard and his team also are responsible for producing an expendable version of the main engine, the RS-25E.

Another key component of the Exploration Launch Office's crew launch vehicle development efforts is integration of all stage elements into a single, in-line vehicle stack. This is the responsibility of the Vehicle Integration Office, managed by Jim



A concept image of NASA's crew launch vehicle on the launch pad, as the engine ignites for liftoff.

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Office of Strategic Analysis and Communications provides integrated approach

By Sanda Martel

As part of the realignment, the Marshall Center is gaining a comprehensive planning, analysis and communications capability through a restructured and newly named Office of Strategic Analysis and Communications. The office will develop, execute and guide an integrated capability that will help the center make informed decisions and develop relationships based on priorities, business intelligence, performance assessment and strategy decisions.



Rose Allen

"Significant and rapid changes in Marshall's environment and in stakeholder satisfaction levels, and a need to focus on future missions have highlighted the need to have an office to integrate information and build collaborations between and among various offices at Marshall," said Rose Allen, deputy director of the Office of Strategic Analysis and Communications.

Such integration will allow Allen's organization to assess future opportunities and challenges and formulate mutually beneficial options available to carry out the agency's new space exploration work, Allen said.

"We need to focus our resources and capabilities toward reaching our goals in supporting the Vision for Space Exploration," she added.

Planning and analysis functions, including some now performed by the Systems Management Office and the Office of the Chief Financial Officer, will be integrated into the Office of Strategic Analysis and Communications.

Vision

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Launch Office will manage the new launch system. The new Science and Mission Systems Office, led by Acting Director Charles Chitwood, will integrate Marshall's scientific and engineering expertise and more effectively design and develop NASA's science, exploration and space operations mission products, including spacecraft, propulsion elements, robotic systems and research instruments.

The Exploration Launch Office will be closely linked to Marshall's Space Shuttle Propulsion Office, managed by Robert Lightfoot. The shuttle office will share engineering and legacy expertise and ultimately ensure a smooth transition from the current shuttle technologies to the new launch system.

Additional center restructuring is being finalized as well. Systems engineering and integration expertise will be the responsibility of the Engineering Directorate, directed by Michael Rudolphi. The new structure is expected to better serve the many programs and projects now under way, continuing the broadening and renewal of Marshall's design and development expertise.

In the newly named Office of Strategic Analysis and

A new Planning and Integration Office, under the direction of Dr. Elizabeth Newton, and the Performance and Capability Management Office led by Bill Hicks have been created. Steve Creech, who heads the Cost Estimating Office, formerly a part of the Office of the Chief Financial Officer, is integrating his team into the Office of Strategic Analysis and Communications.

The Planning and Integration Office will focus on business assessment and planning. Some functions the office will provide include analyzing the external environment, stakeholder views and business opportunities.

The Performance and Capability Management Office will provide resource and performance assessments, capability development and readiness planning. For example, the office will integrate budget and workforce assessments of current and future needs; develop facility, equipment and personnel assessments to support center investments; and provide work breakdown structure, schedules and data requirements. These services will help Marshall managers and decision makers plan for future needs, Hicks said.

"When coupled with our existing communications capability, each of these groups is critically important in our efforts to help Marshall develop an integrated approach to the future," Allen said. She added that it is logical to integrate analysis, planning and communications functions because communication is the activity that translates center strategies into action.

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

Communications led by Acting Director Robin Henderson, the center gains a comprehensive program analysis and evaluation function designed to enhance and integrate center strategic assessments and decision making. Planning and analysis functions, including some now performed by the Systems Management Office and the Office of the Chief Financial Officer, will merge into the new organization.

"We are confident that the organizational alignment and workforce reshaping we are pursuing will help position us to carry out our missions in a focused and integrated way in support of the Vision," Henderson said. "We must continue to do what is necessary to create options and prepare for the future."

The Marshall Center is playing a key role in NASA's achievement of the Vision, which calls for a safe return of the space shuttle to flight, completion of the International Space Station, a return to the moon and exploration of Mars and beyond. This exploration will open opportunities for fundamental science pursuits in astrobiology, lunar geology, exobiology, astronomy and physics.

