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MARSHALL STAR

In This Week's Star

Q & A with Center Director Patrick Scheuermann

By Jenalane Rowe

- **What does it feel like to be back at Marshall, now as center director?**

  It feels wonderful. It's an incredible honor to be able to come here and follow great people. This is a great place to come back to. As I get the chance to go to different centers, I am continually amazed at the dedication of the workforce to NASA's mission and doing something greater than themselves. To be a part of the Marshall team again is just wonderful.

Patrick Scheuermann (NASA/MSFC)

- **What did you learn from your tenure as director of the Stennis Space Center and how do you plan to apply that here at Marshall?**

  Well, a lot of people look for the director to lead and make decisions and I'm OK to do that. However, I'm also an inclusive and collaborative manager and there are a lot of folks who know Marshall Space Flight Center a lot better than I do. My job is to understand the facts of Marshall Space Flight Center and come up to speed on its rich history, incredible engineering and talented workforce in order to be able to go to different places, including NASA Headquarters, to make sure the Marshall story is told appropriately and resources are invested into our incredible capabilities so we can deliver on SLS now and for the next 20 or 30 years.

- **What is your philosophy of leadership?**

I ask people to feel ownership and accountability at every level. Everybody brings value to the table no matter what job they have. Marshall Space Flight Center has an incredible workforce, not only on the civil servant side, but on the partner side and industry as well. We're not going to be able to reach our goals without our partners, so we all need to be sure we understand what that word means and embrace those relationships because that's going to lead to success.

- **Have you set some goals to accomplish as Marshall's center director? What are they and how do you plan to go about achieving them?**

  In the short-term, my goal is for people to get to know who I am and that I'm here to help in any way that I can. I want to ensure that the workforce understands that we have incredible clarity in our mission. The NASA administrator has said time and time again there are three priorities for the agency: the Space Launch System, International Space Station, and the James Webb Space Telescope. Marshall Space Flight Center plays a role in all three. So, if we're looking for clarity in our mission and what we should focus on, we have it. My job is to continue to make sure the employees understand and embrace that because we have an incredible future and a future that, quite frankly, is in our own hands.

- **What are the greatest challenges you see facing Marshall Center, near term and long term?**

  I think the biggest challenge we will face in both near and long term is you are never going to have all the resources that you absolutely need to do a job. We have an economy where all of us as taxpayers should look for any and all efficiencies that we can bring to the table to get our job done with fewer resources. There's not going to be a magic wagon filled with a whole bunch of gold that comes to us. The good news is that Marshall has been known for doing incredible things in the past, and I don't think there is any difference in the future for what this workforce can do. We have a very clear picture of the set of requirements, and I think we've identified and been funded with the resources necessary to execute the mission safely.

- **Affordability is getting a lot of emphasis now; how will the center balance affordability and safety?**

  Safety is paramount. We pride ourselves in the success of the past that prepares us for the future and accepting and managing risk for any vehicle that could put human life at risk. From an affordability perspective, we're not going to get any big increases in resources. In light of that, we have to look inward for ways that we can do things from a business case perspective, so when it comes to investment decisions that NASA Headquarters has to make, whether that's at the beginning of the year for budgets or mid-years, they'll look to centers they know are efficiently managing their money. When you are efficiently managing the money that you have, that translates into affordability. Not only from a NASA Headquarters' perspective, but also with our partners within the commercial world who provide us with vital resources needed to succeed. When those companies look forward to investing their money, they are going to look for some place that's affordable and efficient in what they do. I believe we are.

- **What is your view of commercial space and how do you see NASA's reliance on commercial companies to get us to low Earth orbit (LEO) affecting Marshall Center?**

  I think it's going to affect it in a positive way. SpaceX and Orbital Sciences are well on their way to providing that stop-gap, if you will, because we have to put our precious resources into going beyond low Earth orbit, which is the Space Launch System. But we need that to be able to continue working on the science we're doing here at Marshall and the

research we're doing from space station to make those efforts successful. Marshall has facilitated a lot of commercial success that not a lot of people know about, but it goes on daily here at the center. The bottom line is, just like in the early voyagers, Marshall led the way with Apollo and shuttle to get a reliable path to LEO. That is a well-worn path and it's time for us to push further.

- **Marshall Center has been entering into many new partnerships with industry and other government organizations in recent years. What benefits does the center derive from these partnerships and how do they contribute to the nation's interests?**

  There are a couple of benefits derived from partnerships with industry and other government organizations. First, is that it takes advantage of the government's investment in knowledge and skill base to facilitate commercial space. As new partnerships are formed, the fact is reinforced that if you're serious about getting into the space business, Huntsville -- which has the highest number of engineers per capita -- and the Marshall Space Flight Center are where you should consider partnering. Second, the practical matter is that partnerships bring in reimbursable dollars that contribute to an already tight budget so costs can be shared across several funding sources. Our Flight Programs and Partnerships Office has done a great job moving partnerships to the next level.

