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# MARSHALL STAR

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## Larry Hill Named Manager of Marshall's Science & Space Technology Projects Office

By Ken Kesner

Lawrence "Larry" Hill has been appointed manager of the Science and Space Technology Projects Office at NASA's Marshall Space Flight Center.

In his new role, Hill is responsible for all management aspects of the office, including overseeing the planning, scheduling, resources, support requirements, management systems and personnel for multiple programs and projects. Those include the Chandra X-ray Observatory, Hinode project, James Webb Space Telescope and the Astronomical Roentgen Telescope, a Russian-reimbursable project also known as ART-XC.

Hill most recently served as manager of the Science and Instruments Management Office at Marshall, where he worked closely with many of those programs, said Daniel Schumacher, manager of the Marshall Center's Science & Technology Office.

"I'm very pleased to be working with Larry Hill in this new position," Schumacher said. "His familiarity with our office, combined with his experience as a manager and lead on other key Marshall programs, such as the Robotic Lunar Lander Development project, will be of tremendous value as we continue our space exploration missions."

Hill began his NASA career in 1981, as an electrical systems design engineer in the Electronics and Control Laboratory at



Larry Hill (NASA/MSFC/Emmett Given)

the Marshall Center. There, he designed, built and maintained a number of electronic components for space-based experiments.

In 1984, he became lead electrical systems engineer in the Preliminary Design Office, where he conducted numerous feasibility and design studies of electrical systems for advanced spacecraft, proposed flight experiments and facilities. His first project office experience came in 1987, when he accepted a position in the Optical Telescope Assembly (OTA) Office of the Hubble Space Telescope Office. He was responsible for OTA post-delivery activities including pre-launch, launch and orbital verification. Later, he was significantly involved in the investigation of the telescope's primary mirror spherical aberration.

From 1992-98, Hill was manager for the Chandra X-ray Observatory telescope subcontract effort and, from 1998-2007, he was manager of the Solar-B project, an international effort by the Institute of Space and Astronautical Science of Japan in collaboration with NASA and the United Kingdom. Next came two years as Lunar Reconnaissance Orbiter mission manager, providing day-to-day contact between NASA's Goddard Space Flight Center and the Marshall Center program office.

Hill was deputy project manager for the Robotic Lunar Lander Development Office from 2009-11. He was instrumental in developing numerous lander concepts capable of conducting scientific or exploration missions to the moon or elsewhere. The office performed risk-reduction activities, including development of the free-flying "Mighty Eagle" used to demonstrate autonomous control systems for landing spacecraft on airless bodies.

In 2011, Hill became manager of the Science and Instruments Management Office, overseeing individuals providing project management support for various science projects, tasks and activities at the Marshall Center.

Hill, a native of Montgomery, Ala., earned a Bachelor of Science degree in electrical engineering from Auburn University, and a Master of Business Administration degree from the Florida Institute of Technology - Redstone Campus.

*Kesner, an Analytical Services Inc. employee, supports the Office of Strategic Analysis & Communications.*

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## NASA On Course to Launch Orion Flight Test



The first spacecraft NASA has designed to fly astronauts beyond Earth orbit since the Apollo era is well on its way to making a flight test next year, agency officials said at a press update at NASA's Kennedy Space Center on Feb. 27. The mission is planned for launch in September 2014, and will see an Orion capsule orbit Earth without a crew and return through the atmosphere at speeds unseen since astronauts last returned from the moon in 1972.

***Image left: NASA officials detail progress toward a September 2014 flight test called Exploration Flight Test-1, or EFT-1, as part of the agency's goal of launching astronauts into deep space. Speaking inside***

***the Young-Crippen Firing Room at NASA's Kennedy Space Center, the officials discussed the goals and expectations for EFT-1 with news media. Seated, facing the camera from left, are Pepper Phillips, Ground Systems Development and Operations program manager; Todd May, SLS program manager; Mark Geyer, Orion program manager; and Dan Dumbacher, deputy associate administrator for the Exploration Systems Development Division.***

***Standing is Rachel Kraft, a public affairs officer at NASA Headquarters. (NASA/Jim Grossmann)***

"It's a key element of our overall plan to get humans beyond Earth orbit as quickly as we can," said Dan Dumbacher, deputy associate administrator for NASA's Exploration Systems Development Division.

