National Aeronautics and Space Administration

Goddard View

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GoddardView

TRENDING

General Comes to Goddard for Memorial Day Ceremony
Retired four-star U.S. Marine Corps Gen. John R. Allen addressed employees during the center's commemoration of Memorial Day. Allen commanded the NATO International Security Assistance Force in Afghanistan from 2011 to 2013.

GCDC Joins STEM Symposium
The Goddard Child Development Center was invited to participate in the White House Symposium on Early STEM. The event highlighted the importance of expanding, improving and supporting STEM education for young children.

"The Science Guy" Visits Goddard
Celebrity science educator and television personality Bill Nye toured Goddard's facilities on May 19. The center's scientists briefed Nye on Goddard's latest work in Earth science and detailed the latest progress on the James Webb Space Telescope.

Goddard Observes Asian Pacific American Heritage Month
The Goddard Asian Pacific American Advisory Committee and the Goddard Chinese American Club sponsored a tasting event and several entertainment performances during a celebration on May 3.

GoddardView

On the cover: John Mather, senior project scientist for the James Webb Space Telescope, looks on as engineers stand the telescope's primary mirror upright for the first time.

Photo credit: NASA/Goddard/David Friedlander

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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.

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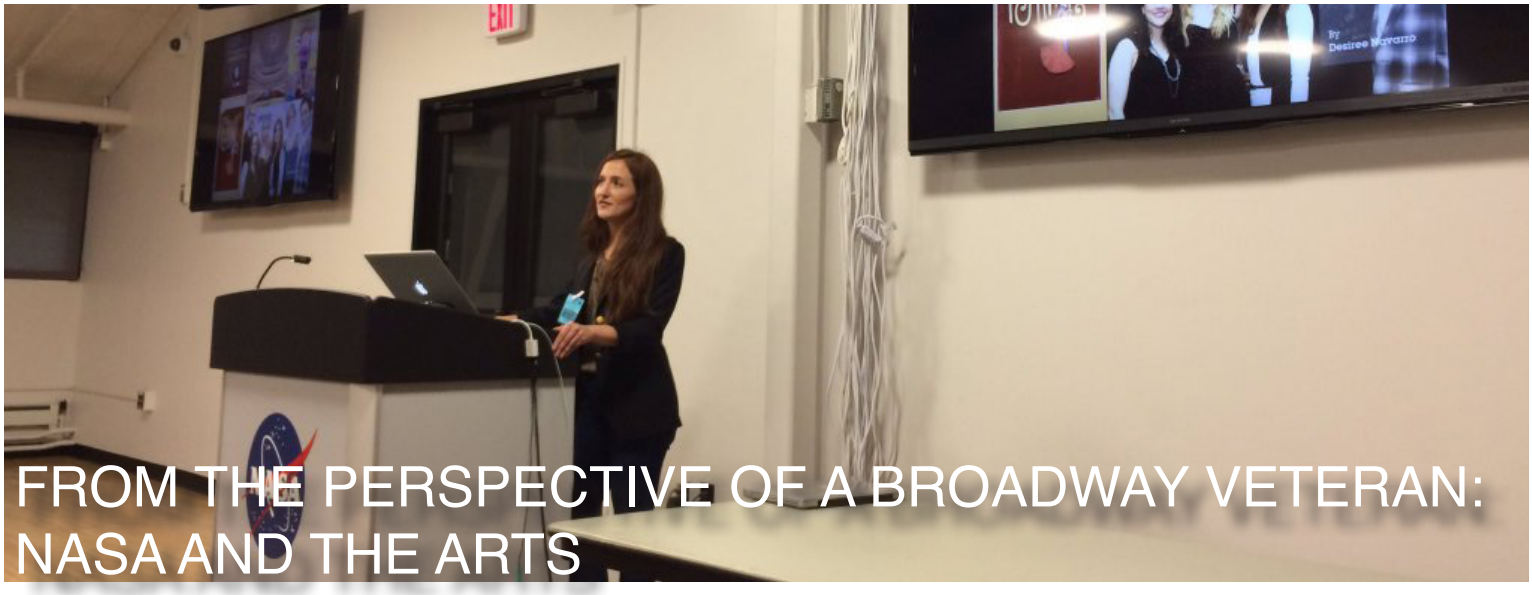


FROM THE PERSPECTIVE OF A BROADWAY VETERAN: NASA AND THE ARTS

By Clare Skelly

Former Broadway actress Christine Nolan grew up thinking the arts and sciences were two separate entities. However, while on tour for the Tony Award-winning musical "Hair," her curiosity about space spiked after reading "Hyperspace" by Michio Kaku.

