National Aeronautics and Space Administration

Goddard View

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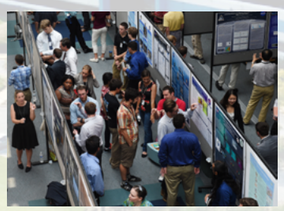
GoddardView

TRENDING

John Mather Makes Radio Appearance
James Webb Space Telescope Senior Project Scientist John Mather made an appearance on The Kojo Nnamdi Show, a radio talk show based on the campus of American University in Washington, D.C. Mather spoke about Goddard's efforts in the search for life beyond Earth.

Internships Culminate With Poster Session
Members of Goddard's 2015 summer internship class presented what they learned over the past couple of months through the use of posters that illustrate their projects and how NASA has helped them in their work.



Daughter of Goddard Engineer Receives NASA College Scholarship
Nathalie Eegholm, daughter of optical engineer Bente Eegholm, was named a recipient of the NASA College Scholarship Award. She is a freshman studying biomedical engineering at the University of North Carolina at Chapel Hill.

NASA Scientists Selected as AGU Fellows
Larry Travis and Cynthia Rosenzweig from the Goddard Institute for Space Studies, along with former Goddard scientist Lorraine Remer, were named fellows by the American Geophysical Union.

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On the cover: Dava Newman (left), who took office as NASA's deputy administrator in May, stops by the Hubble Space Telescope control center during her first visit to Goddard. Photo credit: NASA/Goddard/Bill Hrybyk

GoddardView Info

Goddard View is an official publication of NASA's Goddard Space Flight Center in Greenbelt, Maryland. Goddard View showcases people and achievements in the Goddard community that support the center's mission to explore, discover and understand our dynamic universe. Goddard View is published by the Goddard Office of Communications.

You may submit story ideas to the editor at darrell.d.delarosa@nasa.gov. All contributions are subject to editing and will be published as space allows.

WEBB TELESCOPE BACKPLANE ARRIVES FOR MIRROR ASSEMBLY

By Laura Betz

One of the most crucial pieces of the James Webb Space Telescope, the flight backplane, arrived on Aug. 25 at NASA's Goddard Space Flight Center for mirror assembly. The "spine" of the telescope, the backplane is responsible for holding its 18 hexagonal mirrors and instruments steady while it is looking into deep space.

Engineers will unpack the backplane and ensure it works as it should and that nothing was damaged during transit.

Once settled in the large clean room at Goddard, the backplane will be hoisted onto an assembly stand. In late fall, Webb's flight mirrors will be placed by a robotic arm onto the backplane. Together, those 18 mirrors make up Webb's "primary mirror." Along with the secondary, tertiary and fine steering mirrors, this primary mirror comprises a telescope that will help scientists observe the formation of the first stars and galaxies more than 13.5 billion years ago.

"The delivery of the backplane to Goddard represents another significant step in the evolution of Webb," said Bill Ochs, the Webb telescope's project manager. "Final assembly of the telescope can now begin this fall, leading to integration of the telescope and science instruments in late spring of 2016."

The backplane arrived at Goddard after undergoing integration and testing at Northrop Grumman Aerospace Systems in Redondo Beach, California.

"The telescope's beryllium mirrors are held together nearly motionlessly in space by the backplane, which also acts as a stable platform during ground test operations and launch," said Scott Texter, telescope manager at Northrop Grumman. "The stability of this hardware contributes to the Webb telescope's ability to provide an unprecedented look at our own solar system as well as discover exoplanets well beyond this solar system."

The backplane will also meet the most stringent thermal stability requirements of any space-based telescope to minimize thermal distortion. Webb undergoes extreme temperature changes in the time between its construction and its final home in deep space. Webb's components are built at room temperature, but will eventually operate at extremely cold temperatures as low as minus 389 degrees Fahrenheit.

While the telescope is in orbit, the temperature of the backplane will also vary depending on where it is pointing relative to the sun. Extreme changes in temperature may cause the backplane to shrink or expand. Throughout this swing in temperature, the backplane portion of the telescope structure must not vary more than 38 nanometers – approximately a thousandth the diameter of a human hair.

