National Aeronautics and Space Administration

Goddard View

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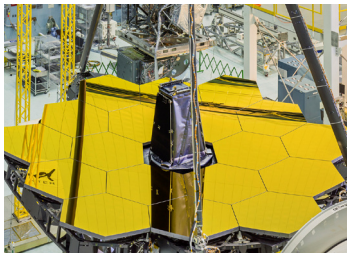
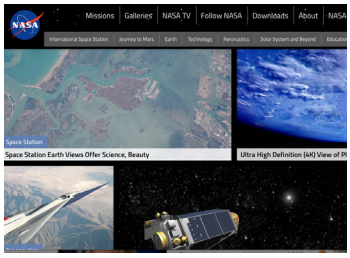
GoddardView

TRENDING



Webb's Golden Unveiling
Goddard engineers removed the black covers from the James Webb Space Telescope's 18 primary mirror segments, unveiling a giant golden mirror that will undergo further integration and testing as part of preparations for a 2018 launch.

Smithsonian Screens "A Beautiful Planet"
The Smithsonian National Air and Space Museum in Washington, D.C., offered a screening for NASA and special guests. Goddard helped produce the film, which displays images of Earth accompanied by narration.



Website Wins Webby
Online voters named NASA.gov the best government website in the latest round of Webby Awards. The awards recognize online excellence in the following mediums: websites, film and video, advertising, mobile sites and apps, and social media.

NASA and Nats
The Washington Nationals baseball club honored the agency and its work as part of NASA Night on April 26. Astronaut Kjell Lindgren, who recently returned to Earth from the International Space Station, threw out the ceremonial first pitch.

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On the cover: Students and scientists talk about NASA's work during the agency's Earth Day event at Union Station in Washington, D.C.

Photo credit: NASA/Goddard/Debora McCallum

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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.

RENOWNED CARTOONIST BRINGS ART TO GODDARD'S SCIENCE

By Clare Skelly

On April 21, a cartoon image of a robot with rocket trails fuming from its feet flashed across an auditorium projector screen at NASA's Goddard Space Flight Center. In red block letters, the slide asked, "Is creative concentration contagious?"

For several hours, Goddard employees worked with renowned author, cartoonist and self-proclaimed "near-sighted" monkey Lynda Barry to find out the answer.

The center hosted Barry as part of StoryLab, a recurring series of talks about communicating science better to the public and other similar topics.

Barry is well known for her comic strip "Ernie Pook's Comeek," which ran for almost 30 years in weeklies across the country. She shifted her focus to teaching after discontinuing the comic in 2008. Barry now works as an assistant professor of interdisciplinary creativity at the University of Wisconsin in Madison.

Mark Hess, Goddard chief of communications, heard Barry give an interview on National Public Radio, and he knew he had to reach out.

"Learning about Barry's approach to creativity, which she says works whether you are a Ph.D. student or kindergartner, inspired me to bring her to Goddard," he said. "We are a creative bunch here."

After singing her summarized life story – something she believes played a large role in shaping her personality – Barry offered the center her views on creativity, comparing and contrasting inherent tendencies in children and adults. She used personal experiences, humor and wit to convey her ideas about states of mind and how people can uncover their core creative energies.

For starters, people should learn to put down their smartphones. "Digital devices take away natural feelings of uncertainty and boredom," she said. For Barry, uncertainty and boredom are her students' allies and such devices are their enemy, stifling most creativity.

After the StoryLab session, Barry taught her three-hour workshop "Writing the Unthinkable" to 40 Goddard employees. Insisting cellphones, tablets and computers remain out of sight, she put her methods to work.

"Do you wish you could write? Do you wish you could draw? I'm not saying I'm a genie, but I'm not saying I'm not," Barry joked. "Wish granted."

Barry has taught her workshop to a wide range of people, from graduate students to prisoners in Philadelphia. She uses timed writing and drawing exercises to tap into participants' memories and uncover innate creativity – all done in the absence of technology.