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

Engineering is 'backbone' to project success

By Lori Johnston Meggs

Delivering technical content to Marshall programs and projects, the Engineering Directorate is the backbone to success of projects at the Marshall Center.

The directorate, led by Michael Rudolphi, oversees Marshall's research and development capability for accomplishing engineering functions associated with the design, development, testing, operations and evaluation of its projects. Along with Rudolphi, the directorate has two co-deputies, Chris Singer and Teresa Vanhooser, who share leadership of several major NASA programs.



Michael Rudolphi

The Engineering Directorate provides integrated products and engineering services to NASA, other government agencies and the commercial space development community.

The Engineering Directorate and the Safety and Mission Assurance Directorate make up Marshall's Independent Technical Authority, an organization of technical experts under NASA's Office of the Chief Engineer in Washington. The organization partners with project teams across NASA to ensure safe, reliable operations for every flight program.

To accomplish its assigned functions, the Engineering Directorate is organized into three departments, three laboratories and three offices. The Instrument and Payload Systems Department designs, develops and tests products for human space flight programs, science investigations and exploration initiatives. This department, managed by Steve Pearson, provides design-to-finished-product avionics, structural, mechanical, scientific, flight and implementation for instruments and payloads used throughout NASA.

The Spacecraft and Vehicle Systems Department, managed by Jack Bullman, tackles responsibilities ranging from doing research to integrating systems for the space shuttle, International Space Station and future exploration missions. The Propulsion Systems

Department advances science and engineering excellence for propulsion systems and components for NASA's space transportation systems, including Earth-to-orbit and in-space transportation systems. This department is managed by Preston Jones.

The Mission Operations Laboratory conducts ground and flight requirements and operations for missions. The laboratory, managed by Ann McNair, is responsible for the Payload Operations Center at Marshall. This center is the command post for planning and executing U.S. science on board the space station.

Ralph Carruth manages the Materials and Processes Laboratory, which is dedicated to research, technology and engineering support in materials, processes and products to be used in space exploration. In this lab, technical problems are identified, studied and resolved.

Marshall's Test Laboratory, led by Pete Rodriguez, manages the functions, services and facilities necessary to simulate the space environment and flight conditions. Marshall has more than 40 facilities capable of all types of rocket and space transportation



NASA/MSFC

NASA astronaut Stephen Robinson trains for repair work on reinforced carbon-carbon for STS-114 in a vacuum chamber in Marshall's Test Laboratory.



NASA/MSFC

Marshall's Payload Operations Center in the Mission Operations Laboratory is the command post for science on the International Space Station.

Systems Engineering and Integration brings expertise to Engineering Directorate

By Lori Johnston Meggs

Systems Engineering and Integration expertise is realigning within divisions of the Engineering Directorate to better serve the many programs and projects under way at the Marshall Center.

Last year, Marshall underwent a significant reorganization, with a major objective of centralizing and strengthening engineering while enabling a flexible, product-focused, responsive team. The bulk of systems engineering, however, remained with the project organizations.

This decision reflected the existing environment and the state of many of the major projects. Given the customer environment and the nearness of return to flight, the complete alignment was deferred until a later date.

"With return to flight behind us and the creation of a new large project — the Crew Launch Vehicle — the opportunity and need to finish the alignment developed," said Chris Singer, co-deputy of the Engineering Directorate, who also was on Marshall's realignment team.

After considerable discussions with customers and assessing the new environment, the team considered several organizational options for systems engineering and integration, then weighed those options against overall alignment objectives. "Just as good engineering is a balancing and optimization of conflicting requirements, so is any reorganization or realignment," said Singer. "Enabling the exploration mission is heavily dependent on the collective strength of the dedicated and experienced engineers at Marshall."

To support Marshall's customers, the realignment team decided



Chris Singer

systems engineering, analysis and integration requirements would best be accommodated by moving these functions into the Engineering Directorate.

