

Living on Mars: Aerospace Crew Accelerates Human Space Exploration Knowledge

April 28, 2023



⁽Image Credits: MDRS, NASA)

The Aerospace Corporation's first all-Aerospace analog mission crew embarked on a two-week simulation at The Mars Society's Mars Desert Research Station (MDRS) in Hanksville, Utah. Last November, the six members journeyed into this remote location with a robust roster of experiments to conduct and a unifying sense of determination to improve their understanding of cislunar and planetary missions.

"Any time you can test something out in the field beyond the comfort zone of the laboratory, you can learn a lot," said Alli Taylor, MDRS Crew 269 Executive Officer and Senior Project Leader in Aerospace's Human Exploration and Spaceflight Division. "This opportunity has improved the technology readiness level of individual experiments and is an example of how Aerospace is building skills and strengthening human spaceflight expertise in an operationally relevant environment." At the conclusion of their experience in mid-December, the crew returned from the almost-Martian environment with new knowledge, including data from multiple extravehicular activities (EVAs), opportunities to improve in-house technology, and lessons learned for operating and living in space. Beyond the immediate scope of their mission, MDRS Crew 269's successful simulation validated Aerospace's ability in providing cutting-edge human space exploration support and paves the way for future opportunities.

"We demonstrated that Aerospace was able to form an astronaut-like crew, recruit high-quality experiments, put together a mission plan, and execute it — all from using expertise and people that we have from within," said Dr. Kristine Ferrone, MDRS Crew 269 Commander and Senior Engineering Specialist in Aerospace's Civil Systems Technology Division. "That was something we were pretty sure we could do, but now that we have successfully gone to MDRS, we know for certain we are capable."

Read the full article on Aerospace.org.

Honoring Our Admins at Aerospace!

April 26, 2023



As the space enterprise continues its rapid transformation, Aerospace is moving faster and in greater alignment with its government customers to provide unparalleled technical expertise where it's needed most. A key enabler of that dynamic are the many administrative professionals within the corporation that facilitate and coordinate these efforts on a daily basis, clearing the path for our technical colleagues to do their best work. Admins are an essential part of Aerospace's community and culture – simply put, they're Circle-A through and through.

Today is also National Administrative Professionals Day, which is celebrated annually on the Wednesday of the last full week of April – which is also recognized as National Administrative Professionals Week. The

observance actually dates back to 1952, changing to its current name in 2000 to encompass the expanding responsibilities and wide-ranging job titles of administrative support staff in the modern economy.

It's only fitting that we at Aerospace take this opportunity to express our gratitude and appreciation for our admin colleagues!

Meet Aerospace's New Senior Technical Fellows

April 20, 2023

As the space domain continues to rapidly evolve, it is critical for Aerospace to strengthen its role as the nation's partner for innovative capabilities and novel approaches to solve the hardest problems. As mentioned by President and CEO Steve Isakowitz at the most recent All Hands, Aerospace is expanding its Technical Fellows program with the appointments of Dr. John Hackwell and Andrew Dawdy as the first ever Senior Technical Fellows, effective April 22, 2023.



Andrew Dawdy and Dr. John Hackwell begin serving as a Senior Technical Fellows on April 22, 2023.

The Tech Fellows are considered the foremost experts, not only within the corporation but in their respective fields, and actively broaden Aerospace's capabilities and technical knowledge across multiple disciplines. The program also provides a distinct career progression path for engineers and scientists who desire to provide technical leadership and broader impact primarily by deepening their technical expertise.

"As the first-ever appointed Senior Tech Fellows, John and Andrew will serve as a technical 'Special Forces' resource, responsible for broad program and strategic leadership while driving solutions in alignment with Aerospace's corporate and business strategies," said Dr. Debra Emmons, Chief Technology Officer and Vice President at Aerospace. "Widely recognized as thought leaders, innovators, and influencers on corporate priority initiatives and customer imperatives, they represent a new level to strive for on Aerospace's technical career path."