"Here they are," Barry said, as she held up her hands. "These are the original digital devices." ■

Above: Cartoonist Lynda Barry discusses creativity with center employees during her visit to Goddard on April 21. Photo credit: NASA/Goddard/Rebecca Roth

Below: Lynda Barry reviews some of the drawings submitted during her "Writing the Unthinkable" workshop. Photo credit: NASA/Goddard/Rebecca Roth

SAFETY CAMPAIGN CHANNELS EINSTEIN, BUT SAFETY DOESN'T TAKE A GENIUS

By Jenny Hottle

On July 16, 2013, NASA astronaut Chris Cassidy and European Space Agency astronaut Luca Parmitano were a little more than 45 minutes into their second spacewalk together aboard International Space Station Expedition 36, finishing some maintenance work on the orbiting laboratory. Suddenly, Parmitano noticed some water on the back of his neck.

A malfunction had caused water to leak into Parmitano's helmet, and within a few minutes, he was unable to fully see, hear or communicate with anyone. The two made it safely back inside the space station, but the incident was a reminder that space exploration is a dangerous endeavor.

Cassidy, now chief of NASA's Astronaut Office in Houston, recounted this story on April 25 at the kickoff event for the annual Safety Awareness Campaign at NASA's Goddard Space Flight Center. The weeklong series of events aimed to remind Goddard employees of their role in safety.

"It's always a good thing to talk through an example of a real-world experience," Cassidy said. "What would I have done differently? The week before, when a little bit of water was filling up on Luca's first spacewalk, I probably would have pulled the layers back and found out why that was happening."

SAC started eight years ago as an opportunity for Goddard employees to complete mandatory training all at once. Over time, it evolved to include other safety-related topics.

Adopting a quote from Albert Einstein, "The only mistake in life is the lesson not yet learned," this year's campaign encouraged people to stop and think about their actions before trying something, and seeing if there is a past lesson that could be applied.

"We want to be more proactive, as opposed to when we're forced to learn lessons from negative events, such as a mishap," said Frank Coleman, campaign chair.

The campaign covered more than 100 topics, activities and training sessions on safety awareness, both in the workplace and at home. Experts delivered presentations on such subjects as fire safety, CPR, active shooter situations, self-defense, identity theft and much more. There were also several topical talks on the Zika virus and NASA's role in the rescue of 33 Chilean miners from a collapsed mine in 2010.

Throughout the week, directorates held safety stand-down sessions, which included information about Goddard safety resources, safety metrics and an incident reporting overview.

"This is always one of the events that I like every year, because it gets us all together and gives us a chance to stop and focus on what we need to know," said Center Director Chris Scolese during the Code 100 stand-down session.

On April 27, managers from each directorate competed in a "Jeopardy!"-style quiz game, answering questions in categories ranging from home and office safety to IT security and emergency preparedness. This year, the Goddard Applied Engineering and Technology Directorate – or Code 500 – took home the coveted Safety Cone Award.

Whether it's through the use of games or more serious presentations, the campaign is grounded in the belief that safety success is a key element of future mission success.

"Repeating success is difficult to do," Coleman added. "If we can learn from the things we did well, there's no reason we shouldn't be able to repeat them again." ■

Center: During the Safety Awareness Campaign kickoff event, NASA astronaut Chris Cassidy recounts an incident in which European Space Agency astronaut Luca Parmitano's helmet unexpectedly filled up with water during a spacewalk aboard International Space Station Expedition 36. Photo credit: NASA/Goddard/Bill Hrybyk

Opposite, top: Employees listen to a presentation on identity theft during the Safety Awareness Campaign. Photo credit: NASA/Goddard/Debora McCallum

Opposite, bottom: Contestants from Code 500 lift the Safety Cone Award as the winners of Safety Jeopardy. Rich Barney (right), Goddard safety and mission assurance deputy director, served as host. Photo credit: NASA/Goddard/Bill Hrybyk

SPRING AND SCIENCE COME TOGETHER

By Darrell Dela Rosa

With the arrival of warm weather and cherry blossoms in Washington, D.C., residents around the nation's capital think, "Spring!"

Not far from the Tidal Basin – where most of the iconic trees rest – the moderate temperatures and flourishing flora bring another thought to mind: "Science!"

The USA Science and Engineering Festival, that is. With some 350,000 attendees, the biennial spring gathering at the Walter E. Washington Convention Center is effectively the country's largest science fair and celebration. During the fourth edition of the expo from April 15 to 17, science junkies and novices alike listened to more than 1,000 exhibitors from government, industry, academia and the nonprofit community as they demonstrated 3,000 activities in science, technology, engineering and mathematics.

Scores of entertainment acts – including "mathemagician" Art Benjamin, actor and STEM advocate Wil Wheaton, and the pompom- and Ph.D.- toting Science Cheerleaders – reminded audiences that while science may be difficult and demanding, it is also captivating and cool.

