NASA OFFICE OF INSPECTOR GENERAL

SEMIANNUAL REPORT

OCTOBER 1, 2021–MARCH 31, 2022

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Cover image:
The Space Launch System (SLS) rocket's core stage and launch vehicle stage adapter are integrated at Kennedy Space Center in Florida.

FROM THE INSPECTOR GENERAL

By the close of this reporting period, the NASA Office of Inspector General (OIG) was poised to move from operating in an exclusively telework mode due to the COVID-19 pandemic to an experimental hybrid workplace that stresses teamwork while maximizing the telework flexibilities that have served the office well during the previous two years.

Throughout the pandemic, NASA OIG auditors, investigators, attorneys, and support staff conducted impactful and comprehensive oversight of NASA programs and personnel. We are confident that our work products and support activities will only be enhanced as we resume work-related travel and on-site collaboration at NASA Centers and Headquarters. I remain extremely proud of the NASA OIG staff for their continued professionalism and resilience during these challenging times.

As we do each November, we issued our report identifying the top management and performance challenges facing NASA. This year, we organized the top challenges under the following topics:

- Returning Humans to the Moon
- Improving Management of Major Projects
- Sustaining a Human Presence in Low Earth Orbit
- Managing and Mitigating Cybersecurity Risk
- Improving Oversight of Contracts, Grants, and Cooperative Agreements
- Attracting and Retaining a Highly Skilled and Diverse Workforce
- Managing NASA's Outdated Infrastructure and Facilities
- Managing the Impacts of COVID-19 on NASA's Mission and Workforce

In our latest report, we reframed the Artemis and workforce challenges to reflect the most up-to-date Agency information on these issues, and we added a standalone COVID-19 challenge because the impact of the pandemic on NASA's operations will cost billions of dollars, lead to schedule delays, and affect how the Agency conducts business for years to come. In the months ahead, we plan to conduct audits and investigations that focus on NASA's continuing efforts to address these and other significant Agency challenges.

This Semiannual Report summarizes the OIG's activities and accomplishments between October 1, 2021, and March 31, 2022. We hope you find it informative.

Paul K. Martin
Inspector General
April 29, 2022

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INSPECTOR GENERAL
NASA
AERONAUTICS AND SPACE ADMINISTRATION

NASA'S TOP MANAGEMENT AND PERFORMANCE CHALLENGES

NASA's Perseverance Mars rover took this selfie on September 10, 2021, 198 Martian days into its mission.

As required by the Reports Consolidation Act of 2000, the Office of Inspector General (OIG) annually provides its independent assessment of the top management and performance challenges facing NASA. In our November 2021 report, we organized challenges under the following topics:

- Returning Humans to the Moon
- Improving Management of Major Projects
- Sustaining a Human Presence in Low Earth Orbit
- Managing and Mitigating Cybersecurity Risk
- Improving Oversight of Contracts, Grants, and Cooperative Agreements
- Attracting and Retaining a Highly Skilled and Diverse Workforce
- Managing NASA's Outdated Infrastructure and Facilities
- Managing the Impacts of COVID-19 on NASA's Mission and Workforce

This year's list includes many of the same challenges discussed in previous reports. However, we reframed the Artemis and workforce challenges to reflect the most up-to-date Agency perspectives and OIG analysis of these issues, and we added a standalone COVID-19 challenge because the impact of the pandemic on NASA's operations will cost billions of dollars, lead to schedule delays, and affect how the Agency conducts business for years to come. In our Management Challenges report and all related work, the OIG is committed to providing independent, objective, and comprehensive oversight of NASA programs, projects, and personnel to improve Agency outcomes. To that end, we plan to conduct audits and investigations in the coming year that focus on NASA's continuing efforts to address these and other challenges.

OFFICE OF AUDITS

NASA astronaut Mark Vande Hei, shown here in the International Space Station's cupola, holds the U.S. record for the longest single spaceflight at 355 days.

HUMAN EXPLORATION

Space operations and human exploration are among NASA's most highly visible missions, with the Agency currently operating the International Space Station (ISS or Station), managing the commercial crew and cargo programs that support the Station, and planning for future exploration beyond low Earth orbit, including ambitious goals for the Artemis program. Through Artemis, NASA aims to complete exploration missions to orbit and land on the Moon. Our oversight of this area typically involves missions and operations within the Agency's Exploration Systems Development Mission Directorate, Space Operations Mission Directorate, and Space Technology Mission Directorate.

NASA'S MANAGEMENT OF ITS ASTRONAUT CORPS

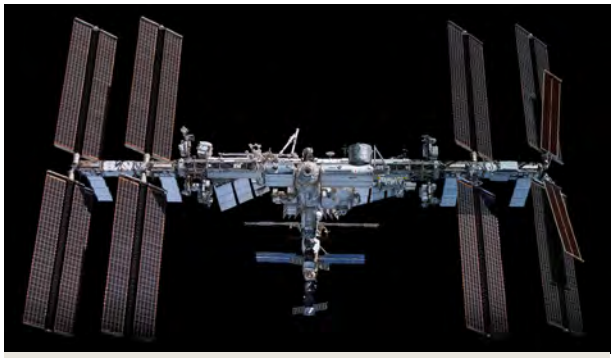
IG-22-007, JANUARY 11, 2022

This audit examined the extent to which NASA's sizing, training, and assigning of the astronaut corps are aligned with the Agency's current and future missions and objectives. We found that NASA's processes are primarily calibrated toward meeting current needs—that is, filling seats for missions to the ISS. But given anticipated needs, the corps' processes might be misaligned when it comes to fulfilling future Artemis missions. We also found that the Astronaut Office's personnel databases lack comprehensive demographic information specific to the corps, which poses a challenge to assessing whether NASA is meeting Agency and Administration diversity, equity, inclusion, and accessibility objectives. The Agency concurred with our four recommendations.

NASA'S MANAGEMENT OF THE INTERNATIONAL SPACE STATION AND EFFORTS TO COMMERCIALIZE LOW EARTH ORBIT

IG-22-005, NOVEMBER 30, 2021

This audit examined the costs associated with the Station's continued use and maintenance, risks to its structure, NASA's utilization of the ISS, and the Agency's plans for commercialization of low Earth orbit.



The ISS as seen from the SpaceX Crew Dragon Endeavour in November 2021.

We found that:

- Research needed for long-duration missions to the Moon and Mars will not be complete by 2030, the planned date for ending ISS operations.
- Continued Station operation requires costly maintenance and system upgrades, and the discovery of multiple cracks and leaks in the Station's Service Module Transfer Tunnel warrants further investigation.
- The Agency will face significant challenges with fully executing its plan to replace the ISS with

a commercial destination in low Earth orbit by 2028.

NASA management partially concurred with our one recommendation, which related to addressing cracks and leaks in the Service Module Transfer Tunnel; we plan to continue to monitor the issue.

NASA'S MANAGEMENT OF THE ARTEMIS MISSIONS
IG-22-003, NOVEMBER 15, 2021

This audit assessed the Artemis program's schedule and projected costs as well as the Agency's acquisition and programmatic approaches for landing astronauts on the Moon. We found that:

- NASA will exceed its current timetable of landing humans on the Moon in late 2024 by several years due to technical difficulties and delays with its first three Artemis missions and the time needed to develop and test the Human Landing System (HLS) and new spacesuits.
- NASA lacks a comprehensive and accurate cost estimate that accounts for all Artemis program costs. We project the Agency will spend $93 billion on the Artemis effort through fiscal year 2025, with a cost-per-launch exceeding $4 billion for each of the first four missions. Without capturing, accurately reporting, and reducing the cost of future Space Launch System (SLS)/Orion Multi-Purpose Crew Vehicle (Orion) missions, NASA will be challenged to sustain the Artemis program in its current configuration.
- Due to reduced funding in FY 2021, NASA only selected one provider for the HLS demonstration mission and delayed selection of a second contractor for several years under a separate lunar services contract. The HLS program is tailoring its project management approach—replacing the typical program milestones for annual synchronization reviews—to meet an aggressive schedule, reduce costs, and encourage innovation, which may increase risk and limit insight into HLS development.

Of our nine recommendations, the Agency concurred with five, partially concurred with two, and did not concur with two.

NASA's X-59 Quiet SuperSonic Technology aircraft is prepared for the installation of the landing gear and other hardware required for structural testing. Image credit: Lockheed Martin

ONGOING AUDIT WORK

NASA's Management of the Space Launch System Engine Contracts

NASA has contracts with Aerojet Rocketdyne and Northrop Grumman to develop rocket engines for the SLS, with the total estimated cost for these engines projected at $13.2 billion through 2025. This audit is examining NASA's management of the SLS engine contracts.

NASA's Space Technology Mission Directorate Portfolio

NASA's Space Technology Mission Directorate (STMD) seeks to develop innovative technologies to enable extended missions on the Moon and travel to Mars. This audit is examining the Agency's management of its STMD portfolio.

NASA's Management of the Mobile Launcher 2 Contract

NASA is in the process of developing a second mobile launcher that will serve as the ground structure to assemble, process, transport, and launch the integrated SLS/Orion system. In 2020, we reported on development efforts for the first mobile launcher. This audit is evaluating the Agency's management of the contract to design and build the Mobile Launcher 2, which will be used to support future, larger variants of the SLS beginning with Artemis IV.

NASA's Partnerships with International Space Agencies for Artemis Missions

NASA is collaborating with several established and emerging international space agencies for its flagship Artemis program in order to strengthen partnerships and defray costs. This review—the third in a series examining the Agency's management of the Artemis program—is examining NASA's partnerships with international space agencies in support of Artemis missions.