The book focuses on how forces function within higher dimensions. "It allowed my imagination to run wild," Nolan recalled during a talk at NASA's Goddard Space Flight Center.

During her presentation, arranged by the center's Music and Drama Club – or MAD – Nolan discussed her journey to the Great White Way and drew parallels between the performance world she knows well and the science world she grew to have a genuine passion for.

Nolan has explored the overlap between the arts and sciences. She recounted how she discovered the NASA arts program, which was launched in the early 1960s by the agency's then-Administrator James Webb.

"Important events can be interpreted by artists to give a unique insight into significant aspects of our history-making advances into space," Webb explained in a 1963 press release. "An artistic record of this nation's program of space exploration will have great value for future generations."

More than half a century later, Nolan is one who understands this value. She actively promotes the inclusion of the arts in the curriculum-based idea STEM – or science, technology, engineering and math. The so-called STEAM movement adds art and design to the innovation equation.

Nolan's favorite piece of artwork in the NASA collection is "Grissom and Young" by Norman Rockwell. It depicts astronauts Gus Grissom and John Young dressed in spacesuits for the first flight of Project Gemini in March 1965. NASA even loaned Rockwell a Gemini spacesuit in order to make the painting as accurate as possible.

"I believe the arts and sciences work in tandem," Nolan said. "The arts are a wonderful tool that NASA uses more than people realize, in both a functional sense as well as to communicate NASA stories to the public."

For instance, Paula Cain – a Goddard engineer technician – uses her design experience and skills to make custom thermal blankets that protect oddly shaped satellites in space. She used to make clothes and purses.

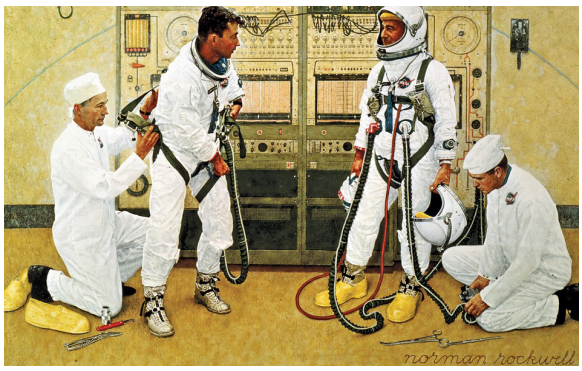
"We have to use the arts as a recruiting tool to bring in young, talented minds beyond the traditional scientists and engineers," Nolan added.

While Nolan holds a bachelor's in fine arts from the Boston Conservancy, she hopes to return to school and pursue a science-related field of study. She'll know who to ask for help, should she need it.

"Is anyone here really good at physics and math?" she rhetorically asked the crowd. ■

Above: Former Broadway actress Christine Nolan discusses her artistic and scientific influences during her presentation. Photo credit: NASA/Goddard/Katrina Jackson

Below: Norman Rockwell's "Grissom and Young" – Nolan's favorite piece of artwork in the NASA collection. Image courtesy: Smithsonian National Air and Space Museum



SUPER PRESSURE BALLOON BEGINS GLOBETROTTING JOURNEY

By Jeremy Eggers

NASA successfully launched a super pressure balloon from Wanaka, New Zealand, on May 17, for a potentially record-breaking, around-the-world test flight. The balloon will test and validate the SPB technology with the goal of staying afloat for at least 100 days at midlatitudes.

In addition, the gondola is carrying the Compton Spectrometer and Imager (COSI) gamma-ray telescope as a mission of opportunity.

“The team performed a brilliant launch operation today,” said Debbie Fairbrother, chief of NASA’s Balloon Program Office, which is managed out of NASA’s Wallops Flight Facility in Virginia. “The balloon is pressurized, healthy and well on its way for this important test mission.”

NASA estimates the balloon will circumnavigate the globe around the Southern Hemisphere’s midlatitudes once every 1 to 3 weeks, depending on wind speeds in the stratosphere.