Additionally, the breakthrough folding design of the backplane enables it to fit inside the 15-foot-diameter fairing of the launch vehicle.

Scheduled to launch in 2018, the Webb telescope is the scientific successor to NASA's Hubble Space Telescope. It will be the most powerful space telescope ever built. Webb is an international project led by NASA with its partners, the European Space Agency and the Canadian Space Agency. ■

Above: The James Webb Space Telescope's backplane arrived at NASA's Goddard Space Flight Center after undergoing integration and testing at a Northrop Grumman facility in Redondo Beach, Calif.

Photo credit: NASA/Goddard/Chris Gunn

CLIMATEBITS: SIMPLIFYING EARTH SCIENCE ONE BIT AT A TIME

By Ginger Butcher and Holli Riebeek

For millions of students nationwide, the impending fall season means the start of another school year. For the White House, the return to the classroom is another chance to provide the next-generation workforce the knowledge and skills it needs to confront the challenges of a changing climate.

As part of the call-to-action issued through its Climate Education and Literacy Initiative, the Obama administration hosted on Aug. 20 a Back-to-School Climate Education Event in which it presented new commitments from federal agencies and external collaborators intended to enhance climate literacy. Following her opening remarks, Kathryn Sullivan – administrator of the National Oceanic and Atmospheric Administration and former NASA astronaut – highlighted the series of ClimateBits videos as a collaboration between NASA's Goddard Space Flight Center, NOAA, and the University of Maryland, College Park.

Using the NOAA-created Science On a Sphere®, a 6-foot globe that displays Earth and planetary data sets as well as short movies, the video series explains and illustrates key concepts in Earth science as a way to connect students and citizens to the best available science-based information about climate change.

Stephanie Schollaert Uz, senior support scientist in the Goddard Earth Sciences Division, created ClimateBits after noticing the need for clear and concise vignettes tailored to the public.

"It became apparent that museum staff and visitors have lots of questions about the climate change discussions they hear in the news, but have limited time to focus on in-depth science content," she said. "Thus, ClimateBits is now being developed to give quick background to help the general public understand important Earth science concepts."

Combining global NASA satellite imagery with concise narration by Goddard scientists and others, ClimateBits isolates and explains concepts in an easily digestible way. For example, in "Fast Carbon, Slow Carbon" – the most viewed video to date – the popular "Carbon Crisis in 90 Seconds" cartoon produced by Goddard scientist Peter Griffith is juxtaposed with the NASA Scientific Visualization Studio's animations of land vegetation, atmospheric carbon dioxide and black carbon.

Additional ClimateBits videos focus on such topics as air quality, the ozone layer, the ultraviolet index and carbon dioxide.

Museums and educational institutions are finding several ways to use ClimateBits as an educational tool and incorporate it into their curricula. At the Denver Museum of Nature & Science, videos are played within live shows or in auto-run mode when the staff isn't available to deliver live presentations. "Volunteer facilitators use ClimateBits as one of the tools to educate museum guests about the impacts of climate change on our planet," said Dave Blumenstock, one of the museum's educators and a volunteer coordinator.

The James E. Richmond Science Center – attached to St. Charles High School in Waldorf, Maryland – is part of Charles County Public Schools, one of three K-12 school systems that has a Science On a Sphere installation. The center uses the installation and series to expand learning beyond classroom walls. "We try to make field trips align to what's being covered in the classroom. The ClimateBits Solar Radiation piece works perfectly for fourth-grade field trips whose curriculum includes energy," said Patrick Rowley, the center's SphereMaster.

The school district and the Colorado-based Space Foundation recently added ClimateBits and its supplemental resources to two-week-long educator professional development courses that have been offered for nine summers. The district now routinely uses ClimateBits on its Science On a Sphere installation to introduce concepts covered in the Next Generation Science Standards – a multistate effort focused on improving science education.

"Visualizing the data and hearing about a concept in a concise way helps students see the big picture," said Uz. "These ideas can then be reinforced through experiential and inquiry-based learning methods."