NASA's Multi-Mission Program Cost Estimating and Reporting Practices

NASA has struggled to establish credible cost estimates for its space flight missions and programs, which are composed of multiple programs with multiple deliverables stretching over many years. As a result, policymakers and stakeholders lack meaningful visibility into the Agency's major acquisitions. This audit assesses the effectiveness of the Agency's cost-estimating and reporting practices for large, multi-mission programs such as those supporting the Artemis program.

Northrop Grumman's Cygnus space freighter approaches the ISS orbiting 272 miles above the South Pacific off the coast of New Zealand.

SCIENCE AND AERONAUTICS

Science missions like the Mars 2020 Perseverance Rover, the Parker Solar Probe, and the James Webb Space Telescope further our understanding of the solar system and the universe. Meanwhile, NASA's Earth-observing missions shed light on climate change, severe weather and other natural hazards, wildfires, and global food production. And, as it has since its earliest days, the Agency continues to conduct research in pursuit of improvements and efficiency in aviation technology. Our oversight of these areas generally corresponds to efforts housed in the Agency's Science Mission Directorate and the Aeronautics Research Mission Directorate.

ONGOING AUDIT WORK

NASA's Management of the Johns Hopkins University Applied Physics Laboratory Portfolio

The Johns Hopkins University Applied Physics Laboratory (APL) participates in multiple NASA missions, such as Europa Clipper, Parker Solar Probe, New Horizons, and the upcoming Dragonfly mission to Titan, Saturn's largest moon. APL's two major contracts with NASA have a combined potential cost of approximately $3.8 billion. This audit is evaluating NASA's processes and controls for ensuring the effective management of the APL portfolio.

NASA's Management of the Radioisotope Power Systems Program

NASA has long used Radioisotope Power Systems (RPS)—sometimes referred to as a nuclear battery—for spacefaring missions such as Voyager, Cassini, and Perseverance, where solar power or chemical batteries would be impractical. This audit is assessing the RPS Program regarding plutonium-238 production, technology development maturation, and space flight project mission planning.

NASA's Earth Science Disasters Program

NASA's Earth Science Disasters Program disseminates data from Earth-observing satellites to improve the prediction of, preparation for, response to, and recovery from weather- and climate-related disasters. This audit is evaluating NASA's management of the program.

NASA's Volatiles Investigating Polar Exploration Rover (VIPER) Mission

As a precursor to landing on the Moon, NASA is developing a number of new science instruments, systems, and capabilities, including the Volatiles Investigating Polar Exploration Rover (VIPER), a mobile robot that will survey the concentration of water ice at the Moon's South Pole. This audit is assessing NASA's management of VIPER relative to achieving technical objectives, meeting established milestones, and controlling costs.

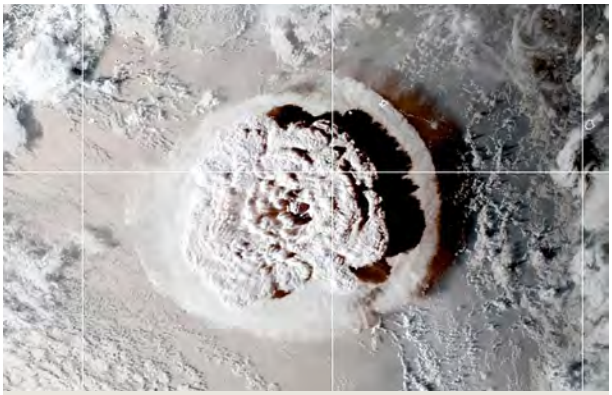
The iron-rich rocks of the Pilbara region of northwestern Australia are some of the oldest exposed rocks on Earth. This image was acquired by NASA's Terra spacecraft.

MISSION SUPPORT AND INFORMATION TECHNOLOGY

Institutional services such as human capital management, procurement, infrastructure, and security are organized under NASA's Mission Support Directorate. Our oversight of these functions covers a wide array of topics, including the Agency's procurement of goods and services, operations and maintenance of facilities and infrastructure, workforce management, and physical security. We also monitor and evaluate NASA's information technology (IT) management, which is led by the Agency's Chief Information Officer, and we continue to pay specific attention to the Agency's efforts to improve its IT management practices and cybersecurity.

NASA'S INSIDER THREAT PROGRAM
IG-22-009, MARCH 14, 2022

This audit examined whether the Agency has established and implemented an effective insider threat program in accordance with federal policies, NASA policies, and best practices. We found that while NASA has a fully operational insider threat program for its *classified* systems, the vast majority of the Agency's IT systems—including many containing high-value assets or critical infrastructure—are *unclassified* and are therefore not covered by current insider threat program requirements. Consequently, the Agency may be facing a higher-than-necessary risk to its unclassified systems and data. The Agency concurred with our two recommendations.



Geostationary Operational Environmental Satellite (GOES) 17, a joint effort by NASA and the National Oceanic and Atmospheric Administration, captured this image of the powerful volcanic eruption of Hunga Tonga-Hunga Ha'apai in Tonga in January 2022.

EVALUATION OF NASA'S INFORMATION SECURITY PROGRAM UNDER THE FEDERAL INFORMATION SECURITY MODERNIZATION ACT FOR FISCAL YEAR 2021
ML-22-001, NOVEMBER 9, 2021

The Federal Information Security Modernization Act of 2014 (FISMA) requires that we conduct annual independent evaluations of information security programs and practices at NASA and report the results to the Office of Management and Budget (OMB). In November 2021, we reported to OMB that NASA's cybersecurity program was at a Level 3 (Consistently Implemented), which marked an increased assessed maturity level over the previous four years. However, this still fell short of a Level 4 rating (Managed and Measurable), which OMB requires federal cybersecurity programs to meet in order to be considered effective. Moving forward, we encouraged the Agency to continue to mature its information security program and strengthen its cybersecurity efforts.

Launched 50 years ago in March 1972, Pioneer 10 was NASA's first mission to the outer planets and the first to use all-nuclear electrical power. It flew past Jupiter and sent back these closeups in December 1973.

ONGOING AUDIT WORK

NASA's Efforts to Advance Diversity, Equity, Inclusion, and Accessibility

NASA established inclusion as one of its core values and, like all federal agencies, is working to meet federal requirements while also advancing its efforts in diversity, equity, inclusion, and accessibility (DEI&A). This audit is evaluating the Agency's DEI&A efforts.

NASA's Space Communication Infrastructure Upgrade and Modernization Projects

NASA's space communication infrastructure is composed of a series of ground terminals, antennas, and satellites located around the world. Spacecraft operating in low Earth orbit rely on the Near Space Network to provide continuous tracking and command connectivity; those traveling to farther destinations such as the Moon or other planets use the Deep Space Network. This audit is assessing NASA's progress toward upgrading the Near Space Network and Deep Space Network ground stations and the ability of the networks to support current and future mission requirements.

Ames Research Center's Lease Management Practices

Ames Research Center, located at Moffett Field in California's Silicon Valley, leases space in pursuit of its goal to develop a world-class, shared-use research and development and education campus. The leases—which vary in scope and duration—are intended to attract tenants from private industry, academia, government, and nonprofit organizations as potential partners for collaboration. This audit is assessing Ames' implementation and management of its lease agreements.

NASA's Software Asset Management

In fiscal year 2020, NASA spent approximately $129 million on software licenses to facilitate operations that control spacecraft, collect and process scientific data, provide security for IT infrastructure, and enable NASA personnel to collaborate with colleagues around the world. This audit is examining whether NASA is managing its software assets in an effective and efficient manner while complying with security best practices.

NASA's Compliance with the Geospatial Data Act for Fiscal Year 2022

The Geospatial Data Act of 2018 seeks to foster efficient, government-wide management of geospatial data—objects, events, or phenomena that have a location on the surface of the Earth—technologies, and infrastructure. This mandated audit is examining whether NASA has fulfilled its responsibilities for managing geospatial data.

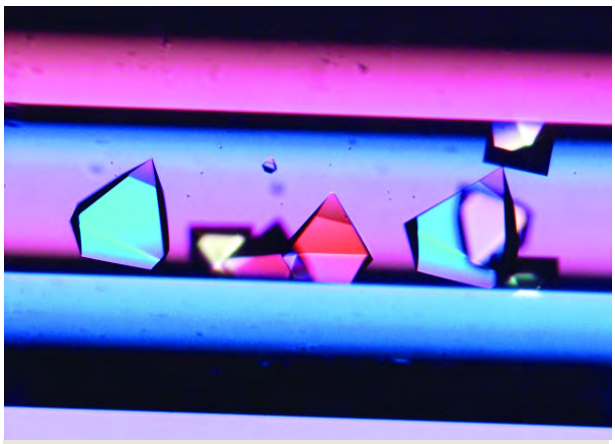
NASA astronaut and SpaceX Crew-4 mission specialist Jessica Watkins trains for a spacewalk at the Neutral Buoyancy Laboratory in Houston in November 2021.

FINANCIAL MANAGEMENT

The OIG and its independent external auditor continue to assess NASA's efforts to improve its financial management practices by conducting and overseeing a series of audits—including the annual financial statement audit—to help the Chief Financial Officer and the Agency address weaknesses. We also assess single audits of NASA grantees performed by external independent public accountants. The single audits provide NASA and stakeholders with assurance that these award recipients comply with federal directives and assist the Agency in performing pre-award risk assessments and post-award monitoring efforts.