Exploration Flight Test-1, or EFT-1, will be the first chance engineers get to test Orion's design in space. Flying on top of a United Launch Alliance Delta IV rocket, the spacecraft will be pressurized, as it would be if astronauts were on board.

Although EFT-1 will focus largely on testing Orion, it also will aid the teams designing and building the Space Launch System, or SLS, rocket, which is managed at NASA's Marshall Space Flight Center.

"There are a lot of things about this mission that help SLS," said Todd May, SLS Program manager. "A lot of this data we're going to use to understand the structural properties, the aero-loading, the guidance navigation and control that we feed back into our calculations."

The SLS team designed and is building an adapter ring for this mission that will connect Orion's broad base with the much narrower Delta IV second stage. Orion will orbit the Earth twice on a track that will take it more than 3,600 miles above us, about 15 times higher than the International Space Station.

From that height, Orion will be steered to a re-entry at speeds of about 20,000 mph, slamming into the atmosphere to test whether the heat shield will protect the spacecraft adequately.

"It allows us to stress the heat shield in conditions that are very close to what we will see coming back from a region around the moon," said Mark Geyer, Orion program manager. "This is going to help us make our heat shield lighter, safer and more reliable."

Launching from Cape Canaveral Air Force Station in Florida, the spacecraft will carry scores of instruments. Even the heat shield will have instruments to measure temperature and plasma flow around the spacecraft as it endures the searing conditions of high-speed reentry.

Engineers will use the readings to update computer models and refine designs for the spacecraft, ground support equipment and the in-development SLS rocket. The agency also will provide the data to the agency's commercial partners developing their own spacecraft.

NASA designed Orion as a versatile spacecraft able to handle the hardships of flying safely far beyond Earth's atmosphere to take astronauts to distant destinations such as an asteroid and Mars. Starting in 2017, Orion will be paired with the full-stack of the SLS.

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**Building the Stage Adapter for Orion and SLS**

NASA's Langley Research Center and the Marshall Space Flight Center are collaborating to design and build the Stage Adapter that will attach the Orion crew vehicle to the United Launch Alliance Delta IV-Heavy rocket that will launch the spacecraft during Exploration Flight Test-1, or EFT-1, in 2014. Langley engineers work on the diaphragm pathfinder for the stage adapter. The diaphragm is a contamination barrier, which keeps the gases from the launch vehicle away from the spacecraft.



The pathfinder, recently completed at Langley, is a piece of the diaphragm that acts as a demonstration unit, which will improve the overall performance of the manufacturing process used to develop the stage adapter.

EFT-1 will be the first launch of Orion. During the flight test, Orion will travel farther into space than any human spacecraft has gone in more than 40 years. In 2017, the stage adapter will connect NASA's Space Launch System rocket to Orion on Exploration Mission-1. SLS will be the most powerful rocket in history and is designed to meet a variety of crew and cargo mission needs. (NASA/LaRC)

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## J-2X Engine 'Goes the Distance' at Stennis



J-2X rocket engine testing continued at NASA's Stennis Space Center on Feb. 27 with the second in a series of tests. The 550-second, full-duration test, [video of which is available here](#), provided critical information on the combustion stability of the engine and on its performance with the nozzle extension. Engineers also continued evaluation of the test stand's clamshell configuration, as well as calibration of the facility's cryogenic flow meters. J-2X engine testing allows engineers to collect additional data on the next-generation engine that will provide upper-stage power for the new Space Launch System, or SLS. Managed at the NASA's Marshall Space Flight

Center, the new SLS rocket is being developed to enable missions farther into space than ever before. Following this series of tests on the A-2 Test Stand, Engine No. 10002 will be transferred to the site's A-1 stand to undergo gimbal, or pivot tests for the first time. The J-2X engine is the first human-rated liquid oxygen and liquid hydrogen engine developed in the United States in four decades. It is being designed and built for NASA by Pratt & Whitney Rocketdyne of Canoga Park, Calif. (NASA/SSC)

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## NASA Selects Contractors For Engineering Solutions and Prototyping at Marshall Center

NASA has selected three companies to provide engineering solutions and products to the Marshall Space Flight Center.