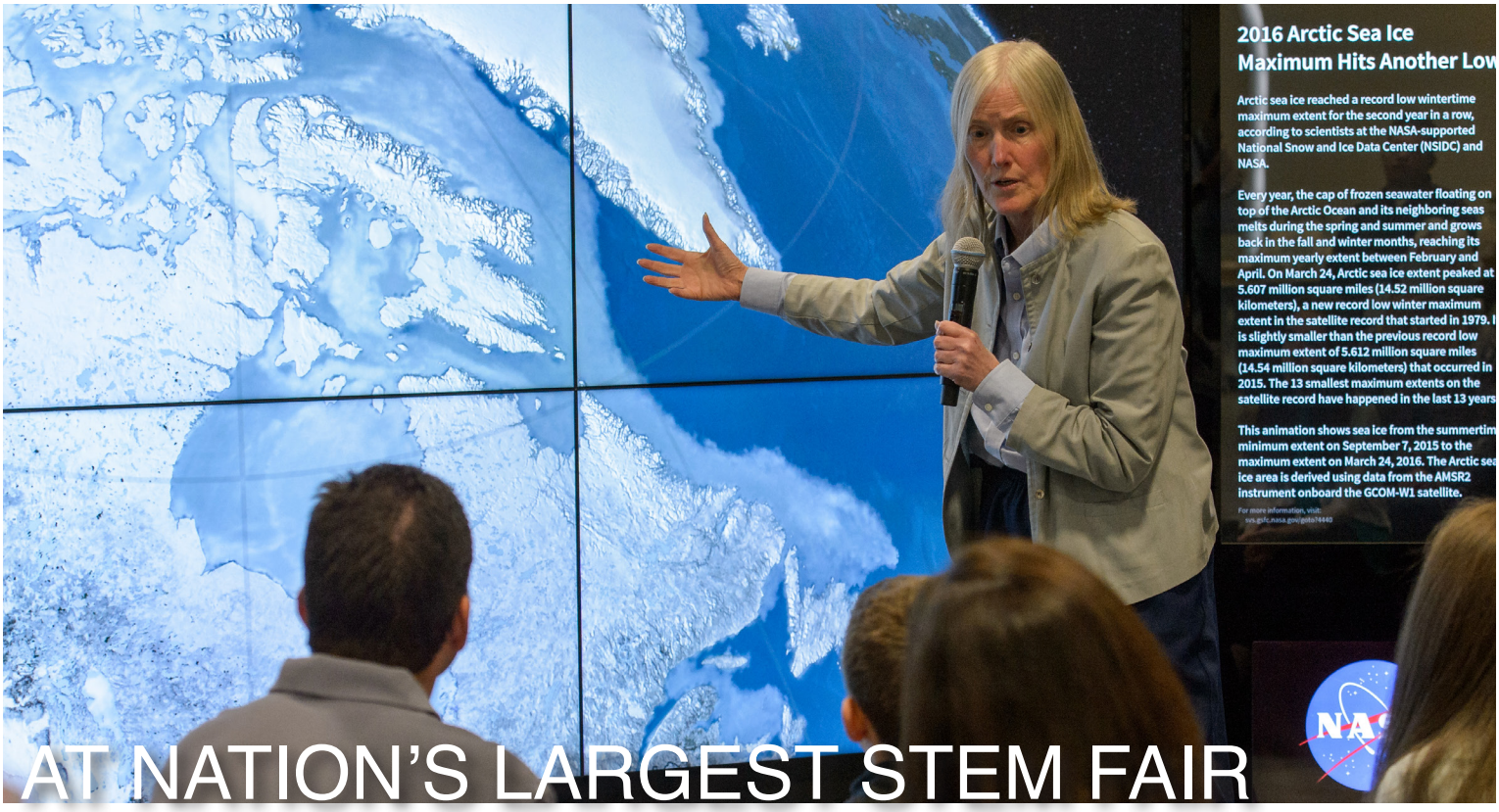
Since the festival's inception in 2010, NASA's Goddard Space Flight Center has been a regular fixture at the event, engaging space enthusiasts in its latest missions and taking would-be explorers through a tour of the cosmos by way of a scavenger hunt. This year, Goddard brought about a dozen of its missions to the floor, spanning its work across astrophysics, Earth science, heliophysics and planetary science.

