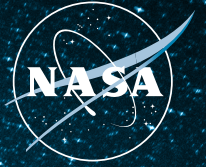


National Aeronautics and
Space Administration



2024 | NASA INFORMATION TECHNOLOGY ANNUAL REPORT





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LETTER FROM THE CIO



The NASA Office of the Chief Information Officer (OCIO) team profoundly impacts every NASA mission, whether it's sending astronauts to circumnavigate the moon on Artemis II or conducting experiments aboard the International Space Station (ISS), NASA's IT environment is critical to mission success. The positive contributions of the OCIO team are embedded in ground-breaking inventions such as the quiet X-59 aircraft, the Europa Clipper as it searches for signs of life beyond Earth, and every STEM student aspiring to be the next NASA astronaut or engineer engaging with NASA through our online presence. NASA's information technology is one of the key enablers of NASA's mission success.

OCIO is constantly discovering, adopting, and modernizing NASA's digital capabilities to keep pace with the ever-changing digital landscape. In 2024, the agency's Digital Transformation (DT) initiative launched the Digital Service pilot, which leverages a human-centered design to bolster collaboration between the digital team, subject matter experts, and the NASA customer community for a prototype service. The pilot identified "pain points," addressing more than ten, streamlining the design and delivery of operational solutions.

With new technologies emerging every year, NASA must also educate our workforce on how to integrate these technologies responsibly. The agency held the Summer of AI campaign, hosting workshops, podcasts, and AI simulations for employees to experiment with AI tools, setting the stage to incorporate them securely into our workspaces.

Although all personnel share responsibility for the security of NASA's data and systems, our cybersecurity teams across NASA go above and beyond to enable the NASA mission while optimizing our security posture through advanced capabilities. In 2024, we deployed multi-factor authentication and encryption for data-at-rest and data-in-transit across more than 90% of all NASA systems, exceeding our implementation goals. We also introduced the Vulnerability Disclosure Program, allowing external security research to be conducted on our NASA systems and driving a stronger security defense against cyber threats.

While the Moon eclipsed the Sun during the 2024 Total Solar Eclipse, the talents and hard work of our OCIO team shined brightly as we brought the world together to share this cosmic moment. NASA teams provided an incredible online experience that reached a world-wide audience. From locations around the country, center OCIO teams collaborated with other NASA organizations and rallied to prepare event stages and managed multiple video feeds. More than 300,000 people attended in-person events hosted by NASA, with over 12 million viewers on NASA's YouTube channel, 7 million on the telescope feed, and 3 million on NASA+.

These are just a few significant accomplishments from the past year. The IT Annual Report that follows features many more achievements and developments that would not be possible without the hard work and dedication of our OCIO teams across the agency. We also appreciate the commitment of, and collaboration with the broader NASA community. Together, we are modernizing the information and technology environment that is critical to continued mission success and creating the technology foundation that will enable amazing discoveries that are to come.

With Gratitude,

A handwritten signature in black ink that reads "Jeff M. Seaton". The signature is fluid and cursive, with the first name "Jeff" and last name "Seaton" clearly legible.

Jeff Seaton

NASA Chief Information Officer

IT STRATEGIC FRAMEWORK

NASA's IT Strategic Plan outlines our vision for the strategic use of information and technology at NASA through fiscal year (FY) 2026. This plan provides a unified direction for mission alignment, roadmaps, investments, and accountability for NASA's IT community to help achieve NASA's Strategic Plan. We engaged NASA's mission directorates, mission support offices, and centers during formulation, as well as external stakeholders. The agency's resulting IT strategy focuses on achieving outcomes—the impacts and change NASA's missions need to be successful.

IT Vision

Exploring the secrets of the universe for the benefit of all.

IT Mission

We empower NASA's people and partners to achieve mission success through secure, evolving information technology and accessible data.

Progress toward the plan and related performance objectives helps NASA personnel improve agency outcomes by driving discoveries as a strategic partner, accelerating results through productivity, sharing NASA's data and results, and increasing quality, resiliency, and cost-effectiveness.

To achieve these outcomes, the strategic goals and objectives in the NASA IT Strategic Plan focus on consistent and reliable IT service delivery and operations leading to excellent customer experiences, digitally-enabled, modern ways of working at NASA, and proactive, resilient cybersecurity, all supported by an engaged, customer-focused IT team.