The companies are Radiance Technologies, Inc.; Teledyne Brown Engineering, Inc.; and Wyle Laboratories, Inc. of Houston.

The performance-based, cost-reimbursement fixed-fee, indefinite-delivery, indefinite-quantity contracts have a potential value of \$350 million. The contracts have a five-year performance period with a minimum order quantity value of \$1 million.

Under the contract, the three companies will compete to provide engineering solutions and products for design, development, test, evaluation, operations and training in support of Marshall Center flight projects, human and robotic exploration, science and technology development, future programs/projects, and other Marshall organizations that have similar needs.

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## Materials Science Research Rack Heats Up For Valuable Space Station Science

*By Shannon Ridinger*

Have you ever wondered how we develop new materials or find out what properties we can change in existing materials to improve them? Scientists and researchers at NASA are doing just that through materials science research using the Materials Science Research Rack, or MSRR, aboard the [International Space Station](#).

***Image right: Before a mock-up used to test a new software upgrade for the Materials Science Research Rack is the team of engineers and scientists that designed the upgrade, including, front row from left, Mike Murray, Wayne Gandy, Mark Montgomery, Shawn Reagan, Tim Lauderdale, and Chris Matthews; standing from left, Amy Cardno, Lucinda Murphy, Dee Chapman, and Natalie Frazier. This new software will give researchers more time to troubleshoot problems with the furnace, which will prevent contamination due to overheating of materials. (NASA/MSFC/Fred Deaton)***



Materials science research is the applied study of the properties of matter and substances. Conducting this type of research in space benefits from the microgravity environment and allows researchers to isolate chemical and thermal properties of materials from the effects of gravity.

The Materials Science Research Rack is about the size of a large refrigerator and contains two furnace inserts that can heat materials to temperatures of 2,500 degrees Fahrenheit. Cartridges are placed inside the furnace insert one at a time for processing. Once a cartridge is in place, the experiment can be run from the ground. Processed samples are returned to Earth as soon as possible for evaluation and comparison of their properties to samples from similarly processed cartridges on the ground. Researchers have used the rack to process 16 samples of different materials since the facility launched to the space station in 2009.

In late 2011, there was a loss of communications between the MSRR and the computer that controls it. The automatic safety procedures on the rack caused it to shut down as designed; but, in doing so, it also caused the temperatures inside the furnace to exceed their normal limits. These higher temperatures caused some of the material inside the furnace to become bonded to the furnace itself. This required the station crew to clean the furnace and remove the materials.

To prevent such an event from happening again, Shawn Reagan, manager of the Materials Science Research Rack project at NASA's Marshall Space Flight Center, and his team worked with Marshall engineers to design a software upgrade for the rack. This update will prevent this scenario from occurring in the future.



"The MSRR has been a great tool in understanding how different materials like ceramics or metals react when heat is applied to them in space," said Reagan. "The original design of the software that controls the MSRR called for it to shut down within 30 seconds of losing communications from the main computer that controls it. We were able to design a much more efficient software program that will allow the furnace to stay operating for up to three hours after losing communications. This will give researchers enough time to troubleshoot any problems and prevent any contamination of the furnace due to overheating of materials."

***Image left: The Materials Science Research Rack is a highly automated facility containing two furnace inserts in which sample cartridges are processed up to temperatures of 2,500 degrees Fahrenheit. (NASA)***

The MSRR was fired up Jan. 23 and began its work processing the first of 11 new samples that will be tested over the next several months. Getting the rack back online is important because applied materials science is essential for the development of new, safer, stronger and more durable materials for use throughout everyday life.

"Everything looks great and the first sample was processed successfully," said Reagan. "We are really proud of our team for working through these issues with the MSRR and designing this software to make it work even better. This is what science is all about -- working through challenges and coming out of those with an even better product."

