



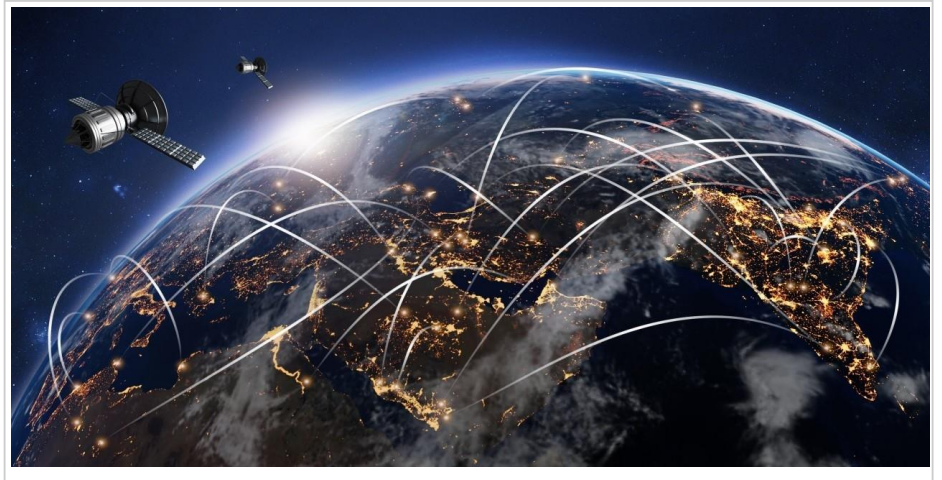
## ORBITER NEWS

News, announcements, and more.

# Mission Assurance Baseline Matrix: Aerospace Provides a New Way to Rethink Risk

January 31, 2024

An increasingly dynamic environment is driving changes in the risk posture across the industry. As a result, Aerospace is shaping the future by developing new strategic approaches to balance risk with mission needs across the space domain. Aerospace's Mission Assurance Baseline (MAB) matrix provides a framework for tailoring mission assurance that leverages industry crowdsourcing to advance new, dynamic approaches to risk management while delivering on Enterprise Mission Success.



"Aerospace has a depth of knowledge that makes us unlike just about any other entity across the enterprise," said Barbara Braun, Principal Director of the Corporate Chief Engineer's Office (CCEO). "Increasingly, we are able to help not only our government customers, but also our commercial contractor partners by providing the expertise they need for mission success – and the MAB matrix will help make that happen."



## Responding to Change

By creating resources like the MAB matrix, Aerospace hopes to enable broader enterprise collaboration to address the needs of an industry changing faster than ever before. While this matrix provides more than 4,000 data points to ensure mission success for a spacecraft, it is also flexible enough to allow users to focus their approach.

“This new format will make mission assurance more accessible, especially for programs that are looking to tailor their efforts. These programs can now look, in an outline format, at Aerospace’s baseline at a high level and then dive down deeper,” said Braun.

The MAB is a comprehensive toolkit that Aerospace has been using for years. The MAB matrix is an adaptation of that toolkit designed to better serve evolving customer needs and the broader space community. Like the Space Attack Research and Tactic Analysis ([SPARTA](#)), the MAB matrix will soon be publicly available, empowering both external companies and Aerospace employees to more easily access the resource. **Today, employees can access the MAB matrix beta site [here](#).**

“We pay attention to the changing mission assurance landscape and develop tools like the MAB matrix to help the whole enterprise adapt to the changing times,” said Braun.