- **What do you consider to be your greatest strengths as a leader and how do you think those strengths will benefit the center?**

  My leadership style is focused on empowering the leadership team and maintaining accountability. I've said before, Todd May doesn't need me to tell him how to build a rocket. Chris Singer doesn't need me to tell him how to run an engineering organization. Audrey Robinson doesn't need me to tell her how to run the Office of the Chief Counsel. My job is to clear the runway for them to do their jobs and free up their time by efficiently managing our schedules so they can actually manage their organizations. Also, I love for people to be proactive and I'm a big fan of options. I want to make sure that the environment we have at Marshall Space Flight Center is open, collaborative and that diversity of thought is appreciated and welcomed. So, if I can succeed in continuing to cultivate that environment I think that will be a success in the time that I'm here.

- **What do you see as the center's greatest strengths? Do we have any weaknesses that we need to work to improve on?**

  I think the greatest strength is in our people. Especially when it comes to large spaceflight programs and critical science missions, work that the center has done has been entrusted to people before us and will hopefully continue long after we're gone. So, I definitely say the people and their work ethic, too. Concerning weaknesses, a lot of it is probably in terms of becoming distracted by external things that don't matter. It's hard in today's information society to not hear the news or to not understand what's happening in Washington, D.C. So, it's not really a weakness as much as it could be a detriment if we spend too much time worrying about things that aren't in our control. Our job, on the leadership team and the workforce, is to make sure we concentrate on the work and resources that we have, because the agency is looking at one center to deliver SLS and that's Marshall Space Flight Center.

- **How important do you think it is to communicate Marshall Center's activities and achievements to our stakeholders and to the American public? Why?**

  I think communication is extremely important. Since 1958, the taxpayer has graciously invested resources for us to deliver what seems like impossible dreams. We have delivered on that investment in our agency's history. In order to

make sure that investment continues, we must continue to give back to the community that raised us. I encourage everyone, as much as you can, to give back to the school system that gave you a chance and armed you with what you need to be successful today. Pay it forward by inspiring the children in the next generation because they are the ones that are going to come take our place one day. I don't think there is a better feeling any person can have than to go to an outreach activity and see what effect you have on those people. It doesn't matter if it's a group of 1,500, 15 or two; I'll personally testify to the fact that my own personal batteries get recharged when those events happen.

- **What do you expect from your direct reports? From every Marshall civil service and contractor employee?**

  I expect everybody to be open, collaborative and embracing of new ideas. I'm a fan of options. I'd like people to feel empowered to put new ideas on the table. The responsibility of those that are more experienced is to give feedback to the employees who put the idea on the table. The expectation is to be open to diversity of thought, collaborative and inclusive. I think that's what is going to make Marshall Space Flight Center great and able to accomplish great things in the future.

- **Do you see any major changes coming to the center's workforce, mission and capabilities in the near term?**

  No. I think Marshall's history will dictate what expertise will be called on for the future. Our job is to deliver on the work the agency is counting on us to do and I have no doubt the workforce will step up every time.

- **How optimistic are you about Marshall Center's future in the long term?**

  I can't imagine an agency that doesn't have Marshall Space Flight Center in it. To the public, NASA is mostly associated with putting people in space and the center that facilitates or enables that is the Marshall Space Flight Center. Marshall has played a major role in many missions from Apollo to the shuttle to the Space Launch System as well as leading science efforts on the space station, and now doing outreach for humanitarian efforts in developing nations through the SERVIR program. I think the time will continue to testify to the fact that Marshall Space Flight Center has led the way in spaceflight and we look forward to continuing that.

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

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Marshall Researchers Studying Advanced Nuclear Rocket Technologies
By Rick Smith

Advanced propulsion researchers at NASA's Marshall Space Flight Center are a step closer to solving the challenge of safely sending human explorers to Mars and other solar system destinations.

Image left: Marshall Center researchers Mike Houts, left, and Bill Emrich discuss upcoming testing using Marshall's Nuclear Thermal Rocket Element Environmental Simulator, or NTREES. (NASA/MSFC/Fred Deaton)

By using an innovative test facility at Marshall, researchers are able to use non-nuclear materials to simulate nuclear thermal rocket fuels -- ones capable of propelling bold new exploration missions to the Red Planet and beyond.

The Nuclear Cryogenic Propulsion Stage team at Marshall is tackling a three-year project to demonstrate the viability of nuclear propulsion system technologies. A nuclear rocket engine uses a nuclear reactor to heat hydrogen to very high temperatures, which expands through a nozzle to generate thrust. Nuclear rocket engines generate higher thrust and are more than twice as efficient as conventional chemical rocket engines.

