National Aeronautics and Space Administration

THE CRITICAL PATH

A FLIGHT PROJECTS DIRECTORATE PUBLICATION | 2023 FALL ISSUE

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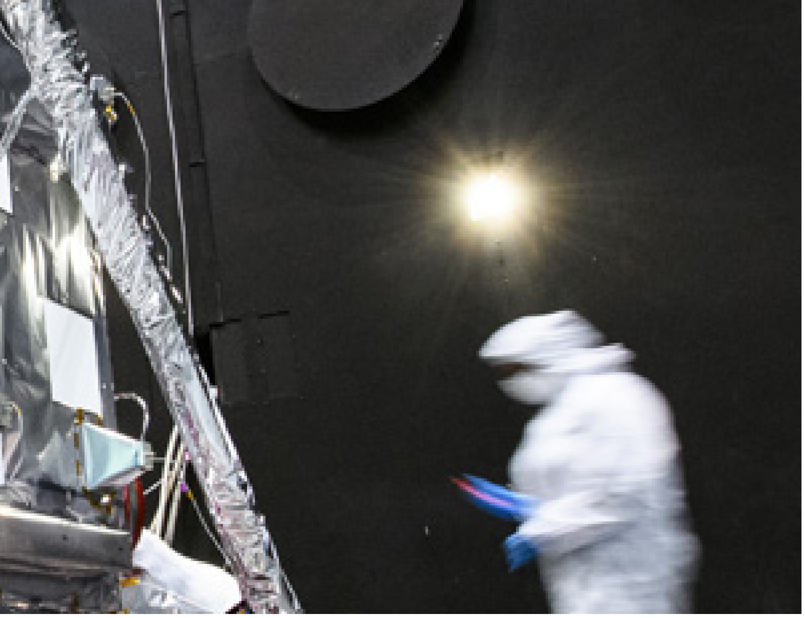
The PACE Observatory inside the SES Chamber prior to Thermal Balance Testing at NASA Goddard Space Flight Center in Greenbelt, MD. CREDIT: NASA/DENNY HENRY



THE CRITICAL PATH
A FLIGHT PROJECTS DIRECTORATE PUBLICATION ■ 2023 FALL ISSUE

Congratulations to Cynthia Simmons!

Previously serving as FPD's Director of Flight Projects, Cynthia was recently selected as Goddard's Deputy Center Director.

We are extremely grateful for her time in FPD and her continued leadership and engagement in FPD's work in her new role.

PUBLISHED BY THE FLIGHT PROJECTS DIRECTORATE

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The deadline for the next issue is **March 15, 2024**

DOWNLOAD ISSUE

The PACE of Progress

The latest from NASA's Plankton, Aerosol, Cloud, ocean Ecosystem (PACE) Mission

PACE Solar Array Lead, Jeffrey Twum, inspecting the Flight Solar Array prior to integration onto the Observatory.
CREDIT: NASA/DENNY HENRY

The Plankton, Aerosol, Cloud, ocean Environment (PACE) mission will investigate how Earth's atmosphere and oceans exchange carbon dioxide. Its new technology will advance the study of phytoplankton, tiny organisms in Earth's oceans; clouds; and aerosols, small particles that are suspended in the atmosphere. PACE's radiometric and polarimetric measurements will build on NASA's strategic investments in high-quality ocean ecological, ocean biogeochemical, cloud, and aerosol particle data, adding to existing climate and Earth system records and answering new questions about Earth's complex ocean systems and changing climate.

The PACE Observatory team has shown unparalleled commitment to the NASA mission and has performed an incredible amount of work.

GSFC In-House Spacecraft: Starting in September 2021, the PACE Spacecraft team worked to integrate 24 major components/assemblies (9 of which were built in house). Many disciplines, including the mechanical, thermal, electrical, and integration and test (I&T) teams, worked together to manage these components and assemblies. The spacecraft team conducted thousands of hours of powered testing, plus hundreds of hours of unpowered work, like alignments, blanketing, and harness routing. The PACE Spacecraft was officially delivered in October 2022.

GSFC In-House Instrument: The Ocean Color Instrument (OCI), PACE's key science payload, will enable scientists to map ocean color, measuring not only the visible spectrum, but also collecting ultraviolet to short-wave infrared radiance data.

After starting flight I&T in 2021 and assembling the instrument suite, which was designed almost entirely in house, the OCI team completed environmental testing and delivered OCI to the PACE Observatory in November 2022.

Contributed Science Instruments: The full science power of the PACE Observatory is unlocked by two contributed polarimeter instruments that will complement OCI's radiometric data: the Hyper-Angular Rainbow Polarimeter 2 (HARP-2), built and tested by the University of Maryland, Baltimore County, and delivered in November 2022, and the Spectro-Polarimeter for Exploration (SPEXone), built and tested by the Netherlands Institute for Space Research and Airbus and delivered in July 2022. Both instruments will offer capabilities for atmospheric aerosol and cloud science far beyond what OCI can accomplish alone.

The PACE Mechanical team performing a lift of the PACE Observatory in preparation for the Flight Solar Array Deployment. CREDIT: KATIE MELLOS

Key Review Milestones: The PACE team successfully completed its System Integration Review in November 2022, paving the way for instrument integration onto the spacecraft. The team also successfully completed its Pre-Environmental Review in January 2023, enabling PACE to embark on an incredibly successful environmental test campaign.

Environmental Testing: Once the three science instruments were integrated, the PACE Observatory completed its extraordinarily thorough "comprehensive performance test" (CPT), and then the team moved into electromagnetic interference/compatibility test, mechanical environments, and thermal balance/thermal vacuum testing. The team completed the bulk of the environmental tests, including pre-and post-CPT activities, in an impressive eight months.

Mission Operations: The PACE Observatory team also performed several critical mission simulations in concert with the Goddard-based Mission Operations Center and the Flight Operations and Science Data Segment teams. These simulations prepare the entire team for the sequence of events that immediately follow launch: commissioning and initial operations, during which they will bring PACE online and begin collecting science data.

Mission-Enabling Technology Development: The PACE team implemented new technologies for next-generation GSFC in-house missions. For example, PACE uses uplink encryption, which is now required for low Earth orbit missions. PACE will also be the first mission to demonstrate delay-tolerant networking (DTN), which is brand new to Goddard missions. These technologies have performed well in ground testing, and their use on orbit will further demonstrate their fidelity for future missions.

Finishing Touches Before Shipping: The PACE Observatory team is completing the last of its post-environmental tests and re-integrations, including re-integration and testing of the flight solar array, post-environmental system alignments, installation of the flight battery, and launch day script dry runs, before shipping PACE to the launch site in mid-November.

We are extremely proud of the hard work and incredible dedication of the PACE team, who adapted to the pandemic and programmatic uncertainties to deliver this fully qualified observatory to the launch site! To find out more about PACE, visit https://pace.gsfc.nasa.gov/. We hope you'll join us in cheering PACE on as it launches from Cape Canaveral early next year! ■

Veronica Pinnick / Code 568
PACE Integration & Test Manager

The PACE spacecraft bus with mass simulators is lifted into the Modal Facility at NASA's Goddard Space Flight Center in preparation for strength pull testing.
CREDIT: NASA/DENNY HENRY

Congratulations to the XRISM team!