Goal 1: Satisfaction

Deliver Great
Customer Experiences



Goal 2: Excellence

Achieve Consistent
Operational Excellence



Goal 3: Transformation

Transform NASA with
Information & Technology



Goal 4: Cybersecurity

Ensure Proactive,
Resilient Cybersecurity



Goal 5: People

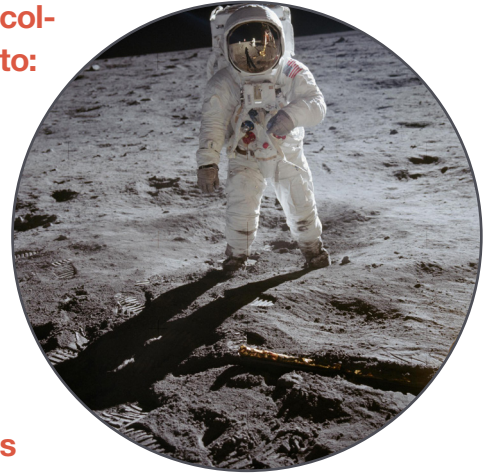
Develop an
Exceptional OCIO Team

OCIO ENABLES NASA MISSION SUCCESS

NASA's Office of the Chief Information Officer partners and collaborates with missions and mission support organizations to:

- Deliver secure and innovative IT services.
- Enable groundbreaking achievements in research, discovery, and exploration.
- Share information with NASA's external partners and the public.
- Explore the secrets of the universe for the benefit of all.

The NASA team is comprised of more than 50,000 civil servants and contractors, with many more partners from academia, the commercial sector, and from organizations around the world. Together we explore, discover, and expand knowledge for the benefit of all humanity:



Aeronautics: conducts research to advance the safety, capacity, and efficiency of the air transportation system, reduce emissions, and sustain U.S. technological leadership in the aviation industry.



Space Technology: invests in transformational technologies that help offset future mission risk, reduce cost, advance capabilities that enable NASA's missions, and support space industry growth and high-quality job creation.



Science: conducts scientific exploration enabled by observatories that view Earth from space, observe, and visit other bodies in the solar system, and gaze out into the galaxy and beyond.



Exploration Systems Development: defines and manages the systems development for programs critical to the Artemis lunar exploration initiatives and capabilities to support sustainable human deep space exploration.



Space Operations: focuses on launch and space operations, including launch services, space communications and navigation, the International Space Station, and eventually, sustaining operations on and around the Moon.



Mission Support: enables the agency's missions by managing institutional services, capabilities, and critical mission support resources.