The team recently used Marshall's Nuclear Thermal Rocket Element Environmental Simulator, or NTREES, to perform realistic, non-nuclear testing of various materials for nuclear thermal rocket fuel elements. In an actual reactor, the fuel elements would contain uranium, but no radioactive materials are used during the NTREES tests. Among the fuel options are a graphite composite and a "cermet" composite -- a blend of ceramics and metals. Both materials were investigated in previous NASA and U.S. Department of Energy research efforts.

Nuclear-powered rocket concepts are not new; the United States conducted studies and significant ground testing from 1955 to 1973 to determine the viability of nuclear propulsion systems, but ceased testing when plans for a crewed Mars mission were deferred.

The NTREES facility is designed to test fuel elements and materials in hot flowing hydrogen, reaching pressures up to 1,000 pounds per square inch and temperatures of nearly 5,000 degrees Fahrenheit -- conditions that simulate space-based nuclear propulsion systems to provide baseline data critical to the research team.

"This is vital testing, helping us reduce risks and costs associated with advanced propulsion technologies and ensuring excellent performance and results as we progress toward further system development and testing," said Mike Houts, project manager for nuclear systems at Marshall.

A first-generation nuclear cryogenic propulsion system could propel human explorers to Mars more efficiently than conventional spacecraft, reducing crews' exposure to harmful space radiation and other effects of long-term space missions. It could also transport heavy cargo and science payloads. Further development and use of a first-generation nuclear system could also provide the foundation for developing extremely advanced propulsion technologies and systems in the future -- ones that could take human crews even farther into the solar system.

Building on previous, successful research and using the NTREES facility, NASA can safely and thoroughly test simulated nuclear fuel elements of various sizes, providing important test data to support the design of a future Nuclear Cryogenic Propulsion Stage. A nuclear cryogenic upper stage -- its liquid-hydrogen propellant chilled to super-cold temperatures for launch -- would be designed to be safe during all mission phases and would not be started until the spacecraft had reached

a safe orbit and was ready to begin its journey to a distant destination. Prior to startup in a safe orbit, the nuclear system would be cold, with no fission products generated from nuclear operations, and with radiation below significant levels.

"The information we gain using this test facility will permit engineers to design rugged, efficient fuel elements and nuclear propulsion systems," said NASA researcher Bill Emrich, who manages the NTREES facility at Marshall. "It's our hope that it will enable us to develop a reliable, cost-effective nuclear rocket engine in the not-too-distant future."

The Nuclear Cryogenic Propulsion Stage project is part of the Advanced Exploration Systems program, which is managed by NASA's Human Exploration and Operations Mission Directorate and includes participation by the U.S. Department of Energy. The program, which focuses on crew safety and mission operations in deep space, seeks to pioneer new approaches for rapidly developing prototype systems, demonstrating key capabilities and validating operational concepts for future vehicle development and human missions beyond Earth orbit.

Marshall researchers are partnering on the project with NASA's Glenn Research Center; NASA's Johnson Space Center; Idaho National Laboratory in Idaho Falls; Los Alamos National Laboratory in Los Alamos, N.M.; and Oak Ridge National Laboratory in Oak Ridge, Tenn.

The NTREES test facility is just one of numerous cutting-edge space propulsion and science research facilities housed in the state-of-the-art Propulsion Research & Development Laboratory at Marshall, contributing to development of the Space Launch System and a variety of other NASA programs and missions.

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

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Dr. Chryssa Kouveliotou Receives the Dannie Heineman Prize in Astrophysics

Dr. Chryssa Kouveliotou, center, an astrophysicist at the Marshall Space Flight Center, was selected as the 2012 recipient of the Dannie Heineman Prize for Astrophysics, jointly awarded each year by the American Institute of Physics and the American Astronomical Society, or AAS. She received the award at the 2013 AAS conference, which took place Jan. 6-10 in Long Beach, Calif. With Kouveliotou are Catherine O'Riordan, vice president of the American Institute of Physics, left, and David Helfand, AAS president.

The citation for the Heineman Prize recognizes Kouveliotou "for her extensive accomplishments and discoveries in the areas of gamma ray bursts and their afterglows, soft gamma ray repeaters and magnetars." The citation particularly mentions her collaborative efforts and "her effectiveness and insights in using multi-wavelength observations."

The Heineman Prize is named after the late Dannie N. Heineman, a Belgian-American engineer, business executive and philanthropic sponsor of scientific endeavors. The prize was established in 1979 by the Heineman Foundation for Research, Education, Charitable and Scientific Purposes. (AAS/2013 Joson Images)

For more information visit: http://www.nasa.gov/centers/marshall/news/news/releases/2012/12-010.html

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Huntsville Space Enthusiasts Will Miss Jesco von Puttkamer

By Mike Wright

Many of us at NASA's Marshall Space Flight Center were saddened to hear of the passing of Jesco Freiherr von Puttkamer, senior manager for the International Space Station Program at NASA Headquarters, on Dec. 27.