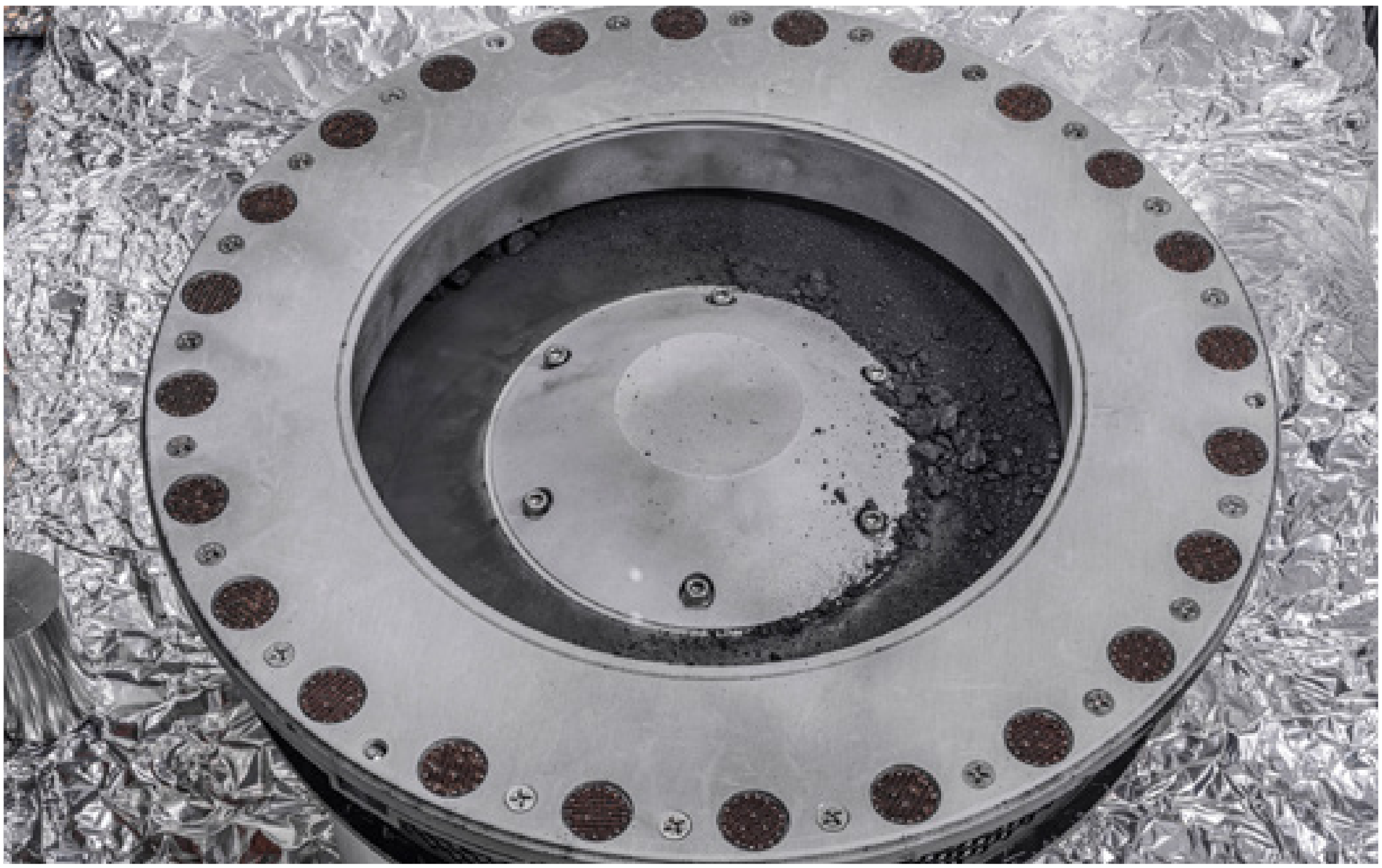
Congratulations to the X-ray Imaging and Spectroscopy Mission (XRISM) team on the successful launch on September 7 (September 6 in the United States) from Tanegashima Space Center in Japan. We look forward to XRISM's discoveries as it studies the most energetic objects in the universe, with continued support the Japan Aerospace Exploration Agency (JAXA), ESA (European Space Agency), and other partner organizations. On September 11, JAXA announced the end of the critical operation period, which is the period after the separation of the satellite from the launch vehicle until the satellite can maintain a stable and safe condition. XRISM has entered the commissioning period, which will last about three months to verify the functions of the satellite's onboard equipment.

For more information about the XRISM project, see: https://heasarc.gsfc.nasa.gov/docs/xrism/index.html

Congratulations to the OSIRIS-REx team!

RETURNED!

SEPTEMBER 24TH



Congratulations to the Origins, Spectral Interpretation, Resource Identification, and Security-Regolith Explorer (OSIRIS-REx) sample return team! O-REx, the first U.S. mission to collect a sample from an asteroid, delivered rocks and dust from asteroid Bennu to Earth on September 24, 2023. The pristine material from Bennu – which the spacecraft collected from the asteroid's surface in 2020 – will offer generations of scientists a window into the time when the Sun and planets were forming about 4.5 billion years ago. After its sample delivery, OSIRIS-REx continued on to a new mission to asteroid Apophis and was renamed OSIRIS-APEX (OSIRIS-Apophis Explorer).

Learn more about the OSIRIS-REx mission: https://science.nasa.gov/mission/osiris-rex/

Photographers Keep PACE

How FPD's technical photographers record the building of a spacecraft

Technical photographers Mike Guinto, Barbara Lambert, Katie Mellos, Desiree Stover, and Denny Henry pose for a group photo in front of the PACE Observatory. CREDIT: NASA

By the time the Plankton, Aerosol, Cloud, ocean Environment (PACE) Observatory launches early next year, it will have been photographed over half a million times. When a spacecraft at Goddard undergoes assembly and then integration and testing (I&T), a team of photographers records every step. On PACE, there's a visual record of every piece of hardware and procedure that went into building and testing the spacecraft. That imagery can be crucial for ensuring that work was done correctly or investigating anomalies.

The Flight Projects Directorate (FPD) technical photographers that capture the visual record have a unique role at Goddard. During assembly and I&T, they're often on the floor with the technicians and engineers from start to finish. While the technicians execute their work plans, the photographers find ways to record every little detail—all of the circuit boards, cables, blankets, motors, and instruments that make up a Goddard-built spacecraft.

The assembly and I&T processes are like a carefully choreographed dance, and the photographers must learn to join in to get their shots.

> **"Everybody's role is something different and that's what they're focused on. A lot of fitting in with the techs on the floor is trust—they need to be able to trust us to be around their hardware."**
>
> *- KATIE MELLOS, PHOTOGRAPHER*

An electrical technician repairs a piece of electrical equipment on the PACE spacecraft CREDIT: NASA/KATIE MELLOS

The PACE spacecraft bus with mass simulators installed is lifted into the vibration testing facility.
CREDIT: NASA / DENNY HENRY

That trust is often built through training. If the spacecraft technicians go somewhere, chances are the photographers do too, which means they need to train to work at dizzying heights, in tightly enclosed spaces, in environments that are highly sensitive to static electricity, and of course in Goddard's famous clean rooms, where everybody inside dons white "bunny suits" to avoid contaminating equipment. They might find themselves taking photos of tiny bolts while suspended 40 feet in the air above a spacecraft. In a moment like that, they have to put aside any nervousness and concentrate on getting the shot.

"The I&T facilities become your office," photographer Denny Henry said. And the needs of the spacecraft dictate the schedule. The photographers will get last-minute calls to come shoot a task, and they back each other up to ensure that they can always cover the work that's being done.

Technical photographers come from a range of backgrounds—photojournalism, corporate communications, wedding and event photography, and jack-of-all-trades freelancing—but must quickly come up to speed on the NASA project lifecycle and the process of building a spacecraft, from the first circuit boards to the final payload fairing.

In fact, technical photography is often the complete stylistic opposite of fine art photography. A photographer shooting a wedding might try to maximize bokeh—that swirly, blurry effect you see in the background of a portrait. A Goddard technical photographer would want the entire image to be sharp throughout, which presents its own set of challenges, like shooting with a narrower aperture, which in turn requires more light or a higher sensor sensitivity setting to capture a clear im age. Clarity is essential; a key part of technical photography is capturing imperfections: tiny scratches, flecks of dust, or a hairline crack in a solder joint that can affect a spacecraft or instrument's performance down the road. The photographers balance all these considerations during a shoot, adjusting on the fly to get accurate, useful images, no matter the shooting conditions.

"We like to make pretty pictures," Henry said, "but we also make a lot of 'ugly' pictures that show what needs to be shown. The way I use flash here is way different than I would use it previously. Before, I'd try to bounce it to be flattering; now, if I give it soft light and the dust disappears, that's not helpful to anyone."