FISCAL YEAR 2021 REPORT ON THE STATUS OF CHARGE CARD AUDIT RECOMMENDATIONS
ML-22-003, JANUARY 4, 2022

The Government Charge Card Abuse Prevention Act of 2012, Public Law 112-194, as implemented by OMB Memorandum M-13-21, requires each Inspector General to report to OMB within 120 days of the end of each fiscal year on its agency's progress in implementing charge card–related audit recommendations. We did not issue any reports regarding NASA's charge card programs in FY 2021 and therefore had no recommendations to report; as of the issuance of our letter, NASA had no open recommendations related to its charge card programs.



Protein crystals formed in microgravity in the ISS Kibo Module. Photo credit: Japan Aerospace Exploration Agency (JAXA)

AUDIT OF NASA'S FISCAL YEAR 2021 FINANCIAL STATEMENTS
IG-22-004, NOVEMBER 15, 2021

We contracted with the independent public accounting firm Ernst & Young to audit NASA's fiscal year 2021 financial statements in accordance with the Government Accountability Office's *Government Auditing Standards* and OMB Bulletin No. 21-04, *Audit Requirements for Federal Financial Statements*. The audit resulted in the 11th consecutive "clean" or unmodified opinion on NASA's financial statements. An unmodified opinion means the financial statements present fairly, in all material respects, the financial position and results of NASA's operations in conformity with U.S. generally accepted accounting principles. However, Ernst & Young identified one significant deficiency related to NASA's evaluation of public-private partnerships for disclosure in the financial statements.

REVIEW OF NASA'S FISCAL YEAR 2020 DIGITAL ACCOUNTABILITY AND TRANSPARENCY ACT SUBMISSION

IG-22-002, NOVEMBER 8, 2021

This audit assessed the completeness, accuracy, timeliness, and overall quality of NASA's FY 2020, fourth quarter financial and award data and the Agency's implementation and use of required data standards. According to standards established by the Council of the Inspectors General on Integrity and Efficiency (CIGIE), data quality is considered "Excellent" if the Agency's total score on the quality scorecard is 95 points or higher. We found that NASA achieved that rating, based on the results of our statistical and non-statistical testing of its submission. However, despite this high rating, we identified errors that affected the timeliness, accuracy, and completeness of the data similar to those identified in our prior reviews. NASA management concurred with our two recommendations.

ONGOING AUDIT WORK

Audit of NASA's Fiscal Year 2022 Financial Statements

This audit of NASA's fiscal year 2022 consolidated financial statements is being performed by Ernst & Young with oversight by OIG staff.

NASA's Compliance with the Payment Integrity Information Act for Fiscal Year 2021

Improper payments are payments the federal government should not have made or made in an incorrect amount under statutory, contractual, administrative, or other legally applicable requirements. This audit is examining whether NASA complied with the requirements of the Payment Integrity Information Act in fiscal year 2021.

View of the Milky Way over Los Padres National Forest in California. Photo credit: David Hawbecker

OTHER AUDIT MATTERS

NASA'S COMPLIANCE WITH FEDERAL EXPORT CONTROL LAWS

IG-22-008, FEBRUARY 3, 2022

We are required to annually assess the Agency's compliance with federal export control laws and reporting requirements regarding cooperative agreements between NASA and China or any Chinese company. Since we last reported on these issues, NASA has not established any new bilateral agreements with China. In a February 2022 letter to Congress, we summarized our work relating to NASA's compliance with federal export control laws. During the past year, we completed five audits that examined NASA's controls over sensitive information and IT assets and security systems, many of which contain data subject to export control laws, and our Office of Investigations closed six investigations related to the misuse of and unauthorized access to NASA computer systems and export-controlled information. We also initiated one new audit related to IT security.

The Moon rises above a cliff face in Rock Creek Park, California. Photo credit: David Hawbecker

Technicians at NASA's Michoud Assembly Facility in New Orleans test welds for the SLS rocket's Exploration Upper Stage.

STATISTICAL DATA

TABLE 1: AUDIT PRODUCTS AND IMPACTS

Report No. and Date Issued	Report Title	Impact
Human Exploration		
IG-22-007 1/11/2022	NASA's Management of Its Astronaut Corps	Provided recommendations to ensure the astronaut corps is aligned to meet current and future mission needs and to ensure the training process for future Artemis missions is developed with sufficient time for implementation and revision.
IG-22-005 11/30/2021	NASA's Management of the International Space Station and Efforts to Commercialize Low Earth Orbit	Provided recommendations to mitigate risks to the Station's structural integrity.
IG-22-003 11/15/2021	NASA's Management of the Artemis Missions	Provided recommendations to increase accuracy, transparency, and safety of human space flight.
Mission Support and Information Technology		
IG-22-009 3/14/2022	NASA's Insider Threat Program	Provided recommendations to strengthen NASA's insider threat program.
ML-22-001 11/9/2021	Evaluation of NASA's Information Security Program under the Federal Information Security Modernization Act for Fiscal Year 2021	Provided a review of NASA's information security program pursuant to the Federal Information Security Modernization Act of 2014 for fiscal year 2021.
Financial Management		
ML-22-003 1/4/2022	Fiscal Year 2021 Report on the Status of Charge Card Audit Recommendations	Provided an update on NASA's charge card programs for fiscal year 2021.
IG-22-004 11/15/2021	Audit of NASA's Fiscal Year 2021 Financial Statements	Identified improvements in NASA's ability to provide auditable financial statements and sufficient evidence to support the financial statements throughout the fiscal year and at year end.
IG-22-002 11/8/2021	Review of NASA's Fiscal Year 2020 Digital Accountability and Transparency Act Submission	Provided recommendations to improve the accuracy and completeness of NASA's DATA Act submissions.
Other Audit Matters		
IG-22-008 2/3/2022	NASA's Compliance with Federal Export Control Laws	Provided assurance to Congress that NASA is abiding by applicable laws and regulations regarding its interaction with Chinese entities.

TABLE 2: AUDIT PRODUCTS ISSUED AND NOT DISCLOSED TO THE PUBLIC, CURRENT SEMIANNUAL REPORT

Report No. and Date Issued	Report Title	Objective
ML-22-006 3/22/2022	Desk Review of the Challenger Center for Space Science Education, Inc.'s Fiscal Year 2020 Single Audit Reporting Package	Determined whether the audit report met generally accepted government auditing standards and the Uniform Guidance audit requirements.
ML-22-005 2/17/2022	Desk Review of the National Institute of Aerospace Associates' Fiscal Year 2020 Single Audit Reporting Package	Determined whether the audit report met generally accepted government auditing standards and the Uniform Guidance audit requirements.
ML-22-004 1/24/2022	Desk Review of the Farallon Institute's Fiscal Year 2020 Single Audit Reporting Package	Determined whether the audit report met generally accepted government auditing standards and the Uniform Guidance audit requirements.
IG-22-006 12/15/2021	Fiscal Year 2021 Management Letter	Identified improvements in the effectiveness of the controls over financial reporting and the IT control environment.

Report No. and Date Issued	Report Title	Objective
ML-22-002 11/29/2021	Desk Review of the New Mexico Consortium's Fiscal Year 2020 Single Audit Reporting Package	Determined whether the audit report met generally accepted government auditing standards and the Uniform Guidance audit requirements.
IG-22-001, 10/28/2021	Fiscal Year 2021 Vulnerability Assessment and Penetration Testing of NASA's Financial Network	Identified improvements in the security of the Agency's financial systems.

TABLE 3: AUDIT RECOMMENDATIONS YET TO BE IMPLEMENTED, CURRENT SEMIANNUAL REPORT

Report No. and Date Issued	Report Title	Date Resolved	Number of Recommendations		Latest Target Completion Date	Potential Cost Savings
			Open	Closed		
Human Exploration						
IG-22-007 1/11/2022	NASA's Management of Its Astronaut Corps	1/11/22	4	0	11/1/2022	$0
IG-22-005 11/30/2021	NASA's Management of the International Space Station and Efforts to Commercialize Low Earth Orbit	11/30/21	1	0	5/31/2022	$0
IG-22-003 11/15/2021	NASA's Management of the Artemis Missions	--	9	0	12/31/2022	$0
Mission Support and Information Technology						
IG-22-009 3/14/2022	NASA's Insider Threat Program	3/14/2022	2	0	12/1/2023	$0
Financial Management						
IG-22-006 12/15/2021	Fiscal Year 2021 Management Letter	12/15/2021	28	0	12/30/2022	$0
IG-22-004 11/15/2021	Audit of NASA's Fiscal Year 2021 Financial Statements	11/15/2021	3	0	11/30/2022	$0
IG-22-002 11/8/2021	Review of NASA's Fiscal Year 2020 Digital Accountability and Transparency Act Submission	11/3/2021	2	0	5/2/2022	$0
IG-22-001 10/28/2021	Fiscal Year 2021 Vulnerability Assessment and Penetration Testing of NASA's Financial Network	10/31/2021	5	0	11/30/2022	$0