The basic structure of the three existing engineering departments and the Chief Engineers' Office has been modified. Two new teams have been added to the Chief Engineers' Office to support the Exploration Launch Office and the Science and Mission Systems Office. These two teams will be led by Jim Snoddy and Scott Croomes, respectively.

"The chief engineers are our focal points for ensuring appropriate and vigorous technical support for our partners, so they will be an essential element of the system engineering process," added Singer.

Two divisions within the Spacecraft and Vehicle Systems Department will provide the systems engineering for multiple, large, space transportation systems such as the Crew Launch Vehicle. Dale Thomas will lead the Systems Engineering Division, while John Hutt will lead the Systems Design and Analysis Division.

Also, the Instrument and Payload Systems Department created a new Systems Engineering Division. Led by Tom Stinson, the division's multiple teams will support the myriad of small and large customers within the Science and Mission Systems Office, such as nuclear systems, the Environmental Control and Life Support System and the Robotic Lunar Exploration-2 Project.

The Propulsion Systems Department will infuse systems engineering into its existing structure with a Propulsion Systems Design and Integration Division, led by Robert Garcia.

"This overall consolidation of systems engineering provides the opportunity to support current and new programs and projects with greater expertise, flexibility and experience," said Singer.

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

NASA news

NASA awards contract for New Millennium mission

The \$27 million competitively awarded contract is between Orbital and NASA's Jet Propulsion Laboratory, Pasadena, Calif. JPL manages New Millennium for NASA. The Space Technology 8 satellite will validate four advanced technologies in space for possible use in future NASA science missions.

The satellite consists of four payload experiments: a large flexible solar array; a 40-meter deployable boom; a high radiation environment electronics; and a spacecraft thermal control device.

The satellite is based on a lightweight, multi-role spacecraft similar to others in orbit performing communications, Earth and space science missions. It will weigh approximately 385 pounds. Orbital Sciences also will provide the mission's Pegasus launch vehicle under a separate contract with NASA's Kennedy Space Center, Fla. The mission is scheduled for launch in 2009.

For information about the Space Technology 8 Satellite on the Web, visit: <http://nmp.jpl.nasa.gov> .

Science and Mission Systems Office highlights science expertise, partnering, future opportunities

By Sherrie Super

Blazing new trails and powered by the principle that “the whole is greater than the sum of its parts,” the Science and Mission Systems Office will be focused on the future. As a place for new strategic directions and growth, the new organization integrates all Marshall non-launch vehicle programs and projects, including science.



John Horack

“This is the integration of a new organization, not just the assembly of a variety of elements,” said John Horack, technical assistant for the new office. “Our successes will come from our ability to integrate these parts to create a new and better whole.”

The new office will employ nearly 300 civil servants, incorporating strategic elements from the former Science Directorate, Space Systems Programs/Projects Office and the Space Transportation Programs/Projects Office. If a Marshall program or project is not related to the Space Shuttle or the Crew Launch Vehicle, it likely falls under the domain of the Science and Mission Systems Office.

“Vital to our success will be the assembly of our science expertise, program and project management, and engineering disciplines,” Horack said. “We can’t accomplish our work without engineering or science. They are integrated partners in executing our programs and projects.”

The Science and Mission Systems Office addresses programs and projects within three NASA Headquarters mission directorates — Science Programs and Projects, Exploration Systems, and Space Operations. The office also is home to the Robotic Lunar Exploration-2 Project, Science and Exploration Research, and Projects and Partnerships Development.

Science and Mission Systems will host NASA program offices and a number of science projects within a Science Programs and Projects Office. These include: In-Space Propulsion, focused on new propulsion technologies for interplanetary travel; NASA’s Chandra X-ray Observatory and Gravity Probe B Programs; the Discovery

and New Frontiers Program Office; and several science instrument projects including Solar B and Gamma Burst Monitor.