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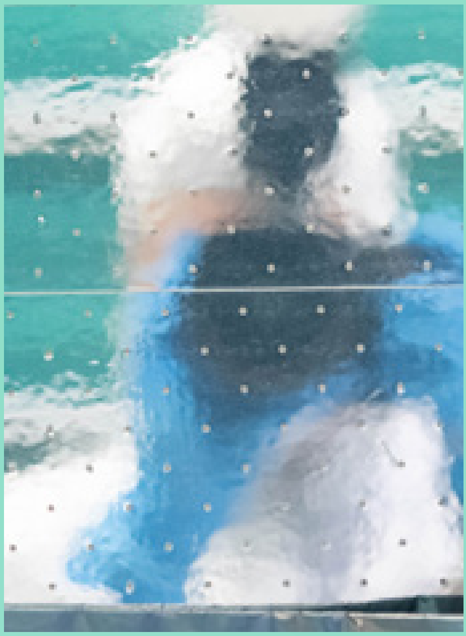
The team also creates time-lapse videos. By placing cameras in strategic spots around the workspace, they can capture an entire process—assembling major hardware, moving in or out of a test chamber, or executing a lift—from start to finish. In the resulting sped-up footage, you can watch a spacecraft move across the I&T floor as technicians scurry around—hours or days of work compressed into seconds. The team created one such time-lapse for the Ocean Color Instrument (OCI), the main instrument aboard PACE, and is currently working on one for the entire spacecraft build. "You can watch the spacecraft being built from the ground up," Mellos said. "Videos show everything: every person involved, everything that's done."

Digital cameras and editing software have made it easier to quickly capture and refine images and video, but that wasn't always the case. Photo documentation at Goddard has its origins in the film era, when the Hubble Space Telescope was preparing to launch.

FPD technical photography lead Barbara Lambert worked on the first photo documentation retrieval system, which would be used on the Hubble project, and was a photographer on the first iteration of what would become the modern Godard photo documentation process, taking photos that would be used for "crew familiarization"—training astronauts on Hubble's hardware.

Lambert continued to work on Hubble's photo documentation team, capturing a live feed from divers in the neutral buoyancy pool where astronauts were training to service Hubble and developing an early database that saved all of the original



"Technical selfie" by Katie Mellos, reflected in thermal material on the PACE spacecraft.
CREDIT: NASA/KATIE MELLOS

Hubble photos on optical disks. The photos would later be crucial for training the astronauts who conducted the famous Hubble servicing missions, first to correct an aberration in the telescope's primary mirror, and later to make repairs and install new scientific instruments. The photos provided an exact record of how the hardware would look when astronauts arrived to work on it, allowing them to train with extreme precision. Lambert also helped to evaluate and select a camera that was mounted to the astronaut's workstation at the end of the shuttle's robotic arm to capture closeout photos in orbit.

That need for a detailed visual record hasn't changed. PACE mission system engineer Gary Davis said that just having photographs of a piece of hardware can be essential as a spacecraft undergoes the long

An OCI engineer adjusts ground support equipment for an OCI optical test.
CREDIT: NASA / DENNY HENRY

assembly and testing process. "That evidence is needed because these projects take so long—on the span of years. So, you forget what [a specific piece of equipment] looks like. Imagine if you had a kid and you didn't see them for three years. They'll look different!"

The photo record also helps spacecraft teams investigate on-orbit anomalies, as when one of the four Magnetosphere Multiscale Mission satellites was hit by a micrometeoroid. "It punched through a blanket and took out one of our heaters. The photos we had showed where the heaters and blankets were installed and what was behind them," Davis said "We were able to verify all the flight data by showing, 'This is probably where it hit, and where it went; this is the circuit that doesn't work anymore because it was hit.'" The visual record from the I&T process helped the spacecraft controllers confirm the telemetry from the spacecraft, account for the damage, and continue the mission. I&T photos also contain valuable clues for investigations that occur on the ground, before a spacecraft launches. If a failure during testing destroys a part, engineers can use the photo record to go back and see whether the part was defective or installed incorrectly, or whether the problem lies elsewhere.

But Davis also values the photos as a record of his colleagues at work. "One of the special things about Goddard is that we're not just watching [external] contractors do stuff," Davis said. "We're building, creating, and testing. It gives the public a sense of, here's a NASA team actually building a spacecraft. The photographers document that."

Denny Henry photographs PACE flight solar array panels. An OCI engineer adjusts ground support equipment for an OCI optical test.
CREDIT: NASA / GREG MERCER

Photographer Desiree Stover also described the camaraderie of working around a spacecraft: "I work with people from so many walks of life, and we come together for a shared purpose. I get to know people during downtime on shoots, and I've created some really great working relationships. The technicians I work with are like my brothers—one taught me to change the oil in my car." During the downtime between various tasks, the photographers will spot other compositions and take more artistic photos when the opportunity arises. Stover captured one such image while working on the James Webb Space Telescope. She realized that as the team rotated the spacecraft, one of its enormous mirrors would reflect the NASA seal and the Goddard logo painted on the adjacent wall. She lined up the shot and captured an image that has since appeared in dozens of publications.

Like anybody working on a spaceflight project, the photographers are eagerly awaiting PACE's upcoming launch. They will be in Florida with the rest of the team, documenting the process as PACE is mated to the rocket that will carry it to orbit and rolled out to the launchpad. The team has worked alongside PACE for years, literally seeing it come together. After launch, they'll move on to new projects, often starting back at the very beginning, photographing the delivery of the first components. "It'll be exciting but bittersweet," Henry said, "to wave goodbye as it goes up." ■

Greg Mercer / Code 420
Technical Writer, Earth Science Projects Division

GUSTO Launch to Propel Study of Complete Stellar Life Cycle

The Cosmic Ray Energetics And Mass (CREAM) experiment, a NASA Ultra-Long Duration Balloon (ULDB) similar to GUSTO, launched from the National Science Foundation's McMurdo Station, Antarctica on Dec. 16, 2004. CREDIT: NASA

The Explorers and Heliophysics Projects Division's (EHPD; Code 460) Galactic / Extragalactic ULDB Spectroscopic Terahertz Observatory (GUSTO) mission is a NASA partnership with the Johns Hopkins Applied Physics Laboratory (APL) and the University of Arizona (UA), with contributions from the Massachusetts Institute of Technology, the Netherlands Institute for Space Research, and NASA's Jet Propulsion Laboratory. GUSTO will fly on a zero-pressure Ultra-Long Duration Balloon (ULDB) scheduled to be launched from McMurdo Station, Antarctica in December 2023.

GUSTO's ULDB will **carry a telescope with carbon, oxygen and nitrogen emission line detectors**. These will be used to measure emissions from the interstellar medium (ISM), the cosmic material that exists between star systems. Specifically, **three types of surveys** are planned during mission operations; a Galactic plane survey (producing spectral line images of the Milky Way to provide insight into ISM phases), a Large Magellanic Cloud (LMC) survey (to investigate star formation in different environments), and multiple targeted deep surveys of the Milky Way and LMC. These surveys will allow GUSTO to act as a **'Rosetta Stone' for understanding the inner workings of our galaxy and the LMC.**

GUSTO will cruise at an altitude of around 120,000 feet, about 21 miles up, or three times higher than the average passenger jet, and above 99 percent of our atmosphere. At that elevation, GUSTO's far infrared detectors will be more easily able to study areas of our Milky Way galaxy and the nearby LMC. From there, the ULDB will take advantage of the local anticyclonic winds over the continent to remain in a circular flight path while in operation.

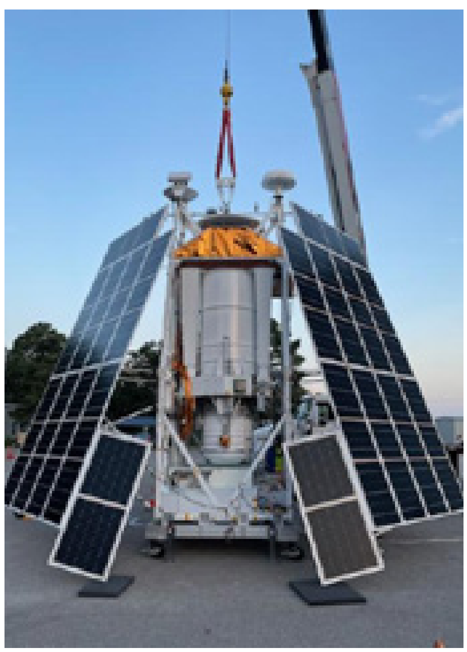
GUSTO is expected to continue operations over the continent for anywhere from 55 to 75 days, depending on local weather conditions. The GUSTO payload and instruments are solar powered, making the Antarctic summer, when the region is **in sunlight 24 hours a day**, an optimal period for operations.