ClimateBits videos are available on all Science On a Sphere installations in 126 museums and science centers worldwide, including the visitor centers at Goddard and Wallops Flight Facility, as well as NOAA Headquarters in Silver Spring, Maryland; the Smithsonian National Museum of Natural History and the Smithsonian National Zoo in Washington, D.C.; and the Maryland Science Center in Baltimore. ■

For more information and to view all ClimateBits videos, visit climatebits.org.

Center: ClimateBits creator Stephanie Schollaert Uz (center) talks about the series during a Science On a Sphere presentation at the Denver Museum of Nature & Science in July.

Photo credit: Denver Museum of Nature & Science/Eddie Goldstein

Conrad Mason

Code 543, Pathways Intern; Mechanical Engineering Branch

Why Goddard?: I love space and haven't given up my childhood dream of becoming an astronaut.

Hobbies/interests: traveling, kiteboarding, tennis

Ronda Vincent

Code 155, Financial Management Analyst

Why Goddard?: To continue my career working with an agency making a difference in the world.

Hobbies/interests: reading, music, travel, water activities

Michael Purucker

Code 695, Chief; Laboratory for Planetary Magnetospheres

Why Goddard?: This lab makes the magnetometers that enable my science.

Hobbies/interests: studying magnetic fields to better understand the solar system

Samantha Hurley

Code 543, Pathways Intern; Satellite Servicing Capabilities Office

Why Goddard?: I have wanted to work for NASA since I first visited the National Air and Space Museum when I was 5 years old.

Hobbies/interests: travel, sports, reading, cello

Alexis Basantis

Code 542, Student Trainee (Engineering)

Why Goddard?: Working at NASA has been a dream for me ever since I was a little kid.

Hobbies/interests: reading, hiking, basketball

Aaron Crasner

Code 596, Pathways Intern; Components and Hardware Systems Branch

Why Goddard?: Goddard has so many exciting space missions and projects.

Hobbies/interests: camping, reading, tennis, running, making jewelry

Caitlyn Cooke

Code 555, Pathways Intern; Microwave Instrument Technology Branch

Why Goddard?: To learn from great scientists and engineers.

Hobbies/interests: rock climbing, hiking, swimming, stargazing

EMPLOYEE SPOTLIGHT

Goddard is pleased to welcome these new employees to the NASA community.

NEW DEPUTY ADMINISTRATOR MAKES HER GODDARD DEBUT

By Darrell Dela Rosa

As an aerospace engineer and professor at the Massachusetts Institute of Technology for more than two decades, Dava Newman has dedicated her career to reaching for the stars and helping others do the same.

In May, her career-long commitment to advancing space exploration arrived at its latest pinnacle as she began her duties as NASA's deputy administrator, the second-highest-ranking position in the agency. Nominated by President Barack Obama in January, Newman was unanimously confirmed, 87-0, by the U.S. Senate in late April.

"Dr. Newman brings with her valuable experience at the nexus among engineering, science and space policy," said NASA Administrator Charlie Bolden in a statement following her confirmation. "Her talents and skills as an educator and technological innovator will bring a new energy to our NASA leadership team."

On Aug. 18, she made her first visit to NASA's Goddard Space Flight Center. Accompanied by Center Director Chris Scolese, Newman met with Goddard's leadership and had a close-up look at some of the center's projects and facilities, including the Hubble Space Telescope control center, James Webb Space Telescope clean room, Goddard Satellite Servicing Capabilities Office and NASA Center for Climate Simulation.

"I'm already blown away," she said of her experience. "The passion and dedication here at Goddard are enabling breakthroughs."

Newman also spoke with some of Goddard's interns and early career professionals and took the opportunity to address the entire center.

"It's difficult to say what's impossible," Newman told the packed audience, echoing the famous words spoken by rocket scientist Robert H. Goddard, for whom the center is named. "And that's why we are all here. We think about impossibilities, believe in our dreams and try to make those real."

In response to questions asked by the center's personnel, she affirmed her commitment to gender diversity within the agency. For her part, Newman is the third consecutive woman to serve in the deputy administrator post.

She also encouraged continued collaboration between NASA centers and underscored the importance of constantly engaging the public around NASA's work.

"For kids to dream and have the vision that they can be part of this, there's probably nothing more exciting," she said.