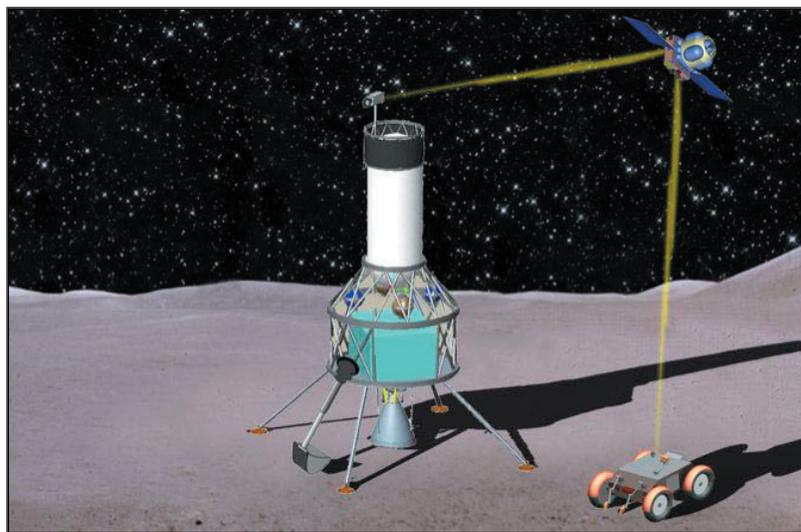
This group contains the next scheduled NASA mission to launch — New Horizons, a mission to explore Pluto and beyond. Set to launch in early 2006, New Horizons is the first in the New Frontiers Program.

A second area of the Office will be comprised of Exploration Systems and Space Operations Programs and Projects, dedicated to creating new capabilities, along with the supporting research and technologies, to enable and sustain human and robotic exploration. At Marshall, this will encompass projects ranging from nuclear-powered systems to spacecraft and systems with a focus on propulsion.

Additionally, this area will contain two offices supporting the International Space Station. A vehicle office is responsible for station elements such as the Environmental Control and Life Support System and the Multi-Purpose Logistics Modules that serve as space station “moving vans.” A payload office is responsible

for research racks and experimental hardware such as the Microgravity Science Glovebox — a sealed facility that space station crew members access using gloves on its sides and front.

The Robotic Lunar Exploration-2 Project will oversee NASA’s next spacecraft to land on the Moon. The lander is the second in NASA’s Robotic Lunar Exploration Program, which provides a series of robotic missions to support human exploration. The lander is tentatively planned for launch as early as 2011.



Proposed Robotic Lunar Exploration Program Mission 2 (RLEP 2) Architecture of Lunar Lander, Communications Relay Satellite and Evolvable Rover Concept. The theoretical lander is approximately 30-feet tall with a payload capacity of roughly two metric tons.

The Science and Exploration Research Office encompasses Earth science, space science and optics research conducted at the Marshall Center. This includes research conducted by Marshall team members at the National Space Science and Technology Center in Huntsville.

“The National Space Science and Technology Center is an important asset to help us build on our excellent scientific strengths, develop partnerships and enhance opportunities,” said

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Exploration

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Reuter and deputy Jim Taylor.

The office also works closely with Marshall's Safety and Mission Assurance Office to ensure flight performance and the safety of the vehicle.

Administrative and budget functions of the Exploration Launch Office are conducted by several additional offices within the new organization. The Program Planning and Control Office is accountable for the program's resources, including budget, workforce, integrated program schedules,

earned value and development of multi-year project budgets. Kathy Pollard serves as manager, and Luanne Kidd is deputy manager.

Bruce Morris and deputy Bob Armstrong are responsible for all nontechnical project integration activities for the overall Crew Launch Vehicle Project. Duties include the alignment of program and project-level boards to run work activities and implementation of information management services.

Phil Sumrall is responsible for laying the

foundation for development of the next generation heavy-lift launch vehicle and Earth-departure stage. Richard Tyson serves as special assistant.

NASA's Exploration Launch Office at Marshall is an element of the Exploration Systems Mission Directorate at NASA Headquarters in Washington. The office answers directly to NASA's Constellation Program Office, located at the Johnson Space Center in Houston.

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

King

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teams and I have pursued these goals with absolute passion, basing all of our decisions on forward thinking and sound business decisions.