TABLE 4: AUDIT RECOMMENDATIONS YET TO BE IMPLEMENTED, PREVIOUS SEMIANNUAL REPORT

Report No. and Date Issued	Report Title	Date Resolved	Number of Recommendations		Latest Target Completion Date	Potential Cost Savings
			Open	Closed		
Human Exploration						
IG-21-025 8/10/2021	NASA's Development of Next-Generation Spacesuits	8/10/2021	2	2	6/30/2022	$0
IG-21-011 1/27/2021	NASA's Efforts to Mitigate the Risks Posed by Orbital Debris	1/27/2021	6	1	12/31/2025	$0
IG-21-004 11/10/2020	NASA's Management of the Gateway Program for Artemis Missions	11/10/2020	5	3	8/31/2022	$0
IG-20-018 7/16/2020	NASA's Management of the Orion Multi-Purpose Crew Vehicle Program	10/2/2020	1	2	4/29/2022	$0
IG-20-013 3/17/2020	Audit of NASA's Development of Its Mobile Launchers	3/17/2020	2	2	4/29/2022	$0

Report No. and Date Issued	Report Title	Date Resolved	Number of Recommendations		Latest Target Completion Date	Potential Cost Savings
			Open	Closed		
IG-20-012 3/10/2020	NASA's Management of Space Launch System Program Costs and Contracts	8/21/2020	4	4	7/29/2022	$0
IG-20-005 11/14/2019	NASA's Management of Crew Transportation to the International Space Station	11/14/2019	1	4	7/31/2022	$0
IG-17-012 3/9/2017	NASA's Management of Electromagnetic Spectrum	3/9/2017	1	1	12/31/2022	$0
Science and Aeronautics						
IG-21-022 7/14/2021	NASA's Management of USRA's Cooperative Agreements	7/14/2021	1	11	11/30/2022	$0
IG-21-002 10/27/2020	NASA's Management of Its Acquisition Workforce	10/27/2020	3	1	12/1/2023	$0
IG-20-023 9/16/2020	NASA's Planetary Science Portfolio	9/16/2020	8	3	11/30/2021	$0
IG-19-019 5/29/2019	Management of NASA's Europa Mission	8/8/2019	1	9	11/12/2021	$0
IG-19-018 5/7/2019	NASA's Heliophysics Portfolio	5/7/2019	3	1	12/30/2021	$0
IG-19-014 3/26/2019	NASA's Engineering and Technical Services Contracts	3/26/2019	2	1	6/30/2022	$0
IG-18-015 4/5/2018	NASA's Management of GISS: The Goddard Institute for Space Studies	4/5/2018	1	7	9/30/2022	$0
IG-17-003 11/2/2016	NASA's Earth Science Mission Portfolio	11/2/2016	1	1	11/30/2021	$0
Mission Support and Information Technology						
IG-21-027 9/8/2021	NASA's Construction of Facilities	9/8/2021	6	0	1/31/2023	$0
IG-21-019 5/18/2021	NASA's Cybersecurity Readiness	5/18/2021	5	0	7/29/2023	$0
IG-21-014 3/2/2021	Fiscal Year 2020 Federal Information Security Modernization Act Evaluation—A Center Command and Control System	3/2/2021	1	1	8/31/2022	$0
IG-21-006 12/3/2020	NASA's Management of Hazardous Materials	12/3/2020	3	5	10/1/2023	$0
IG-21-001 10/2/2020	Audit of NASA's Compliance with the Geospatial Data Act	10/2/2020	3	1	10/28/2022	$0
IG-20-021 8/27/2020	Audit of NASA's Policy and Practices Regarding the Use of Non-Agency Information Technology Devices	8/27/2020	4	1	6/15/2022	$0
IG-20-017 6/25/2020	Evaluation of NASA's Information Security Program under the Federal Information Security Modernization Act for Fiscal Year 2019	6/25/2020	1	7	7/29/2022	$0
IG-20-011 3/3/2020	NASA's Management of Distributed Active Archive Centers	3/3/2020	1	2	3/31/2024	$0
IG-20-001 10/21/2019	NASA's Security Management Practices	10/21/2019	2	6	12/31/2023	$0
IG-19-002 10/22/2018	Audit of NASA's Historic Property	2/5/2019	3	2	6/30/2022	$0

Report No. and Date Issued	Report Title	Date Resolved	Number of Recommendations		Latest Target Completion Date	Potential Cost Savings
			Open	Closed		
IG-17-021 5/17/2017	Construction of Test Stands 4693 and 4697 at Marshall Space Flight Center	10/5/2017	3	0	9/30/2022	$17,115,009
IG-12-017 8/7/2012	Review of NASA's Computer Security Incident Detection and Handling Capability	8/7/2012	2	1	9/29/2023	$0
Financial Management						
IG-21-020 5/18/2021	NASA's Compliance with the Payment Integrity Information Act for Fiscal Year 2020	5/18/2021	3	0	6/30/2022	$0
IG-20-016 5/15/2020	NASA's Compliance with the Improper Payments Information Act for Fiscal Year 2019	6/11/2020	1	3	5/15/2022	$0
IG-20-004 11/7/2019	Review of NASA's Fiscal Year 2019 Digital Accountability and Transparency Act Submission	11/7/2019	1	4	7/29/2022	$0
IG-18-017 5/14/2018	NASA's Compliance with the Improper Payments Information Act for Fiscal Year 2017	5/14/2018	1	2	5/31/2022	$0

TABLE 5: AUDITS WITH QUESTIONED COSTS

There were no audits with questioned costs (the Inspector General Act of 1978, as amended). Questioned costs are costs questioned by the OIG because of (1) alleged violation of a provision of a law, regulation, contract, grant, cooperative agreement, or other agreement or document governing the expenditure of funds; (2) a finding that, at the time of the audit, such cost is not supported by adequate documentation; or (3) a finding that the expenditure of funds for the intended purpose is unnecessary or unreasonable.

TABLE 6: AUDITS WITH RECOMMENDATIONS THAT FUNDS BE PUT TO BETTER USE

There were no audits with recommendations that funds be put to better use for this reporting period. A recommendation that funds be put to better use (the Inspector General Act of 1978 definition) is a recommendation by the OIG that funds could be more efficiently used if management took actions to implement and complete the recommendation, including (1) reductions in outlays; (2) deobligation of funds from programs or operations; (3) withdrawal of interest subsidy costs on loans or loan guarantees, insurance, or bonds; (4) costs not incurred by implementing recommended improvements related to the operations of the establishment, a contractor, or grantee; (5) avoidance of unnecessary expenditures noted in pre-award reviews of contract or grant agreements; or (6) any other savings that are specifically identified. (Dollar amounts identified in this category may not always allow for direct budgetary actions but generally allow the Agency to use the amounts more effectively in the accomplishment of program objectives.)

TABLE 7: OTHER MONETARY SAVINGS

There were no audits reporting other monetary savings for this reporting period. These would be savings resulting from actions taken by NASA due to conclusions or information disclosed in an OIG audit report that were not identified as questioned costs or funds to be put to better use in Tables 5 and 6, respectively.

TABLE 8: STATUS OF SINGLE AUDIT FINDINGS AND QUESTIONED COSTS RELATED TO NASA AWARDS

Audits with Findings	12	
Findings and Questioned Costs		
	Number of Findings	**Questioned Costs**
Management decisions pending, beginning of reporting period	11	$396,578
Findings added during reporting period	9	$68,616
Management decisions made during reporting period	(15)	
Agreed to by management		($209,684)
Not agreed to by management		$0
Management decisions pending, end of reporting period	5	$255,510

Note: The Single Audit Act, as amended, requires federal award recipients to obtain audits of their federal awards. The data in this table is provided by NASA.

DEFENSE CONTRACT AUDIT AGENCY AUDITS OF NASA CONTRACTORS

The Defense Contract Audit Agency (DCAA) provides audit services to NASA on a reimbursable basis. DCAA provided the following information during this period on reports involving NASA contract activities.

DCAA AUDIT REPORTS ISSUED

During this period, DCAA issued 20 audit reports involving contractors who do business with NASA. Corrective actions taken in response to DCAA audit report recommendations usually result from negotiations between the contractors and the government contracting officer with cognizant responsibility (e.g., the Defense Contract Management Agency and NASA). The agency responsible for administering the contract negotiates recoveries with the contractor after deciding whether to accept or reject the questioned costs and recommendations that funds be put to better use. The following table shows the amounts of questioned costs and funds to be put to better use included in DCAA reports issued during this semiannual reporting period and the agreed-upon amounts.

TABLE 9: DCAA AUDIT REPORTS WITH QUESTIONED COSTS AND RECOMMENDATIONS THAT FUNDS BE PUT TO BETTER USE

	Amounts in Issued Reports	Amounts Agreed To
Questioned costs	$4,559,000	$1,122,000
Funds to be put to better use	$0	$0

Note: This data is provided to the NASA OIG by DCAA and may include forward pricing proposals, operations, incurred costs, cost accounting standards, and defective pricing audits. Because of limited time between availability of management information system data and legislative reporting requirements, there is minimal opportunity for DCAA to verify the accuracy of reported data. Accordingly, submitted data is subject to change based on subsequent DCAA authentication. The data presented does not include statistics on audits that resulted in contracts not awarded or in which the contractor was not successful.

AUDITS OF NASA CONTRACTORS

NASA contracts with independent public accounting firms and the Department of the Interior Business Center to perform a broad range of contract audits on the companies that conduct business with the Agency. The purpose of the audits is to assist procurement officials with financial information and advice relating to contractual matters and to assess the effectiveness, efficiency, and economy of contractor operations. Contract audits also assist NASA in the negotiation, award, administration, and settlement of contracts. During the period covered in this Semiannual Report, independent public accounting firms issued 13 audit reports that involved contractors who do business with NASA. The auditors questioned $114,000 in costs.

