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IT Talk

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Welcome to JPL's MetaVerse!

IT Talk

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Message from the NASA CIO

As many of us are thinking about the future of work, virtual reality (VR) and augmented reality (AR) have exciting potential beyond our conversation today around hybrid meetings. Both technologies bring together a virtual/online element in engaging ways, although the technology is continuing to mature. VR and AR are changing the way we use screens, creating new and exciting interactive experiences that are moving beyond the gaming world into more and more business applications. In this issue we'll explore how NASA's Jet Propulsion Laboratory is using these technologies to improve collaboration and efficiency for an increasingly remote workforce.

We'll also look at how artificial intelligence and machine learning are helping astronauts on the International Space Station (ISS) through an innovative pilot effort where a new prototype model helps to detect spacesuit glove damage through rapid inspection.

We will examine how NASA's Chief Health and Medical Officer and the Office of the Chief Information Officer (OCIO) are collaborating on a Customer Relationship Management (CRM) tool that's helping with NASA's business processing and reporting needs.

And finally, I'd like to recognize some of the great work being done by the OCIO Team. Many of our people have won Agency Honor Awards for their outstanding contributions to the agency mission. If you recognize any names, be sure to congratulate your colleagues.

I hope you enjoy reading this edition which is filled with many inspiring stories that highlight the great work being done in our IT community at NASA.

Sincerely,

Jeff Seaton

NASA Chief Information Officer

Workplace and Collaboration Services (WCS) News and Updates

Check out the latest news from WCS (all links are internal to NASA):

- *Internet Explorer 11 Retiring June 15, 2022*
- *Remote Work Enhancements*
- *Use WIMS to Track ESD Order Progress*
- *External Drive Encryption with BitLocker To Go Now Available*
- *New Process for Intern Computer Ordering*
- *Delay or Schedule Sending Email Messages*
- *Enterprise-Managed Product Updates*
- *See What's New with ICAM*
- *Getting Started with Planning Your Virtual Event*
- *Future of Work*

Fusing Together Strategic IT Services for Flight Projects at Wallops

By Hilary Gambale, Strategic Communications Specialist, Goddard Flight Space Center

NASA's Wallops Flight Facility (WFF) is located on Wallops Island on the Eastern Shore of Virginia. WFF is NASA's only owned and operated range, providing flight and launch range services for both the Government and the commercial sector. On February 19, Northrop Grumman launched its Antares rocket carrying the Cygnus resupply spacecraft to the International Space Station from the Wallops facility. WFF was recently selected by Rocket Lab as the home for its new Neutron rocket's first launch pad and production facility, thus increasing the facility's ability to provide services to the commercial space sector. All launches at WFF, including the Antares launch, rely heavily on IT services supported and managed by the local WFF Office of the Chief Information Officer (OCIO) team. The WFF OCIO team includes the Facility-Unique and Specialized IT Engineering (FUSE) team, which provides specialized services that are instrumental in making launches such as Antares successful.

The FUSE team consists of only seven civil servants, but as a group they have many years of experience in the development, operation, maintenance, and modernization of Wallops critical range support and safety systems. FUSE team members are highly integrated with flight and mission personnel to provide specialized, facility/mission-unique support, such as networking, voice, video, infrastructure, computing, and IT security services and solutions. Senior leaders at Wallops rely heavily on the expertise of the FUSE team to advise them on current capabilities when evaluating new business requirements, recommending strategic IT infrastructure planning for growth and cost savings, and providing agile support for mission-critical systems.

The team works directly with Wallops tenants, partners, and new customers to ensure proper integration of their requirements with the capabilities of the range systems. In addition, they ensure that missions are complying with Agency IT policies. Members of the team are highly integrated and embedded in the mission engineering process through the entire life cycle, from pre-planning and pre-formulation to operations and sustainment. Whenever immediate IT services are required, FUSE members are on console or strategically placed in key locations to provide direct launch support. The team also serves on several range IT system review boards and launch or range readiness review sessions.

Wallops is recognized for a providing a low-cost but reliable option for missions and commercial space companies to launch, fly, land, and test aeronautical equipment and technologies. As such, Wallops leadership requires the IT expertise of the WFF OCIO to fully support, integrate, and work with mission personnel through the entire engineering life cycle from concept to launch. Lastly, with Rocket Lab, Wallops launches will increase by 15 to 20 annually, a roughly 100 percent increase in flights. Those missions will require additional IT services and solutions, and the local OCIO team is excited about the opportunity and ready to support!