And she didn't miss the chance to share her passion for NASA's journey to Mars. "I've been waiting my whole life to get the opportunity to participate at NASA and make sure we're clear and focused on the journey to Mars," Newman added.

With the end of the Space Shuttle Program, Newman said the agency's messaging for its human exploration efforts must now center on the Red Planet.

Her appointment comes at a time when NASA is enhancing the capabilities needed to send humans to Mars in the coming decades, leveraging the advances made by such missions as the International Space Station, the Mars Science Laboratory which manages the Curiosity rover, and the Goddard-managed Mars Atmosphere and Volatile Evolution mission.

"We're on a journey to Mars. It's not theoretical," Newman said. "We are building one big and heavy launch vehicle; we're bending metal."

Prior to her arrival at NASA Headquarters in Washington, much of her research at MIT focused on measuring and improving astronaut performance, spaceflight mission analysis, engineering systems design, space policy analysis, and developing assistive technologies for those with motion impairment. She also served as principal investigator for three spaceflight experiments and as director of the MIT Technology and Policy Program as well as the MIT Portugal Program – a collaboration between the university and Portuguese institutions to further develop the country's engineering research and education programs.

But her crowning achievement to date within the aerospace community has been the development of the MIT BioSuit – a cutting-edge lightweight, skintight spacesuit with considerably less bulk than traditional gas-pressurized suits. In addition to offering greater bodily support for future astronauts, the so-called "second-skin spacesuit" allows for increased mobility during human planetary exploration.

"That may help us when we go to Mars, where there is a bit of an atmosphere," Scolese said during his introduction for Newman.

And wherever the next destinations may be in the years and decades ahead, those in the Goddard community believe she can help NASA get there.

"Whether it be Mars or anything beyond the International Space Station, Dava is an overachiever who is always thinking about the next era of human exploration," said James Garvin, Goddard chief scientist and longtime admirer of Newman's work. "That perspective is vitally important as we prepare for an era that will necessarily be radically different from previous ones."

Just a few months into the job, Newman remains steadfastly committed to learning more about all the missions and projects at Goddard and other NASA centers while maintaining the long-term vision needed for sending humans to Mars.

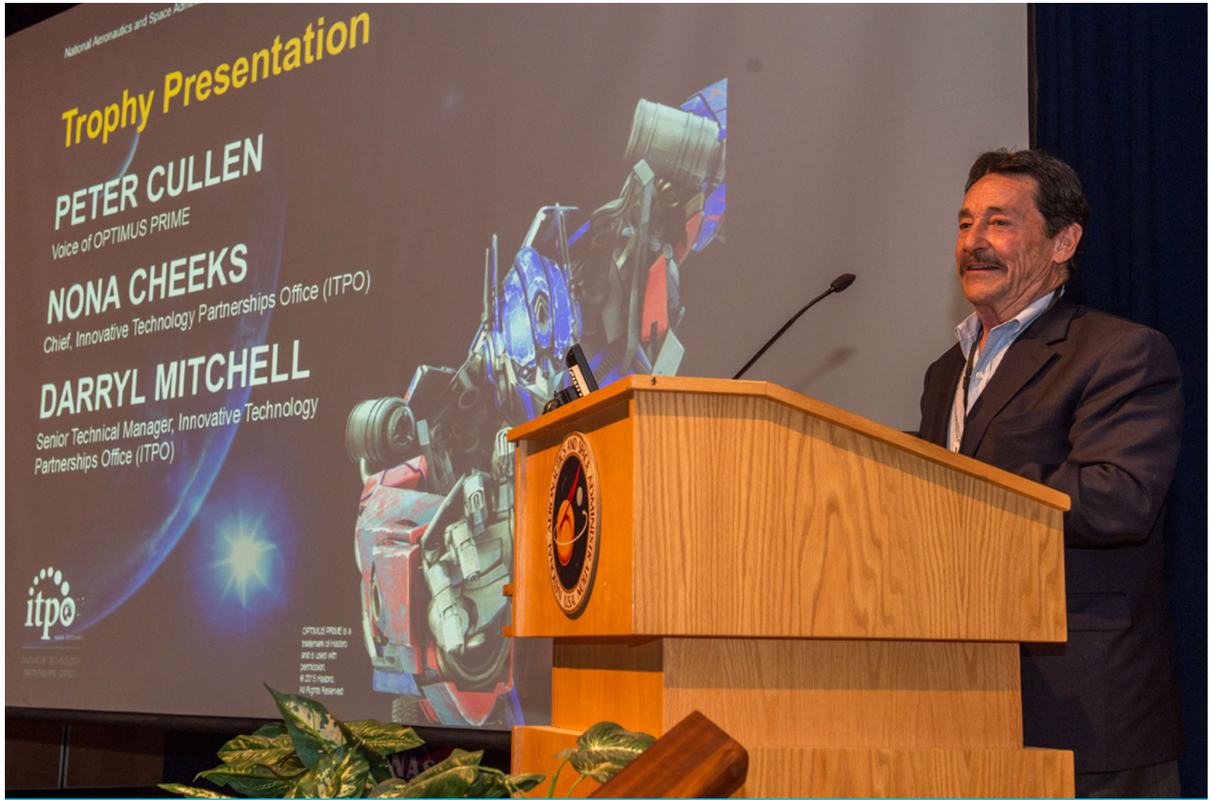
"It has been incredible learning about all the work that you're doing: the missions you're involved in, the milestones and the accomplishments. You get to rewrite the science books completely over again," she said to the Goddard audience.