Hackwell and Dawdy were selected for their deep technical expertise and breadth across multiple disciplines and were conferred by Aerospace's Corporate Officers. They will be called on to perform high-level external corporate communications, and lead both technical and policy-oriented corporate strategic projects and initiatives.

With world-class recognition for their technical achievements, Hackwell and Dawdy have demonstrated technical leadership throughout their accomplished careers. Both have shown the ability to drive widespread adoption of solutions for the most challenging problems.

Globally recognized for his work in long-wave infrared hyperspectral imaging, Hackwell also oversees the Technical Fellows program. Previously, he served as director of the Office of Spectral Applications in the Engineering and Technology Group, and in 1998, received the Trustees' Distinguished Achievement Award for the invention of the Spatially-Enhanced Broadband Array Spectrograph System (SEBASS). The instrument, an advanced sensor designed to identify invisible gases in the air and materials on the ground, has increasingly become the focus of LWIR imaging spectrographic work in the country.



Dr. John Hackwell has a long legacy at Aerospace and is widely renowned for his work in advancing long-wave infrared hyperspectral imaging capabilities.

"I was surprised and honored to be selected as an inaugural Senior Technical Fellow. To me, the creation of this new position signals a true commitment to develop and reward technical excellence at Aerospace," said Hackwell. "In my new role, informal access to senior staff has already helped me see what technical issues need to be tackled and some commonalities of mission needs across programs. This new insight will help me work with other technical experts to address our most technical important problems."



Andrew Dawdy's leadership on initiatives like Project Thor has been key in Aerospace's approach to supporting to the nation's space enterprise.

Dawdy is widely known as a technical thought leader for advanced concepts and strategic initiatives for Aerospace and Space Systems Command (SSC) and has led a series of corporate teams helping Aerospace reshape its support to SSC Space Systems Integration Office (SSIO). Dawdy had a leadership role on Project Thor, which was a 2018 corporate wide initiative that identified several approaches to help increase speed and resilience for space by broadly leveraging innovation. One of the approaches developed in Project Thor was continuous production agility (CPA). This agile, high-volume space production concept focuses on delivering an entire constellation over a short period of time (for example five

years) and then immediately beginning the replenishment process to benefit from new technologies sooner and to adapt to any emerging threats. He is currently an Associate General Manager in the Space Systems Group, serving in an SSIO Cross-Enterprise role tasked with strategic issues for SSC and Aerospace.

"I'm excited at the prospects of being an Aerospace Senior Tech Fellow. As we look at the challenges we face in the space domain, it's clear that we need to bring a whole-of-Aerospace response to addressing them if we are to be successful," Dawdy said. "It's never been more important to tackle enterprise

integration issues and I want to do my part in helping Aerospace deliver the full spectrum of our technical, operational and programmatic talent to defining and championing solutions. An important area that I'm currently focused on is helping SSC and the Space Force make hard decisions in long-range planning and programming; sorting through what could or should be done in space, and driving to decisions — based on the need, value and constrained resources —to determine we can and will do."

In addition to their new responsibilities, Hackwell and Dawdy will continue their work mentoring and developing the next the generation of technical talent, ensuring continuity of Aerospace's commitment to technical excellence through future generations of space leaders.

Aerospace CubeSats to Unravel Complexities of Upper Atmosphere for NASA's LLITED Mission

April 17, 2023

NASA recently launched its Low-Latitude lonosphere/Thermosphere Enhancements in Density (LLITED) mission, which consists of two identical 1.5U spacecrafts designed, built and operated by The Aerospace Corporation.

The LLITED mission's two Aerospace CubeSats will investigate the equatorial temperature and wind anomaly (ETWA) that occurs in the neutral atmosphere, and the equatorial ionization anomaly (EIA) that occurs in the region containing



charged particles. While named anomalies, these features occur daily between approximately 100 to 400 km and have been observed separately from different satellites or from multiple ground observations.

"There are two unusual phenomena that are created during the day in the ionosphere/thermosphere on either side of the equator and then disappear after sunset," said Dr. Rebecca Bishop, principal investigator for the LLITED mission. "One displays an increase in neutral atmosphere temperature and changes in winds, and the other shows an increase in the ionospheric plasma density almost at the same time. LLITED's goal is to understand how long each last after sunset and how the two interact with each other."