Wallops' Range Control Center (RCC) and Multiple Operation Control Center (MOCC), with technology managed by the FUSE team.

Exploring the GVIS Lab

By Herb Schilling and Libby Hancock, Office of the Chief Information Officer, Glenn Research Center

Glenn Research Center (GRC) is home to the *Graphics and Visualization (GVIS) Lab*, which is part of the GRC Scientific Computing and Visualization Team. For over 30 years, the lab has been providing insight to researchers, scientists, and engineers through interactive visualizations of their data and models. Most recently, the team provided *NASA's Aerosciences Evaluation and Test Capabilities (AETC)* Portfolio Office with a way for guests to virtually visit the wind tunnel at GRC (which was inaccessible due to safety restrictions). Thanks to their efforts, visitors can now tour the tunnel lobby by visiting a *website* and using their computer keyboard and mouse to navigate. The team is also reviewing future capabilities to make the room accessible through a virtual reality (VR) headset.

A few of the other projects planned for the GVIS Lab include installing a state-of-the-art 3D spatial audio system in their *Cave Automatic Virtual Environment (CAVE)*, further developing extended reality (XR) collaboration applications with gestural control, as well as creating X-Plane visualizations in VR. X-Plane is a high-fidelity flight simulator that makes it possible for users to create their own 3D models to be implemented within the simulators flight engine, using real-time mathematical calculations.

Simulated wind tunnel lobby at GRC.

Welcome to JPL's MetaVerse

By Whitney Haggins, IT Communication Strategist, and Chris Mattmann, Chief Technology and Innovation Officer, Jet Propulsion Laboratory, California Institute of Technology

In the early months of the pandemic, JPL, like many employers, experienced a shift to large-scale remote work. As the Lab's workforce dispersed across the country, employees wondered what this new phase meant for JPL's culture, particularly the move from in-person collaboration and meetings to videoconferencing and the now-all-too-familiar impacts of "Zoom fatigue." JPL's key business of engineering future planetary and deep space remote sensing satellites, landers, and autonomous robots is predicated on dynamic communication and collaboration among teams. Enabling that via videoconference is extremely challenging.

To meet the challenge, JPL's IT organization initiated the "Welcome to Our MetaVerse" project. The project will initially scan significant spaces at JPL into the MetaVerse using Oculus Quest 2 technology and the Spatial.io application. This virtual reality (VR) solution leverages Apple's ARKit and commodity iPad systems to scan rooms using light detection and ranging (LIDAR) technology. Rooms are digitally reconstructed and imported into the Spatial.io application, where a user wearing a VR Quest 2 headset can virtually attend a meeting within a scanned location, whether that is in a public space or in an individual's building or office. Next, the project aims to bring the participants themselves into the MetaVerse using Spatial.io's 3D face-scanning technology, enabling customization of a very realistic avatar to represent the meeting participant. JPL participants can congregate, meet, and take advantage of VR capabilities from the Quest 2, including spatial audio and gestures (e.g., high-five, thumbs up), as well as other features that add to the sense of realism and interactivity and the experience of "being together" in as full a sense as possible.

With the MetaVerse, remote and hybrid teams can innovate, create, and perform engineering activities without having to physically procure and manipulate actual materials and assemblies. The project leverages JPL's ProtoSpace to meet engineering challenges. ProtoSpace, a proven collaboration tool for engineering activities, uses augmented reality (AR) capabilities and Microsoft HoloLens to allow engineers to import complex computer-aided design (CAD) drawings, including JPL mission hardware, which can then be visualized and realized in a clean room alongside partially finished builds of the same hardware. Engineers can perform just-in-time and early phase assessments and adjustments, evolving engineering design activities for missions at an extremely low cost with a high payoff. ProtoSpace has been used by multiple missions, including Mars 2020, the Soil Moisture Active Passive (SMAP) mission, NASA-ISRO (Indian Space Research Organisation) Synthetic Aperture Radar

(NISAR), and Europa. ProtoSpace was JPL's 2021 Software of the Year and received a NASA 2021 Software of the Year honorable mention.