For Newman, that's been the best part of it all.

"Every day, I get to celebrate a bunch of firsts and discoveries," she added. "I start my mornings thinking about all the great work that NASA is doing." ■

Above, left: NASA Deputy Administrator Dava Newman (right) and Center Director Chris Scolese answer questions from center personnel during the former's first visit to Goddard. Photo credit: NASA/Goddard/Bill Hrybyk

Above, right: NASA Deputy Administrator Dava Newman (left) listens to a presentation about the Sample Analysis at Mars instrument suite from Melissa Trainer, Goddard research space scientist. Photo credit: NASA/Goddard/Bill Hrybyk



TRANSFORMING TECHNOLOGY: STUDENTS STEP UP TO SPINOFF CHALLENGE

By Ashley Morrow

Five students who won the latest OPTIMUS PRIME Spinoff Video Contest will knock your socks off. That's exactly what they did to one NASA film crew.

Teams from third to 12th grade created videos to showcase how they think NASA technology could be spun off, or repurposed for other technological and scientific projects. The brainchild of the Goddard Innovative Technology Partnerships Office, the contest awards two winning teams the opportunity to make another video, this time with voice actor Peter Cullen – the voice of OPTIMUS PRIME in a series of TRANSFORMERS movies, TV shows and games. They worked in the TV studio at NASA's Goddard Space Flight Center.

Stevie Artezana, Jackson Cichelli and Kate Wilcox from Barrett Elementary School in Arlington, Virginia, triumphed with their video about fitting heat shield tiles to a drone so it could explore volcanos from above. Kelly DeRees and David Sugg from H.H. Dow High School in Midland, Michigan, and Glendora High School in California, respectively, won for their video detailing the use of laser algorithm technology to create better maps.

The winning teams traveled to Goddard to receive their awards and make their new video, as well as participate in several days of tours and activities on center. Video producer Claire Saravia scheduled each team an hour and a half in front of the camera to get the video just right, but DeRees and Sugg finished in only 20 minutes.

"My favorite part was the bloopers, when someone would make a mistake," Wilcox said. The miscues and flubs notwithstanding, the Barrett Elementary School team finished in 45 minutes.

"I think these kids are pros," Saravia said of both teams. "This is a testament to the way they work. They created really great videos, and I'm not at all surprised that the production process went really smoothly."

Crew members, ITPO personnel and parents watched as the students took the stage amid cameras, lights and studio structures.

"We got our scripts the night before," DeRees said. "And we just kind of did it. Filming with Peter Cullen was pretty cool."

After meeting through the NASA Interdisciplinary National Science Project Incorporating Research and Education Experience program, in which they participated during their first two years in high school, DeRees and Sugg decided to compete together in other NASA challenges despite living more than 2,000 miles apart.