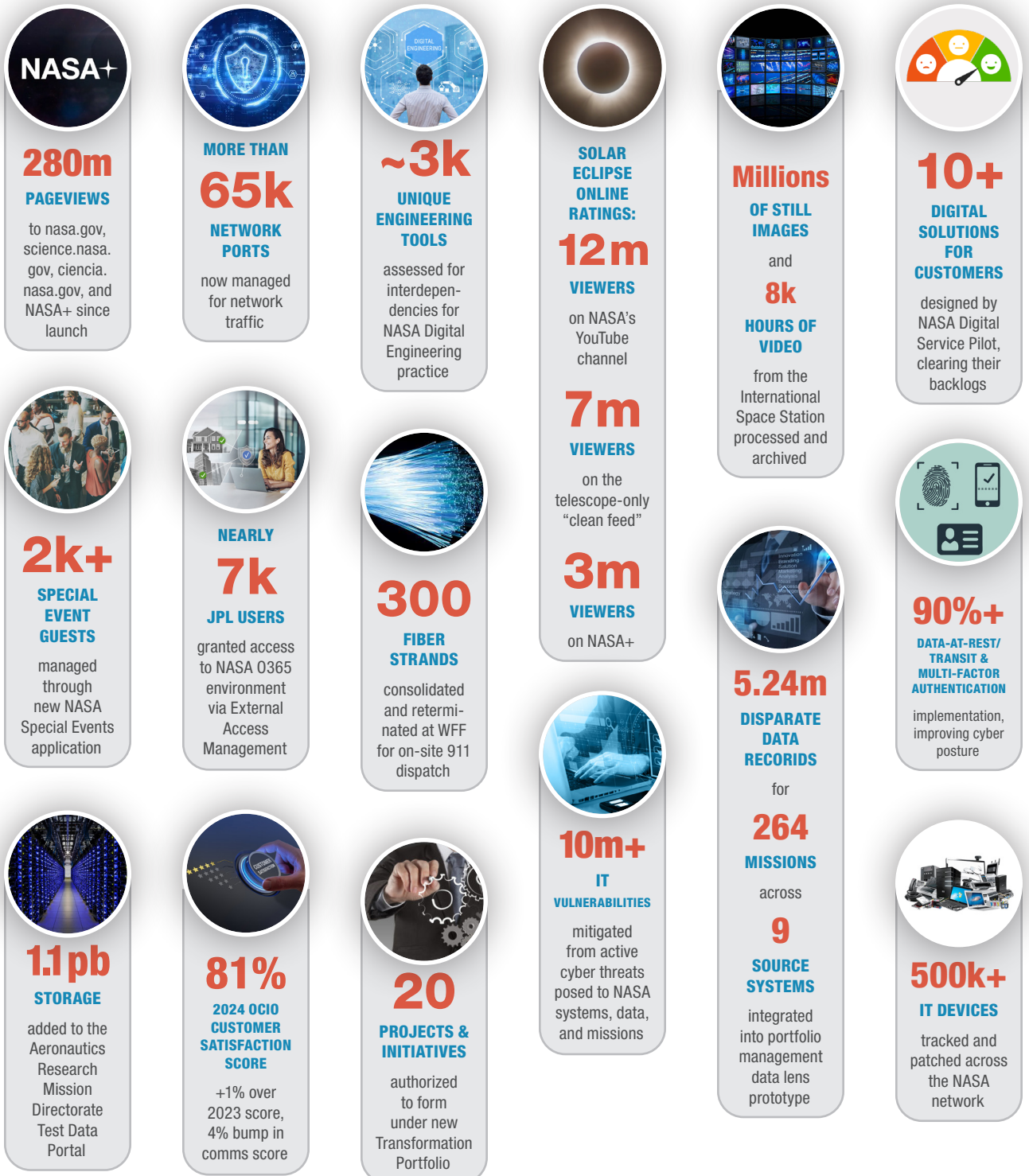
Administrator's Staff Offices: provide cross-cutting direction for safety and mission assurance, workforce, acquisition and use of IT, small business opportunities, as well as coordinating science, technology, engineering, and mathematics (STEM) engagement activities, international partnerships, and legislative affairs.



NASA Centers: In support of NASA missions, OCIO has leadership at every NASA center to support their unique contributions to NASA mission success.

2024 IN NUMBERS

Teams from across the Office of the Chief Information Officer reached great heights in 2024. These are a few of those achievements, by the numbers:

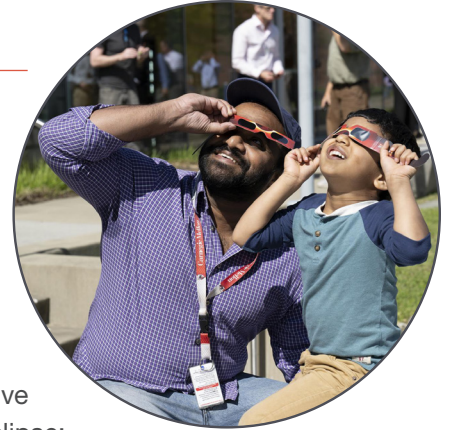


DELIVERING EXCELLENT CUSTOMER EXPERIENCES WITH TECHNOLOGY

Delivering for Our Missions

During the April 8 total solar eclipse, Office of the Chief Information Officer (OCIO) teams across the country helped NASA deliver the event into the hands and homes of people around the world.

The OCIO's Network and Communication Services (NaTS) and center teams provided the Office of Communications (OCOMM) and Science Mission Directorate (SMD) with broadband access, website support, video content and services, and imagery experts across the country. NASA was live around the world to more than 20 million viewers for the 2024 Total Solar Eclipse: Through the Eyes of NASA event from Cleveland, OH, with 12 million watching NASA's YouTube channel, 7 million on the telescope-only "clean-feed," and 3 million streaming NASA+.



The eclipse drove more than 20 times the normal web traffic to NASA's new unified web experience (nasa.gov, science.nasa.gov, ciencia.nasa.gov, NASA+, NASA app). There were more than 22.6 million pageviews in 24-hours and more than 1 billion individual server requests. Since launching in late 2023, the common web design system, navigation, and information architecture made it easier for 43 million average monthly public visitors to navigate 280 million pageviews. Over 750 editors have created content for nearly 8,000 web articles.