*Ridinger is a public affairs officer in the Office of Strategic Analysis & Communications.*

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## **Marshall Center Names New Senior Scientist for High Energy Astrophysics**

*By Megan Davidson*

Dr. Chryssa Kouveliotou, an astrophysicist and longtime collaborator with NASA's science mission, will put her expertise and passion for universal discoveries to work in her newly appointed role at NASA's Marshall Space Flight Center.

Kouveliotou is now senior scientist for high-energy astrophysics within the Science and Technology Office at the Marshall Center. She conducts extensive research on a host of astronomical objects that have powerful magnetic fields, like black holes, neutron stars and gamma-ray bursts.

"I am thrilled to work with Chryssa Kouveliotou, and I'm confident she will continue her world-class research in her new position," said Daniel Schumacher, manager of Marshall's Science and Technology Office. "The science we do at Marshall has a huge impact on our understanding of the universe, and Chryssa is a crucial part of that success."



Dr. Chryssa Kouveliotou (NASA/MSFC)

Kouveliotou, a NASA astrophysicist since 2004, has been the principal investigator on numerous research projects in the United States and Europe. She is currently a coinvestigator on the Gamma-ray Burst Monitor, an instrument flying aboard the Fermi Gamma-ray Space Telescope; a Swift associated scientist and a member of a NuSTAR Science Team, researching topics important to science. Throughout her career, she has worked on multiple missions, including the International Sun Earth Explorer-3, the Solar Maximum Mission and the Burst and Transient Source Experiment (BATSE), which flew on NASA's Compton Gamma-Ray Observatory.

Kouveliotou has made numerous contributions to the fields of astronomy and astrophysics. Her research has expanded scientific understanding of fleeting -- transient phenomena in the Milky Way galaxy and throughout the high-energy universe. Besides determining the unique properties of the highly energetic emissions from gamma-ray bursts -- the brightest and most powerful events in the universe -- Kouveliotou was part of the team which first revealed the extragalactic nature of these sources. She and her team made the first confirmed detection of ultra-dense neutron stars called magnetars -- the cinders of stars left over after a supernova.

A native of Athens, Greece, Kouveliotou has received many awards for her work. She earned top honors in 2012, including the Dannie Heineman Prize for Astrophysics and the NASA Exceptional Service Medal; and she was named among Time Magazine's 25 most influential people in space.

In 2005, Kouveliotou received the NASA Space Act Award, which recognizes and rewards outstanding scientific or technical contributions which are significant to NASA's mission. In 2003, she was honored with the Rossi Prize -- awarded annually by the High Energy Astrophysics division of the American Astronomical Society for a significant contribution to high-energy astrophysics. In 2002, she was the only person from the United States on the team which received the Descartes Prize, which recognizes scientific breakthroughs from European collaborative research in any scientific field. She has published 382 papers in refereed journals and has been among the top 10 most-cited space science researchers in published journals worldwide.

Kouveliotou is a member of multiple international advisory committees, boards and review panels. She was elected chair of the Division of Astrophysics of the American Physical Society and is currently elected as vice president of the American Astronomical Society. She previously served as chair of that organization's High Energy Astrophysics Division. She is a past member of the Committee on Astronomy and Astrophysics of the National Academy of Sciences and is currently the U.S./International Union of Pure and Applied Physics (IUPAP) liaison for the Astrophysics Committee. She is a fellow of the American Physical Society and of the American Association for the Advancement of Science.

## **Marshall Center Participating in National Telework Week through March 8**

It's National Telework Week, and NASA's Marshall Space Flight Center has joined other federal agencies in encouraging supervisors and employees to discuss telework and, to the extent mission requirements permit, allow telework during some part of the week for team members who wish to participate by working part of a day, a full day or a few days at home or other remote location.

The initiative, which began March 4 and runs through March 8, is a global effort through the Mobile Work Exchange, a public-private partnership focused on demonstrating the value of mobility and telework. This is the third year for National Telework Week, which gives organizations and individuals the opportunity to see first-hand the many benefits of teleworking, including commuter cost savings and work/life balance.