When I think about how far we have come since February 1, 2003, I am inspired because it has taken a strong and dedicated team to get us to this point — it has taken you. As I look back over the many months of planning, restructuring, transforming and genuine self-examination, I am reminded of how important it truly was, and will continue to be, for us to remain steadfast and keep our priorities in order.

What is before us leaves no doubt what we need to accomplish. I am energized when I think about the new technologies and scientific breakthroughs that are just around the corner. I am

energized that a new generation will have the opportunity to experience the excitement of humans walking on planets other than our own. We are writing a new chapter in America's space history, and I am indeed grateful to be a part of this exciting time. I am hopeful that you, too, are energized about the future and eager to play a role. When we succeed, we will inspire our nation and the world.

America is going back to the Moon, on to Mars, and then beyond, and Marshall is leading the way with its scientific spacecraft and launch vehicle systems.

The Vision is our new frontier, and the journey ahead will be exciting.

David A. King
Director, Marshall Space Flight Center

Engineering

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technology testing — from small components to full-up engine systems. It is one of the few government groups in the United States responsible for the overall performance of the test program from conception to completion.

The Engineering Directorate's three offices include the Chief Engineer's Office, which has 16 engineers dedicated to ensuring that the designs and hardware of the shuttle propulsion elements and space systems programs and projects meet requirements and can meet mission objectives.

The Engineering Policies & Programs Office, managed by Herb Shivers, encompasses engineering skills development through in-house training to the Innovative Partnership Program/Technology Transfer Program, which creates partnerships with industry, academia and other nontraditional sources to develop and transfer technology for commercial use.

Terry Hopper manages the Resource Management Office,

which enables the departments and laboratories to efficiently perform assignments by consolidating the business aspects of the departments and standardizing those processes within the Engineering Directorate.

One significant change is the return of Systems Engineering and Integration to the Engineering Directorate to better serve the many programs and projects under way. Also, the Propulsion Research Laboratory is now part of the Engineering Directorate. The 108,000-square-foot laboratory provides cutting-edge research into new and advanced propulsion technologies.

The Engineering Directorate's mission focuses on its customers' success. According to its mission statement, "in partnership with our customers, we provide engineering and excellence in research, technology, development and support essential to mission success and safety, and built upon our core values."

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

Chandra proves black hole influence is far-reaching

From the *Smithsonian Astrophysical Observatory*

Scientists using NASA's Chandra X-ray Observatory have discovered evidence of energetic plumes — particles that extend 300,000 light years into a massive cluster of galaxies. The plumes are due to explosive venting from the vicinity of a supermassive black hole, and they provide dramatic new evidence of the influence a black hole can have over intergalactic distances.

"In relative terms, it is as if a heat source the size of a fingernail affects the behavior of a region the size of Earth," said Andrew Fabian of Cambridge University, U.K. Fabian is lead author of a report on this research that will appear in an upcoming issue of the *Monthly Notices of the Royal Astronomical Society*.

Fabian's group discovered the plumes by studying data from 280 hours of Chandra observations of the Perseus cluster, the longest X-ray observation ever taken of a galaxy cluster. The cluster contains thousands of galaxies immersed in a vast cloud of multi-million degree gas with the mass equivalent of trillions of suns.

The plumes showed up in the X-ray data as low pressure regions in the hot gas extending outward from the giant galaxy in the

center of the cluster. The low gas pressure measured in the plumes is likely the result of the displacement of the gas by bubbles of unseen high-energy particles.

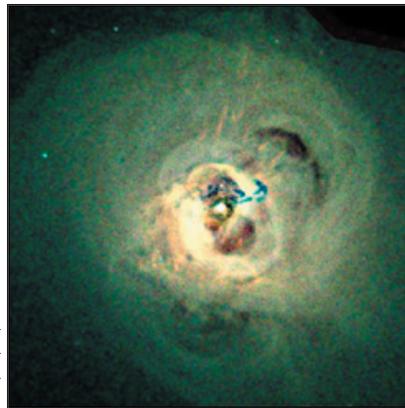
The bubbles appear to be generated by high-speed jets blasting away from the vicinity of the giant galaxy's supermassive black hole. Individual bubbles seen in the inner regions expand and merge to create vast plumes at larger distances.