Understanding mission requirements and ensuring services are easily accessible and intuitive

- The NASA Mission Imagery Photo Archives team digitized priceless physical imagery, including film, negatives, and slides. Approximately 170,000 negatives were digitized from the Johnson Space Center and Ames Research Center archives, dating back to the 1950s and 1970s, respectively. Similarly, the teams digitized an additional 40,000 historic tapes, reels, and negatives at Armstrong Flight Research Center and approximately 80,000 historic negatives at Langley Research Center. These teams are advancing and preserving NASA's contributions to scientific discoveries.
- The Mission Imagery team collects, protects, tags, and archives images from the International Space Station (ISS) twice daily, also delivering playback to Mission Control when they make important decisions. When the Soyuz module attached to the ISS leaked, video playback provided a variety of views for issue resolution. Playback was also used to identify and track an object detached from the ISS, informing decisions about damage and potential problems. In 2024, millions of still images from the ISS were processed, hundreds of thousands of Earth observation timelapses were captured, and 8,000 hours of mission video was archived.
- A new enterprise IT Equipment on International Travel service request consolidates unique center travel processes into a single, integrated process. The request is always improving, with more than 50 enhancements planned to improve the efficiency, effectiveness, and customer experience. More than 3,200 IT Equipment on International Travel service requests have been processed since March 2024.

ACHIEVING OPERATIONAL EXCELLENCE FOR RELIABLE AND EFFECTIVE IT SERVICES AND SYSTEMS

Delivering for Our Missions

The OCIO makes strategic investments and improvements in program and project management for more consistent, reliable, and cost-effective IT services that fit the needs of NASA's missions.

Two new funds, the IT Modernization Working Capital Fund and the IT Modernization for Transformation Fund (ITMx), allow NASA to invest in and develop advanced IT solutions. Through integrated strategic plans and roadmaps, ITMX supports informed IT investment and priority decisions to address unfunded needs. It fosters consistent, integrated, and repeatable business processes that ensure ongoing evaluation of IT strategy, risk posture, customer commitments, and budget controls, improving service delivery efficiency and effectiveness. 20 transformation projects from 11 organizations were funded for collaboration, federated search, AI, cybersecurity, and data interoperability solutions.

Looking to the future, NASA's Digital Transformation (DT) Initiative partnered with the Office of the Chief Engineer (OCE) to make foundational investments in digital engineering (DE). This created a DE functional architecture for community needs, goals, and objectives; standards and policies; and necessary services. Also boosted was the next generation NASA Engineering Toolchain, including identifying data interdependencies between more than 3,000 tools and integration of the tools within the cloud. Digital engineering, already in use by the Department of Defense and aerospace industry, will allow partnerships across centers and teams to more effectively collaborate, design, and deliver missions at a faster pace.

Increasing the reliability, effectiveness, and efficiency of IT operations

- NASA's Pegasus Barge transports flight hardware between Stennis Space Center, the Michoud Assembly Facility, and the Kennedy Space Center via the Gulf of Mexico and Atlantic Ocean. On the inland waterways, the Pegasus uses data services provided by the OCIO's NaTS service line. This past year NaTS implemented the Starlink satellite for data services in the open water, improving safety, allowing monitoring of vital environmental and component pressurization status, and supporting video. Starlink was successfully used when transporting the Artemis II core storage to Kennedy.
- Across the agency, IT purchase approvals were transitioned to the new enterprise Commercial IT Request (CITR) application to make buying IT easier. The CITR app streamlines IT purchases by automating review and approval tasks and the CITR SHELF feature enables rapid purchase authorization, often within minutes, for pre-approved IT products. Local processes were decommissioned, and the new system has received more than 18,000 requests for over 33,000 individual items.
- The Goddard Space Flight Center's new Mission/Project IT Governance Framework asks, "How can OCIO enable the success of our approximately 150 mission IT programs and projects?" The Goddard OCIO will measure and evaluate IT requirements, solutions, and risks necessary to support our missions and create value for the center IT infrastructure.