Working within the MetaVerse comes with its own challenges, such as striving for seamless integration of the technologies that leverage powerful and complex digital and mixed reality options while facilitating the MetaVerse experience for different types of users and enabling interaction between remote and on-Lab participants. Another issue to resolve was how to include more people into the MetaVerse than the allowable platform limit. The solution was to create a workaround that mimicked a videoconference integration using screen and audio sharing. In testing, 25 people joined the MetaVerse in VR while an additional 30 joined via videoconference through the workaround solution. Participants from either platform were able to interact with those in the other platform seamlessly. This not only provided a solution to the limit on the number of participants but also offered a lower barrier to entry for those who are VR-hesitant.

Solving the challenge of integration of these technologies for different types of users has huge implications. For example, engineers can enter a clean room and, using the AR capabilities, look at a partially completed and physically built spacecraft assembly for the NISAR mission—a future synthetic aperture radar (SAR) mission looking at earthquakes in partnership with our colleagues at ISRO—and then look at the fully realized NISAR spacecraft using ProtoSpace. Seeing the full, realized, and completed assembly in mixed reality enables assessment, adaptation, and full end-to-end engineering without having to finish and test the CAD model and fabricate it fully in production, thus saving costs, energy, and critical resources.

Using the HoloLens and with ProtoSpace loaded, JPL engineers can build the elements for complex interplanetary missions much earlier, faster, and more collaboratively than if they were performing these activities solely based on what was occurring in real life. Next steps will be to make it so that the environments can be viewed only by remote users or those on the Web.

These successes have encouraged further exploration of capabilities in the MetaVerse, including early loading of digital CAD models of our most recent missions, assessing and updating engineering designs long before completion, leading to significant cost savings in development. In March, our project/JPL was named a 2022 CIO 100 winner.

But we are not done. We are only getting started, and we look forward to seeing you in the MetaVerse.

CP Completes Innovative Fiber Optic Cable Installation at Wallops Flight Facility

By Sylvester Placid, Communications Strategist, Communications Program, Marshall Space Flight Center

The monumental effort by the Communications Program (CP) to install upgraded fiber optic cable across protected marshland for launch operations at Wallops Flight Facility (WFF) is complete. The strategically critical project was accomplished on schedule despite the difficult terrain, environmental challenges, hard deadlines, and inclement weather.

Project Stats:

- ***4.3 years*** from beginning of design stage to construction closeout
- ***11 months*** to obtain required environmental approvals
- ***2 years*** for compressed construction schedule around nesting season for Eastern Black Rail endangered species
- ***6,100-foot*** 8-inch bore from mainland to Walker Island is one of the longest single bores for fiber optic cable in marshland in the world
- ***12-feet*** is all the 6,100-foot bore across Watts Bay missed its surveyed exit point mark by – more than a mile of underground drilling surfaced just several feet off target
- ***20,000-foot*** single segment of fiber with no splices (just under 4 miles of fiber)
- ***9 miles*** of additional fiber to buildings at WFF main base and ten additional buildings on Wallops Island
- ***240-feet/minute*** or 25 minutes to install the first 6,100-feet of fiber using "fiber jetting"
- ***4 hours*** to place 10,000-feet of fiber in its final resting position to work around tide schedule

Difficult Terrain Required Innovation

The soft marshland presented a unique challenge for installing nearly 20,000 feet (nearly 4 miles) of fiber optic cable under two bodies of water to the launchpads at WFF. Horizontal directional drilling (HDD) was utilized for minimal impact, trenchless, secure installation of the fiber pathway through the marsh. To reach stable soil conditions, the HDD pathway needed to be 100 feet underwater. This required specialized equipment transported on barges while navigating shifting tides and frequent winter storms every several days during the construction period.

The long distance deep under protected marshland meant opportunities to access the cable were extremely limited. Installing the fiber using traditional pulling in methods would not be possible without stressing the cable and exceeding tension limits. A new, high-tech method called fiber jetting (or blowing) was utilized instead.

This method uses a high volume of air pressure to "float" the fiber inside of the duct, minimizing the friction between the cable and duct itself, and allowing for extended installation distances. Specialized equipment employed tractor feeds to precisely control the speed of the fiber during installation—which exceeded expectations. The first 6,100 feet of cable was installed using this method in just 25 minutes, or roughly 240 feet per minute.

Meticulous organization and highly skilled personnel fed 17,000 feet of fiber through the duct in the marshland from the mainland to Wallops Island with each duct exit requiring the fiber to be strategically placed in a figure-eight coil, flipped, and then fed into the next duct to complete installation. With precise planning, 10,000 feet of fiber (roughly 2 miles) was installed in an eight-hour day—with more than half of the day required to move equipment barges to the island while navigating the tide schedule.