"The plumes show that the black hole has been venting for at least 100 million years, and probably much longer," said co-author Jeremy Sanders also of Cambridge University.

The venting produces sound waves which heat the gas throughout the inner regions of the cluster and prevent the gas from cooling and making stars at a large rate.

This process has slowed the growth of the central galaxy in the cluster, NGC 1275, which is one of the largest galaxies in the universe.

The Marshall Center manages the Chandra program for the NASA's Science Mission Directorate. The Smithsonian Astrophysical Observatory controls science and flight operations from the Chandra X-ray Center in Cambridge, Mass.



Chandra X-ray image of the Perseus galaxy cluster

Science and mission

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Horack. "We — those of us here at Marshall, in the Huntsville community, along with the state — share a common vision and purpose, to integrate among different science disciplines and dissolve the barriers that have inhibited collaboration, growth and new ways to solve problems. I foresee great opportunity for new programs and partnerships within the National Space Science and Technology Center."

These partnerships will help fuel the Vision for Space Exploration, and share NASA technology and know-how with other agencies and organizations. "Much of the science research done at the National Space Science and Technology Center is well-aligned with the Vision, and has application to those outside NASA as well," Horack said. "The next step is to strengthen these ties, and find new opportunities."

The New Programs and Partnerships Office will manage the long term product push for the Center's strategic growth and new directions. As its name implies, it will assume a visionary role — developing new products for emerging and future markets that are aligned with NASA's overall direction. "The New Programs and Partnerships Office is charged with anticipating or creating changes

— or both," said Horack.

With built-in project and partnership development, the Science and Mission Systems Office is guided by a mission statement focused firmly on exploration. The office's mission is "to conceive, develop, integrate, operate and manage programs, projects and activities; perform research to achieve NASA science and exploration objectives; and develop new systems, solutions and technologies for exploration."

The Science and Mission Systems Office already provides unique value to many NASA programs. The organization manages or contributes to a multitude of agency efforts including five NASA programs, 31 projects and 11 other activities.

Seamless integration of the programs that encompass the new organization will be critical to accomplishing this mission, believes Horack. "Science and Mission Systems is more than the simple addition of projects from around the center," he said. "With this organization, we're going to integrate and work across former operational barriers to do our part in ensuring Marshall's future contributions to America's Space Program."

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

Classified Ads

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

Miscellaneous

Craftsman drill press, \$150; Voyager electric trailer brake control, new in box, \$45. 837-6776

Pennsylvania House video cabinet, Cherry, holds up to 30" TV, VCR/DVD, \$725. 931-427-2059

Radio-controlled scale helicopter, MD500 body, Raptor 60 Mechanics OS61 engine, \$800. 828-3569

Nesco convection roaster air oven, 12 quart. 256-971-2773

New Rawlings OLB3 official size and weight baseballs in bucket, one dozen, \$20. 828-1234

Jim Zimmerman designer sofa, 7', colorful, down-filled, \$1,000. 256-536-5132

Baby changing table, Pottery Barn, white, \$75. 656-7132

Jeff Gordon scale model race car hood, built-in wall hangers, new in box. 256-506-3236

SWR SuperRedhead professional bass guitar amp, 350-450 watts RMS, 2x10 w/horn, \$600. 303-3702/Decatur

Electric adjustable twin-sized bed, \$250; L-shaped Banker's style desk, \$50. 961-9744

Washer/dryer, extra large capacity, \$550; King double pillow top mattress set w/frame, \$800. 656-6755

Medela Pump-in-Style breast pump w/accessories, \$60. 682-7165

Used washer and dryer set, excellent working condition, \$175. 565-6499

HF dust collector, 2 HP; Miller Thunderbolt 225 AC welder; \$125 each. 890-0554

Men's leather coat, size 42/44, \$25; gas pack, 3-1/2 ton, \$70; expandable clothes rack, \$10. 256-852-6952

Howard Miller wall clock, \$30; Leap-pad learning system w/5 books cartridges, \$40. 885-2293