“The successful launch demonstrates the value of an experienced scientific ballooning team and represents a partner NASA can count on,” said John Pullen, vice president and general manager of the technical services division of Orbital ATK’s Space Systems Group. “The NASA/Orbital ATK Columbia Scientific Balloon Facility team executed flawlessly on the mission and reinforced Wallops Flight Facility’s position as the world leader in scientific ballooning operations.”

The launch marked the beginning of the second SPB flight for COSI, a NASA-funded mission designed to probe the mysterious origins of galactic positrons, study the creation of new elements in the galaxy, and perform pioneering studies of gamma-ray bursts and black holes. Long-duration flights are vital to these types of studies.

Another mission of opportunity is the Carolina Infrasound instrument – a small, 3-kilogram payload with infrasound microphones designed to record acoustic wave field activity in the stratosphere. Developed by the University of North Carolina at Chapel Hill, previous balloon flights of the instrument have recorded low-frequency sounds in the stratosphere, some of which are believed to be new to science.

NASA’s balloon experts at CSBF and Wallops will monitor and control balloon flight operations throughout the mission.

“We’re absolutely delighted to see NASA’s visit culminate in another successful launch,” said Ralph Fegan, Wanaka Airport operations manager. “The project has provided fantastic exposure for our region and New Zealand to date, and this launch has helped us consolidate our relationship with NASA and its global balloon program. It’s been a pleasure to welcome the team back again, and we’re very grateful to our airport users, neighbors and the wider community for their ongoing support.”

The science and engineering communities have previously identified long-duration balloon flights at constant altitudes as playing an important role in providing inexpensive access to the near-space environment for science and technology. The current record for a NASA super pressure balloon flight is 54 days.

On May 31, just two weeks after launch, the balloon completed its first circumnavigation of the globe.

The balloon’s flight is monitored in real time from CSBF in Palestine, Texas. As the balloon travels around Earth, it may be visible from the ground, particularly at sunrise and sunset, to those who live in the Southern Hemisphere’s midlatitudes, such as Argentina and South Africa. ■

Above: The super pressure balloon prepares to launch on May 17 from Wanaka, New Zealand.

Photo credit: NASA/ Wallops

IN WEBB SPINOFF CHALLENGE, NASA'S PRESENT MEETS ITS FUTURE

By Darrell Dela Rosa

Launching in 2018, the James Webb Space Telescope will be the most powerful space telescope ever built, examining the universe's most distant stars and galaxies from its perch a million miles away from Earth. Like a caterpillar morphing into a butterfly, Webb will unfold itself from the compact space of a rocket payload capsule and settle into its final form – ready to spread its wings.

While engineers at NASA's Goddard Space Flight Center are diligently preparing the telescope for its eventual metamorphosis deep into the cosmos, the engineers of tomorrow have another transformation in mind: repurposing Webb's embedded technologies to address matters here on Earth. Since 2011, the NASA RealWorld-InWorld Challenge has engaged teams of aspiring engineers at high schools across the country in developing hypothetical solutions to problems using elements from Webb's rich technology portfolio.

"The James Webb Space Telescope captures students' imaginations and offers new insights into our universe," said Sharon Bowers, associate director for the Center for Integrative STEM Education at the National Institute of Aerospace, which manages the competition that is now part of Goddard's OPTIMUS PRIME Spinoff Promotion & Research Challenge – named after the robot-themed cartoon and film series TRANSFORMERS. "Webb technology and the 3-D digital tools used by the students are a perfect pairing for an engineering design challenge."

This year, as in past competitions, teams were paired with college mentors who helped assess and improve the design of each spinoff, provided guidance on best presentation practices, and assisted in the development of 3-D models and knowledge spaces within NIAUniverse – a 3-D, multi-user virtual platform. Two such mentors were David Sugg and Kelly DeRees, winners from last year's competition who are now freshmen engineering students at the University of California at Irvine and The Ohio State University, respectively.

"One measure of success for InWorld OPSPARC is when students' excitement is sustained over time. Participants who return as college mentors demonstrate that this challenge is a pathway for STEM education," Bowers added.

With ideas ranging from better air filtration and foldable homes to solar-powered trains and various aspects of environmental sustainability, this year's breadth of spinoffs was one of the widest yet.