ENABLING NASA TO WORK DIGITALLY BY INVESTING IN INNOVATIVE EMERGING IT CAPABILITIES

Delivering for Our Missions

We are dedicated to the transformation of NASA with information and technology, through innovation, digital capabilities, and data insights. 2024's Summer of AI campaign was hosted by the Office of the Chief Human Capital Officer (OCHCO), DT, and the Chief AI Officer (CAIO). This program saw great participation in online training, guest speaker events, and center and mission-led workshops. Around 4,000 unique learners participated in 40 events, generating a 300% increase in first-time AI upskilling participation.

DT and OCHCO partnered to revitalize NASA's Digital Academy as a centralized hub for employee training in AI, data, cybersecurity, and digital engineering. It has learning modalities for specific roles, skill levels, and microlearning preferences, as well as learning trends to inform investment decisions and catalog expansions. The Digital Academy also provides resources for identifying training that supports career development and the agency's mission.

Centers also championed AI, including the AI Symposium held by the Goddard OCIO and CAIO, featuring more than 20 speakers from government and AI leaders, as well as the Symposium Training Lab/Hackathon with the Mission Cloud Platform (MCP) and Amazon Web Services. The events shared advice from AI experts, encouraged networking with AI professionals, and offered hands-on learning with AI technology.

Expanding digital capabilities and enabling data insights

- NASA's data catalog archives 280 data sources across seven NASA offices and centers. The catalog lists detailed metadata and context for each data source, helping users understand the origins, quality, and relevance of the data and ensures they have access to accurate and meaningful data. A recent technical demonstration of the catalog represents significant progress in the agency's data management strategy.
- Increased transparency and dynamic reporting to drive organizational decision-making was achieved through a new suite of dashboards showcasing Scientific and Technical Information (STI), forms, and records management activities and use. Customers can now easily access data, including the number of STI submissions for release outside of the agency, processing time, print and digital forms by center, and volume of records transfers to federal records centers and the National Archives.
- Using process automation, NASA saved 52,000 cumulative person-hours in FY 2024, surpassing a target of 45,000 hours. More than 150 automations focus on streamlining processes like help desk support, financial operations, and travel-related activities. NASA Enterprise Automation Service's "Power Platform Palooza" competition participants submitted automations to inspire creativity and information sharing. Working together to optimize processes and free up time better positions NASA's resources for core mission and business objectives.



FOSTERING RESILIENT, PROACTIVE CYBERSECURITY

Delivering for Our Missions

Ensuring NASA's data, systems, networks, and missions are protected, cybersecurity teams use modernization, monitoring, and risk management to protect from a wide variety of threats.

In 2024, NASA enacted a major response to the [Executive Order on Improving the Nation's Cybersecurity](#) and National Security Council's action for 90% implementation of data encryption and multifactor authentication (MFA). NASA developed comprehensive technical and executive reporting; conducted extensive education and outreach to executives, leaders, and technical personnel; supported information system stakeholders in remediation; and reported to the National Security Council and Office of Management and Budget.

These activities, enacted by our cybersecurity team, information system owners, technical personnel, managers, and leaders across centers, pushed NASA past 90% implementation targets for Data-at-Rest, Data-in-Transit, and MFA, increasing the cyber posture, safeguarding data and missions more effectively, while still aligning with mission objectives. To reach these goals, center OCIO teams worked with our customers to prepare them for changes in accessing their accounts, developing stronger customer relationships and partnerships. Additionally, new technologies like the NASA Privileged Access Management System were leveraged to protect older applications not designed for modern cybersecurity practices, mitigating risks while allowing time for teams to upgrade applications without missions losing access to critical systems.



Strengthening cybersecurity and operational resilience through strategic risk management

- A partnership between the Cybersecurity Mission Integration Office (CMI) and 2023 Human Space Flight (HSF) Cybersecurity Summit community members, representing 50 mission partners, addressed several key cybersecurity areas needing improvement, including external collaboration, risk and project management tools, requirements in contract language, and authorization and assessment. The CMI team collected feedback from the summit and volunteers from OCIO and mission partners made improvements in each area by August.
- The Cybersecurity Standards and Engineering Office (CSE), along with NaTS and the Cloud and Computing Services (CCS), designed and implemented the Enterprise Secure Shell Proxy. The proxy, used across the agency, adds an additional layer of protection against data exfiltration using the Secure Shell (SSH) Protocol. As centers migrate to the new protocol, the agency will move closer to meeting the Federal Zero Trust mandate.
- The new Vulnerability Disclosure Program (VDP) allows members of the public to notify NASA of cybersecurity vulnerabilities in our IT environment. Since VDP go-live, it has resulted in more than 800 reports about vulnerabilities, allowing for remediation of over 700. Lauded by the Department of Homeland Security (DHS) and the Cybersecurity and Infrastructure Security Agency (CISA), NASA shared its best practices with other Federal agencies at a June 2024 workshop.