Representatives from other NASA centers showcased the agency's endeavors in aeronautics and technology, along with its research aboard the International Space Station and ambitions for a future human spaceflight to Mars.

"Not all of NASA's research is visible and known to the public, but a big event like this gives the public an opportunity to learn some content directly from scientists, engineers and various NASA specialists," said Carolyn Ng, an education specialist in the Goddard Heliophysics Science Division, who helped organize the center's presence.

The booth presentations were accompanied by stage talks from some of the agency's brightest minds. With topics ranging from Earth's climate and space weather to astronaut Scott Kelly's year in space and the search for extraterrestrial life, scientists detailed the applicability of NASA's work to everyday life and established linkages between what is currently science fiction and what may one day become "science fact." A hyperwall – a rectangular set of interconnected panels displaying data models and high-definition images – added a visual element to the mini-lectures.

"Large group presentations enabled a different type of engagement and discussion with the public," said Stephanie Schollaert Uz, a Goddard Earth scientist who spoke about the impacts of the El Niño and La Niña weather patterns on the marine food web. "People asked great questions that often led to questions by others in the audience. They became interested in ocean circulation and weather impacts and asked about the education required to become an oceanographer."



AT NATION'S LARGEST STEM FAIR

Speaking in front of a live audience also had the added benefit of making the public more aware of NASA's work on our home planet, according to Uz. "People know about NASA's work in space exploration, but hopefully they've gained a better appreciation for how much we're learning about Earth by watching it from space," she added.

Founded by entrepreneur Larry Bock and Lockheed Martin executive Ray O. Johnson, the expo aspires to "stimulate and sustain the interest of our nation's youth in STEM." As one of the nation's leading science agencies, NASA espouses similar objectives and uses events like the festival to strengthen the nation's future workforce.

"The NASA exhibit at the USA Science and Engineering Festival was an outstanding educational exhibit," said attendee Ali Nelson, owner of Mad Science of Central Virginia, a small business that produces innovative programs and workshops to make science fun for kids. "Its many hands-on and interactive displays demonstrated a great ability to engage and inspire the next generation of scientists and engineers."

Melissa Pore, the director of marketing, professional development and training at the Fun Bot Lab robotics camp in northern Virginia, sees the agency's presence as a shining example of what her students may someday achieve.

"We need to have role models, such as those at NASA, interact with students to support and explain how they can follow their dreams," she said. For her part, Pore teaches students robotics using a model Mars rover and shows them how to use amateur radio to speak to astronauts on the ISS. She and her students have also developed a CubeSat that is currently aboard the orbiting laboratory.

During the final day, NASA Chief Scientist Ellen Stofan delivered one of the event's keynote addresses. Drawing parallels with last year's Hollywood sci-fi hit "The Martian," Stofan outlined the challenges and benefits associated with the journey to Mars. In keeping with the festival's mission, the agency's top science advisor underscored the importance of developing STEM talent today if NASA hopes to fulfill its goal of sending humans to the Red Planet by the 2030s.

To that end, while astronaut Mark Watney nurtured potatoes in the fictional blockbuster, NASA used the festival to sow the seeds of its actual future.

"More people, especially the young, now know more about how NASA contributes to the understanding of our home, our very own star, the solar system and beyond," said Ng. "And hopefully they know what so many at NASA already do: Working at NASA is cool." ■

Above, left: Lora Bleacher, education and public outreach lead for the Goddard Solar System Exploration Division, shows students a piece of volcanic glass during the USA Science and Engineering Festival. Photo credit: NASA/Joel Kowsky

Above, right: One of NASA's many speakers at the festival, Goddard climatologist Claire Parkinson discusses the center's latest research in sea ice and climate change. Photo credit: NASA/Joel Kowsky

HELIO WORKSHOP DISCUSSES EVERYTHING UNDER THE SUN

By Sarah Frazier

Throughout its area of influence – which extends far beyond the orbit of Pluto – the sun is the primary driver of changes in the space environment, shaping temperature, density, magnetic field strength and direction, and particle energy. Scientists study our star to better understand the nature of space as well as solar events which can cause recognizable effects such as auroras or, in extreme cases, power outages.