GUSTO Observatory prior to Compatibility (Hang) Test, August 10, 2023, at CSBF.
CREDIT: NASA/MICHAEL SILBER

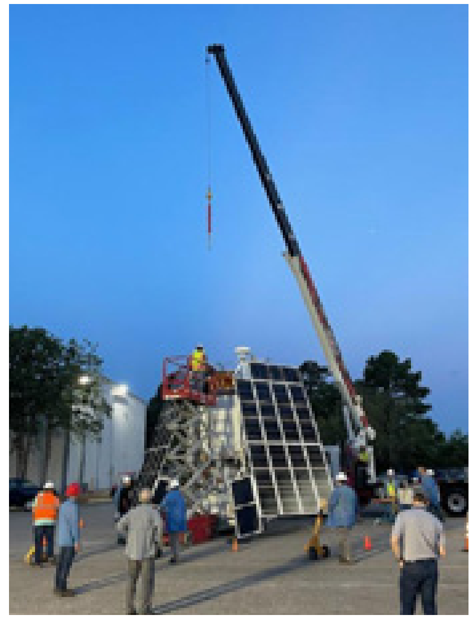
Principal Investigator Dr. Christopher Walker has **led UA's portion of the mission to provide the telescope and instrument**, while APL has **provided the balloon gondola and oversees mission operations**. Additionally, the Massachusetts Institute of Technology, the Netherlands Institute for Space Research, and NASA's Jet Propulsion Laboratory have **contributed detector technologies.**

Typically, similar balloon projects are initiated under a $5-10 million grant. GUSTO's est imated cost settled around $50 million, and the mission was moved under EHPD's Explorers program where it became the first balloon mission managed out of the program. There, LaMont Ruley serves as NASA's Mission Manager (MM) for GUSTO where he has led NASA's contributions and oversight of the mission's technical authority since June 2021.

The COVID-19 pandemic and technical issues presented substantial challenges to GUSTO's mission development lifecycle and launch schedule. GUSTO was initially scheduled to launch in December 2020, but required a replan due to the pandemic. This pushed back the next projected launch date until December 2021 due to the suspension of the entire NASA balloon program in Antarctica during that time. However, payload development also took longer than anticipated, and GUSTO was therefore unable to meet the December 2021 launch campaign's specific time constraints. NASA Headquarters then suggested a Continuation/ Termination review to take place in 2022. In February 2022, NASA personnel completed a pre-review as independent evaluators to ensure that GUSTO could meet threshold requirements.



GUSTO Observatory During Compatibility (Hang) Test, August 10, 2023, at CSBF.
CREDIT: NASA/MICHAEL SILBER



GUSTO initiates Compatibility (Hang) Test, August 10, 2023, at CSBF.
CREDIT: NASA/MICHAEL SILBER

The independent review team and the project then presented their findings at the NASA Headquarters Continuation/ Termination Review conducted on May 19, 2022, which GUSTO successfully passed.

Additional work then proceeded on the project to resolve technical payload issues, complete the payload integration and testing, and to prepare GUSTO for eventual shipment to Antarctica. On July 3, 2023, **GUSTO's integrated payload and gondola departed the APL campus** in Laurel, Maryland, the first step on its journey to McMurdo Station. GUSTO then arrived at the Columbia Scientific Balloon Facility (CSBF) in Palestine, TX, where additional hardware components (including antenna boom, antennas, and data/video transmitters) were successfully integrated with the observatory.

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Side-view of GUSTO Observatory During Compatibility (Hang) Test, August 10, 2023, at CSBF.
CREDIT: NASA/MICHAEL SILBER

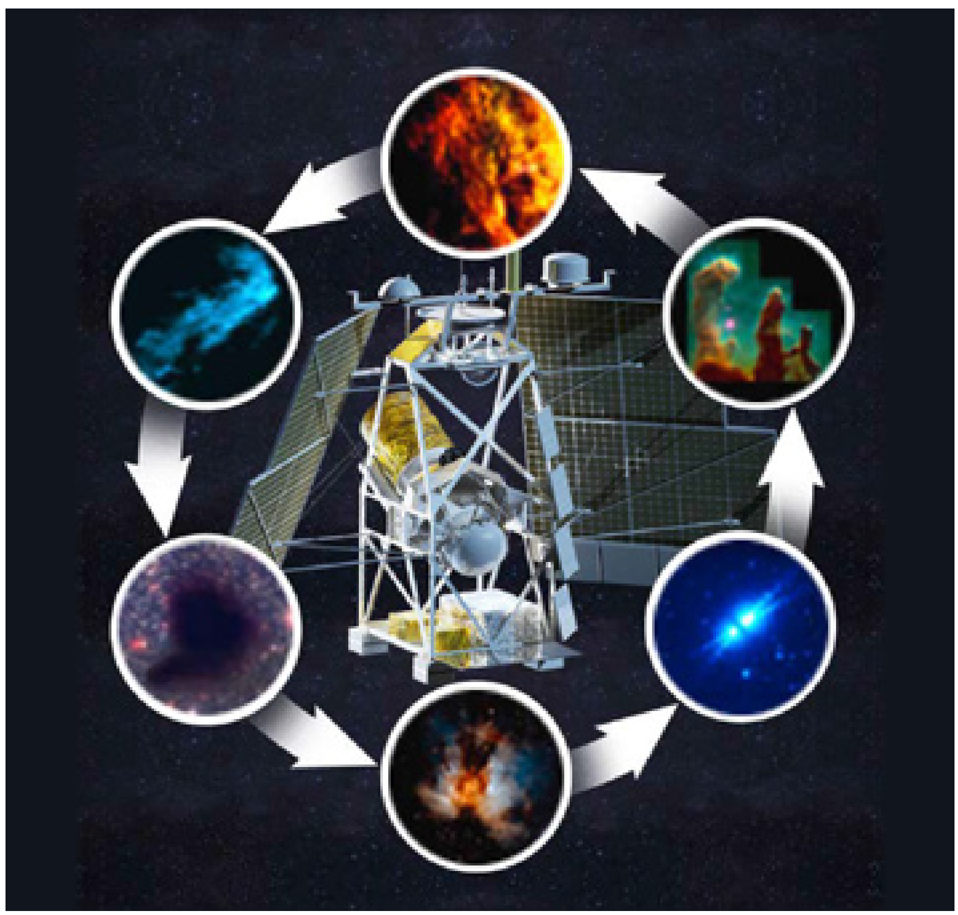
On July 8, 2023, GUSTO passed observatory integration and testing at CSBF. Afterward, the GUSTO team successfully completed compatibility "hang" testing on August 10, verifying telecommunications, power, attitude determination and control, and thermal tests. GUSTO then conditionally passed pre-ship review on August 21, verifying all flight data paths, with the observatory transmitting gondola and payload data.

GUSTO is currently on schedule to arrive in Antarctica with launch from McMurdo Station scheduled for December 2023 (during a launch window from December 5 through December 25). Once in operation, GUSTO will provide a wealth of scientific information.

After around 75 days in operation, GUSTO will approach a pivotal stage. According to Ruley, the PI (Dr. Walker) will then need to make the call to decide whether to maintain GUSTO's studies above the continent to gather as much science data as possible, or to terminate the mission earlier so that the instrument and gondola are easier to retrieve. If the balloon leaves the Antarctic landmass and drifts over open water, the chances of recovery become exceedingly slim. The PI may also terminate flight operations earlier if the balloon risks travelling out of retrieval range at any point.

The GUSTO team, including UA, APL, and NASA, has gone above and beyond to deliver a truly innovative balloon mission. As a first-of-its-kind Explorers balloon mission, GUSTO has encountered multiple challenges not typical for other (space-based) Explorers missions, or other balloon missions generally, yet the team has overcome each one. GUSTO's success will serve as a model for future balloon projects. Its progress is a testament to what cross-organizational collaboration, effective problem-solving, and a passionate dedication to the mission can accomplish. ■

J. Titus Stupfel / Code 460
Senior Technical Writer, Explorers and Heliophysics Projects Division



GUSTO uses large-scale surveys and spectral diagnostics of the Interstellar Life Cycle to address the science goals. CREDIT: NASA/UA/APL

AWE Launches to ISS to Study Atmospheric Gravity Waves via Airglow

The Explorers and Heliophysics Projects Division's (EHPD; Code 460) Atmospheric Waves Experiment (AWE) is a NASA Mission of Opportunity scheduled to launch to the International Space Station (ISS) in November 2023.