## Cultivating Collaboration

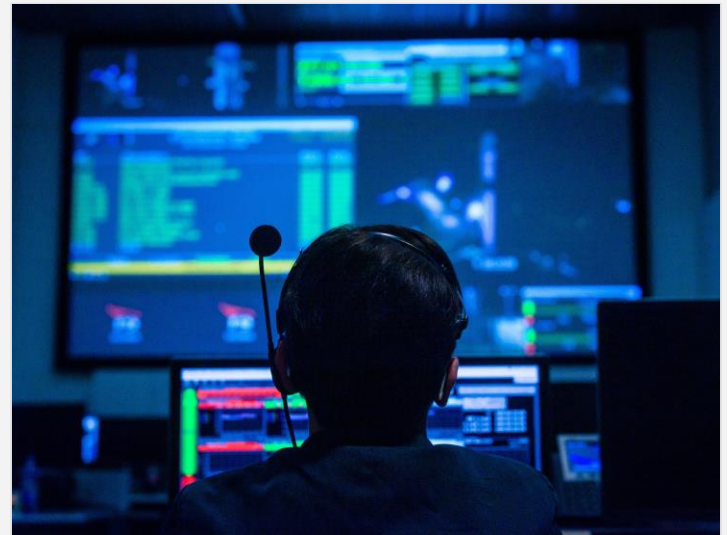
The MAB matrix will allow users to focus mission assurance efforts in specific areas rather than across the entire breadth of possible tasks, some of which may not be necessary or desired. The matrix will also gather user feedback and lessons learned from across the industry, which will be used to increase collaboration and knowledge sharing.

“We have to really be in front of the enterprise leading agencies and our customers through this collaboration; the matrix does an excellent job of showing folks what we have learned while allowing everybody to contribute and benefit from the experience of others,” said Braun.

The adaptive mission assurance that Aerospace affords customers is key to the success of the entire space enterprise and the MAB matrix provides the framework for collaborative knowledge sharing and problem-solving.

“We are a servant of the enterprise with a lot of knowledge gained from working with so many customers,” said Braun. “It’s time we put this out there for everybody to use, which will benefit our ultimate goal of securing a space enterprise that serves our national interests.”

*CCEO focuses on bringing employees together and providing the support, resources and tools necessary to achieve Enterprise Mission Success across a broad range of mission areas.*



*With resources like the MAB matrix, Aerospace can enable broader enterprise collaboration to address the needs of an increasingly dynamic space industry.*

## COSMIC: Propelling ISAM From Transformational to Routine

January 29, 2024

A new era of integration, innovation and collaboration for human, uncrewed and robotic space activity is underway. U.S. preeminence in space may someday expand within this paradigm even to the far reaches of the solar system. This will depend on the advancement of capabilities for in-space servicing, assembly and manufacturing (ISAM) and will be manifested by emphasizing a collaborative whole-of-nation approach.

The Consortium for Space Mobility and ISAM Capabilities (COSMIC) serves as a catalyst for this vision, facilitating the

convergence and coordination of diverse stakeholders across government, industry and academia to create a new foundation that will propel the space architectures of the future. Established by the NASA Space Technology Mission Directorate (STMD) and managed by The Aerospace Corporation, COSMIC is a direct response to the White House’s National ISAM Implementation Plan.



*Aerospace’s Greg Richardson, Executive Director for COSMIC, outlines the roadmap and end-goal for the consortium.*



“One of the defining trends of this new space age has been the dramatic increase in stakeholders across defense, civil and international space. At Aerospace, we take our role as a connector and convener across the space enterprise very seriously, and we are increasingly focused on ensuring success from the enterprise perspective,” said Steve Isakowitz, President and CEO of Aerospace. “This means looking beyond individual systems or spacecraft and delivering end-to-end solutions that meet the needs of diverse partners and missions and supporting national priorities. ISAM is a great example of this type of approach that is needed.”

In November, COSMIC held its inaugural meeting, kicking off its endeavor to chart the course for ISAM as integral part of space activities and turning what was once considered novel achievements—as demonstrated by missions such as Orbital Express and OSAM-1—into the standard of future missions.

The two-day event hosted at the University of Maryland featured leaders from NASA, the U.S. Space Force (USSF), Air Force, U.S. Space Command and the White House Office of Science and Technology Policy (OSTP), drawing nearly 600 total participants from industry, academia and research organizations to collaborate on advancing the nation’s ISAM leadership.

Read the ***[full article on Aerospace.org](#)*** to learn more about COSMIC and key takeaways from the consortium’s kickoff meeting.

## Aerospace Celebrates MLK Day: Carrying on a Legacy of Service

January 17, 2024



*Aerospace employees all across the country did their part to honor Dr. King’s legacy of making positive change during the MLK National Day of Service.*

Aerospace’s culture of giving shines bright throughout the year but truly stood out during the Dr. Martin Luther King Jr. (MLK) Day of Service. Employees from all across the country joined together to honor Dr. King’s legacy of making positive change. This year, employees gave their time and talents to support their local communities to fight food insecurity.