"The students gave very impressive presentations showing creativity and originality," said Jody Davis, a Goddard aerospace engineer who previously worked at NIA. "You could tell they put in a lot of hard work in thinking of creative ideas."

During a two-day session at Goddard, Davis and Bowers joined several other panelists – including Goddard Technology Liaison Specialist Erin Majerowicz, Goddard Astrophysics Director Mark Clampin and Webb Social Media Lead Maggie Masetti – to evaluate the entries of six finalists.

Through NIAUniverse, teams made their pitch virtually as lifelike avatars. They were assessed on such criteria as knowledge about Webb technology, realistic 3-D virtual models, an effective marketing plan, workability of their spinoff design and lessons learned.

"This challenge is a great chance for the students not only to show technical proficiency, but also how to come together and work as a unit," said Masetti. "We've had teams of students that have had to work around time differences and distance to create a cohesive project and presentation."

The winning team will be recognized at Goddard in June during a ceremony featuring Peter Cullen, voice actor behind OPTIMUS PRIME. In what will be a bridge between NASA's present and its possible future, the winners will also have the opportunity to present their design to Paul Geithner, Webb deputy project manager.

"This experience has the power to help crystallize the students' passion and interest in STEM. Presenting in front of Paul Geithner brings the collaboration and experiences full circle," said Bowers. "Better than most, students who participate in InWorld OPSPARC know the power of technology." ■

Center: A panel of judges evaluates team presentations via the NIAUniverse virtual platform during the final round of InWorld OPSPARC. Photo credit: NASA/Goddard/Debora McCallum


NASA
Goddard Visitor Center

40 YEARS OF THE GODDARD VISITOR CENTER: LOOKING BACK AND WHAT'S NEXT

By Ashley Morrow

This year, the Goddard Visitor Center marks 40 years of showcasing the spaceflight center's work to more than a million guests.

"In many cases, this is all the public sees of Goddard, or even NASA," said Kristin Metropoulos, Goddard Office of Communications program manager for the visitor center. "We get a lot of walk-in visitors. Our goal is to engage them and inspire them so they'll want to learn more."

The visitor center opened on May 18, 1976, in a building that previously housed an experimental radio station for the National Institute of Standards and Technology. The building also served as a storage facility for Goddard's maintenance equipment before it was converted to a visitor center with exhibits that featured Goddard's early work. They included a weather station and a display of weather photos, as well as a model of an Orbiting Astronomical Observatory satellite from an early series of astrophysics missions, plus a demonstration of Goddard's communication networks that connect spacecraft to the ground, a model of the solar system and more.

The opening received much fanfare. Numerous local figures attended, including a U.S. Senate staffer, a TV meteorologist, representatives of the local chapter of the NAACP, and Goddard and NASA Headquarters employees.

Since then, the visitor center has grown and evolved alongside Goddard as a whole, hosting countless tours, events and launch viewings. In the 1980s, the visitor center was renovated to create more room for new exhibits, such as a retrospective view of space satellites and a video game that allowed guests to design, build and launch their own satellites. In the 1990s and early 2000s, exhibits for some of Goddard's most famous missions, including the Hubble Space Telescope and several Earth-observing missions, filled the visitor center.

The Goddard Office of Communications refreshes the visitor center with an overarching story in mind, using a variety of science and engineering work as a foundation. In early 2015, the visitor center debuted "Solarium," a whole new type of exhibit that uses imagery of the sun from the Solar Dynamics Observatory to create an immersive digital art installation.

"The point of the exhibit is to connect people to an experience or a feeling and get people interested in NASA's work in heliophysics," Metropoulos said.

The James Webb Space Telescope added its exhibit in 2015. Regarded as the successor to the Hubble Space Telescope, Webb will study the universe in the infrared portion of the electromagnetic spectrum. The exhibit gives visitors a close-up view of a full-size replica of one of Webb's gold hexagonal mirror segments. It also features an interactive piece in which guests see their image in visible light and infrared.

Two more exhibits are expected to open in 2017: an interactive Earth science exhibit as well as an introductory display about Goddard's overarching mission and history.

In addition to exhibits, the visitor center gives wildly popular tours of the Spacecraft Integration and Test Facility in Building 7. Spots fill up months in advance, reflecting in part on a great team – employees and volunteers who make each tour special.