Built by Utah State University's (USU) Space Dynamics Laboratory (SDL), AWE will study how atmospheric gravity waves (AGW) created by Earth's weather interact with and contribute to space weather in the area surrounding our planet.

Primarily originating in the lowest level of the atmosphere, the troposphere, AGWs may be caused by strong weather events such as tornadoes, hurricanes, or even thunderstorms. As they travel upward into higher layers of our atmosphere, AGWs interact with the ionosphere-thermosphere-mesosphere (ITM) system.

AWE's location on the exterior of the ISS is therefore ideal for studying AGWs. There, AWE's Advanced Mesospheric Temperature Mapper (AMTM) instrument will be able to observe AGWs rising upward through the ITM system and create temperature maps of the AGW structures revealed by the colorful bands of light in our atmosphere, known as airglow.

Early on, the mission was intended as a more modest ground-based experiment. As ground or terrestrial aircraft solutions alone would supply information limited to local regional studies, NASA and SDL began to consider additional options for the mission. Therefore, AWE transitioned its implementation to a streamlined Class D Explorers Heliophysics mission with a $60 million lifecycle cost to include ground-based instrument measurement suites and the AMTM aboard the ISS. AWE's AMTM utilizes four identical telescopes, which together comprise an onboard wide-field-of-view imaging radiometer. This instrument will be installed on an ExPRESS Payload Adapter (ExPA) on the exterior of the ISS, where it will operate for two years.

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AWE Instrument, the Advanced Mesospheric Temperature Mapper (AMTM) CREDIT: NASA/SDL

AWE's four telescopes visible in cleanroom at SDL facilities on USU campus. CREDIT: SDL/ALLISON BILLS

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AWE instrument installed on the ExPA. Red fixtures protect crucial areas and will be removed prior to launch. CREDIT: SDL

The AWE team navigated various obstacles throughout its lifecycle to get to launch. As a Principal Investigator-led mission, SDL manages AWE with NASA's Explorers program holding technical authority. Additionally, the team had many project management firsts, being the first time SDL served as the prime contractor for a NASA mission and one of its EHPD Mission Manager's (MM) first projects. NASA's MM, LaMont Ruley, noted that the mission's foundation centered on good collaboration between NASA and SDL, including Project Manager, Burt Lamborn. Thanks to building strong communication into the project from the beginning, this productive working relationship enabled NASA and SDL to proactively resolve technical, schedule, or cost issues together. This was vital as the team mitigated risks following notification of issues with the vendor's primary subcontractor-supplied detectors.

The detectors immediately elevated to the project critical path, consuming nearly eight months of slack, and eventually overtaking the initial payload schedule. Initially, the project adjusted internally and through active engagement with the vendor was able to stay on schedule. However, subsequent challenges with the detectors risked more delays and necessitated schedule relief and replan. NASA and SDL held weekly meetings to work with the subcontractor. They assisted with testing and verified functionality on site at the subcontractor facility. The team identified additional heritage hardware replacement parts in advance of key need dates for the detectors and certified the new hardware from the same subcontractor vendor to ensure it met **Technology Readiness Level (TRL)** requirements. In the midst of determining a path forward, the project received additional schedule relief due to a launch site replan that also enabled the team to resolve the detector issues.

The team then pivoted to focus on updating its launch vehicle integration plan. Due to Sierra Space development delays, AWE transitioned to a SpaceX Dragon launch vehicle alongside the Integrated Laser communications relay demonstration Low-Earth orbit User Modem and Amplifier Terminal (ILLUMA-T) mission. AWE mitigated these hurdles with the help of Payload Integration Manager (PIM), Kevin Ferguson, of NASA's Johnson Space Center (JSC), to address the unique challenges and complexities associated with launching to the ISS. Regular communication on ISS integration allowed AWE and the PIM to capture payload information and other technical specifications required for launch and ISS integration. Ferguson also coordinated meetings with AWE and ILLUMA-T to eliminate contamination concerns between the two missions when sharing the same capsule at launch, helped select the optimal location on the ISS to accomplish the mission's science goals, coordinated the use of a 'clean tent' for post-shipment testing, and helped the mission prepare for eventual handover to SpaceX prior to launch.

Ruley and Lamborn note that, to resolve issues such as those that emerged with the contractor-supplied detectors, the prime and NASA must carefully consider the actions needed to ensure mission success. Specifically, Lamborn says prime contractors must determine how best to support any vendor delays while maintaining transparency and proactively communicating

AWE instrument unpacking at NASA's Kennedy Space Center (KSC) in Florida, August 21, 2023. CREDIT: SDL

potential risks. For example, AWE couldn't launch without the detectors. This required NASA and SDL to go beyond just communication and work closely with the contractor supplier to review technical requirements and schedule risks to help identify workarounds. As AWE Payload Manager Dr. Erik Syrstad noted after leading active dialogue with the subcontractor hardware supplier, "strong communication alone won't solve every challenge, but it's the starting point for every solution."

As a payload launching to the ISS, AWE was also required to hold four crucial safety reviews. The mission was successfully certified as an ISS payload at its last review in July 2023. Part of this certification involved 'sharp edge' testing with astronaut gloves to ensure safety during AWE's installation and as required for maintenance on the exterior of the ISS. In fact, while AWE is a Class D mission, many of its safety requirements are similar to those of a Class A mission due to its ISS integration.

"...strong communication alone won't solve every challenge, but it's the starting point for every solution."

- DR. ERIK SYRSTAD, PAYLOAD MANAGER

Aside from the multitude of challenges above, Lamborn also noted that the team encountered a lot of unanticipated tasks as a new prime. While SDL took these in stride, Lamborn recommends that any other new external organizations ensure they have ample cost and schedule reserves to support partnership missions.

That said, Lamborn and Syrstad stress that, "while there will always be a tension between cost and schedule, one must have confidence in mission success and an accurate grasp of what's needed to get there. If you do, you can then take into account known potential issues that may impact the schedule, while attempting to plan for the unknown to ensure mission success." The SDL team also noted that unforeseen delays are more likely the more complex the mission is, and that leveraging previously-developed TRL 6 (and/or commercial) hardware can save time, cost, and pose less risk. Ruley observes that "leveraging institutional knowledge and engaging personnel with a deep legacy of expertise is vital to the success of such missions."

By leveraging these lessons, AWE is fast approaching its November 2023 launch date. Notably, AWE is the first NASA mission to attempt this type of science to provide insight into fundamental questions of physics and our climate, but also to illuminate how terrestrial and space weather interactions may affect satellite communications and tracking in orbit. The project successfully completed ISS Phase III Safety Review with the ISS Payload Safety Review Panel on July 13 at JSC, where AWE received Flight Safety Certification. The AMTM instrument is now in storage following successful pre-ship functional testing.

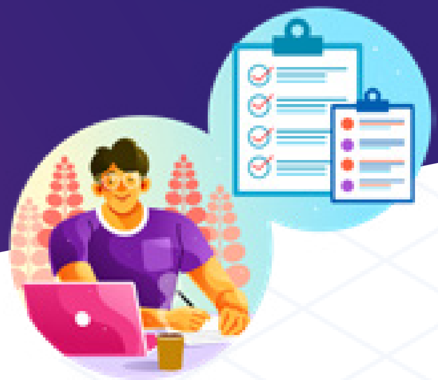
After launch, AWE's focus will be getting its science data out to the public, with information available on the AWE mission website: **https://www.awemission.org/**

Asked if he had any final advice for future new missions, Lamborn says to "pick a good acronym."■

J. Titus Stupfel / Code 460
Senior Technical Writer, Explorers and Heliophysics Projects Division

KNOWLEDGE MANAGEMENT *Insights*

Continuity Books



Whether you're transitioning out of a job into a desired new role, a temporary assignment, or retirement, you can help your successor by creating a transition document. Leaving your position on good terms is enabled by smoothly transitioning your responsibilities.

An effective continuity plan outlines necessary changeover activities to facilitate personnel change, including the knowledge transfer to support it. The plan should in essence, address what the departing employee would like to know if they were starting again in that role.