Since 2000, the Community Coordinated Modeling Center has grown to support thousands of scientists in their research and development of space science models. Housed at NASA's Goddard Space Flight Center and run by Goddard space scientist Masha Kuznetsova, CCMC is a partnership among several U.S. agencies that hosts more than 60 computer models that simulate everything from the evolution of coronal mass ejections as they travel through space to the impact of incoming space weather on Earth's magnetic field. In 2015, one of its primary real-time analysis tools – the Integrated Space Weather Analysis system – had 22,000 unique users.

"It's very important we understand the space weather environment for our robotic missions and our future human exploration missions beyond low-Earth orbit," said Steve Clarke, director of the Heliophysics Division in NASA's Science Mission Directorate. "The modeling capability at the CCMC will continue to be a critical asset in furthering that understanding."

Scientists can request runs for any of the dozens of models with customized initial conditions, meaning that the models can be applied to a wide range of studies.

"The CCMC has given me freedom, flexibility and capability," added Joe Borovsky, a space scientist at the Space Science Institute in Colorado and the University of Michigan.

In April, Borovsky joined more than 140 other scientists from dozens of institutions for the CCMC's eighth workshop in Annapolis, Maryland. Attendees included model developers, science and operational users, educators, agency representatives, and CCMC staff.

Representatives from CCMC partners – including the U.S. Air Force and the National Oceanic and Atmospheric Administration – attended the workshop, along with scientists from institutions as far as Finland, Croatia, Nigeria and Japan.

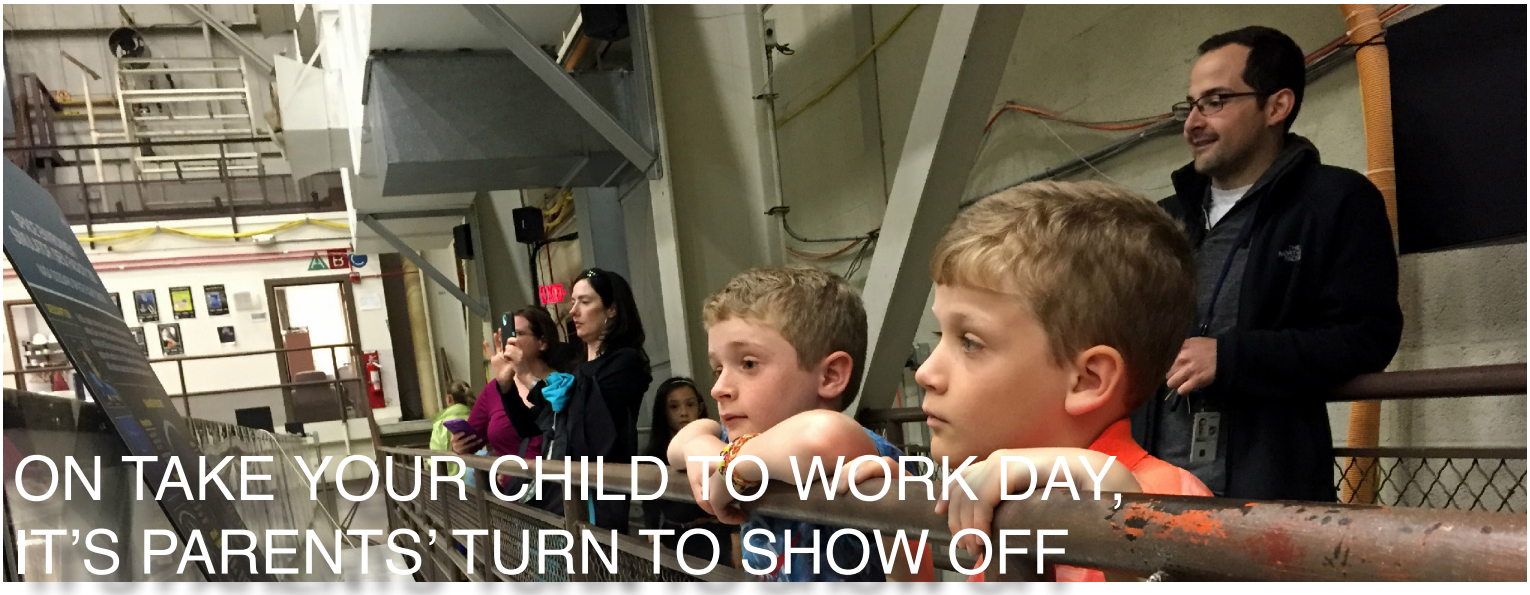
The biennial weeklong gathering covered everything from collaboration among agencies, to technical details of models, to discussions on how to validate model predictions – a particularly important process, since many of the CCMC's models simulate events in regions where there's little or no data to corroborate. Those same data gaps mean that CCMC models provide some of the only estimates of space environment conditions in some regions of space, making the CCMC a key tool in understanding the sun and its influence on space.