Sony computer and printer. 777-3782

Gift certificate: Golfing for 4 people at Limestone Springs in Oneonta, \$195. 536-8692

Utility trailer, tilt option, black, 8' long, \$325. 256-721-1398

Antique Oak dresser with beveled mirror, \$275. 353-0370

Maxxis Mudzilla tires, 26", mounted on factory Honda wheels, \$350. 256-230-0311

Basset Light Oak dining room set-lighted china cabinet w/table and 6 chairs, \$900. 783-1243

Tommy Armour 845 Clone golf clubs, 2-SW, mid-size grips, stiff steel shafts, \$135. 851-7406

Golden oak cocktail table, 4'x3', end tables, \$50, Broyhill 4-poster queen bed w/mattress set, \$350. 503-5172

Wesco treadmill, \$40. 931-433-8542

Stairmaster 4000 PT, powder coat, black, low hours, includes reading stand, \$1,400. 776-0537

Two tickets to BTL Chicago, Saturday, Jan. 7, 2 p.m., seats G17/18, \$95, 773-2863

Pre-1988 Chevy/GMC SWB step-side truck bed. 683-9364

Crossbow workout gym, \$500 firm. 457-3744/Stacy

Phillips Magnavox TV, 61", \$550. 256-751-0999

AKC/CKC Maltese, ready Dec. 22, 5 girls/3 boys, \$700. 797-0408

Sun Series 424L 24-bulb tanning bed, new bulbs, \$700. 931-937-7830

Fender Acoustasonic Junior guitar amp, two channels including XLR microphone input, all papers, \$300. 655-6701

New Lane reclining sofa, microfiber tan, 88" wide, \$425. 655-0571

Casio CTK-691 keyboard w/sustain pedal, stand, & carrying bag, Musical Instrument Digital Interface, \$200. 883-1003

Futon bunkbed w/mattresses and matching entertainment center & nightstand. 751-3766 after 4 p.m.

Basset bedroom suite: nightstand, dresser, chest, headboard, including full-size mattress, dark wood, \$350. 655-3065

King-size mattress, box springs, & frame, \$100; large bookcase, 72"x36"x12", w/adjustable shelves, \$45. 603-3558

Vehicles

1999 Pontiac Grand Prix GT, 4-door, white w/black leather, all-power, CD w/premium sound, 130K miles, \$4,950. 859-9165

2001 Honda Accord LX sedan, 4-cyl., 74.5K miles, \$9,995. 864-2629

2003 Toyota Tacoma, black, toolbox, TRD off-road, SR5, mud tires, all-power, one-owner, 51K miles, \$18,500. 325-8958

2002 Honda XR100, well-maintained, \$1,100; 2003 Honda XR250, adult ridden, \$2,950. 256-746-0776

1999 Yukon-Denali, low mileage, \$13,900. 536-1186

2004 Honda Civic EX, \$16,000. 233-6197

2001 Chevy Camaro, one-owner, \$9,000 negotiable. 714-4962/Larry

1996 Honda XR100 dirt bike, 4-stroke, low usage, \$900. 256-655-6293

1991 Ford Ranger, 4 -cylinder, auto, \$1,500. 682-0392

Wanted

Enclosed utility trailer, 1,600 lbs. or less. 828-6213

Drum set for a beginner for a Christmas gift. 256-550-2725

Non-working digital camera for project. 527-8116

Small office refrigerator. 656-7997

Leather or faux leather sectional, does not have to be perfect. 256-653-8886

Lost

Austin-Healey sports car hardbound book, since April, 2005. 355-3089

Marshall's Engineering Directorate hosts technology forum

By Lori Johnston Meggs

The Marshall Center's Engineering Directorate recently hosted the Tennessee Valley Corridor Federal Alliance Technology Forum at the U.S. Space & Rocket Center. The event was part of a business development initiative to bring new programs and opportunities to alliance members.

The forum provided opportunities for technologists to discuss current and developing technologies in the areas of high-temperature materials and composites. These materials could be used to benefit NASA programs and other government agencies in the alliance.