TABLE 10: AUDIT REPORTS OF NASA CONTRACTORS WITH QUESTIONED COSTS AND RECOMMENDATIONS THAT FUNDS BE PUT TO BETTER USE

	Amounts in Issued Reports	Amounts Agreed To
Questioned costs	$114,571	$0
Funds to be put to better use	$0	$0

The Artemis I Orion spacecraft, enclosed in its Launch Abort System and stacked atop the SLS rocket in the Vehicle Assembly Building at Kennedy Space Center in January 2022.

OFFICE OF INVESTIGATIONS

The James Webb Space Telescope comes into focus on March 11, 2022. Taken as a test to align the telescope to the bright star at the center, this image also displays Webb's sensitive optics, with numerous galaxies and stars appearing in the background.

The Office of Investigations investigates fraud, waste, abuse, misconduct, and mismanagement involving NASA personnel and contractors.

PROCUREMENT, ACQUISITION, AND GRANT FRAUD

$1.3 Million Civil Settlement with NASA Subcontractor

As the result of a multi-year NASA OIG investigation, an Arlington, Virginia, company agreed to a civil settlement of $1,389,509, of which $578,591 was returned to NASA, to resolve allegations that it submitted inflated labor and indirect costs for a contract at Goddard Space Flight Center.

Contractor Agrees to Civil Settlement

As the result of a NASA OIG investigation, an Ohio company agreed to a civil settlement of $990,000 to resolve allegations that it conspired with a subcontractor to hire temporary employees in order to increase its own profits.

Former NASA Contractor Employee and Spouse Plead Guilty to a Kickback Scheme

A former NASA contractor employee and her spouse were sentenced to 20 months and 17 months of imprisonment, respectively, for steering contracts to a former NASA subcontractor in exchange for money and gifts as the result of a joint investigation by NASA OIG, the FBI, and IRS Criminal Investigation.

Contractor Agrees to Civil Settlement

A Buffalo, New York, company agreed to a civil settlement of $128,985 to resolve allegations of breach of contract, payment by mistake, unjust enrichment, and fraud. The company overstated the number of hours a principal investigator and program manager performed services on two NASA research contracts.

Former CEO of a Nanotechnology Company Convicted of Multimillion-Dollar Securities Fraud Scheme

As the result of a joint investigation by the NASA OIG, FBI, and the Securities and Exchange Commission, the former CEO of a nanotechnology company was found guilty of securities fraud, wire fraud, and conspiracy. From 2013 to 2020, the former CEO misappropriated investors' funds through false and misleading statements regarding the company's research and development activities, which included reimbursable Space Act Agreements. Sentencing is scheduled for June 15, 2022.

Investigation Results in Significant Repudiated Claims

As the result of a NASA OIG investigation, a Stennis Space Center construction contractor's request for equitable adjustments resulted in a dispute before the Armed Services Board of Contract Appeals, which denied three of the five claims appealed by the contractor. The repudiated claims are valued at $9.5 million.

Texas Company Convicted for Falsifying Rocket Fuel Transportation Documents

A fuel delivery company used to transport rocket fuel pleaded guilty to wire fraud for falsifying tank trailer wash certificates over a 9-year period. The potentially contaminated fuel was used for ISS supply and military payload launches. Accordingly, the company and its two principals entered into voluntary exclusions wherein each agreed to be banned from government contracting for two years. The company also agreed to forfeit $251,401 in gross profits traceable to the deliveries in question. The investigation was worked jointly by NASA OIG and the Defense Criminal Investigative Service.

Former Kennedy Space Center Subcontractor Employees Sentenced

As the result of a NASA OIG investigation, the CEO, chief operating officer, and president of a Titusville, Florida, company were sentenced for their roles in a 22-year conspiracy to defraud NASA and its contractors of more than $84 million in contract awards by misrepresenting the company as a woman-owned small business. The CEO was sentenced to six months of imprisonment and three years of supervised release and ordered to pay an $893,062 criminal forfeiture and $5,000 fine. The chief operating officer and president were each sentenced to one year of unsupervised release, and the president was also ordered to pay a $183,262 criminal forfeiture. The company had previously agreed to a $250,000 civil settlement for its misrepresentations.

Former General Manager of Florida Subcontractor Sentenced

In January 2022, the former general manager of a Titusville, Florida, small business was sentenced to 90 days of house arrest and one year of supervised release and ordered to pay a $5,000 fine after being convicted on multiple counts of conspiracy and wire fraud for his role in misrepresenting his company as a woman-owned small business in order to secure more than $6 million in NASA contracts. The general manager was the fourth individual sentenced in the fraud scheme.

Former NASA Contractor Employee Pleads Guilty and Is Sentenced

A former NASA contractor employee pleaded guilty to theft for stealing personal computers from Glenn Research Center. As a result, he was sentenced to 12 months of probation.

University of Arkansas Professor Pleaded Guilty to False Statements

As the result of a joint investigation by NASA OIG, the FBI, and the Air Force Office of Special Investigations, a University of Arkansas professor pleaded guilty to one count of false statements for failing to disclose that his inventions are patented in the People's Republic of China. Sentencing is expected in May 2022.

Former Senior NASA Scientist Debarred for Three Years

A former chief scientist at Ames Research Center was debarred for three years. The scientist was convicted and sentenced for making false statements to the FBI and NASA OIG regarding his employment by a Chinese government-funded program that recruited individuals with access to foreign technologies and intellectual property.

Contractor Agrees to Voluntary Exclusion

The president of a NASA contractor agreed to voluntary exclusion from participating in federal procurement and non-procurement transactions for three years after he used grant funds for prohibited purposes and submitted false information to NASA.

Nonprofit President Debarred

As a result of a joint investigation by NASA OIG and the Los Angeles County District Attorney's Office, the former president of a NASA-funded nonprofit was debarred for two years. The former president had previously pleaded guilty to one felony count for her role in a corruption investigation involving two city consultants improperly paid with NASA funding.

Former NASA Senior Executive Debarred

As the result of an investigation by NASA OIG and the IRS, a former NASA Office of the Chief Financial Officer senior executive was debarred by the NASA Acquisition Integrity Program for a period of seven years. The former NASA official previously pleaded guilty to one felony count for receiving three Coronavirus Aid, Relief, and Economic Security (CARES) Act loans under the Paycheck Protection Program and was sentenced to 18 months of imprisonment, 3 years of supervised release, and ordered to pay $285,449 in restitution.

EMPLOYEE MISCONDUCT

Education Manager Resigns Due to Nepotism

As a result of a NASA OIG investigation, an education manager at Goddard Space Flight Center resigned in lieu of termination for using her position to secure nine internships for her two children between 2014 and 2020; the children had received combined internship stipends totaling $56,260.

Financial Management Specialist Resigns

As a result of a NASA OIG investigation, a Kennedy Space Center financial management specialist resigned in lieu of termination after it was determined she was provided an unfair advantage when selected for the position and had conspired with her former supervisor to conceal their personal relationship.

NASA Engineer Charged in Pandemic Relief Fraud Scheme

A Johnson Space Center engineer was charged with submitting fraudulent applications for Economic Injury Disaster Loans administered by the Small Business Administration. The purpose of such loans is to help small businesses and other entities overcome the effects of the pandemic by providing borrowers with working capital to meet operating expenses. The charges alleged that materially false and fraudulent representations and promises were made to obtain money for personal benefit. Investigation determined that loan documents were signed utilizing a NASA network, resulting in the improper receipt of $156,500 in loan proceeds.

Kennedy Space Center Investigation Results in Significant Administrative Action

An extensive NASA OIG investigation identified multiple failures within Kennedy Space Center management's application of NASA's anti-harassment policy. As a result, all Kennedy Space Center Procurement Directorate employees and supervisors were required to complete anti-harassment training. In addition, two civil servants received verbal counseling, and a letter of counseling was issued to a third employee. A fourth Kennedy Space Center civil servant retired in lieu of a proposed 14-day suspension for conduct unbecoming and lack of candor.

Unmanned Aerial Systems Recovered

A NASA OIG investigation determined a senior Aircraft Management Division employee used his position to improperly transfer three unmanned aerial systems and two controllers to a university his daughter was attending. As a result, the NASA Logistics Management Division secured an agreement to transfer the systems from the university to the General Services Administration (GSA).

Former Kennedy Space Center Contractor Employee Terminated After Fuel Thefts

In December 2021, a former contractor employee was terminated for his role in the misuse of GSA fuel credit cards. Investigation determined the employee fraudulently used 11 fuel cards to purchase more than $12,000 worth of gasoline over a two-year period.

Former Kennedy Space Center Contractor Charged with Felony Drug Possession

In January 2022, a former NASA contractor employee was charged by the Florida State Attorney's Office with two counts of possession of controlled substances without a prescription after he was found carrying Schedule III narcotics while working at Kennedy Space Center. The subject's employment was subsequently terminated.

OTHER CASES

Former Spouse of NASA Civil Servant Sentenced

As the result of a NASA OIG investigation, the former spouse of a Kennedy Space Center contracting officer was sentenced to six months of imprisonment and one year of supervised release after pleading guilty to charges related to altering official government records in an attempt to frame her then-husband. Investigation revealed the subject altered government emails and fabricated text messages to make it appear that her husband made terroristic threats against her.

Florida Police Officer Resigns While Under Internal Investigation

In February 2022, a Melbourne (Florida) Airport Police Department officer resigned while under internal investigation for aiding the former spouse of a Kennedy Space Center contracting officer in framing her then-husband for making terroristic threats against her. Investigation revealed the former police officer misused computer systems and improperly accessed law enforcement databases in support of the scheme.