Visitors also have the opportunity to participate in a number of public and education events, such as the monthly Sunday Experiment – featuring free activities focused on NASA's missions – for elementary and middle school students and their families, or public lectures on topics near and dear to Goddard. The next such lecture will focus on a mission approaching its biggest milestone this summer. On June 22, the visitor center will host "Mission Juno: Unlocking the Secrets of Jupiter" with Goddard astrophysicist John Connerney. Juno is expected to arrive at Jupiter on July 4 to begin unraveling the giant planet's origin and evolution.

Four decades later, the Goddard Visitor Center continues to spark the imaginations of tens of thousands of guests a year with its wide variety of exhibits, programs and more. ■

Center: Entrance to the Goddard Visitor Center's exhibit gallery. Photo credit: NASA/Goddard

Opposite, top: The opening ceremony for the visitor center in 1976. Photo credit: NASA/Goddard

Opposite, bottom: Guests gather at the visitor center during a community day event in 1993. Photo credit: NASA/Goddard

Salema Bridges

Code 600, Student Trainee (Accounting and Budget)

Why Goddard?: I like the idea of working for an organization focused on interesting space missions and research.

Hobbies/interests: traveling, art, dance

Scott Shipman

Code 221, Realty Specialist

Why Goddard?: I want to experience a new challenge and be part of a dynamic organization.

Hobbies/interests: golfing, hiking

Batuhan Osmanoglu

Code 618, Research Physical Scientist

Why Goddard?: I always wanted to build scientific instruments to address specific science questions.

Hobbies/interests: my son, cars, computers

Charlotte Brock

Code 114, Learning Consultant

Why Goddard?: There are billions and billions of reasons.

Hobbies/interests: science fiction, triathlon training, writing, camping, current events, community

Jana Gill

Code 113, Supervisory Human Resources Specialist

Why Goddard?: NASA and Goddard have such compelling missions and are ranked high in employee engagement.

Hobbies/interests: music, theatre, shopping

Jonathan Burroughs

Code 383, Chief Safety and Mission Assurance Officer

Why Goddard?: I always had a deep interest in science and technological advances gained from space exploration.

Hobbies/interests: photography, movies, sports

EMPLOYEE SPOTLIGHT

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

Margaret Hudson

Code 549, Pathways Intern

Why Goddard?: It's NASA. I'm pretty sure everyone wants to work here.

Hobbies/interests: karate, cooking, dancing, fixing cars

LEFT BRAIN, MEET RIGHT BRAIN: GODDARD ENGINEER MOONLIGHTS AT ART SCHOOL

By Lori Keesey

It all started because Paul Mirel, creator of an important enabling technology for the Goddard-developed Primordial Inflation Polarization Explorer – a soon-to-launch balloon mission which will search for a predicted signature of primordial gravitational waves that would prove that the infant universe expanded far faster than the speed of light – wanted to give his then 3-year-old niece a birthday gift she would never forget.

While she loved coloring books, she also had an affinity for princesses, so Mirel set out to create a dress that would befit royalty, equipping it with tiny light-emitting diode bulbs that would change patterns and colors depending on how his niece moved.

"A friend said, 'You have to talk with an Annet Couwenberg. She will love what you're doing,'" Mirel recalled, referring to one of the instructors at the Baltimore-based Maryland Institute College of Art (MICA) who teaches a fiber and technology class.

Mirel contacted the instructor, thinking he might be able to help the institute's various departments. The school took him up on his offer.

His offer has since evolved into a paid position. For the first year, he volunteered at MICA's Digital Fabrication Studio, a state-of-the-art facility that houses 3-D printers and other equipment that students use to model and create everything from violin bows and microfibers to actual art objects.

He now works as a visiting engineer for MICA's Graduate Studies Department and teaches workshops on mechanism design for a toy design class and electronics for an interactive animation class.

"Paul's skills are so valuable," said Ryan Hoover, an artist and instructor at the studio. "Artists sometimes don't approach things in an efficient way. If we want artists to interpret the world, they need a strong understanding of technology and how it is shaping our world. Paul is providing that for us."

From his evening and weekend moonlighting job, which he sees as a hobby, Mirel has gained as much as he's given.

"One student built a 3-D printer from scratch," Mirel said. "They don't know what they 'can't' do, so they just jump in and see what happens."