They began work on their spinoff video last October and submitted the final product in January. In the video, they explain how laser algorithm technology – which is currently used to scan the James Webb Space Telescope's mirrors for flaws – can create more detailed and accurate maps that will help scientists understand such concepts as how ice melts or how land changes in natural disasters.

For their part, Artezana, Cichelli and Wilcox thought transferring heat shield scales from a spacecraft to a drone could help reduce the destruction caused by volcanic eruptions to people and their property by allowing scientists to better understand the phenomena.

Unlike their high school counterparts, they weren't separated by thousands of miles, but they did face some serious obstacles to making their prize-winning video.

"They had to give up recess for a few days," joked Laurie Sullivan, their teacher. "Stevie doesn't really like recess, but Kate and Jackson definitely do." ■

Center: David Sugg (right) and Kelly DeRees (second from right), the winning high school team in the OPTIMUS PRIME Spinoff Video Contest, work on editing a video they made with voice actor Peter Cullen. Photo credit: NASA/Goddard/Bill Hrybyk

Opposite (top): Voice actor Peter Cullen addresses students during the OPTIMUS PRIME Spinoff Video Contest awards ceremony. Photo credit: NASA/Goddard/Bill Hrybyk

Opposite (bottom): Kate Wilcox, Jackson Cichelli and Stevie Artezana (foreground, from left to right) – who collectively comprise the winning elementary school team in the OPTIMUS PRIME Spinoff Video Contest – explain their approach to a construction challenge given during the contest's awards ceremony. Photo credit: NASA/Goddard/Bill Hrybyk

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JACKIE BOLDEN OBSERVES WOMEN'S EQUALITY DAY WITH GODDARD COMMUNITY

By Max Gleber

In celebration of Women's Equality Day, Alexis "Jackie" Bolden paid a visit to NASA's Goddard Space Flight Center to share her workplace and life experiences with center employees. Organized by the Goddard Women's Advisory Committee, her presentation – entitled "We're All in This Together" – explored themes of womanhood and equality.

"Gender equality is not solely a women's concern, but the responsibility of all individuals of society," said Bolden, an entrepreneur, volunteer in several organizations and the wife of NASA Administrator Charlie Bolden.

She credited her father-in-law, husband and son for being examples in advancing equality. "It requires active participation, contributions and input from not only women, but men as well," she added. "My husband learned great lessons from his dad about gender equality, and our son learned those same lessons from his father."

Bolden would also address the roots of gender equality, issues for women in the workplace and where the United States currently stands on the issue.

In his introductory remarks, Center Director Chris Scolese lauded the contributions women continue to make at NASA.

"Women play an absolutely incredible part in this space program and this country," he said. "Jackie has done wonderful things for NASA and the broader community." ■

Above: The Goddard Women's Advisory Committee and Center Director Chris Scolese (left) present Jackie Bolden (center) with a plaque for her Women's Equality Day presentation.

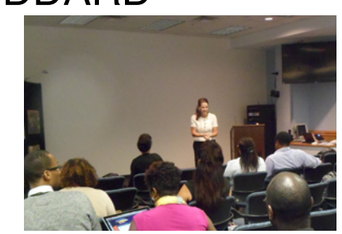
Photo credit: NASA/Goddard/Bill Hrybyk

NSBE'S GREENBELT CHAPTER HOLDS LEADERSHIP CONFERENCE AT GODDARD

By Trena Ferrell

The Greenbelt Space Chapter of the National Society of Black Engineers held its 2015 Space Leadership Conference at NASA's Goddard Space Flight Center. Under the theme "Institutionalizing Space Technology Within the Black Community," the conference focused on advancing engineering research relevant to NASA, other federal agencies and the American aerospace industry.