Global Volunteer Month: Many Ways Employees Can Give Back

April 11, 2023

Aerospace employees continue to share a dedication in giving back and making positive impact in their communities, demonstrating generosity of time and talent. During the month of April, Aerospace is encouraging employees to give back during Global Volunteer Month, joining together to make a meaningful difference for those in need.

Since being established in 1991 by Points of Life, Global Volunteer



Month has inspired countless individuals from across the world to make a great impact through volunteering. Throughout the month, Aerospace is providing numerous in-person and virtual volunteer opportunities and giving campaigns, making it easy and accessible for everyone to make change in their community and around the world.

Giving in April

Aerospace is once again partnering with Los Angeles Team Mentoring (LATM) which serves more than 1,000 middle school students with the support of over 300 volunteer mentors, including a number of Aerospace employees. Earlier this month, Aerospace hosted 46 middle school students who made a virtual visit to the El Segundo STARS facility and learned more about the endless opportunities in space. Aerospace has set up a giving campaign throughout April and will match up to \$1,250 in donations which will go directly to LATM. Aerospace's Vice President and Chief Information Officer Tammy Choy will be matching up to \$2,000 in donations creating an even bigger impact with every dollar donated by the Aerospace team.



Aerospace volunteers play a key role in inspiring the next generation in space. "Working with LATM over the last seven years has been immensely rewarding," said Choy. "These students are some of the most vulnerable in Los Angeles, so the work that we do with LATM is vital to opening the students' eyes to the future possibilities during this impressionable time in their lives. We want to do everything we can to assist them in reaching their full potential."

Aerospace will be hosting a Girl Scouts Badge in a Day event in Colorado Springs on April 15 in celebration of all that the Space Workforce 2030 companies have accomplished in the first year. The signatory companies are coming together to host the event in partnership with the Girl Scouts of Colorado. <u>Volunteers are needed</u> to help 100 Girl Scouts (from kindergarten through 5th grade) work through 10 stations of activities, showing the scouts the wonders of STEM.

In addition to Volunteer Month, April 22 is Earth Day and this year <u>Aerospace is encouraging employees</u> to pitch in, pick up, and help out. Everyone can take small steps to celebrate and honor Earth at home and employees can give back through the <u>Great Global Cleanup</u> or <u>other opportunities</u> in <u>their area</u>. Aerospace is also hosting a giving opportunity and donating to several environmental charities through <u>Aerospace</u> <u>Cares</u> creating a variety of ways for employees to make a difference this Earth Day.

Spotlighting Volunteers



Volunteer of the Month John Martillo gives back by teaching students about the wonders of engineering and space.

Aerospace employees do amazing work in their communities all year round and each month Aerospace has been featuring an employee volunteer and sharing how they are making a difference. April's Volunteer of the Month is John Martillo, Systems Director of Vulcan Development and Operations. Martillo has dedicated his time to volunteering around the world, installing solar lighting in a remote village in Mexico. He has also volunteered with Aerospace at City of STEM, where he worked with young aspiring scientists and engineers to show them the many opportunities that lay ahead of them and how they can take their place in space.

"Volunteering at the City of Stem event was an incredibly fulfilling experience," said Martillo. "Witnessing the enthusiasm and passion of the young cohort of future scientists, doctors, engineers, and other

STEM professionals was awe-inspiring. Seeing their eyes light up with excitement as they learned about the wonders of science and technology made me feel proud to be a part of this community."

Impacting the Community

Giving at Aerospace doesn't stop when Volunteer Month comes to an end. In California, Aerospace is <u>looking for volunteers</u> to join together with the U.S. Air Force and give back at the Torrance Armed Forces Day. On May 19, volunteers will host a STEM booth with activities for kids teaching them about the joys and possibilities space has to offer. The event will also include a variety of activities, including a 5K run, parade, aircraft and support vehicles on display, and live performances by a military band.