“At Aerospace, we spend our careers giving back to the nation, making sure Americans are safe and secure as a result of a strong space enterprise,” said DSG Vice President Dr. Lara Schmidt, who volunteered in Colorado Springs. “Giving back at the community level is a whole different experience—it’s personal and it affects individuals.”

This is the second year Aerospace has celebrated MLK National Day of Service, which is the only federal holiday also designated as a day of service. Inspired by MLK’s legacy, Aerospace hosted more volunteers than ever before with employees generously sharing their time to make a difference in their communities.

## Making a Difference Together

In Los Angeles, employees gathered at the Los Angeles Regional Food Bank to box more than 22,000 lbs. of food. Aerospace President and CEO Steve Isakowitz joined employees to package food for low-income seniors and women with infants and children in Los Angeles County.



*Aerospace employees came together and boxed more than 22,000 lbs. of food at the Los Angeles Regional Food Bank for those in need.*

“It makes me feel hopeful. I’m proud to work at Aerospace knowing that we care not only about what we’re doing for our work on national security and defense, but also that we care deeply about our communities, giving back and fighting food insecurity,” said Lianne McGinley, Associate Director of Corporate Social Responsibility. “I think all of us working together can help make a difference in that area. Small acts, everybody doing a little bit, can really add up.”

During the Day of Service, nearly 13,000 lbs. of food was packed by Aerospace volunteers for the Care and Share Food Bank in Colorado Springs.



*Volunteers in Colorado Springs helped to package nearly 13,000 lbs. of food was packed for the Care and Share Food Bank.*

In Albuquerque, volunteers packed and assembled boxes at the Roadrunner Food Bank, helping to put food on the table of those in need. In Chantilly, volunteers sorted, stocked, and organized food at the Western Fairfax Christian Ministries food pantry.

“I think it is important to give back to the community any way we can because we don’t always know the struggles some people face,” said Senior Project Engineer Nikki Wilcox, who organized a Day of Service volunteer opportunity in her hometown of Ellicott City, MD. “By volunteering, we can appreciate the evolving needs and give back when an opportunity arises, no matter how small.”

MLK Day also provided opportunities for remote workers to donate or volunteer for various opportunities through Volunteer Match and logging their hours on Aerospace Cares.

“Remote workers are a significant working group at Aerospace, and we wanted to help them find ways to give back in their own communities, and especially to join in with all of us as we’re working to fight food insecurity,” said McGinley.

In Utah, employees will get together on Jan. 17 and 18 to pack and organize food for Airman’s Attic, which supports servicemembers stationed in Hill Airforce Base. On Jan. 27, employee volunteers in the D.C. area will help to provide emergency groceries to those in need at the Capital Area Food Bank.

“It feels really rewarding to be a part of a bigger movement,” said Lauren Gandara, Outreach Coordinator for Corporate Social Responsibility. “When I volunteer with Aerospace, I feel like I’m part of a community that’s doing good and really able to make a difference where I live.”



## 5,000 Good Things

During the holidays, Aerospace employees gave back by volunteering for the MLK Day of Service, donating to the annual Holiday Gift Drive, supporting ERG giving activities and much more. Aerospace's goal for the One Good Thing campaign this year was to accomplish 5,000 Good Things. The goal was surpassed by an exponential multitude with the Aerospace team doing more than 35,000 Good Things during the holiday season. Aerospace's substantial impact was recognized in local media.

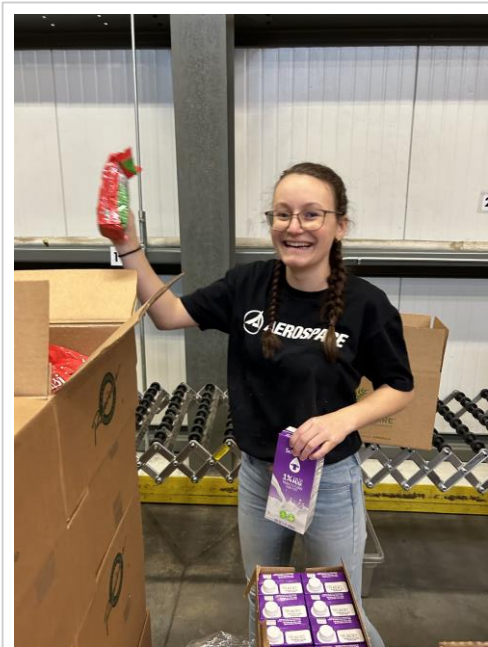


*During the holidays, employees in Albuquerque participated in a holiday gift drive for Locker 505, a local student clothing bank, and for residents of South Valley Care Center, a local nursing home.*