The workshop provided a rare opportunity for the scientists behind the models to work extensively with the people using them for research and operations. The CCMC's models run the gamut of heliophysics topics, including models that trace out the sun's magnetic field lines, simulations that track how clouds of solar material propagate through space at a million miles an hour and predictions of how Earth's magnetic field deforms in response to space weather.

"The CCMC is something we're really proud of in the Goddard Heliophysics Science Division," said Michael Hesse, division director and founding director of the CCMC. ■

Above: Scientists listen to a presentation at the Community Coordinated Modeling Center's eighth workshop in Annapolis, Maryland.

Photo credit: NASA/Goddard/Justin Boblitt



ON TAKE YOUR CHILD TO WORK DAY, IT'S PARENTS' TURN TO SHOW OFF

By Jacque Lofton

Children know what their parents do for work, but few really know what a typical day looks like. On April 28, the children of employees at NASA's Goddard Space Flight Center had a chance to find out as the center opened its gates for Take Your Child to Work Day, a nationwide program that encourages parents to bring their children to the office.

In addition to the activities of each individual office, several Goddard organizations hosted activities to keep the students informed and engaged, particularly in the fields of science, technology, engineering and mathematics.

Participants had the opportunity to walk the catwalk in the Goddard Integration and Testing Facility, which helps spacecraft and their components prepare for launch. Newly installed touchscreens along the catwalk allowed passers-by to learn more about the facility's points of interest.

Many also visited the nearby observation deck for the James Webb Space Telescope. Two days earlier, the covers for the primary mirror segments were removed, exposing Webb's shiny golden surface.

Just behind the high bay clean room where the telescope resides, the Goddard Satellite Servicing Capabilities Office took students on a tour of its state-of-the-art Robotic Operations Center, providing an overview of Goddard's robotic work in space.

Staff for the Hubble Space Telescope also organized a tour of its control room. Since Hubble's launch in 1990, the room has served as the ground control center for the renowned observatory.

The Goddard Visitor Center hosted a series of events to give a broader perspective of all the work being done on center. A film festival, developed by the Goddard Visualization Studio, showcased videos and animations of Goddard missions and science concepts. There were also several 20-minute presentations for Science On a Sphere, a global display system that uses computers and video projectors to highlight scientific material on a spherical apparatus.

The Goddard Office of Education delivered talks in its Geo Dome, an inflatable planetarium in which visitors can learn about star alignments and other space experiences.

As NASA moves forward with its next endeavors and explores new frontiers, it relies on events such as Take Your Child to Work Day to nurture the nation's future space scientists and engineers. By engaging them in STEM at an early age, they may one day push the boundaries of what is possible in the universe. ■

Above: Children take a self-guided tour of the Goddard Integration and Testing Facility as part of Take Your Child to Work Day on April 28. Photo credit: NASA/Goddard/Jenny Hottle.

Below: Employees and their children prepare to take a tour of the control room for the Hubble Space Telescope. Photo credit: NASA/Goddard/Debora McCallum