When should you create a transition plan?

The optimal time to create a plan is when you start a new job. During the first days and months in a new role you'll be collecting a lot of information while trying to make sense of it all. A continuity book is a useful organizing document. Over time it should include the following:

- Your regular duties* and responsibilities
- Current projects, deliverables, and upcoming deadlines
- Top priorities including problems and opportunities
- Recurring meetings
- Go-to information sources and names of internal and external network members
- Most used documents; links to tagged and searchable important files
- Learning content – presentations, courses, lessons learned and other resources that would be useful in helping your successor get up to speed
- Guidelines for your successor; rules of thumb; cautionary tales
- Ideas and vision – long-term plans; improvements or recommended steps to take should circumstances allow for them

*You'll want to focus on the main responsibilities that need to be taken care of to experience as little of an interruption as possible. One way to identify those duties is to ask, "If no one did X, what would happen?" If the answer is that other projects or processes would get stuck, include this responsibility in your plan.

> **"It's proof that you were there, that you did good work, and that your work mattered."**

Continuity Book

An example of a transition plan is a continuity book. Any continuity book template should be customizable. Everyone's job is different – the more individualized and nuanced the content, the more helpful it will be to a successor. Like any plan it should be reviewed and adjusted as circumstances change.

Amy Williams, Knowledge Manager at the Jet Propulsion Laboratory (JPL), developed a continuity book prototype in Microsoft OneNote. OneNote has version control and can be integrated with SharePoint and Microsoft Teams.
It's important to note that continuity books are role-centered, not project or topic-centered. By sharing them, colleagues can learn about others' roles. The books can also be useful for career pathing and mentoring discussions. Role backups, if identified, should be familiar with the prime's continuity book.

Benefits

When a senior leader leaves a role, three to four additional roles in succession, frequently turn over. A sudden and unexpected departure by a leader increases the level of disruption. No one wants to see departing employees take their knowledge and experience with them, potentially leaving critical roles without guidance. When continuity planning is part of the culture, successors maintain mission continuity through proactive knowledge sharing and well-informed decision-making.

Resources

- JPL Continuity Plan Template (available to NASA employees only) **https://nen.nasa.gov/web/nen** - In the search field, type 'Continuity Book Template', then click on the three dots to the right to download the file.
- NIH Transition Planning **https://hr.nih.gov/sites/default/files/public/documents/workforce/workforce-planning/pdf/14-stafftransitionplanoverview.pdf** ■

Judy Dickinson / Code 400
FPD Knowledge Management Lead

LENGTH OF SERVICE PERSPECTIVES *from the Directorate*

NASA, Goddard, and the Flight Projects Directorate pride themselves on the dedication of our exceptional wo vrkforce. Please join us in congratulating the three civil servant employees who reached career milestones over the past year. These team members have devoted substantial portions of their career to the Federal Government and their perseverance and commitment enables NASA's mission.

Candace Carlisle

GeoXO Flight Project Manager,
40 Years

Reflecting, what has been the best part of working at NASA/GSFC/FPD?

My favorite part of working in FPD is seeing flight hardware come together into a spacecraft, and knowing that spacecraft is going into space! Working for the GEO program, it is easy to explain to folks the benefit of the mission (weather and climate information).

Mark Lupisella

Exploration Integration Manager,
35 Years

Reflecting, what has been the best part of working at NASA/GSFC/FPD?

Working for NASA and Goddard has given me such diversity and inspiration – diversity of work, people, experiences, and learning – all of which have been endless sources of inspiration.

Russ Snyder

Architecture Development Manager for Exploration and In-Space Services Projects,
5 Years

Reflecting, what has been the best part of working at NASA/GSFC/FPD?

The best part of working at NASA/GSFC/FPD is the wide variety of projects that you get to work on. After working on four Hubble Space Telescope Servicing Missions early in my career as a contractor, I have had the opportunity to work on development efforts for large focal plane arrays, concept development for OSAM-1 extended missions, guidance to future NASA and other agency spacecraft to enable refueling and upgrades, leadership for support modules for Artemis astronaut placed science instruments, and support for multiple Mission Design Laboratory studies.

Risha George

Landsat Next/Code 426
Mission Readiness Manager

Born New York, NY

Education BA in Computer Science & French, Austin College, TX

Life Before Goddard

Risha wanted to be an astronaut when she was 5 years old. She grew up in Houston, TX and whenever someone would visit from out of town, her parents would always take them to visit Johnson Space Center (JSC). She grew up in awe of the Space Shuttle and the fact that Mission Control was practically in her backyard. When the opportunity presented itself to do a summer internship at JSC, she jumped at it and never looked back.

Risha is a first generation Indian-American. Her parents immigrated from Kerala, India in the 1970s. They instilled a strong work ethic in her and emphasized the importance of getting a good education. Going to college was not a choice but an expectation. Risha decided to study Computer Science at Austin College in Sherman, TX because of her love of mathematics. Her professors also encouraged her to do a double major in French, which were always her fun classes.

After college, she became a full-time support contractor at JSC in the Safety and Mission Assurance organization. When Wyle Laboratories won the Bioastronautics contract, she was recruited to lead their Software Assurance Program.

Life at Goddard

Risha wanted to move to the DC area after meeting her husband. She was hired by Mantech International in 2007 on the Safety & Mission Assurance contract to support the Constellation Program. She served as a representative on the Constellation Safety Review Panel and helped to pave the way for how software was included in the human spaceflight hazard analysis process.

Risha became a civil servant in Code 300, Safety & Mission Assurance, in 2010. After a year, she transitioned to the Software Engineering Division to work on the Joint Polar Satellite System (JPSS) mission, as the National Polar-orbiting Operational Environmental Satellite System (NPOESS) program ended and JPSS program formulated. Her role was to focus on software processes and standards.

She was a participant in the Agency Mid-Level Leadership Program (MLLP) Cohort 4, where she got to meet amazing friends across the agency, that still stay in touch to this day. As part of MLLP, Risha completed a detail at the Headquarters Office of Chief Financial Officer.

An opportunity presented itself to support Code 450, Exploration and Space Communications as the Consultative Committee for Space Data Systems (CCSDS) Data Standards Lead for GSFC which she did for about a year before ultimately joining the Space Network Project, which operated the Tracking and Data Relay Satellite (TDRS) constellation and associated ground systems.

On the Space Network Project, Risha was given tremendous growth opportunities by the project management team and took on leadership roles such as serving as the Ground Systems Manager for the Artemis-I modifications, serving as the liaison to the International Space Station (ISS) program for the upgrade to 600 Msps Ku-band downlink service and serving as the Ground Systems Manager

Clockwise from left: Risha, Joseph and their two sons, Zacch and Theo; Supporting the TDRS-M launch!; Risha and her mother.
CREDIT: ALL IMAGES COURTESY OF RISHA GEORGE.

for the Orion Artemis-II Optical Communications (O2O) System. Risha and her fellow female colleagues were nominated for the Women in Tech global award and became finalists for their work on the ISS Ku-Upgrade. She traveled to Paris, France with her coworker and friend, Dr. Haleh Safavi.

During the height of the pandemic, Risha went on a detail to be an Associate Branch Head in Code 592, Instrument and Payload Systems Engineering. Eight months later, she became the Deputy Project Manager of the Code 459/Advanced Communications Capabilities for Exploration and Science Systems (ACCESS) project which operates the government assets of the Near Space Network. Risha's primary responsibilities were to focus on the development efforts within the ACCESS project, which included new direct-to-Earth antenna ground stations for the lunar Gateway mission, modifications to support the Roman Space Telescope, overseeing the development of the O2O ground system and the Low-Cost Optical Terminal (LCOT). She had the opportunity to work with a remarkable team supporting the entire ACCESS project scope of work.

Most recently, Risha accepted an opportunity to become the Landsat Next Project Mission Readiness Manager. Her role is to interface with the United States Geological Survey (USGS), NASA's longtime partner on the series of Landsat missions and plan for and execute the mission readiness test campaign between the observatory and the ground system. She is very excited to work on Landsat Next.