BUILDING THE NASA IT WORKFORCE OF THE FUTURE

Delivering for Our Missions

The OCIO team of dedicated civil servants and contractors support NASA's missions from our centers, service lines, and agency-level offices across the country. Developing this exceptional OCIO team is an organizational priority, with efforts to build a strategically aligned team; enhance the employee experience; and develop their talents and careers.

In 2024, the OCIO continued to take care of and build its team. Even with limited budgets, we have increased the amount of funding allocated to training and development across the OCIO and continue to strive to make OCIO a place where everyone is valued, and every voice is heard. We have created an innovative and collaborative environment for our teammates to thrive and learn. Strengthening a culture of transparency and accountability across OCIO is also paramount. These efforts help us deliver on our commitments to the agency.



Improving the employee experience for people across NASA

- The 2023 and 2024 OCIO Enterprise Peer Awards recognized the amazing achievements of OCIO personnel and teams, fostering a culture of appreciation and collaboration. Team members across the organization nominated their peers under a dozen categories, such as Motivator, Excellence, Unsung Hero, and Integrity. In the past two years, 130 individuals and 12 teams were honored during entertaining, themed ceremonies hosted by the OCIO's Workforce Team from different centers. These awards positively influence employee engagement, morale, and performance.
- The Ames OCIO Civil Servant employees improved their participation in the Federal Employee Viewpoint Survey (FEVS), recording higher scores compared to the previous year. Office leadership is excited to receive a better understanding of employee satisfaction while acknowledging areas that still need attention both locally and across the enterprise, enabling more targeted efforts to enhance the work environment.
- In 2024, NASA implemented the Enterprise Multimedia and IT Services (eMITS) contract and awarded the NASA Consolidated Application and Platform Services (NCAPS) contract. These provide IT management and consolidate center-based OCIO multimedia services, including mission video, launch support, web streaming services, collaboration services, application support, and broadcast, television, and web-based coverage of launches. It is the first time these services have been provided from an integrated enterprise and they will streamline service delivery.
- NASA's workforce may now report digital and IT accessibility issues by submitting tickets using a phone number, email, or online form. Tickets are routed by the Agency IT Accessibility Lead for resolution and ticket data will be regularly assessed to identify areas of improvement. The new centralized IT accessibility reporting method will ensure the availability and accessibility of information and communication technology and improve the time to resolve issues.

WHAT'S NEXT IN 2025

OCIO FY 2025 Priorities

Mission Enabling Transformation

Deploy New Ways of Working Through Technology

- GenAI for All
- Execute NASA Data Strategy & Evolve EDP
- Enterprise Capabilities for External Collaboration
- Modernize Agency Business Systems
- Zero Trust as Mission Enabler
- Develop a NASA Mission Cloud Platform

Great Customer Experiences

Meet Expectations and Continually Improve Services

- Hybrid Conference Room Solutions
- Seamless Refresh Process
- Data Center Optimization
- Classified Network
- Strengthen Customer Relationships

Operational Excellence

Deliver Consistent, Reliable Capabilities

- Streamline Governance
- Strengthen Enterprise Contracts
- Improve Customer Communications
- Use Enterprise-class Operational Processes
- Manage & Reduce Technical Debt