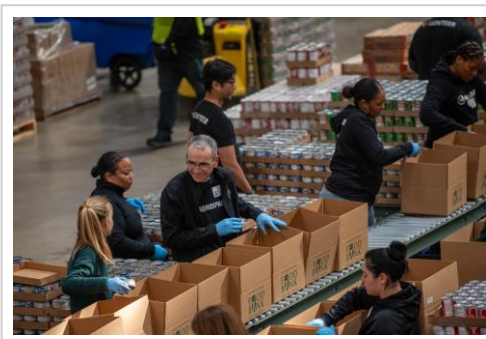
## Giving All Year Round

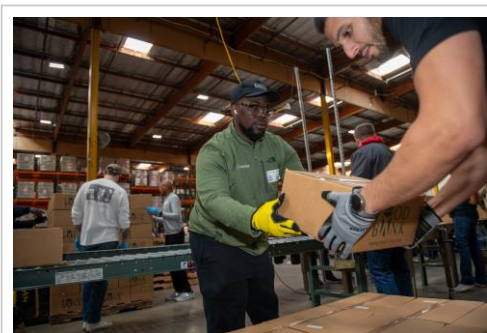
The giving season doesn't end when the holidays are over. Employees are encouraged to volunteer all year round through a variety of activities. In February, volunteer judges are needed in the D.C. area for the upcoming VEX Robotics Competition. Aerospace is also looking for Los Angeles-based mentors and judges to help out in April during the Science Olympiad Urban Schools Initiative, which will give the next generation of scientists and engineers from low-income backgrounds the opportunity to explore their passions.

"We're full of gratitude and appreciation for everyone that participated, whether it was signing up to be a mentor, helping in their communities, contributing to the holiday gift drive, or participating in the MLK Day of Service," said McGinley. "There are so many things that have added up to make a great impact."











# State of DEI: 2023 Report Highlights Aerospace's Impact

January 11, 2024

Aerospace is committed to shaping a vibrant and diverse workplace culture that empowers our people to pursue the groundbreaking innovations and solutions our partners look to us to deliver. Our commitment to diversity, equity, and inclusion (DEI) enables us to leverage the broad perspectives and diverse backgrounds needed to support shaping the nation's leadership in space for this modern age.



We are creating impactful change within Aerospace through the initiatives led by the Aerospace Committee for Equality (ACE) and also collaboratively across our industry through Space Workforce 2030 (SWF2030). While this progress is encouraging, we know the work is not done, and we remain committed to this worthy endeavor.

Read more about Aerospace's accomplishments and ongoing goals in [The State of DEI: 2023 Report](#).



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## BUILDING ON OUR FOUNDATION FOR PROGRESS

### MAJOR ACCOMPLISHMENTS

Through FY22 and FY23, Aerospace made significant progress on building a more inclusive and diverse workforce through our DEI initiatives. Among the notable actions taken this year were:

- Met or exceeded corporate goals for diverse hiring and retention and developed best practices for future success.
- Introduced and supported top talent programs by increasing exposure to senior leaders, fostering connections through expanded networks and awareness of new opportunities, and enhancing future leader readiness.
- Equipped managers across the organization with an enhanced toolkit to assess talent development needs, identify potential flight risks, and plan for continued retention of our talent.
- Through the Future STEM Leaders Scholarship, provided financial assistance and mentorship to underrepresented students nationwide studying STEM disciplines—16 recipients since launching in 2021.
- Provided ongoing workforce education and training to maximize collaboration and innovation by reducing bias and creating a culture of psychological safety where all employees can speak up and contribute.
- Developed the DEI Great Ideas at Aerospace guidance to further support developing high impact and measurable DEI goals for managers.

### SPACE WORKFORCE 2030

Aerospace is leading a growing consortium of space companies to collaboratively pursue exciting opportunities that strengthen DEI across the nation's space workforce.