The 46th Annual Robert H. Herndon Memorial Science Competition is coming soon, and Aerospace is <u>looking for volunteers</u> to help out across the country. In Huntsville, volunteers are needed to support the essay competition. Event support volunteers are needed in El Segundo on May 25 and in Chantilly on June 1 during the science experiment competitions to assist students throughout the day and ensure another successful event.

"Being able to contribute to an event by sharing my knowledge and experience is truly rewarding," said Martillo. "Volunteering leaves me feeling energized and inspired, knowing that these bright minds are the ones who will shape the future of our world."

Aerospace employees volunteer in many ways. If you currently give back to your community, you can log your hours at <u>Aerospace Cares</u>. If you are interested in volunteering you can learn more about the many opportunities Aerospace has to offer here.



There are many ways to give back including at in-person volunteer events across the country.

Dialing Up Space Talk At SXSW 2023

April 06, 2023

Though not typically included in lists of America's space hubs, Austin, Texas, is increasingly making the case to be considered. The Lone Star State capital features a growing space industrial sector, and Texas government leaders there have considered approving unprecedented public investment in commercial space to build on the already rich legacy of Texas contributions in U.S. space history.



Austin has also played host to South By Southwest (SXSW or South By)—one of the preeminent thought leadership venues in America—for 37 years. World-famous as an arts and music festival, SXSW also features a conference that upholds the festival's ethos of changing the world for the better. Recent public interest in space achievements, such as the successful Artemis I mission and the deployment of the James Webb Space Telescope (JWST), has converged with these themes, bringing a higher volume of space-related content to the SXSW stage.

Read the full article on Aerospace.org.

Advancing Space Domain Awareness with Aerospace's Catcher

April 05, 2023

Space is becoming more challenging to navigate due to factors such as natural hazards and the rapid increase of artificial objects, including operating and nonfunctional spacecraft. Acquiring, maintaining, and strengthening space domain awareness (SDA) provides operators and the broader space enterprise a richer understanding of the conditions that spacecraft must operate in, and can also increase speed and agility in troubleshooting on-orbit problems that may arise.



The payload will provide real-time local space domain awareness, noting potential environmental hazards that could affect its host spacecraft.

The Aerospace Corporation, in collaboration with Space Systems Command (SSC), is building confidence in compact SDA capabilities with Catcher, a payload that provides real-time local insights on a variety of hazards that its host may encounter.



The Aerospace Corporation, in collaboration with Space Systems Command (SSC), built Catcher, a payload that provides real-time local insights on a variety of hazards that its host may encounter.

The sensor payload will be able to discern threats within the host's surrounding environment, including those across certain parts of the electromagnetic spectrum and mechanical impacts.

"The capability demonstration provided by Catcher marks the first step toward a future where all space vehicles will have a heightened situational awareness" said 1 st Lt. George Eberwine, program manager for SDA Prototypes at Space Systems Command. "We've reached a point where small and robust sensors can be integrated with space assets and provide operators with real-time data on all aspects of the vehicle's environment, in addition to serving as critical data sources for anomaly attribution, should something unexpected occur."

A Closer Picture of Operating in Space

encounter. Throughout the duration of its mission, a spacecraft can undergo many changing conditions within its environment. This can include radiation, nearby satellites transmitting in its orbital path, or colliding with small pieces of space debris.

Although ground systems are used to identify and track objects in space, a spacecraft's onboard local sensor can pick up on conditions and risks that Earth-based observation tools cannot.

"Catcher is a low-cost, size, weight and power solution that will accurately perceive changes and various hazards in the host satellite's environment," said Dr. Joseph Mazur, Principal Director in Aerospace's Physical Sciences Laboratories. "If an anomaly occurs, operators will be able to look at Catcher's record for information and analysis. If there's a correlation, the mission team will be able to have an increased sense of confidence on why the problem occurred."

The Past as a Way Forward

Catcher leverages the lessons learned and modular design of a previous Aerospace and SSC collaboration: <u>the Energetic Charged</u> <u>Particle (ECP)-Lite</u>. By opting to adopt the design specifications of ECP-Lite, Aerospace engineers were able to focus their efforts and resources on the sensing aspect of the Catcher mission, ultimately accelerating development and optimizing costs.