Life Outside of Goddard

Risha is married and about to celebrate her 15-year wedding anniversary. She and her husband, Joseph have two sons, Zaccheus AKA "Zacch" (age 12) and Theodore AKA "Theo" (age 9). They have tons of energy and always keep her on her toes. Risha also has two rescue dogs, Kona and Storm (age 6). Risha enjoys spending time with family and friends, cooking, entertaining, playing games, and learning how to make cocktails. She is currently training to walk in a half-marathon in Negril, Jamaica at the end of the year. ■

Patrick Crouse

Hubble Space Telescope Project Manager
Code 441
Roman Space Telescope Ground System Manager
Code 448

Born Berkeley Springs, West Virginia

Education Bachelor of Science, Mathematics, Frostburg State University

Bachelor of Science, Aerospace Engineering, University of Maryland

Master of Science, Aerospace Engineering, University of Maryland

Master of Science, Engineering Management, University of Maryland University College

Life Before Goddard

Patrick grew up in Hancock, Maryland, a small town in the skinniest section of western Maryland between Pennsylvania and West Virginia. Pat, the last of eight children, elected to follow a similar path as a number of his siblings to Frostburg State College, which became Frostburg State University while he was there, intent on combining interests in mathematics and computer science. Determining that writing software code may not be in his future, Pat enrolled in the Dual Degree program that saw him complete his mathematics degree from Frostburg and collect his aerospace engineering degree from College Park.

Life at Goddard

Pat graduated from the University of Maryland in May and began work in the Flight Dynamics Division at Goddard in June 1990. Pat was added to the flight dynamics teams that were preparing for the Shuttle-deployed Compton Gamma Ray Observatory in April 1991 and the Solar, Anomalous, and Magnetospheric Particle Explorer that launched in July 1992. Pat really enjoyed the operations aspects of the missions he supported while in flight dynamics. In 1999 he became the mission director for five Small Explorer spacecraft, where he was responsible for overall operations, including anomaly resolution activities, and budget. While in that capacity, he developed and operated a testbed program that utilized the on-orbit Wide-field Infrared Explorer spacecraft to perform a variety of engineering and scientific investigations. These included tests to improve star tracker radiation resilience and observations of stars to study long-term intensity variation associated with asteroseismology and planet detection.

In 2001, Pat entered organizational management as an associate branch head and the lead mission director responsible for the supervision of mission operations personnel, including the mission directors for the Space Science Mission Operations project and the Earth Science Mission Operations project. That experience contributed to Pat's selection as the deputy project manager in 2002, and eventually the project manager of the Space Science Mission Operations Project in 2005 where he was responsible for the management, safe operations, and scientific productivity for more than 30 on-orbit missions.

In 2010, Pat became the project manager for the Hubble Space Telescope, which had launched in 1990, the same year Pat began at Goddard. Thanks to the installation of a new set of gyroscopes and two new instruments, and the repair of two existing instruments

Clockwise from left: Pat, his wife Wendy and daughter Katie near a Mayan pyramid at San Andres, El Salvador; Pat and Wendy near the Louvre museum, taken in 2023 while visiting Miriam, who was teaching in France for the year; (left to right): Miriam, Joseph, Wendy, Pat, Katie, and Jacob. CREDIT: ALL IMAGES COURTESY OF PATRICK CROUSE

during the 2009 servicing mission, Hubble has enjoyed tremendous scientific productivity through the present day with expectations for continued success at the forefront of astrophysics discovery through the decade. Pat's team has worked diligently to address challenges over the last 13 years, including transitioning to automated operations in 2011, experiencing three of six gyroscope failures, transitioning the spacecraft from its Side B to Side A systems following the failure of a power control unit on the B-side of the Science Instrument Command and Data Handling unit in 2021, and conducting a feasibility study for a commercial orbit raising mission. The Hubble team today is working to overcome the effects of aging gyroscopes and fine guidance sensors, as well as enhancing the ground system and flight software to enable science operations to be performed again on the B-side should it become necessary in the future.

In addition to his work on the Hubble project, Pat is the Ground System Manager for the Roman Space Telescope. Pat began working on Roman in 2017 and is leading the development of the mission and science operations ground system and preparing to operate the observatory following its planned 2026 launch. The ground system team is in the middle of its second of three major system builds, preparing for spacecraft and observatory integration and test activity, and kicking off planning for the Mission Operations Review in 2024. These are truly exciting, challenging, and rewarding times.

Life Outside Goddard

Pat and his wife, Wendy, met while at Frostburg State University and settled in Cape St. Claire, Maryland near Annapolis. They have four children and have enjoyed participating in their many activities and watching their college graduations. They enjoy family meals and vacations and are looking forward to traveling. Pat likes gardening, reading, watching the local sports teams, and wishing he was using his kayaks more. ■

COHORT 5 FALL WORKSHOP

The Flight Projects Development Program's (FPDP) Cohort 5 recently hosted their Fall Workshop on Political Savviness, inviting participants from Goddard and every NASA center. The workshop focused on insights and lessons learned in NASA project management from key NASA, other government and industry leaders, and subject matter experts. The participants were able to learn how "Washington" operates and how to navigate the budget and policy landscape with political savviness.

The workshop kicked off with a tour of the U.S. Capitol building, with participants learning rich history throughout the afternoon, followed by a networking reception with Congressman Brian Babin (R-TX) Chair, House Committee on Science, Space and Technology Subcommittee on Space Aeronautics and Eric Sorensen (D-IL) Ranking Member for the Subcommittee on Space and Aeronautics, along with Congressional leaders, staffers, and industry leaders from the Space Transportation Association.

The next two days of the workshop were filled with dynamic speakers including Sam Black, Program Examiner from Office of Management and Budget, Dave Mitchell, NASA's Chief Program Management Officer, Margaret Schaus, NASA's Chief Financial Officer, as well as past NASA leaders such as Lori Garver, NASA Deputy Administrator and Scott Pace, NASA Director of Plans, Analysis and Evaluations, who shared information on the appropriations process and what Congress does to fund the government. Other speakers explained the budgetary process of how all the pieces fit together to work towards a budgetary decision. The workshop was a great success with plenty of networking opportunities to ask questions of the speakers and fellow co-workers across NASA while gaining insights into how DC works and the interplay between the Office of Management and Budget (OMB), NASA, and different factions in Congress. ■

Cohort 5 – back, left to right: Donna Swann (FPDP program manager), Chris Strickland, Konrad Bergandy, Ellen Shea; front, left to right: Neerav Shah, Stephanie Vidal, Carla Newman, Nikki Rawlings. CREDIT: LINDA SEMMEL

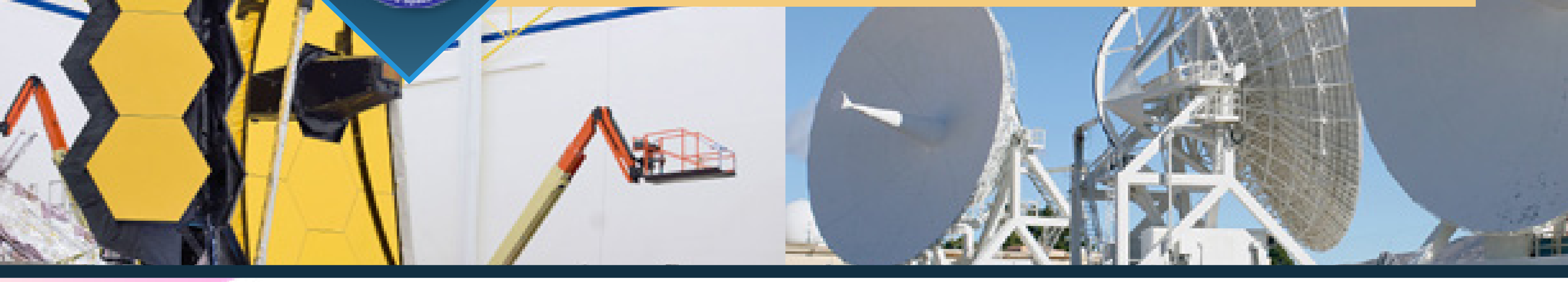
Attendees of the workshop toured the U.S. Capitol and participated in a networking reception with Congressional leaders and staffers on Tuesday, October 17. CREDIT: ESTHER KIM

Donna Swann / Code 400
FPD Assistant Director, FPDP Program Manager

2023 Code 400 FPD Peer Awards & Achievements

Congratulations to all of the 2023 FPD Peer Award recipients! Thank you to our nominators for their work recognizing our FPD teams and individuals for their exceptional achievements. Please use the link below to view the award recipients.