Image left: Jesco von Puttkamer, senior manager for ISS, stands beside a model of the Saturn V rocket in this image taken in 1969. (NASA)

An ardent advocate of human space exploration, von Puttkamer began work at Marshall in 1962 and was a close associate of Dr. Wernher von Braun, Marshall's first center director.

Even after his transfer to NASA Headquarters in 1974, von Puttkamer frequently visited the center and promoted the history of Huntsville's and Marshall's role in the space program. Von Puttkamer often shared his recollections of his work with von Braun. In Huntsville, he helped conduct historical tours and presented papers at local conferences and public speaking events.

Von Puttkamer was the author of NASA SP-313 "Space For Mankind's Benefit," which documented proceedings of a space congress held in 1971 in Huntsville. He also worked with Gene Roddenberry as technical advisor to Paramount Pictures for the first Star Trek motion picture, contributing the hypothetical theory behind the faster-than-light space warp drive and the promotional slogan "Space - The Human Adventure is Just Beginning".

Von Puttkamer was born Sept. 22, 1933, in Leipzig, Germany, and became a U.S. citizen in 1967. He later became a NASA manager involved in the long-range planning of deep space manned activities and other programs such as the International Space Station and the space shuttle.

Wright is the Marshall Center historian.

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Marshall Center Designated a Storm Ready Community

NASA's Marshall Space Flight Center received designation by the National Weather Service as a Storm Ready Community during a brief ceremony Jan. 10. Redstone Arsenal also received designation as a Storm Ready Military Center. The event was held at Redstone Arsenal gate 1.

Image right: Attending the presentation for the Storm Ready Community designation event at Redstone Arsenal were, from left, Chris Darden, meteorologist in charge at the National Weather Service office in Huntsville; Tim D'Ambrosio, director of the Installation Operations Center at Redstone Arsenal; Garrison Commander Col. John Hamilton; Steve Doering, director of the Office of Center Operations at the Marshall Center; Carole Valenti, Emergency Management director for Marshall; and Dave Nadler, warning coordination meteorologist for the National Weather Service in Huntsville. (NASA/MSFC/Fred Deaton)

Marshall is only the second federal location in Alabama to obtain its designation. It is an opportunity that only happens every three years. Redstone has since become the third federal location in Alabama to be designated a Storm Ready Military Center.

To become Storm Ready, a community or county must:
Establish a 24-hour warning point and emergency operations center
Have more than one way to receive severe weather warnings and forecasts and to alert the public
Create a system that monitors weather conditions locally
Promote the importance of public readiness through community seminars
Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises.

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Obituaries

Mary Lou Hardin, 86, of Iowa died Nov. 9. She retired from the Marshall Center in 1987 as a secretary.

Robert William Neuschaeffer, 74, of California died Dec. 15. He retired from the Marshall Center in 1998 as a quality assurance engineer. He is survived by his wife, Bonnie Neuschaeffer.

Clifford Troup, 86, of Owens Cross Roads died Dec. 19. He retired from the Marshall Center in 1983 as an aerospace engineering technician. He is survived by his wife, Marie Hicklen Troup.

Bobby Wayne Kennedy, 76, of Arab died Dec. 20. He retired from the Marshall Center in 2002 as an aerospace engineer. He is survived by his wife, Carolyn Kennedy.

William (Billy) Carl Vaughn, 81, of Huntsville died Dec. 28. He retired from the Marshall Center in 1994 as a contract specialist. He is survived by his wife, Gladys Hutton Vaughn.

Elmer Ward, 89, of Huntsville died Dec. 30. He retired from the Marshall Center in 1973 as an aerospace engineer.

Fred D. Arrington, 77, of Huntsville died Jan. 4. He retired from the Marshall Center in 1997 as a contract price/cost analyst.

Dorothy J. Winsett, 78, of Fayetteville died Jan. 6. She retired from the Marshall Center in 1995 as a secretary.

Pleasant M. (PM) Hughes, 91, of Minnesota died Jan. 9. He retired from the Marshall Center in 1979 as a flight systems test engineer.

Keith H. Clark Sr., 84, of Decatur died Jan. 9. He retired from the Marshall Center in 1989 as an engineering technician.

Hans Friedrich Kennel, 84, of Huntsville died Jan. 9. He retired from the Marshall Center in 1992 as an aerospace engineer. He is survived by his wife, Margaret Kennel.

Find this article at:

http://www.nasa.gov/centers/marshall/about/star/index.html