Florida Resident Indicted on Wire Fraud Related to Government Aircraft

In December 2021, a Florida resident was arrested on one count of wire fraud for fraudulently acquiring a Department of Defense aircraft through the GSA Federal Excess Property Program. In addition, the subject fraudulently acquired two out-of-commission NASA X-34 spaceplanes.

Florida Resident Charged with Felony Cocaine Possession

In February 2022, a Florida resident was charged with felony cocaine possession by the Florida State Attorney's Office following a traffic stop on NASA property. In addition, it was determined that the driver did not have a valid driver's license, was on inmate release through the State of Florida, and was a habitual traffic offender.

Florida Resident Charged with Felony Drug Possession with Intent to Distribute

In September 2021, a Florida resident was charged by the Florida State Attorney's Office with felony possession of marijuana with intent to deliver following a traffic stop on NASA property.

STATISTICAL DATA

TABLE 11: OFFICE OF INVESTIGATIONS COMPLAINT INTAKE DISPOSITION

Source of Complaint	Zero Files[a]	Administrative Investigations[b]	Management Referrals[c]	Preliminary Investigations[d]	Total
Hotline	6	11	—	6	**23**
All others	20	20	1	44	**85**
Total	**26**	**31**	**1**	**50**	**108**

[a] Zero files are those complaints for which no action is required or that are referred to NASA management for information only or to another agency.

[b] Administrative investigations include non-criminal matters initiated by the Office of Investigations as well as hotline complaints referred to the Office of Audits.

[c] Management referrals are those complaints referred to NASA management for which a response is requested.

[d] Preliminary investigations are those complaints where additional information must be obtained prior to initiating a full criminal or civil investigation.

TABLE 12: FULL INVESTIGATIONS OPENED THIS REPORTING PERIOD

Full Criminal/Civil Investigations[a]	25

[a] Full investigations evolve from preliminary investigations that result in a reasonable belief that a violation of law has taken place.

TABLE 13: INVESTIGATIONS CLOSED THIS REPORTING PERIOD

Full, Preliminary, and Administrative Investigations	89

Note: The NASA OIG uses closing memorandums to close investigations. Investigative reports are used for presentation to judicial authorities, when requested.

TABLE 14: CASES PENDING AT END OF REPORTING PERIOD

Preliminary Investigations	60
Full Criminal/Civil Investigations	127
Administrative Investigations	74
Total	**261**

TABLE 15: QUI TAM INVESTIGATIONS

Qui Tam Matters Opened This Reporting Period	5
Qui Tam Matters Pending at End of Reporting Period	10

Note: The number of Qui Tam investigations is a subset of the total number of investigations opened and pending.

TABLE 16: JUDICIAL ACTIONS

Total Cases Referred for Prosecution[a]	32
Individuals Referred to the Department of Justice[b]	23
Individuals Referred to State and Local Authorities[b]	9
Indictments/Informations[c]	6
Convictions/Plea Bargains	5
Sentencing/Pretrial Diversions	9
Civil Settlements/Judgments	4

[a] This includes all referrals of individuals and entities to judicial authorities.

[b] The number of individuals referred to federal, state, and local authorities are a subset of the total cases referred for prosecution.

[c] This includes indictments/informations on current and prior referrals.

TABLE 17: ADMINISTRATIVE ACTIONS

Referrals	
Referrals to NASA Management for Review and Response	17
Referrals to NASA Management—Information Only	4
Referrals to the Office of Audits	—
Referrals to Security or Other Agencies	5
Total	**26**
Recommendations to NASA Management	
Recommendations for Disciplinary Action	10
Involving a NASA Employee	6
Involving a Contractor Employee	2
Involving a Contractor Firm	1
Other	1
Recommendations on Program Improvements	
Matters of Procedure	1
Total	**11**
Administration/Disciplinary Actions Taken	
Against a NASA Employee	11
Against a Contractor Employee	3
Against a Contractor Firm	1
Other	10
Procedural Change Implemented	1
Total	**26**
Suspensions or Debarments from Government Contracting	
Involving an Individual	6
Involving a Contractor Firm	1
Total	**7**

TABLE 18: INVESTIGATIVE RECEIVABLES AND RECOVERIES

Judicial	$6,896,984
Administrative[a]	$10,485,149
Total[b]	**$17,382,133**
Total NASA	**$11,139,399**

[a] Includes amounts for cost savings to NASA as a result of investigations.

[b] Total amount collected may not solely be returned to NASA but may be distributed to other federal agencies.

TABLE 19: WHISTLEBLOWER INVESTIGATIONS

For the reporting period, no officials were found to have engaged in retaliation.

TABLE 20: SENIOR GOVERNMENT EMPLOYEE INVESTIGATIONS REFERRED FOR PROSECUTION

Case Number	Allegation	Referral Date	Disposition
19-0249-O	Conflict of Interest (Multiple Subjects)	12/4/2019 7/31/2020	Declined—Advised to pursue Agency administrative action. Letter of Reprimand issued. One Retirement in lieu of admin action.
21-0058	Sexual Harassment	2/4/2021	Declined—Senior official retired in lieu of suspension. Three letters of counseling issued. Directorate staff given anti-harassment training.

TABLE 21: SENIOR GOVERNMENT EMPLOYEE CASES NOT DISCLOSED TO THE PUBLIC

Case Number	Allegation	Closure Date	Disposition
19-0249-O	Conflict of Interest	12/14/2021	Letter of Reprimand issued to one individual. Another individual retired in lieu of admin action.
20-0305-HL-S	Misuse of Position	11/8/2021	Employee counseled.

CONGRESSIONAL TESTIMONY

The Perseverance rover took this picture of Santa Cruz Hill in Mars's Jezero Crater in April 2021.

KEEPING OUR SIGHTS ON MARS: A STATUS UPDATE AND REVIEW OF NASA'S ARTEMIS INITIATIVE

CT-2022-01, JANUARY 20, 2022

On March 1, 2022, NASA Inspector General Paul Martin testified before the U.S. House of Representatives Subcommittee on Space and Aeronautics about challenges related to NASA's Artemis initiative. Drawing from the OIG's broad, years-long oversight of the issue, IG Martin reported on interrelated challenges NASA must address to achieve its ambitious Artemis goals, manage costs, address technical risks, and create transparency into funding requirements.

Specifically, IG Martin cited the OIG's work over the past two years that included 8 audit reports containing 38 recommendations related to SLS, Orion, the Gateway lunar outpost, a Human Landing System (HLS) to transport astronauts from lunar orbit to the Moon's surface, ground systems and launch infrastructure, next-generation spacesuits, management of the astronaut corps, and management of the International Space Station.

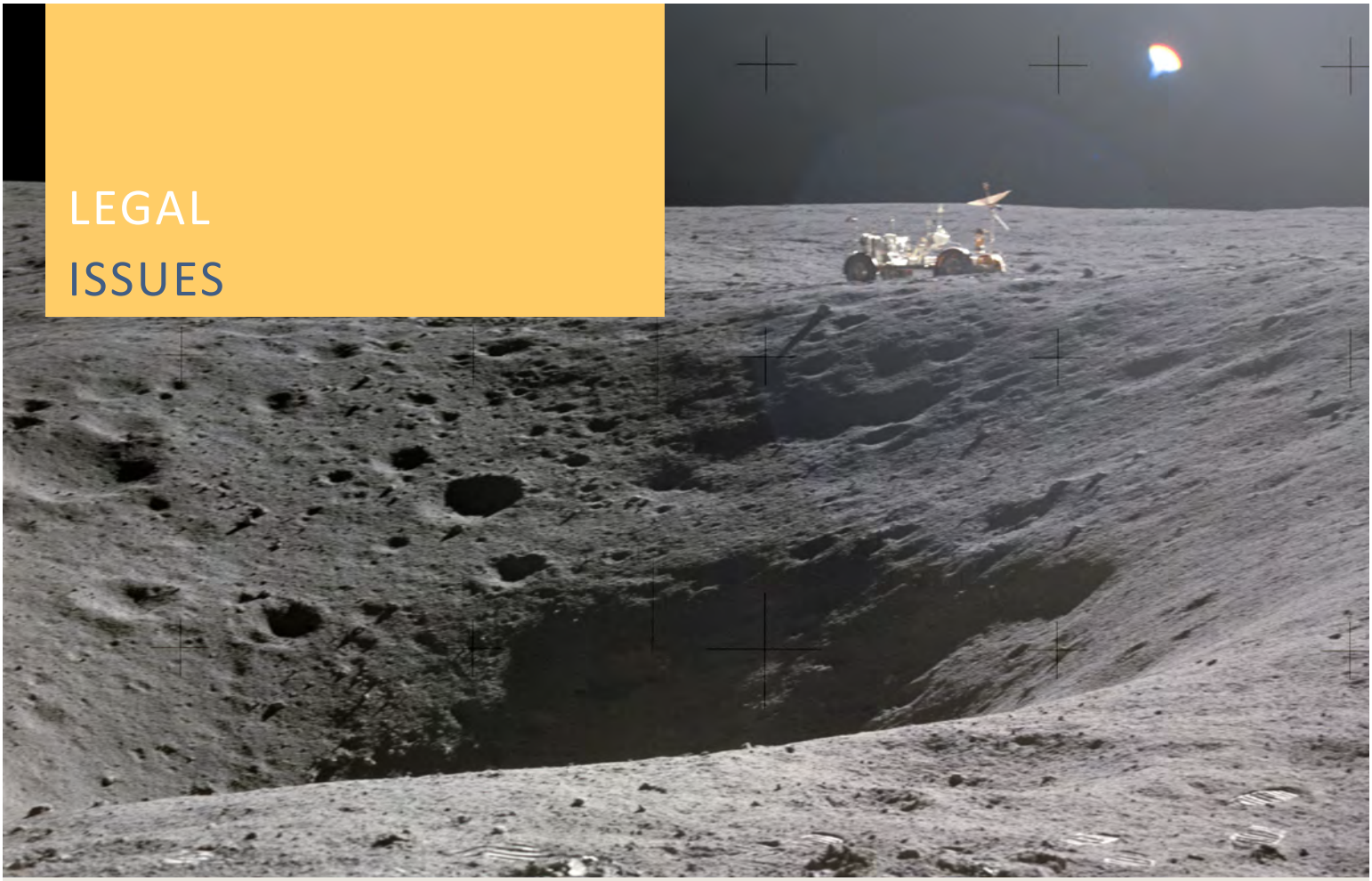
The OIG's written testimony centered on the fact that over the past year, NASA's Artemis systems (SLS, Orion, and Exploration Ground Systems Programs) have made steady progress and are, in our estimation, positioned to launch the first Artemis mission by summer 2022. Despite this progress, NASA's broader goal to land astronauts on the Moon faces significant challenges, including major technical risks, an unrealistic development schedule, and lower-than-requested funding levels. As a result, the date for a crewed lunar landing likely will slip to 2026 at the earliest.