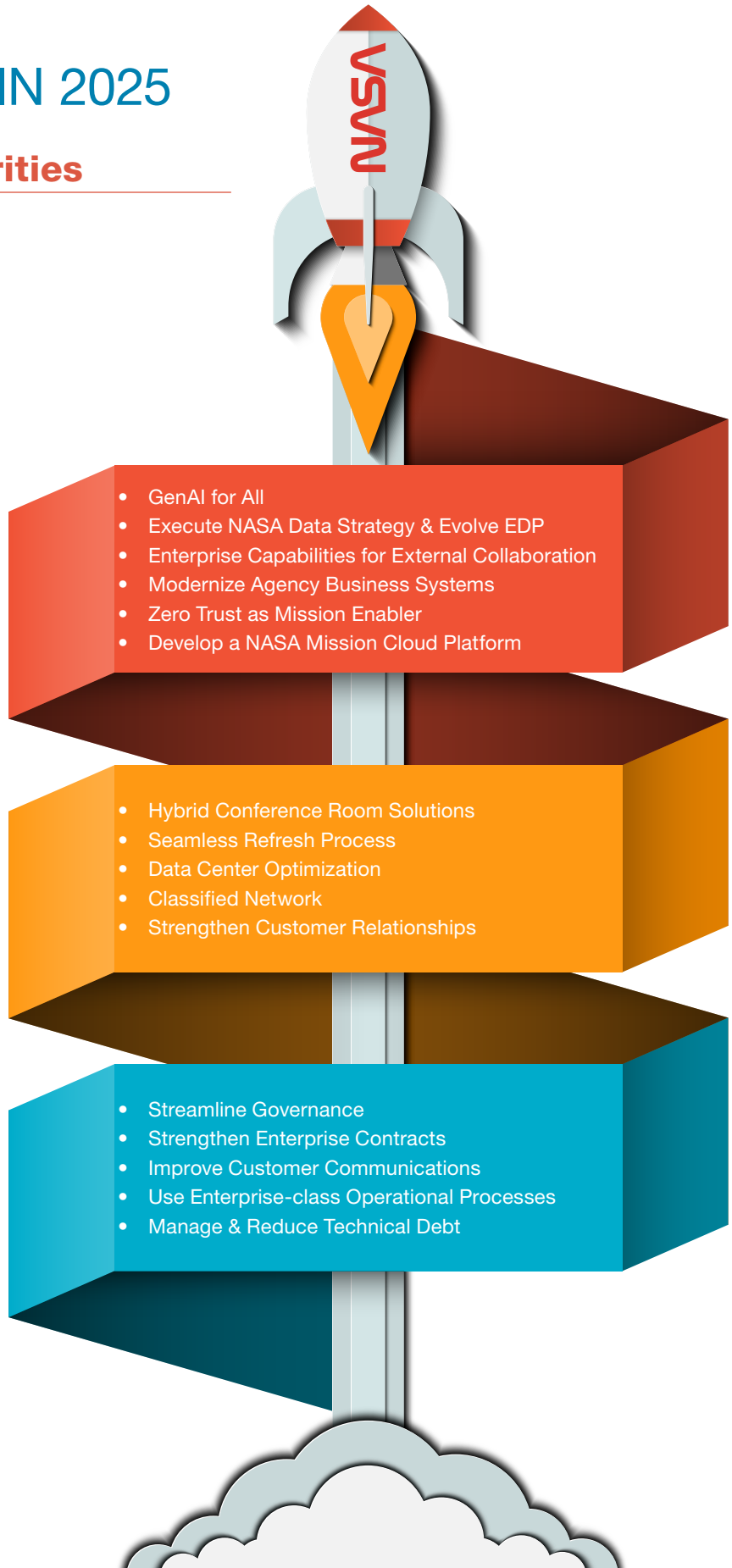




Image Credits

- *Front cover: Unsplash/Greg Rakoz*
- *Page 2: Advanced Air Mobility concept image, illustrating busy airspace management with new air traffic technologies. NASA Graphics/Kyle Jenkins*
- *Page 3: Jeff Seaton official portrait*
- *Page 5: Astronaut Edwin “Buzz” Aldrin walks on the surface of the moon during the Apollo 11 extravehicular activity. NASA*
- *Page 7: A father and son view the partial solar eclipse from NASA’s Langley Research Center. NASA/Ryan Hill*
- *Page 8: The Voyager mission team celebrates the return of engineering data from the Voyager 1 spacecraft for the first time since November 2023. NASA/JPL-Caltech*
- *Page 9: NASA research pilot Nils Larson and photographer Jim Ross complete aerobatic maneuvers during a proficiency flight. NASA/Jim Ross*
- *Page 10: Enterprise Video Content Delivery Network team member providing live eclipse broadcast and on-demand video content for NASA TV, NASA+, and NASA’s YouTube channel. NASA*
- *Page 11: The Goddard Space Flight Center TV team supporting the NASA TV eclipse broadcast. NASA*
- *Back cover: A long exposure photo of SpaceX rocket launch to the International Space Station. SpaceX*

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