Winter Weather and Endangered Species Threatened Schedule

Winter weather posed additional difficulty for the project with temperatures ranging in the 20s and 30s, resulting in equipment failures. The construction phase of the project could only take place during the winter months due to the nesting season for the Eastern Black Rail, an endangered species native to Wallops Island, presenting the team with hard deadlines and narrow completion windows for each of the two winters that construction was scheduled.

Additional deconfliction was required around Unmanned Aerial Systems (UAS) flight operations at the Mid-Atlantic Regional Spaceport (MARS) runway airfield where the final fiber segment would exit, as well as closure of Wallops Island for the fueling of the Cygnus capsule for the Northrop Grumman Antares launch in February 2022. The arrival of a powerful nor'easter winter storm that same month created additional time pressure.

Despite these obstacles, the drilling and installation equipment was off the marshland a full month ahead of schedule. Responsibility plans are being finalized to monitor restoration of disturbed areas on Wallops Island for the next three years, including biannual inspections and reporting to the Virginia Marine Resources Commission. The final step of the project was an environmental inspection that was successfully completed on March 29, enabling closeout of all activities before Eastern Black Rail nesting season begins on April 1 (the second season in a row project activity completed before nesting season, despite environmental factors and delays caused by the COVID-19 pandemic).

Ted Dean, Chip Palumbo, and Karalyn Springle with members of the project team

Ensuring Wallops Success for Decades

Meeting these challenges and completing the massive project successfully and on schedule required significant effort by everyone involved. CP Cable Plant Service Manager ***Ted Dean*** wishes to thank Cable Plant Project Manager ***Chip Palumbo*** and OCIO Project Manager ***Karalyn Springle*** for engaging with the multiple organizations involved in the project – NASA range operations which manages the launchpads at WFF; MARS, which operates the UAS runway airfield at Wallops; the U.S. Navy Surface Combat Systems Center, which conducts testing at Wallops; and the U.S. Fish & Wildlife Service, which operates the Chincoteague National Wildlife Refuge on the island.

The newly installed fiber will enable next-generation mission requirements, including faster data transfer rates, 4K/8K video, and future capabilities over the next 30 years to support *rapidly growing demand at WFF*.

CP Enables Record 816,000 Live Viewers for James Webb Space Telescope Launch

By Sylvester Placid, Communications Strategist, Communications Program, Marshall Space Flight Center

When the James Webb Space Telescope launched on Christmas morning, 2021, from Kourou, French Guiana, more than 800,000 viewers watched across NASA livestreams enabled by the Communications Program's (CP's) Enterprise Video Content Delivery Network (EVCDN) solution.

This was the highest viewership for any launch in 2021 (crewed or uncrewed), the highest viewership for a launch of a science mission, and the second-highest viewership for any mission milestone in 2021—the first was the landing of Mars Perseverance with 4 million viewers.

Digitally Transformed: AI Machine Learning on the International Space Station

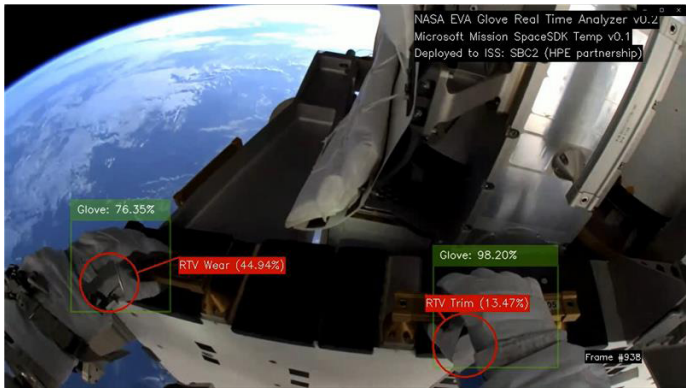
By Martin Garcia, Enterprise Services Team—Information Resources Directorate, Infrastructure and Applications Office, Johnson Space Center; Edward L. McLarney, Digital Transformation Lead for Artificial Intelligence and Machine Learning, Langley Research Center; and Jill Marlowe, NASA Digital Transformation Officer, NASA Headquarters

As part of NASA's Digital Transformation (DT) strategic initiative, profiled in the *January–March 2022 IT Talk*, a team with Johnson Space Center (JSC) has delivered a DT-in-space first: successfully testing an Artificial Intelligence and Machine Learning (AIML) prototype model to inspect astronaut glove readiness for spacewalks (also known as extravehicular activities, or EVAs) on the International Space Station.