Although the students have backgrounds in sculpture and artistic design that would appear to be light-years away from the by-the-numbers perspective of engineers, they face the same electronic, mechanical, materials and software challenges — at least at MICA's fabrication studio, which is unique in offering its students an opportunity to experiment with 3-D printers and other technology as part of their instruction.

The difference is in how they approach their challenges, according to Mirel.

"I'm trying to make a connection between the art school and Goddard," he said. "I'm encouraging the students to apply for internships. I believe we all would benefit from a transfer of expertise in both directions."

As for his niece's gift, Mirel gave it to her for her fifth birthday, and she loves it. ■

Center: Goddard systems engineer Paul Mirel holding the variable-delay polarization modulator – which separates polarized light from nonpolarized light – that he created for the Primordial Inflation Polarization Explorer. Photo credit: NASA/Goddard/Bill Hrybyk

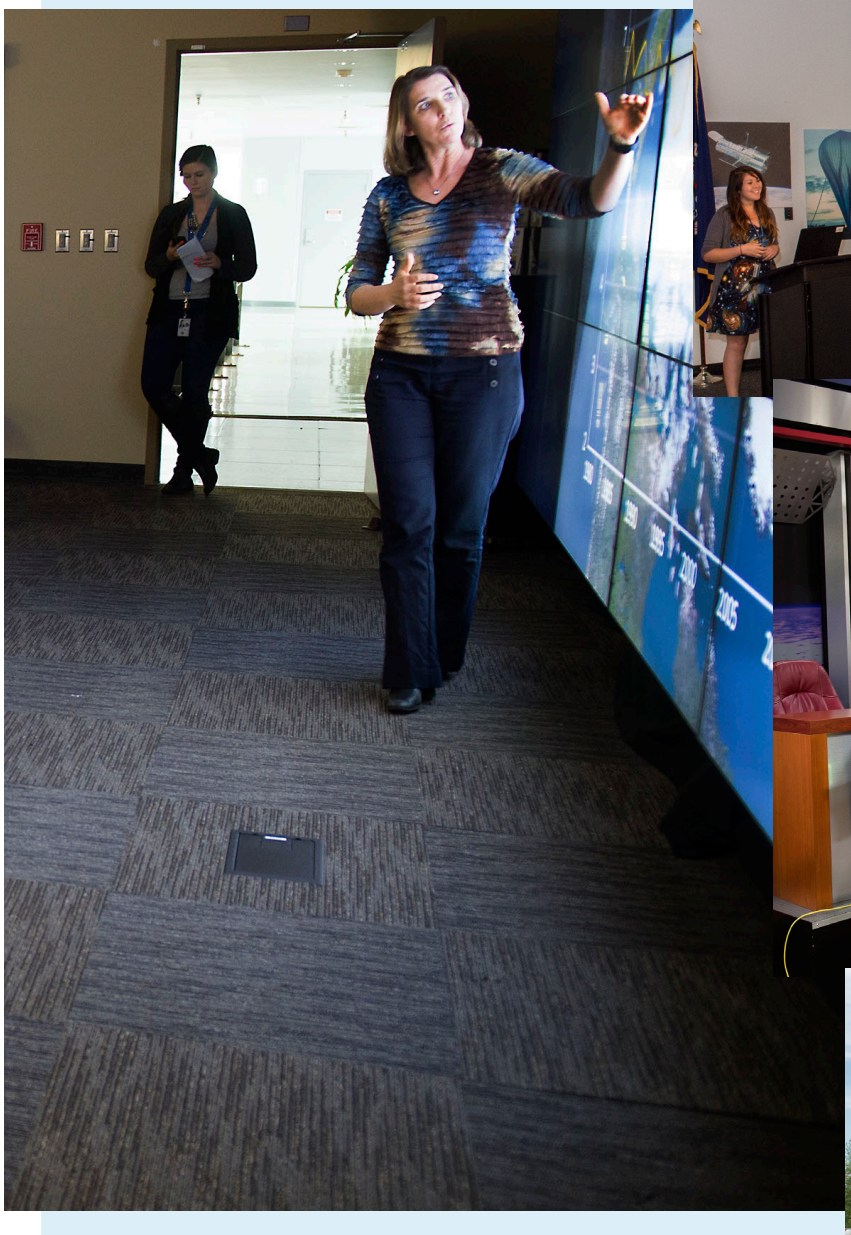
Below: The "princess" dress that Mirel designed for his niece, leading to an eventual teaching position at the Maryland Institute College of Art in Baltimore. Photo credit: NASA/Goddard/Bill Hrybyk

STUDENTS VISIT GODDARD ON

Founded in 1990, the Beating the Odds Foundation serves the needs of at-risk students in their quest to achieve success and live lives of purpose and meaning.