More concerning is the long-term sustainability of the Artemis program. Historically, NASA has struggled to establish credible mission cost estimates. Given that NASA is likely to spend $93 billion on Artemis through FY 2025, the Agency's lunar and Mars ambitions have the potential to cost hundreds of billions of dollars over the next two decades. However, the Agency has disagreed with our recommendations to develop an overall Artemis cost estimate or calculate per-mission costs. In light of the OIG-estimated $4.1 billion price tag per launch for at least the first four Artemis missions, the Agency faces significant challenges to reduce costs to ensure the program is sustainable.

NASA has acknowledged the high costs of its lunar and Mars goals and is exploring ways to make the missions sustainable by transitioning some programs to fixed-price contracts. With the emerging capabilities provided by commercial partners, the Agency may have future options that can help control costs to meet its exploration goals.

Whether acquiring space flight systems for Artemis or eventually for crewed missions to Mars, NASA must determine the procurement and programmatic strategies to best support its objectives. This includes encouraging competition, using appropriate contracting instruments, and ensuring the Agency receives systems that meet its needs. Importantly, understanding the state of technology development and the requirements for each Artemis system will help inform decision makers on the best approach and will help produce realistic schedule and cost estimates. We plan to continue examining key challenges in NASA's human exploration missions to the Moon and Mars.

LEGAL ISSUES



On April 21, 1972—50 years ago this spring—the crew of Apollo 16 explored Plum Crater. The Lunar Roving Vehicle is parked on the far side of the crater.

LEGAL TRAINING

Under the Attorney General's guidelines for Inspectors General with statutory law enforcement authority, IG criminal investigators are required to receive periodic training in the following legal areas: trial process; federal criminal and civil legal updates; interviewing techniques and policy; and the law of arrest, search, and seizure. On January 11, 2022, OIG Legal provided refresher training to agents at NASA OIG and the National Science Foundation (NSF) OIG on criminal, civil, and administrative law updates, including training on the Computer Fraud and Abuse Act, a case involving Law Enforcement Availability Pay, retaliatory investigations, legal aspects of fitness for duty, the legal use of force, and the use of body-worn cameras.

REGULATORY REVIEW

During this reporting period, we reviewed 15 NASA regulations and policies under consideration by the Agency. The following are several of the more significant regulations and reviews.

NASA Interim Directive (NID) 8715.140, Safety Policy Regarding Hazardous Chemicals Storage

This directive establishes requirements that address our report on NASA's Management of Hazardous Materials (IG-21-006). Specifically, the directive answers our recommendation that NASA develop and implement an Agency-wide policy that establishes a standard for storage spaces and facilities used to house hazardous materials. NASA Office of Safety and Mission Assurance (OSMA) will be assessing each Center's compliance with these requirements as part of its plan to address the OIG's findings. These assessments will be conducted as part of the Chief Heath and Medical Office's and OSMA's normal Center auditing processes and are intended to ensure that the concerns the OIG identified at several Centers are not systemic across the Agency. We recommended changes to the directive intended to ensure that hazardous materials are stored in accordance with Occupational Safety and Health Administration (OSHA) 1910.1200 and 1910.1450, NASA Procedural Requirements (NPR) 8715.1, NASA STD-8719.11, NASA STD-8719.12, and all applicable local and state requirements.

NASA Policy Directive (NPD) 2540.1K, Acceptable Use of Government Furnished Information Technology Equipment, Services, and Resources

This directive details NASA policy on limited, acceptable, personal use of the Agency's government furnished property (GFP), IT equipment, and services and resources for non-government purposes. The directive provides that acceptable personal use must be limited to use that incurs no more than minimal additional expense to the government in areas such as communications infrastructure costs; use of consumables in limited amounts; general wear and tear on property; minimal data storage on storage devices; and minimal impacts on NASA IT systems. We recommended changes to the policy directive intended to ensure that NASA policy clearly identifies which data storage devices are allowed for use on NASA GFP devices, as well as include the complete list of communications equipment and services that are deemed to pose an unacceptable risk to national security.

NPD 3713.6R, Delegation of Authority to Act in Matters Pertaining to Discrimination Complaints

This directive was revised in response to a mandatory five-year review. The directive provides executive leadership and establishes Agency policy in matters pertaining to processing discrimination complaints. Special procedures for processing Equal Employment Opportunity (EEO) complaints involving personnel are retained at section 6.a.(19), whereby OIG attorneys are designated co-counsel on cases before the Equal Employment Opportunity Commission; the OIG retains settlement and remedial authority of EEO cases involving OIG personnel; and final Agency decisions on OIG cases are decided by the head of the Agency rather than the head of the Office of Diversity and Equal Opportunity. We reviewed the directive and concurred with the proposed revisions without comment.

NASA's Gulfstream III was one of several research aircraft that the Oceans Melting Greenland mission used to record the temperature, salinity, and depth of the ocean around Greenland.

NPR 8820.2H, Facility Projects Requirements

This document provides minimum requirements for planning, approving, and acquiring all NASA facility projects. This revision of an existing directive captures changes in part due to two OIG reports: NASA's Construction of Facilities (IG-21-027) and Construction of Test Stands 4693 and 4697 at Marshall Space Flight Center (IG-17-021). Specifically, the revision addresses the need for NASA to improve the development and verification of its facility project requirements as well as to ensure that all Institutional and Program-Direct Construction of Facilities Projects have life-cycle cost analyses that are thoroughly reviewed by Headquarters when establishing Agency-wide project priorities. We reviewed the procedural requirements and concurred with the proposed revisions without comment.

STATISTICAL DATA

TABLE 22: LEGAL ACTIVITIES AND REVIEWS

Freedom of Information Act Matters	21
Appeals	1
Inspector General Subpoenas Issued	30
Regulations Reviewed	15


INSPECTOR GENERAL
NASA
AERONAUTICS AND SPACE ADMINISTRATION

APPENDIXES

Divers at the Neutral Buoyancy Laboratory (NBL) in Houston are setting the stage for Moonwalk training by simulating the dark, shadowy lighting conditions that exist at the lunar South Pole. To prepare astronauts, the NBL team is working to create a Moonscape at the bottom of the 40-foot-deep pool, installing black curtains on the pool walls to minimize reflections, using a powerful underwater cinematic lamp, and laying sand on the pool floor to simulate lunar regolith.

APPENDIX A. INSPECTOR GENERAL ACT REPORTING REQUIREMENTS

Inspector General Act Citation	Requirement Definition	Cross Reference Page Numbers
Section 4(a)(2)	Review of legislation and regulations	38-40
Section 5(a)(1)	Significant problems, abuses, and deficiencies	--
Sections 5(a)(5) and 6(b)(2)	Summary of refusals to provide information	--
Section 5(a)(6)	OIG audit products issued—includes total dollar values of questioned costs, unsupported costs, and recommendations that funds be put to better use	5-26
Section 5(a)(8)	Total number of reports and total dollar value for audits with questioned costs	--
Section 5(a)(9)	Total number of reports and total dollar value for audits with recommendations that funds be put to better use	--
Section 5(a)(10)(A)	Summary of audit products issued before this semiannual reporting period for which no management decision has been made	--
Section 5(a)(10)(B)	Reports issued before this semiannual reporting period for which no Agency comment was provided within 60 days	--
Section 5(a)(10)(C)	Unimplemented recommendations and associated potential cost savings for Office of Audit products issued before this semiannual reporting period	21-23
Section 5(a)(11)	Description and explanation of significant revised management decisions	--
Section 5(a)(12)	Significant management decisions with which the Inspector General disagreed	--
Section 5(a)(13)	Reporting in accordance with Section 5(b) of the Federal Financial Management Improvement Act of 1996 Remediation Plan	--
Section 5(a)(14)	Peer review conducted by another OIG	46
Section 5(a)(15)	Outstanding recommendations from peer reviews of NASA OIG	--
Section 5(a)(16)	Outstanding recommendations from peer reviews conducted by NASA OIG	--
Section 5(a)(17)(A)	Summary of investigations	27-33
Section 5(a)(17)(B)(C) and (D)	Matters referred to prosecutive authorities	27-33
Section 5(a)(18)	Descriptions of table metrics	20, 32, 40
Section 5(a)(19)(A) and (B)(i)(ii)	Summary of investigations involving senior government employees	34
Section 5(a)(20)	Summary of whistleblower investigations	--
Section 5(a)(21)(A) and (B)	Agency attempts to interfere with OIG independence	--
Section 5(a)(22)(A)	Closed inspections, evaluations, and audits not disclosed to the public	20
Section 5(a)(22)(B)	Closed investigations of senior government employees not disclosed to the public	34

APPENDIX B. DEBT COLLECTION

The Senate Report accompanying the supplemental Appropriations and Rescissions Act of 1980 (Pub. L. No. 96-304) requires Inspectors General to report amounts due to the Agency, as well as amounts that are overdue and written off as uncollectible. The NASA Shared Services Center provides this data each November for the previous fiscal year. For the period ending September 30, 2021, the receivables due from the public totaled $876,223, of which $357,653 is delinquent. The amount written off as uncollectible for the period October 1, 2020, through September 30, 2021, was $227,473.