Artificial intelligence is a constellation of many different technologies working together to enable machines to sense, comprehend, act, and learn with human-like levels of intelligence. Maybe that's why it seems as though everyone's definition of artificial intelligence is different: AI isn't just one thing. But this is a fitting definition for the efforts made by NASA's pioneers striving to not only explore distant constellations but create digital ones that serve our mission. Space—once considered the final frontier—has witnessed another leap from human technology as artificial intelligence travels to space as a NASA asset.

On December 16, 2021, the JSC Infrastructure and Applications Office announced the first successful test and deployment of the AIML model to detect spacesuit glove damage on the International Space Station (ISS). The AIML Glove Inspection Model was possible only with a small seed investment from DT and enlisted subject matter expertise (SME) teamwork between DT, the JSC OCIO, the EVA team, Microsoft Azure, and the Engineering Office at JSC. The team multiplied that investment many times via ISS Mission SME contributions, as well as contributions from the industry. AIML was an exciting success, and efforts continue to leverage AIML technology and identify future use opportunities, including a collaboration with the EVA dust-mitigation team at JSC to adapt the glove detection models from ISS-based EVA to lunar-based EVA, by inspecting dusty, dirty gloves like those expected from the Artemis missions.

The AIML model was a prototype test leveraging Microsoft Azure machine learning image recognition techniques to prototype astronaut glove inspection, and it was used to validate the AIML concept designed by the Infrastructure and Applications Office team. The test



was a two-step effort: to test the machine learning software on the ground with test images and run the model, then run the same model on the ISS with the same test images. Glove inspection tests run with AIML models substantiated ground tests and successfully detected glove damage in space. The tags used are associated with different damage modalities identified in the training dataset for the classification model. Space-run test probability outputs matched probabilities from the ground-based machines ranging from laptops to ground-based Spaceborne Computer Two (SBC-2). It is important to understand the implications driving this validation test:

- Using Microsoft Custom Vision, it is possible to distinguish between "Go" and "No-Go" gloves utilizing classification models.
- The results are preliminary and have not been confirmed with EMU Glove subject matter experts.
- This AIML model is not in the safety review process to decide, but it is intended to augment the Mission Control Center flight-control and ground-team workers in the future.

The implications could optimize glove inspection by reducing hours invested in safety protocols associated with glove integrity. The glove inspection process is normally performed by a group of individuals and requires multiple days to analyze data and develop a consensus on a "Go" or "No-Go" recommendation. The AIML model was able to perform diagnostics and generate a recommendation in less than 45 seconds.

The ISS glove inspection prototype is part of a multipronged AIML Foundation early win intended to make secure cloud based AIML services secure and affordable for NASA. The team will continue to demonstrate AIML model aptitude testing once post-EVA Glove photos are input to SBC-2 directly by the astronauts on the ISS, without the need for

(Continued on p. 14)

Salesforce… It's More Than a Customer Relationship Management Tool

By the NASA Salesforce Enterprise Service Management Team, Marshall Space Flight Center

When the COVID-19 pandemic hit the United States in early 2020, NASA, along with the rest of the world, was faced with challenges. NASA not only needed to manage the workforce safely but also needed to keep the workplace safe for those individuals working on mission-critical activities. Safety precautions presented challenges because there was no system in place for tracing and tracking individuals who had been exposed to a highly transmissible illness, such as COVID-19. To solve this problem, NASA's Chief Health and Medical Office and the Office of the Chief Information Officer (OCIO) came together to implement a new system. Within private industry, Salesforce was being used to tackle the contact tracing and tracking related to COVID-19. NASA, with the help of a contracting partner, was able to implement this solution with a few modifications to suit NASA's needs. The NASA Contact Tracing and Tracking application is still in use at NASA and has proven to be an effective tool.

While primarily a Customer Relationship Management (CRM) tool, Salesforce has extensive capabilities/modules that have been successfully configured to meet NASA business processing and reporting needs. In addition to CRM and reporting/dashboard capabilities, Salesforce can streamline information gathering and data intake; enable proactive communication, outreach, and external engagement and collaboration; and automate workflows and case management. Salesforce is a FedRAMP-certified, partitioned instance of Salesforce.com's multi-tenant public cloud infrastructure, specifically for use by U.S. Federal, state, and local government customers.