- SWF2030 unveiled first annual report at Space Symposium in April 2023
  - 2021 and 2022 DEI results aggregated across all SWF2030 companies
- Centers of Excellence: INSPIRE, PREPARE, EMPLOY
  - National Space Intern (NSI) Program: 332 offers from 18 of 31 companies, with 104 NSIs at Aerospace
  - NSI opportunities included: welcome package, virtual national events, regional company tours
  - Inaugural year roadmap, including accomplishments, partnerships, media
  - Hosted Girl Scout Badge in a Day event before Space Symposium, with more than 120 Girl Scouts at Space Foundation headquarters



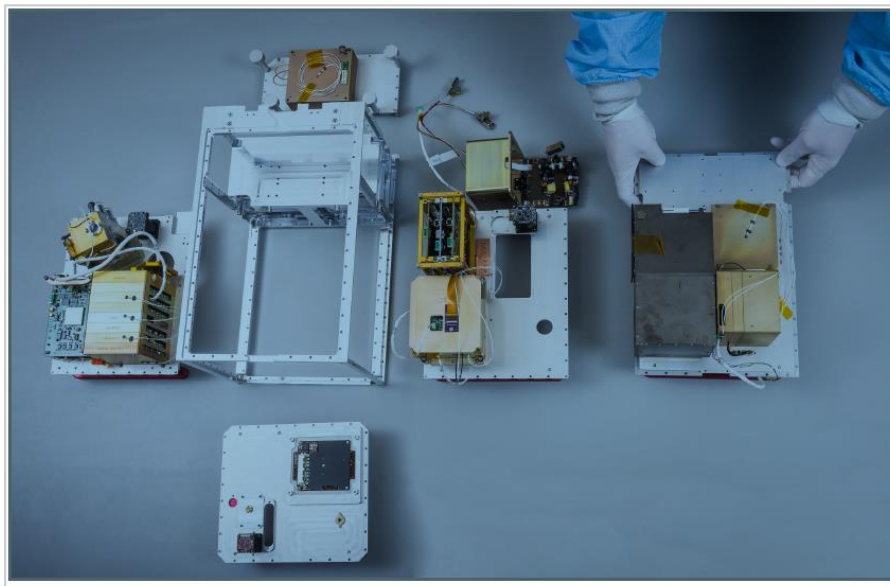
**[Download the 2023 State of DEI Report](#)**



# Aerospace's Slingshot 1 Demonstrates Pathway to Accelerating Space Innovation

January 8, 2024

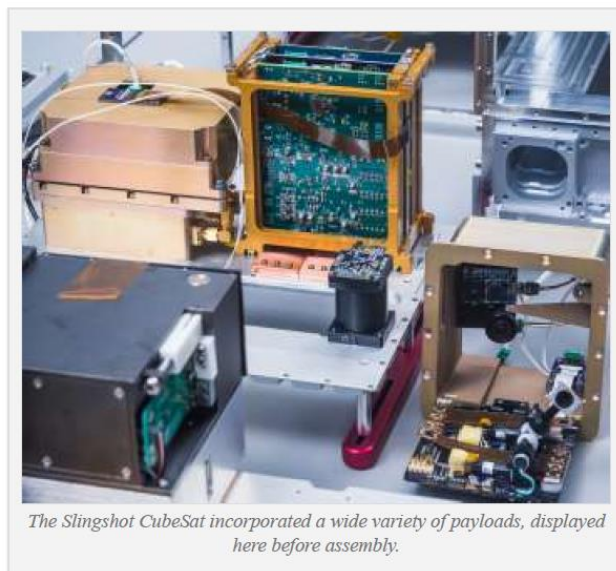
The Aerospace Corporation's Slingshot 1 mission is successfully demonstrating the potential for modular technologies to improve the flexibility of satellites and expedite the integration timeline for payloads. The 12-unit Slingshot 1 CubeSat enabled a variety of experiments across 19 different payloads by connecting them to the satellite bus using a simplified "plug-and-play" interface, demonstrating the use of open standards and non-proprietary interfaces for on-orbit experiments.



The ability to quickly design, build, and deliver advanced prototypes was a key focus of Aerospace's Slingshot 1 mission, highlighting the possibilities for rapid prototyping facilitated by streamlined payload provisioning. With its one-year mission now fulfilled, Slingshot 1 has now started an extended operations period to complete some experiments and provide continued service for customers.