According to the Mobile Work Exchange [website](#), in 2012, more than 71,000 people pledged to telework, saving \$5,651,890 on commuting costs, gaining back 251,774 hours into their day, and removing 3,453 tons of pollutants from the air, while refraining from driving 6,413,006 miles.

Marshall civil service employees who want to participate in the event need to obtain management approval, clearly define performance expectations during the telework period and record telework hours correctly in WebTADS to properly track participation. Procedures for recording telework are located in WebTADS under the "Online Support" tab. Contractor employees should check with their management and follow their company policies on telework.

More information on National Telework Week is available [here](#). Visit [here](#) for details about Marshall's Telework Program.

For questions, contact [Jeff Viars](#), telework coordinator in Marshall's Human Resources Services Office, at 544-0738.

## **New Handbook to Help Team Members to Know What To Do in Emergency Situations at Marshall Center**

*By Jena Rowe*

The Emergency Operations Center at NASA's Marshall Space Flight Center is planning to equip all Marshall team members with an Emergency Procedures Handbook full of easily accessible information about what to do in an emergency situation.

"The Emergency Procedures Handbook is meant to serve as a resource for team members in an emergency situation," said Carole Valenti, emergency management director at Marshall.

"The goal is that people will understand the emergency notification system and have as many resources as possible to equip them with pertinent information to easily handle an emergency situation at any moment. This handbook provides some insight into what should and should not be done in those situations and who should be notified if necessary," she added.

Designed for individual use, the handbook is meant to serve as a quick reference guide of information for any emergency situation -- from severe weather to criminal activity or bomb threats. With tornado season quickly approaching, the Emergency Procedures Handbook also provides helpful definitions of different severe weather warnings and any actions that may be necessary in preparation of expected severe weather.

The handbook also can be personalized with information specific to your work area, as well as points of contact.

Every Marshall team member will receive an Emergency Procedures Handbook in mid-March. There will also be online access to the handbook beginning in April on the Emergency Operations Center's ExplorNet page.

If you have any questions or concerns about what to do in an emergency situation at Marshall, please contact the Emergency Operations Center at 544-3131 or [MSFC-EOC@mail.nasa.gov](mailto:MSFC-EOC@mail.nasa.gov).

*Rowe, an Analytical Services Inc. employee and the Marshall Star editor, supports the Office of Strategic Analysis & Communications.*

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## **NASA's Equipment & Material System Training Now Hosted at Marshall**

NASA's Marshall Space Flight Center has been designated by NASA as the centralized training center to provide comprehensive Integrated Asset Management, Property Plant & Equipment/ Disposal & Material Management Initiative (IAM PP&E/DSPL & MMI) system training for the agency. Training is provided by the Logistics Service Office of the Office of Center Operations.

The schedule for fiscal year 2013 includes two Property Plant & Equipment/Disposal courses and one Material Management Initiative course.

"The need for a system-focused, centralized training site has existed since the initial train up and implementation of IAM PP&E in June 2008," said Edward A. Ahmad, Marshall Center business process lead for IAM PP&E training. "The turnover of personnel across the agency, as well as the requirement for contractors operating onsite to use NASA's equipment and material management system tools, has incrementally raised awareness of the need for the establishment of formal training," Ahmad added.

Most NASA centers have developed and implemented their own training plans and presentation packages. However, these training plans are inclined to be center-specific. The establishment and delivery of centralized training activities have the potential to convey the standardization of business practices across the agency.

Equipment, Disposal and Material management programs are undergoing major policy changes and updates, which without doubt demand a systematic approach for managing and controlling the agency's equipment/property assets. This new training initiative will support that effort.

This training is offered to all government and contractor personnel assigned to property or material management positions. Training will focus on the critical IAM PP&E functional areas of equipment and inventory management; property custodian functions; business warehouse reporting; and disposal. Material Management Initiative training will cover required business process functions.

The classes are now available for enrollment in SATERN. For additional information about the training, please contact Edward A. Ahmad at 544-7964 or Pat Hill at 544-4501.

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