Image via Salesforce

The Applications Division within the OCIO established Salesforce as a service, identified a set of approved Salesforce enterprise capabilities, staffed an Enterprise Service Management Team (ESMT), and stood up a Salesforce Center of Excellence (COE). The COE consists of civil servants and contractors who assist interested programs/projects/Centers in determining if Salesforce will meet their needs. The NASA ESMT serves as a single focal point for defining and managing the Salesforce platform for the Agency and offers a broad range of services, including blanket purchase agreement (BPA) consultations and use case analysis. The ESMT is responsible for overall leadership, governance, coordination, infrastructure, and delivery of the Salesforce service. The Salesforce ESMT also provides a community where Centers and Program Offices can share ideas and collaborate with each other, explore common needs, and benefit from the investments that other Centers and program offices may have already made. Currently, NASA has 22 Salesforce applications in production and 2 in the development and implementation phase.

An Enterprise management approach to Salesforce comes with multiple benefits for the Agency, including the reduction in implementation and operating costs and the elimination of duplicate apps/systems. If you want to know more about Salesforce, contact NASA's Salesforce ESMT via email at agency-dl-salesforce@mail.nasa.gov. You can also learn more about Salesforce@NASA and the Salesforce ESMT by visiting NASA's Salesforce SharePoint site at https://nasa.sharepoint.com/sites/Salesforce.

Agency Honor Awards

Congratulations to colleagues within the Office of the Chief Information Officer (OCIO) who have been selected for the 2021 Agency Honor Awards. The honor awards are an opportunity to express gratitude and appreciation to NASA employees who have helped the Agency achieve great things throughout the year. NASA medals and certificates are subsequently presented to the recipients by the Agency's highest officials at the annual awards ceremonies held at NASA Headquarters and each NASA Center. Here's a list of the OCIO winners. Way to go, team!

NASA Group Achievement Award

COVID-19 Contact Tracing and Tracking Team—In recognition of the outstanding cross-organizational teamwork demonstrated by the rapid development and deployment of the Agency COVID-19 Contact Tracing and Tracking application in response to the pandemic.

Christopher Aguirre, Joey Anders, Leigh Anderson, Gary Arrington, Gregory Barrall, Sittra Battle, Elizabeth Beecham, Christopher Bertagnolli, Robert Birchmeier, Christopher Blakeley, Melody Bowling, Stephanie Chandler, Deepak Chawla, Milton Checchi, Angela Claud, Chad Collier, Tatiana Cooke, Kyle Cossey, Whitney Craig, Dennis daCruz, Sherry Davidson, Esteban Duenas, Leland Dutro, Mignonwoalo Edorh, Shari Feinberg, Tim Fiedorowicz, Dr. Jordan Firestone, Babajide Folarin, Walter Franklin, Justin Fraser, Brittany Freeman, Mark Fridye, Sowmya Gadang, Jeffrey Gernand, Caroline Gerughty, Dr. Susan Gifford, Yekaterina Gilbo, Brandon Goss, Marshall Guillory, Brittany Higgins, Cris Holderman, Tarrie Hood, Stacye Hoult, Lorna Howell, Shannon Jackson, Shelby Johnson, Kirk Johnson, Doris Jones, Becky Kaufman, Robert Keasling, Heather Kimley, David King, Christopher Kusek, Jason Larche, Smith Larona, John McCardle, Barbet McLain, Vivek Mehta, David Meza, Dr. Vincent Michaud, Priyada Mohen, Safiatu Mojidi, Donald Monell, Rupa Nallani, Karen Northon, Patricia Oleksiak, Cheryl Oscar, Michael Pannell, Vanessa Pao, Stephen Pilkenton, Phil Posey, Albert Praetorius, Madhavi Puli, Terri Ratcliff, Benjamin Reist, Iresha Ricks, Stephen Sayousanat, Brent Sherman, Jeffrey Sinnamon, MarKeisha Snaith, Shenandoah Speers, Patti Stockman, Ronald Thompson, Emily Townsend, Eldora Valentine, Ramprisad Varri, David Vivian, Dylan Volk, Anita Webster, Kellie White, Keith Winters, Tami Wisniewski, Allison Wolff, Penny Woods, E. Yates, and Suneetha Yellamaraju

Silver Group Achievement Award

EUSO/CP Strategic Communications Team – For exemplary service to NASA in support of IT communications during COVID-19.