"The journey from a concept, to forming a team that will build it to space flight standards using established processes and then testing it is usually a long road," said David Hinkley, Senior Project Leader at Aerospace's xLab. "Rapid prototyping paid off for Slingshot 1 in a big way, and not just by reducing turnaround time. The standard bus interface brought down the cost per payload, allowing a greater number of experiments on this mission. The experience gained by the payload engineers is valuable to future endeavors as payload developers or advisors to the government."

All payloads onboard Slingshot were connected to a SatCat5 open-source Ethernet switch contained in the "Handle" payload, which served as the electrical interface module that enabled the flow of data and power from the host satellite bus to the other payloads. All payloads on Slingshot 1 – of which 16 are self-funded by Aerospace – were designed to be self-contained and upgradeable. The technologies onboard advance a broad range of capabilities, including autonomy, propulsion, robotics, onboard processing, and communications systems. All these technologies are critical to strengthening capabilities for future space architecture and systems.



## Enabling Rapid Innovation for the Future

In addition to demonstrating the benefits of adopting the modular concept for a small satellite platform, the payloads onboard Slingshot 1 achieved notable milestones, collected meaningful mission data, and advanced new capabilities while in orbit. These milestones demonstrate the potential for Aerospace's modular approach to enhance speed and agility for space missions, allowing for rapid innovation, broader experimentation, and faster maturation of space capabilities.

"Slingshot 1 was a technology demonstration mission featuring experiments from a broad range of areas," said Hinkley. "When you have a deliberately seamless payload interface that's easy to use, it's not a big stretch to put many different experiments on there. This creates opportunities for the evolution and maturation of space-based technology."

## Payloads in Spotlight

The Slingshot bus hosted a number of payloads, enabling a breadth of innovative experiments and technology maturation, such as with Lasercomm for optical communications and ExoRomper for imaging experiments. Lasercomm contains a compact, highly efficient 4-watt laser transmitter for space-to-ground optical communication. The updated laser module incorporates a revised output collimator and new optical monitor for health and status monitoring of the laser. The Lasercomm payload was developed to advance Aerospace's in-house technology and to assess the attitude-control capability of a vendor-supplied spacecraft.



*Lasercomm, Slingshot's next-gen laser communications downlink.*

During preliminary testing, Lasercomm successfully downlinked data to Aerospace ground stations at 250 Mbps. Pointing was observed to be very stable. These results indicated that data rates approaching 10 Gbps would be achievable with this laser platform/bus combination following the insertion of updated laser hardware already developed at Aerospace.

Aerospace developed an approach that enabled the vendor to determine the alignment between the laser emission and the bus star tracker fields of view prior to launch. This information streamlines on-orbit pointing calibration. Additionally, Lasercomm served as a test source for optical ground stations under development by US allied partners. Specifically, downlinks to ground stations in Spain and Australia were conducted.

Meanwhile, the ExoRomper payload is a reprogrammable machine vision testbed designed to test satellite pose estimation algorithms and best practices for machine learning (ML) operations in a low Earth orbit (LEO) environment. ExoRomper used visible and infrared cameras pointed at a maneuverable miniature spacecraft to capture images of the spacecraft in a variety of positions and poses. It then used the Google Coral processor to process the images onboard and estimate the spacecraft's pose using ML and Perspective-N-Point algorithms.

Since the payload's deployment, the ExoRomper team has successfully deployed a first revision of the satellite pose estimation software, captured more than 1,000 operational images across a variety of lighting conditions, and used those operational images to train new ML models on the ground. The ExoRomper team used the payload's software re-programmability feature to update the pose estimation software with the newly trained ML models, improving the accuracy of the pose estimation and raising the technology's readiness level.



## Multiple Payloads, Countless Possibilities

Lasercomm and ExoRomper are just two of the payloads aboard Slingshot 1 that are advancing modern technologies. Other payloads include the low-power ethernet switch SatCat5, C-band transmitter ACETaTE, sensor-to-processor coordinator ROESA, communications downlink SDR2.0, and the imaging system t.Spoon camera. Additional information about these payloads and the Aerospace experts who worked on them is available in [this video](#).