Thirty-four names have been inscribed on one of the payload's planks to reflect the many individuals, including those at Aerospace, whose contributions helped to advance Catcher's concept and development.

The payload successfully launched as part of the United States Space Force's USSF-67 mission on Jan. 15 from Kennedy Space Center's Space Launch Complex 39A. During its inaugural flight in space on the Long Duration Propulsive ESPA (LDPE)-3, the sensor will demonstrate its detection capabilities and the data collected will inform the team if Catcher is functioning as expected.

The testing and evaluation of the payload will be a milestone for in-space SDA capabilities, demonstrating that detecting hazards among a spacecraft's immediate surroundings is possible in an affordable and compact manner.

For the Aerospace team, Catcher may be the first of its kind, but there are additional opportunities to build and expand SDA and resiliency for the U.S. space enterprise.



Catcher launched as part of the United States Space Force's USSF-67 mission on Jan. 15 from Kennedy Space Center's Space Launch Complex 39A. (Credit: SpaceX) (The appearance of SpaceX visual information does not imply or constitute SpaceX endorsement.)

"Since these types of challenging environments have never been detected by a sensor like Catcher before, it is a bit of an experiment and partially a discovery type of mission," said Mazur. "The insights from this experience can help us develop and field more of the same type of payload on other systems. We could also use the verified sensing technologies onboard Catcher for other types of architectures. Catcher is a single box that has lots of capability within it."

Read the article on Aerospace.org.

April 2023 Obituaries

April 01, 2023

Sincere sympathy is extended to the families of:

- Elizabeth Aitchison, office of technical support, hired Jan. 28, 1963, retired Feb. 1, 1987, died Feb. 7, 2023
- William Brown, member of technical staff, hired Jan. 3, 1961, retired July 1, 1989, died Jan. 17, 2023
- Virginia Cook, member of administrative staff, hired Aug. 27, 1962, retired July 1, 1990, died March 12, 2023
- Eileen Cross, office of technical support, hired July, 21, 1964, retired Nov. 1, 1988, died Nov. 25, 2022
- Yolanda Dewees, office of technical support, hired Feb. 1, 1982, retired Sept. 1, 2014, died March 10, 2023
- George Freeman, member of technical staff, hired Jan. 6, 1969, retired Aug. 1, 2005, died Feb. 24,
- 2022 Michael Gyetvay, member of technical staff, hired June 10, 1963, retired April, 1, 1996 died March 12, 2023
- Patrick Heming, office of technical support, hired July 30, 1990, retired Sept. 1, 2000, died Nov. 9, 2022
- Martha Johnson, member of technical staff, hired April 14, 2008, died March 16, 2023
- Stanislav Krecek, office of technical support, hired May 10, 1982, retired April 1, 1990, died March 8, 2023
- Steven Lazar, member of technical staff, hired Nov. 26, 1979, retired Nov. 1, 2019, died March 3, 2023
- Alex Melgun, member of administrative staff, hired Jan. 21, 1974, retired May 1, 1986, died Oct. 20, 2022
- Robert Prentice, member of technical staff, hired June 22, 1980, retired Aug. 1, 1990, died March 19, 2022
- Charles Stasoiski, member of technical staff, hired Oct. 22, 1990, retired June 1, 2014, died Dec. 23, 2022
- David Stell, member of technical staff, hired March 26, 1984, retired Aug. 1, 2007, died March 17, 2023
- Frank Strubel, member of technical staff, hired Dec. 12, 1972, retired Sept. 1, 1995, died Feb. 8, 2023
- Robert Tereska, member of administrative staff, hired June 12, 2006, retired July 1, 2020, died Fab. 27, 2023
- Anthony Witherspoon, member of administrative staff, hired Oct. 19, 1998, retired July 1, 2014, died Feb. 2, 2023

To notify Aerospace of a death and have it included in the Orbiter, please contact People Operations at (310) 336-5107.

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