Brittany Higgins, Daniel Horton, Jaleah Morris, Sylvester Placid, Shaina Strom, Emily Townsend

Exceptional Public Service Medal
Hilary Gambale at Goddard Space Flight Center (GSFC)—For her dedicated efforts to provide Center-wide training and user support for Office 365 applications amid the global pandemic and GSFC's change to a remote workforce.

Hilary Gambale

Silver Group Achievement Award
Goddard's NASA ground communications system (NASCOM) Mission Operations Team—For unwavering dedication, including risking personal safety, while providing onsite support for NASA's mission-critical activities during the pandemic.

Group Achievement Award
Goddard Mission Cloud Platform Team—For outstanding achievements in developing, securing, and implementing the new Mission Cloud Platform (MCP), a critical component of NASA's mission technology transformation.

NASA Group Achievement Award
The End User Services Program COVID-19 Telework Team—For exceptional support and performance ensuring telework readiness for the Agency during the COVID-19 pandemic.

Troy Farsoun, JaLeah Morris, Lauren Strickland, Kirk Johnson, Chris Story, Josh Atchley, Stephanie Elliot, Brittany Garner, Kyle Westbrook, Laura Coil, Steven Foote, T.W. Fowler, Daniel Horton, Rachel Morris, Kim Solomon, James Stovall, Shaina Strom, Emily Townsend, Bobbie Williams, Robert Wilson, Pinar Moore, and Paul Rydeen

NASA Group Achievement Award
The Druva Cloud Backup Solution Team—For exemplary performance in development, planning, management, and deployment of the Druva Cloud Backup Solution.

Troy Farsoun, Kirk Johnson, Kyle Westbrook, Robert Wilson, Steve Foote, Bobbie Williams, Emily Townsend, and Daniel Horton

NASA Group Achievement Award
Collaboration Modernization Team—For recognition of the successful integrated, timely, and effective modernization of the Glenn Research Center Collaboration platforms.

Brian Sommers & Nick Meyer-Fladwood

NASA Silver Group Achievement Award
NASA Stennis Space Center IT Pandemic Response Team—For outstanding support of the NASA workforce during the COVID-19 pandemic mandatory teleworking environment.

Allecia Kimble

Space Flight Awareness Award
For O365 Trainings and Communications during the transition to remote telework.

Brittany Garner, Shaina Strom, Daniel Horton, and Emily Townsend

Group Special Act Award
Cybersecurity and Privacy Division Data Call—For exceptional analysis and going above normal working hours and days for the White House data call.

Phil Posey

Agency Honor Award Exceptional Achievement Medal
Sittra Battle at Marshall Space Flight Center (MSFC). For outstanding achievement leadership during transition to the NASA End-user Services and Technologies contract and supporting agencywide telework.

Sittra Battle

NASA Group Achievement Award
NSSC Information Management Team. For outstanding performance in transforming records management at NSSC into a cohesive, technology-driven Information Management Program.

Julia Akhidue, Colby Albasini, Tammy Bridenbeck, Wendy Byrd, Alina Davis, Maria Etheridge, Harvey Frazier, Jeffrey Hennessey, Lisa Herring, Liz Howard, Doug LeMere, Brandi Mckinley, Brittany McLaurin, Jamie Mettler, Barbara Miramon, Cindy Mroueh, Paul Rydeen, Cynthia Schwingshakl, Jesse Shiyou, Nathan Sisco, Dawnyel Stuart, Tammy Thompson, Deirdre Wolverton and Bobbie Young.

Digitally Transformed (Continued from p. 10)

the ground team to uplink these photos. This will hopefully demonstrate the autonomy needed for Artemis and Mars missions, where communications bandwidth and time delays affect inspections. While the team members have their hands full with post-EVA photo analysis, they are also documenting the real-time inspection steps of the process. With the addition of the HD camera on the Extravehicular Mobility Unit (EMU), the operations team gains access to a 720p signal, enough detail to perform a glove analysis in real time via video stream as the crew performs a spacewalk. The research team is in preliminary planning stages to test the scenario later this year.

A special thanks goes to everyone who supported this project by either providing guidance, developing code, and sharing ideas. Every member of the team was enthusiastic, motivated, and determined to succeed from start to finish. It really took a village to accomplish this endeavor. And the work would not have occurred without the support from NASA leadership who recognized the potential AIML technology provides to the agency's Human Space Flight program.

National Aeronautics and Space Administration

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