APPENDIX C. PEER REVIEWS

The Dodd-Frank Wall Street Reform and Consumer Protection Act requires the OIG to include in its semiannual reports any peer review results provided or received during the relevant reporting period. Peer reviews are required every three years. In compliance with the Act, we provide the following information.

OFFICE OF AUDITS

The Legal Services Corporation OIG completed a peer review of the NASA OIG Office of Audits in December 2021. NASA OIG received a peer review rating of "pass" and has taken all corrective actions to address the recommendations included in the Letter of Comment. We are currently conducting an external peer review of the Federal Housing Finance Agency OIG for the three-year period ending March 31, 2022.

OFFICE OF INVESTIGATIONS

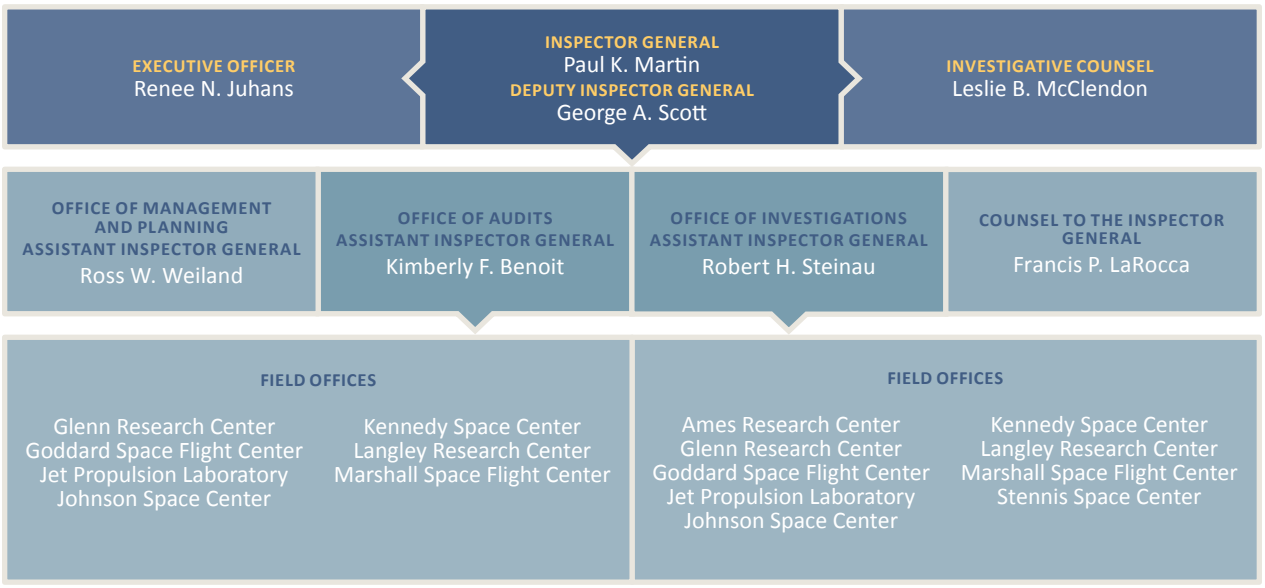
No external peer reviews were performed by the Office of Investigations during this semiannual period. In October 2017, the Office of the Special Inspector General for the Troubled Asset Relief Program reviewed the NASA OIG's Office of Investigations and found the office to be compliant with all relevant guidelines. There are no unaddressed recommendations outstanding from this review.

APPENDIX D. ACRONYMS

APL	Applied Physics Laboratory
CIGIE	Council of the Inspectors General on Integrity and Efficiency
DCAA	Defense Contract Audit Agency
DEI&A	Diversity, Equity, Inclusion, and Accessibility
EEO	Equal Employment Opportunity
FISMA	Federal Information Security Modernization Act of 2014
FY	fiscal year
IG	Inspector General
ISS	International Space Station
IT	information technology
NPR	NASA Procedural Requirements
OIG	Office of Inspector General
OSMA	Office of Safety and Mission Assurance
RPS	Radioisotope Power Systems
SLS	Space Launch System
STMD	Space Technology Mission Directorate
VIPER	Volatiles Investigating Polar Exploration Rover

APPENDIX E. OFFICE OF INSPECTOR GENERAL ORGANIZATIONAL CHART

The OIG's FY 2022 budget of $45.3 million supports the work of 178 employees in their audit, investigative, and administrative activities.



THE NASA OFFICE OF INSPECTOR GENERAL conducts audits, reviews, and investigations of NASA programs and operations to prevent and detect fraud, waste, abuse, and mismanagement and to assist NASA management in promoting economy, efficiency, and effectiveness.

THE INSPECTOR GENERAL provides policy direction and leadership for the NASA OIG and serves as an independent voice to the NASA Administrator and Congress by identifying opportunities for improving the Agency's performance. The Deputy Inspector General assists the IG in managing the full range of the OIG's programs and activities and provides supervision to the Assistant Inspectors General, Counsel, and Investigative Counsel in the development and implementation of the OIG's diverse audit, investigative, legal, and support operations. The Executive Officer serves as the OIG liaison to Congress and other government entities, conducts OIG outreach both within and outside NASA, and manages special projects. The Investigative Counsel serves as a senior advisor for OIG investigative activities and conducts special reviews of NASA programs and personnel.

THE OFFICE OF AUDITS conducts independent and objective audits and reviews of NASA programs, projects, operations, and contractor activities. In addition, the office oversees the work of an independent public accounting firm in its annual audit of NASA's financial statements.

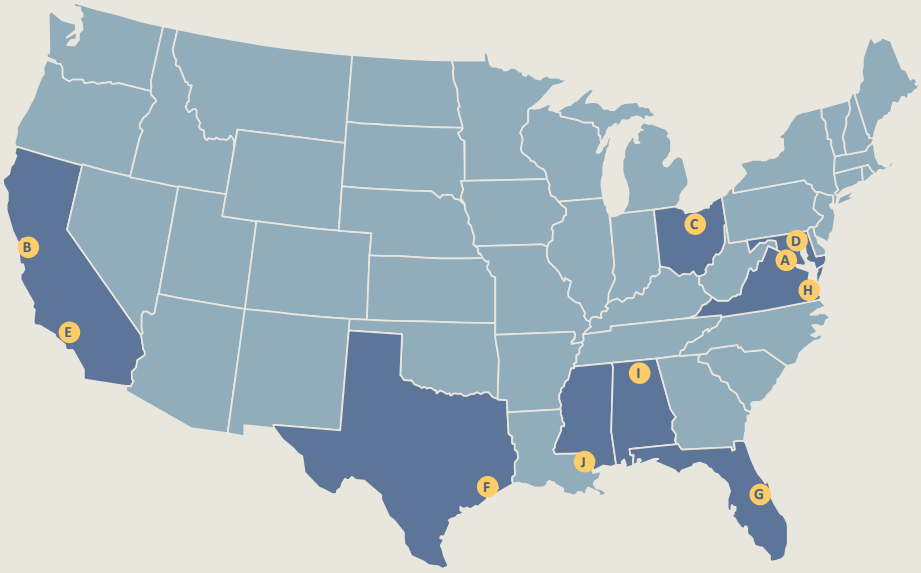
THE OFFICE OF COUNSEL TO THE INSPECTOR GENERAL provides legal advice and assistance to OIG managers, auditors, and investigators. The office serves as OIG counsel in administrative litigation and assists the Department of Justice when the OIG participates as part of the prosecution team or when the OIG is a witness or defendant in legal proceedings. In addition, the office is responsible for educating Agency employees about prohibitions on retaliation for protected disclosures and about rights and remedies for protected whistleblower disclosures.

THE OFFICE OF INVESTIGATIONS investigates allegations of cybercrime, fraud, waste, abuse, and misconduct that may affect NASA programs, projects, operations, and resources. The office refers its findings either to the Department of Justice for criminal prosecution and civil litigation or to NASA management for administrative action. Through its investigations, the office develops recommendations for NASA management to reduce the Agency's vulnerability to criminal activity and misconduct.

THE OFFICE OF MANAGEMENT AND PLANNING provides financial, procurement, human resources, administrative, and IT services and support to OIG staff.

APPENDIX F. MAP OF OIG FIELD OFFICES

NASA OIG OFFICES OF AUDITS AND INVESTIGATIONS



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