## The Future is Modular

With the success of Slingshot 1, Aerospace is advancing the state-of-the-art by contributing to the development and evolution of critical satellite technologies, such as advanced sensors, onboard processing, cislunar technologies, and space robotics. With the goals of the original mission achieved, Slingshot 1 will continue to live on as it transitions to support an Aerospace government customer program.

"Now that Slingshot has completed its primary missions, we can perform new cyber tests that weren't feasible while it had other missions to perform," said Nicholas Cohen, Principal Engineer/Scientist in Aerospace's Cybersecurity and Advanced Platforms department. "There will be opportunities for collaboration with academia and other FFRDCs, and we'll be able to use the knowledge we gain to better defend our nation's crucial space assets."

Accelerating and expanding possibilities for access to space enables our nation's space programs to stay ahead. The Slingshot platform's modular approach, which embraces open standards and autonomous technologies, lays a compelling framework for accelerating innovation for this new era of space.

"Slingshot will continue to keep Aerospace at the leading edge of space science," Cohen said. "It's a fantastic opportunity for the government to get a cyber experimentation platform at a fraction of the cost of building and launching their own."



# January 2024 Obituaries

January 01, 2024

*Sincere sympathy is extended to the families of:*

- **James Alder**, member of technical staff, hired Sept. 2, 1960, retired March 20, 1998, died Nov. 23, 2023
- **Oliver Blackshire**, member of technical staff, hired Nov. 15, 1982, retired Aug. 1, 2020, died Nov. 21, 2023
- **J. Blake**, member of technical staff, hired Sept. 4, 1962, died Oct. 21, 2023
- **Sandra Chang**, member of technical staff, hired Aug. 31, 1992, died Sept. 26, 2023
- **Peter Choban Jr.**, member of technical staff, hired Feb. 14, 1983, died May 12, 2023
- **Richard Clark**, member of technical staff, hired July 11, 1965, retired Nov. 1, 1993, died Oct. 31, 2023
- **John Collins**, member of technical staff, hired Sept. 19, 1977, died Sept. 26, 2023
- **Ruby Fetterhoff**, technical support staff, hired June 5, 1972, retired July 1, 1994, died Dec. 7, 2023
- **William Freed**, member of technical staff, hired Jan. 11, 1988, retired Aug. 1, 2013, died Dec. 2, 2023
- **James Gidney Jr.**, member of technical staff, hired June 2, 1981, died June 2, 2023
- **Donald Gilmartin**, associate technical support, hired July 12, 1961, retired March 29, 1991, died Nov. 7, 2023
- **Selma Goldstein**, member of technical staff, hired July 30, 1990, died Oct. 12, 2023
- **David Hixon**, member of technical staff, hired Sept. 16, 2002, retired May 31, 2012, died Nov. 21, 2023
- **Wei Kao**, member of technical staff, hired Aug. 31, 1981, retired Sept. 30, 2007, died Nov. 3, 2023
- **Allen Klinger**, member of technical staff, hired Jan. 15, 1980, died Dec. 1, 2023
- **Dennis Kuli**, member of technical staff, hired March 22, 1971, retired Oct. 1, 1998, died Nov. 29, 2023
- **June Lawrence**, Office Support, hired April 17, 1961, retired Sept. 30, 1993, died Oct. 20, 2023
- **Chang Lee**, member of technical staff, hired Dec. 5, 2016, died Nov. 15, 2023
- **Pamela Magowan**, Office Support, hired Sept. 28, 1966, died Nov. 15, 2023
- **George McPherson Jr.**, hired March 27, 1972, died Aug. 3, 2023
- **Taryn Montoya**, Office Support, hired March 29, 1982, died Dec. 21, 2023
- **Mae Nakajima**, Office Support, hired Sept. 8, 1975, retired Oct. 31, 1986, died Aug. 1, 2023
- **Harold Robinson Jr.**, hired Feb. 15, 1986, died Dec. 19, 2023
- **Robert Schaal**, hired Jan. 30, 1961, died July 27, 2023
- **Mark Shockey**, member of technical staff, hired Dec. 18, 2000, died May 9, 2023

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

*These articles are reprinted from The Orbiter, a publication of The Aerospace Corporation 2310 E. El Segundo Blvd., El Segundo, CA 90245-4691 310-336-5000*

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