Participants included representatives from Marshall; the Arnold Engineering



Doug Staffer/MSFC

Marshall's Dr. Endwell Daso, left, and Beth Cook, discuss collaborating possibilities at the Technology Forum with Bobby Smith, center, from the Arnold Engineering Development Center.

Development Center at Arnold Air Force Base, Tenn.; the Y12 National Security Complex in Oak Ridge, Tenn.; Oak Ridge National Laboratory in Oak Ridge; Redstone Arsenal's Aviation & Missile Research, Development and Engineering Center in Huntsville; Alabama A&M University in

Huntsville; and the University of Tennessee Space Institute in Tullahoma. In all, 50 technical experts discussed 11 proposals presented for collaboration at the two-day forum.

The alliance is an outgrowth of the Tennessee Valley Corridor Economic Summit held in Huntsville in 2000, and represents a unique partnership for the Tennessee Valley region and the nation. Its strategic plan serves as a foundation for promoting and leveraging each partner's diverse set of assets, communicating best practices and cultivating new and strategic opportunities to support economic and workforce development.

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

NASA Explorer School students reach out to hurricane survivors

By Bill Hubscher

Students from NASA's Explorer Schools across the country are sending school supplies to the Marshall Center to help children affected by Hurricane Katrina continue their education.

Four schools that are designated NASA Explorer Schools — a partnership to help teachers spark student interest in science, math, engineering and technology — suffered heavy damage in the August hurricane. Now, students from the other 182 Explorer Schools are donating money and supplies to help these young survivors.

The idea to assemble "education care packages" to aid the Explorer students and schools was triggered after employees at NASA Headquarters in Washington and NASA's Stennis Space Center near Bay St. Louis, Miss., saw the impact of the hurricane's devastation to the schools. Employees at Stennis, which survived the hurricane with some damage, identified the four damaged schools. Because the storms also inflicted damage to some facilities at Stennis, there was limited room to coordinate a relief project there. So the needed pencils, pens and paper — and the backpacks to hold them — were sent to the Marshall Center, where employees are packaging them for delivery to Explorer School students next week.

The Explorer Schools damaged by Hurricane Katrina are Magnolia Middle

School in Moss Point, Bay-Waveland Middle School in Bay St. Louis and North Gulfport Middle School, all in Mississippi; and Belle Chase Academy in New Orleans.

"We feel like these students and teachers at the NASA Explorer Schools are part of the NASA family," said Vanessa Suggs, an education program specialist in Marshall's Academic Affairs Office. "We've worked with

Center at Stennis, and a coordinator of the relief effort. Because of the devastation, he said, these schools "are lucky to have a board to write a lesson on. The Explorer School kids who are sending supplies really came through in the clutch."

Each student backpack also will include a personal letter from an Explorer School student from another part of the country.

"We have 1,500 postcards and letters from youngsters wishing their fellow students well, expressing sympathy, even offering to be pen pals," said Suggs. "Each child will get one of these letters in their backpack to remind them that other people do care about what happens to them."

Some letter-writers shared similar experiences with Katrina victims. One middle-school student relayed the story of her house being burned down in an Arizona forest fire.

"Houses in the area were burned down and hundreds of acres of forest were destroyed," the student wrote. "My family and I were forced to evacuate. I have not forgotten about my old friends or my old teachers or my old school. I hope that things get better for you. Maybe soon you will be able to make new friends and be happy."

Students and teachers at the affected schools should get their backpacks and school supplies by Dec. 15, said Witherspoon.

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



Doug Steffer/MSFC

Marshall and Stennis employees assemble school supplies in backpacks destined for NASA Explorer School students. From left are Becky Whitaker, Kelly Witherspoon, Kathy Forsythe, Charmein Johnson and Howard Dimmick.

these schools for years to help build up their program. These are our kids and we had to find a way to help them."

The call went out to Explorer Schools two weeks after Katrina, asking for help in the form of supplies, gift cards and even stuffed animals to help ease the pain of the hurricane's devastation. The response was overwhelming.

"It's hard to imagine these teachers trying to do their jobs with literally no materials," said Kelly Witherspoon, a contractor with the Educator Resource

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