2023 FPD PEER AWARD RECIPIENTS



2023 ROBERT H. GODDARD AWARD RECIPIENTS

Congratulations to all of the 2023 Robert H. Goddard Award recipients! Thank you to our nominators for their work recognizing our FPD teams and individuals for their exceptional achievements. Please use the link below to view the award recipients.

2023 RHG AWARD RECIPIENTS

Coming and Goings

March 1 through August 31, 2023

Comings

Donya Douglas-Bradshaw (500) to 435/Mars Sample Return Capture Containment & Return System (MSR-CCRS)

Greg Yoblin (581) to 491.1/ Space Weather Follow-On Lagrange 1 (SWFO L1) Project

Allen Mirkadyrov (566) to 457/Near Space Network Project (NSN)

Brennan Nowak (581) to 495/ Space Weather Next Low Earth Orbiting Instrumentation Series

Justin Rice (586) to 423/Earth Science Data and Information Systems (ESDIS) Project

Kurt Lindstrom (External) to 457/Near Space Network Project (NSN)

Ame Fox (External) to 494/ Space Weather Next Lagrange 5 (L5) Collaboration with ESA

Baran Sahin (568) to 472/ Joint Polar Satellite System (JPSS) Flight Project

Caitlin Bacha (597) to 430.3/ Ocellus Project

Ryan Detter (583) to 474/ Low Earth Orbit (LEO) Ground Services Project

Lori Perkins (587) to 452/Lunar Communications Relay and Navigation Services (LCRNS) Project

Dana Shum (External) to 423/Earth Science Data and Information Systems (ESDIS) Project

Rita Grullon-Pingon (External) to 423/Earth Science Data and Information Systems (ESDIS) Project

Joel McCorkel (618) to 425/ Earth System Observatory (ESO) Atmosphere Observing System (AOS) Mission Office

James Marsh (540) to 435/ Mars Sample Return (MSR) The Capture, Containment, and Return System (CCRS) Project Office

Goings

Tracy Zeiler (423) Retirement

Scott Schwinger (401) to HQ

Michele Gates (400) Retirement

Reassignments/ Realignments Details within Code 400

Devin Bitner (457) to 450.1/ Commercialization, Innovation and Synergies (CIS) Office

Greg Dell (424) to 493/Space Weather Next Lagrange 1 (L1) Series

Matt Handy (474) to 471/ NEON QuickSounder Project

Dan Devito (400) to 470/Low Earth Orbit (LEO) Programs Division

Mark Brumfield (450) to 459/ Advanced Communications Capabilities for Exploration and Science Systems (ACCESS) Project

Ted Sobchak (459) to 423/ Earth Science Data and Information Systems (ESDIS) Project

Chetan Sayal (455) to 472/ Joint Polar Satellite System (JPSS) Flight Project

Todd King (422) to 431/ Dragonfly Project

Cagatay Aymergen (472) to 426/ Landsat NeXt Project

Betsy Park (430) to 483/ On-orbit Servicing, Assembly, and Manufacturing 1 (OSAM-1) Project Office

Obadiah Kegege (422) to 465/ Geospace Dynamics Constellation (GDC) Project

Risha George (459) to 426/ Landsat NeXt Project

Edmonia Caldwell (430.1) to 452/Lunar Communications Relay and Navigation Services (LCRNS) Project

Karen Rogers / Code 400
Administrative Officer

OUT & ABOUT

LIFE'S HIGHLIGHTS OFF CAMPUS

Best wishes to Jessica Still (155.7) and her fiancé, Shane, on the birth of their daughter, Lucy Jane. She was born on June 20, 2023, weighing 5 lbs., 7.5 oz and measuring 18” long. Lucy’s proud grandmother is Patti Still (159.3), and Michael Still (240) is her uncle.

Sherrie Wood (155.7) and her husband Derek are proud to announce the birth of their first grandchild, Emma Nicole. She was born on August 24, weighing 7 lbs., 11 oz., and was 19.5” long. Congratulations to parents Megan and Zach Kirsch.

Congratulations to Jordan Sessoms, son of Kim Wilson (472). Jordan graduated Magna Cum Laude from Salisbury University on May 25, 2023, with a B.S. in Marketing and a Minor in Biology.

Congratulations to Brianna Merton (456) and her husband, Adam on the birth of their first child. Beau Merton was born on September 11, 2023, at 2:35 pm, weighing 8 lbs. and 19.75” long. Proud grandparents are Bob (595) and Sheri Smith (425). Beau was having his first tummy time in this photo.

Continued on page 30

Continued from page 29

The James Webb Space Telescope, The Future Habitable Worlds Observatory, and Me

BARBARA GROFIC

James Webb the man didn't fly into space
A gray metal desk was more likely his place.
Budgets he compiled and people he led
The hunger for a moonwalk he dutifully fed.

But rockets without science was never his goal
Science was key to keep NASA whole.
James Webb the machine flies so far away
Incredible images returning each day.

Galaxies and stars on my laptop I see
The James Webb in space is a miracle to me.
NASA has those who can build and can fly,
Who see future challenge as something to try.

A desk full of budgets and graphs have I
So much more mundane than the show in the sky.
But maybe my work too, an impact has made
The foundations of the next cosmic marvel have laid?

It might find new planets, new worlds not yet ours
Possible to explore with as yet developed powers.
My name on this mission does not need to be
So long as it carries some essence of me.

Barbara Grofic/440 wrote this poem for the Hardwick, MA Community Fair competition, held in August 2023, and was awarded second place.

Share your news!

Weddings, births, interesting travel experiences…we want to know!

Please send your inputs to Paula Wood.
Include your **name, phone number** to:

paula.l.wood@nasa.gov
Code 460
Ext. 6-9125

Increase Your Knowledge!

The Flight Projects Directorate (FPD) recently relaunched its 'Lunch and Learn' sessions, available to all FPD civil servants and contractors, and Program Management (PM) Forums will resume shortly.

Upcoming session topics will include:

- PM Forum: Compliance Matrices
- Configuration Management
- Reporting (Includes Anomaly Reporting, Mishap, Safety, etc. and governing documentation)
- Earned Value Management
- Risk Management
- Planning and Scheduling Management
- Knowledge Management
- Flight Project Life Cycle
- Development (Coaching, Mentoring, Career Paths)
- Personal Growth Plan (PGP) and Career Mapping

For information on recent Lunch and Learn sessions, visit: https://fpd400.gsfc.nasa.gov/sites/400/FPD_Internal/SitePages/Lunch_and_Learn.aspx

If you have any suggestions for new Lunch and Learn or PM Forum topics, please contact:

Jen Poston
jennifer.l.poston@nasa.gov

THE LATEST SAR SAVES

NASA's Search and Rescue (SAR) office continues its efforts to develop and improve on life-saving distress beacon technologies.

COSPAS-SARSAT rescues through October 2023 are shown above.

DID YOU KNOW..?

We want to be in the know!

If you have something to share, send it to Jacqueline Johnson. Include your **name, phone number** and send it to:

Jacqueline.seymore@nasa.gov

Flight Project Diversity and Inclusion Committee

Ext. 6-6307

Hispanic Heritage Month

is a designated period in the United States that celebrates the rich history, diverse cultures, and significant contributions of Hispanic and Latinx individuals and communities. It is observed from September 15th to October 15th every year. This month-long celebration begins on September 15th, which coincides with the independence anniversaries of several Latin American countries, including Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua. The celebration aims not only to showcase the achievements of Hispanic and Latinx individuals but also to raise awareness about the diverse backgrounds, languages, traditions, and histories within these communities. It's a time to foster cross-cultural understanding, promote unity, and appreciate the vibrant mosaic of cultures that enriches the American tapestry. It's a time for people of all backgrounds to come together, learn, share, and celebrate the incredible diversity that contributes to the multicultural landscape of the United States. For historical timelines, FAQ's and traditions check out this website address –

https://nationaltoday.com/hispanic-heritage-month/

FLIGHT PROJECTS
LAUNCH SCHEDULE

FALL 2023 TO SPRING 2024

AWE

ILLUMA-T

GUSTO

PACE

GOES-U