On May 13, as part of the foundation's leadership program, nearly 300 students from Pennsylvania came to NASA's Goddard Space Flight Center to learn more about the center's work as well as future careers in space exploration.

THE WAY TO BEATING THE ODDS



Following earlier visits to NASA Headquarters and the Smithsonian National Air and Space Museum in Washington, the middle and high school students observed the James Webb Space Telescope, the Spacecraft Integration and Test Facility and the production process behind the center's television studios. The NASA Center for Climate Simulation provided an overview of Goddard's latest work in Earth science, while the Goddard Visitor Center hosted presentations about the center and internship opportunities. ■

Photo credits: NASA/Goddard/Bill Hrybyk and Debora McCallum

WILLIAM V. CHAMBERS: HE'S THE MAGICMAN OF GODDARD

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 mechanical engineer and structural stress analyst. I test the strength of materials to calculate stresses in the structures that hold the spacecraft and instruments to be tested. I calculate the factors of safety to ensure that the structures don't break. These structures are holding the test item in place. If they break during a test, then the spacecraft or instrument may be damaged.

Have you been to any launches?

In my 27 years at Goddard, I've been to two Hubble servicing mission launches. I felt very proud to be part of the teams associated with each launch.

Why did you become an engineer?

Initially, I wanted to be a physicist. My first college major was physics, but I didn't like it. I wanted something more hands-on, so I switched to mechanical engineering. I like getting into the nuts and bolts of things.

Who is the most amazing person you have met or worked with at Goddard?

Dr. John Mather, our Nobel laureate, is the most humble person I've ever met and the most brilliant. He wrote a book called "The Very First Light," which is about Goddard's Cosmic Origin Background Explorer mission that launched in 1989 and is the basis for his prize. In his book, he specifically mentioned all the hundreds of people involved in COBE, including me. I have three or four interns I mentor every year. I usually buy each intern a copy, and he is always gracious enough to autograph every copy with personal notes.

He is an inspiration. When I first got to Goddard, I was in a meeting with Dr. Mather and others about the science expected from COBE. I was new and did not know him. Before he even knew me, he took the time to talk to me personally about COBE. He will do the same for anyone, including interns and even the mothers of interns.

What advice do you give to your interns?

I always tell my interns to ask questions about how things work. You have to ask questions to drill down to get to the essence of what is important. I tell them not to be afraid to ask a question and that there is no dumb question. There is an art to asking good questions and the more questions you ask, the better you get at developing good questions. You have to be curious and creative and not afraid to ask probing questions. You need to want to know what is next, where are we going and what is the next big thing.

I also say that learning is a social activity. Getting to know the people on your team will make working together more enjoyable and effective, and you'll also learn more.

What is an example of how you think creatively?

I've been a magician since I was 7. I needed a way to connect with people and be more social. I've performed for years. During the past Goddard open house on Sept. 26, 2015, I performed as a walk-around magician for six hours. I walked around performing close-up magic tricks with cards, coins, ropes and sponge balls. The children loved it.

I also volunteer one Sunday a month at the Goddard Visitor Center, where I combine magic with engineering. For example, when I talk about gravity and the lack of gravity in space, I do a trick with an antigravity rope that stays horizontal about 6 feet in the air.

Do you have another hobby?

I sing in a barbershop quartet. Since 2007, I have also been signing with the Chorus of the Chesapeake, a barbershop chorus in Baltimore. We are a chorus of 55 men. We compete internationally. In 2013, we competed in Toronto and were ranked 21st in the world.

What would be your six-word memoir?

Magic. Music. Humor. Social. Storyteller. Mentoring. ■

Center: Goddard engineer William Chambers demonstrates the floating ball trick.

Photo credit: NASA/Goddard/Chris Gunn