ENGINEER AWAITS LAUNCH OF CUBESAT MISSION DEMONSTRATING VIRTUAL TELESCOPE TECHNOLOGIES

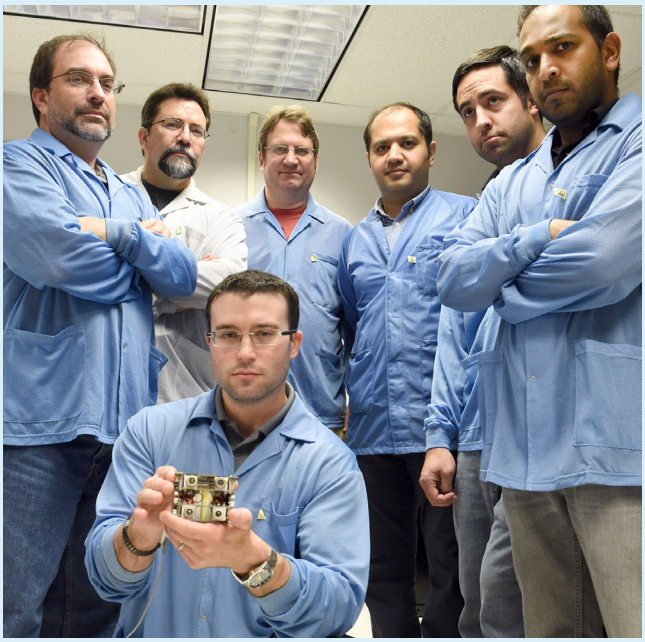
By Lori Keesey

NASA engineers Neerav Shah and Phil Calhoun will realize a long-held ambition later this year when a SpaceX launch vehicle deploys two tiny satellites that will fly in a precise formation to create, in effect, a single or "virtual" telescope benefitting a range of scientific disciplines.

Through a NASA international agreement, Shah and his team have partnered with South Korea's Yonsei University and the Korea Aerospace Research Institute (KARI) to validate technologies that would allow a pair of miniature spacecraft to fly in tandem along an inertial line of sight toward the sun and then hold that configuration — a feat not yet performed in space.

Called CANYVAL-X, short for the CubeSat Astronomy by NASA and Yonsei using Virtual Telescope Alignment eXperiment, the technology demonstration mission is expected to launch in mid-2016.

"The key differentiator with our mission is that we are attempting to align two satellites along an inertial line of sight to a distant celestial target and hold them in alignment for a long enough time to make a science measurement," said Shah, who works at NASA's Goddard Space Flight Center. "Although others have flown two or more satellites in tandem, we are the first in the world to even try holding them in alignment to a distant source."



The technology's obvious beneficiaries are scientists who study the sun's corona and more particularly coronal mass ejections that hurl enormous bubbles of superheated gas across the solar system. Traveling at a million miles per hour, they can disrupt low-Earth-orbiting satellites and terrestrial power grids when they strike Earth. The technology could also benefit scientists searching for planets beyond the solar system.

Both scientific disciplines rely on coronagraphs, which employ an occulter mask to block bright starlight to reveal faint objects hidden by the star's bright light and a camera or spectrograph to gather measurements. Today's space-based coronagraphs house the occulter and a camera or spectrograph in the same telescope, positioning them relatively close to one another.

Some scientists believe, however, that they could gather even more detailed information if they could position the occulter hundreds of feet away from the camera or spectrograph. "Creating a single telescope that achieves these distances is not possible. It would be too large to launch," Shah said.

A solution is launching two spacecraft — one that carries the occulter disk, the other the science instrument. "Formation flying offers the ability to increase the separation distances, which leads to reduced diffracted light," he added.

Under CANYVAL-X, the team plans to position a 2U and a 1U CubeSat in a 435-mile sun-synchronous orbit, in which the two will maintain a tight alignment along a line of sight to the sun.

The larger of the two spacecraft will carry two Goddard-provided technologies that make up the mission's all-important guidance, navigation and control system: a miniature sun sensor and the micro-cathode arc thruster (mCAT) system. Developed at the Wallops Flight Facility in Virginia, the sun sensor calculates a direction to the sun. The George Washington University (GWU)-designed mCAT system, about the size of a coffee mug, fires its thrusters to move the spacecraft so that it maintains its alignment with the smaller CubeSat separated by nearly 33 feet.

Under the collaboration established by the international agreement, Yonsei and KARI are providing the two spacecraft, integrating the Goddard-supplied sun sensor and GWU-Goddard mCAT system, and launching the spacecraft.

"We want to show that the architecture works," Shah explained. "We have all the technology to keep an alignment." Upon demonstrating the capability, he and his partners plan to prepare another mission that would gather scientific data. "Once we do this modest demonstration, we can scale up. We're taking baby steps," he said. ■

Center: A team of Goddard engineers assisted in the development of the micro-cathode arc thruster system, which will maintain CANYVAL-X's alignment to an inertial target.

Photo credit: NASA/Goddard/Debora McCallum

Ada Lorimer

Code 453, Resource Analyst

Why Goddard?: Goddard is a dynamic and renowned facility for scientific achievements and advancements.

Hobbies/interests: working out, spending time with my dog

Lauren Tokarcik

Code 428, Resource Analyst

Why Goddard?: Goddard provides a great work-life balance while allowing me to utilize my degree.