The four days were filled with presentations from NSBE leadership, including a luncheon address given by Karl Reid – the society's executive director. Attendees also participated in a networking cruise, community cookout and sightseeing expedition in Washington, D.C. ■



Above: Kyle Rahn (center), NSBE senior director of fund development, delivers a presentation during the society's leadership conference at NASA's Goddard Space Flight Center. Photo credit: NASA/Goddard/Sanetra Bailey

FILM FESTIVAL BRINGS GODDARD'S WORK TO THE BIG SCREEN

By Roberto Molar Candanosa

With a stadium-like seating arrangement, dimmed lights and a large projector screen, one could easily mistake the Goett Auditorium at NASA's Goddard Space Flight Center as a movie theater. On one day this summer, it actually was.

Over the course of two screenings, employees from across the center gathered to attend this year's Best of Goddard Film Festival.

Now in its sixth year, the film festival showcases some of the finest work by Goddard's multimedia team. "The film festival serves as a dedicated space to celebrate not only the great scientific progress at the center, but also the creative achievements of its office of communications," said Genna Duberstein, heliophysics multimedia producer and organizer of the event.

Every year, producers choose from dozens of project videos released in the past year that best capture Goddard's achievements in its core science disciplines: astrophysics, Earth science, heliophysics and planetary science. The final selections are then included in the film festival.

Fifteen videos were featured this year, the highest total since the festival's inception in 2010. They included animations and visualizations of such missions and subjects as Landsat, Operation IceBridge, the Solar Dynamics Observatory, asteroid Bennu and star system Eta Carinae.

"Animation-driven narratives and visualizations highlighting various findings give general audiences a good sense and taste as to what our producers, animators, writers and visualizers create from week to week," said Brian Monroe, an animator at the Goddard Conceptual Image Lab and whose work appeared in the festival.

The videos, which are often produced in collaboration with scientists and engineers, also bring to life concepts which are often difficult to understand, giving viewers better insight into the latest developments at Goddard and helping scientists understand their own work better.

"Animations help bring the viewer in where they might otherwise not be as engaged if the only things they saw were simply graphs and data sets," Monroe added. "And when scientists, producers and writers see these pieces in their final form in the show, they see a bit of the larger context in which their components fit."

As NASA launches new spacecraft and existing missions continue to provide new images from all corners of the universe, Goddard's multimedia team is pushing the boundaries of its creativity. "Our ability to find diverse ways to tell stories through our short videos has improved," Monroe said.

And with all of Goddard in attendance, the film festival is a culmination of all the collective efforts.

"The event highlights the return of investments from our stakeholders, applauds our scientific achievements, enriches our professional profile and provides an accessible environment for viewers of all backgrounds," said Duberstein. ■

Above: Goddard employees watch videos about the center's scientific achievements during a screening of the Best of Goddard 2015 Film Festival in the Goett Auditorium. Fifteen videos were included this year, a record in the six-year history of the festival.

Photo credit: NASA/Goddard/Bill Hrybyk

NASA Goddard Opens Its Doors

National Aeronautics and Space Administration

SAVE THE DATE!

- Explore the home of the Hubble Space Telescope
- Learn about the next-generation James Webb Space Telescope
- Discover where spacecraft are built and rigorously tested
- See a full-scale model of the Mars rover Curiosity
- Engage in Earth science satellite demonstrations
- View live close-up images of the sun
- Visit Goddard's robotics facilities
- Enjoy live music and other entertainment
- Play games and test your science knowledge
- Build LEGO® spacecraft
- Meet with NASA astronauts
- And much more!

Saturday, Sept. 26, 2015

NASA's Goddard Space Flight Center welcomes the public for a free open house event for all ages on Saturday, Sept. 26, 2015, from 11 a.m. to 5 p.m. We invite you to visit our center in Greenbelt, Maryland, for a day of activities, tours and hands-on demonstrations. Explore@NASAGoddard will engage visitors in Goddard's work in Earth science, heliophysics, planetary science, astrophysics, and engineering and technology.

In celebration of the Hubble Space Telescope's 25th anniversary, this year's theme will be "Celebrating Hubble and the Spirit of Exploration."

Bring your family and friends and come learn about the extraordinary work we are doing to better understand our dynamic universe. For more details, including parking information, please visit www.nasa.gov/explorenasagoddard.

#ExploreGoddard

Public parking will not be available on center. Free shuttle bus service will be provided from nearby metro stations and other parking lots. See website for details.

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