Hobbies/interests: family, traveling, sports

Akbar Khan

Code 112, Student Trainee

Why Goddard?: To be part of NASA's mission is an enormous honor and privilege.

Hobbies/interests: physics, aerospace engineering, C++/Java programming, astronomy

Margareth Bennett

Code 120, Chief

Why Goddard?: NASA's mission is phenomenal, and I would like to be a part of it.

Hobbies/interests: travel, family sports

Krissen Burriss

Code 100, Secretary

Why Goddard?: I have always heard what a wonderful agency NASA is to work for.

Hobbies/interests: family, photography, scrapbooking, travel

Matthew Moran

Code 300.1, Resource Analyst

Why Goddard?: The culture here is second to none, and it's exciting to be a part of our nation's space program.

Hobbies/interests: sports, music, beach, my black Lab

Ryan Hancock

Code 210, Contract Specialist

Why Goddard?: I want to make "The Martian" a reality.

Hobbies/interests: dodgeball, theater, space, exercise

EMPLOYEE SPOTLIGHT

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

SANTIAGO GASSÓ:
CHASING PATAGONIAN DUST TO VOLCANIC BELCHES

By Elizabeth M. Jarrell

What do you do and what is most interesting about your role here at NASA's Goddard Space Flight Center? How do you help support Goddard's mission?

I am a physicist working in atmospheric science, using remote sensing data from satellites to look at Earth's atmosphere. I focus on natural and man-made aerosols, which are very small particulate matter. I am part of the science team for the Ozone Monitoring Instrument on the Aura satellite. Launched in 2004, OMI is an instrument designed to survey pollutants in Earth's atmosphere. I am part of the team that develops algorithms based on this data.

You're from Buenos Aires. How did you come to Goddard?

I was born in Buenos Aires, a city as dense as New York. I got a master's in physics from the University of Buenos Aires. Because I wanted to live abroad, I came to the United States to get a doctorate in geophysics specializing in atmospheric sciences from the University of Washington in Seattle. I came to Goddard because I wanted to learn radiative transfer theory from the people who designed and created the satellites that I used in the observations I utilized for my Ph.D. thesis.

What is your biggest discovery?

About 10 years ago, while looking at dust plumes coming off the Patagonian Desert in the southern end of South America and following these plumes over the south Atlantic, I ran into a very cloudy area with highly distinctive tracks in the clouds. At first they looked like cloud tracks made by smoke from ship engines in shipping lanes, but in fact I had discovered cloud tracks generated by volcanoes in a remote region. The tracks were formed in clouds moving over very weak volcanic eruptions that normally would not have been seen because of the cloudy conditions. Rather than a full eruption, these tracks are made from volcanic belches.

When these aerosols reach the cloud deck above the volcano, they subtly change the properties of the clouds. Just like pollution entering a cloud, the volcanic aerosols induce a change in droplet size that results in a change in the amount of radiation reflected by the cloud. This change is what is detected by the satellite.

I found all this just by chasing a dust cloud from Patagonia. I just wanted to know how far this dust would go.

How have your Patagonian studies evolved?

I was the first person to report observations from space that showed dust storms in Patagonia. I was the first one to study the entire transport of these dust storms using satellites and modeling tools.

This work put me in touch with a diverse group of scientists, including geochemists, paleoclimatologists and geomorphologists who are all interested in the presence of dust in high latitudes – such as in Alaska, Greenland and Iceland – and its impact. We formed a network called the High Latitude Dust and Climate Network, which is hosting a symposium a year from now in Iceland.

What motivates your scientific research?

I am always curious about understanding physical concepts, our surrounding environment and how different phenomena integrate. For example, I want to understand how dust interacts with the ocean biology, so my interests really cross disciplines. Another example is how the ocean interacts with the atmosphere by supplying aerosols. I am a good observer, too.

What else do you do to satisfy your curiosity?

I make it a point to attend seminars outside my field. Presently, I am very interested in planetary exploration, so I go to many lectures. It is fascinating and I learn things that I can apply to my own research. I also read papers from outside my field so I can learn about other areas.

What do you do in your spare time?

On weekends, I spend most of my time with my wife and two kids, playing soccer, swimming, gardening, and trying to keep up with everyone's activities. Every spare minute during the week, I get on my laptop and look at new satellite images, much to my wife's chagrin. ■

Center: Santiago Gassó

Photo credit: NASA/Goddard/Bill Hrybyk