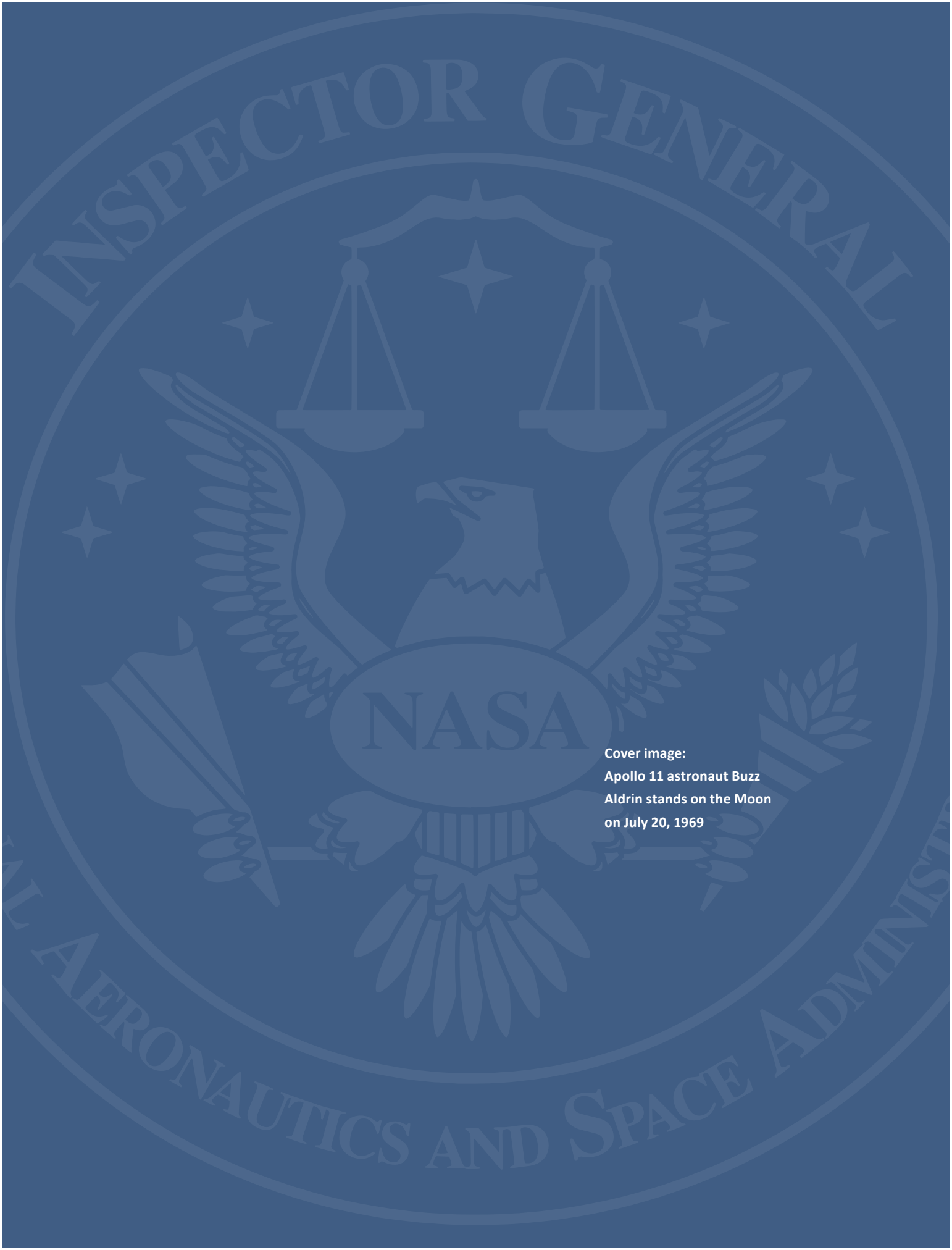
NASA OFFICE OF INSPECTOR GENERAL

SEMIANNUAL REPORT

APRIL 1–SEPTEMBER 30, 2019



Cover image:
Apollo 11 astronaut Buzz Aldrin stands on the Moon on July 20, 1969

FROM THE INSPECTOR GENERAL

In March, the Vice President challenged NASA to return American astronauts to the lunar surface in 2024—a timetable at least four years earlier than the Agency had planned. Since then, NASA has been working to stand up an ambitious program named "Artemis" to put, as the NASA Administrator describes it, "the first woman and next man on the Moon." In addition to the launch vehicle and crew capsule required to make this mission a reality, the Agency needs to develop or purchase lunar landing vehicles and a way station near the moon known as the Lunar Gateway to facilitate a moon landing.

In addition to the substantial technical hurdles in developing and integrating the complex technologies necessary to meet this challenge, NASA will need strong and sustained congressional support. In the program's first year, NASA has requested an additional $1.6 billion as a down payment on its Artemis efforts, and anticipates that "ask" to increase to $4 to $6 billion annually over the next 4 years. Obtaining that level of additional funding will be critical to whether the Agency is able to achieve its ambitious plans to return U.S. astronauts to the Moon's surface in five years.

Against this backdrop, the Office of Inspector General (OIG) is examining many of the Artemis Program's core components. For example, ongoing work is examining three "tent-pole" programs essential to NASA's plans to launch humans to the Moon in 2024: a Space Launch System (SLS) follow-on review that is examining development of the heavy-lift rocket's RS-25 engines, solid rocket boosters, and upper stage; development of the Orion Multipurpose Crew Vehicle (Orion) intended to carry up to four astronauts beyond low Earth orbit on the SLS; and management of the mobile launcher needed to stack, transport, and launch the integrated SLS/Orion system. Simultaneously, we are examining delays by two companies currently working with NASA to develop commercial crew transportation services to the International Space Station.

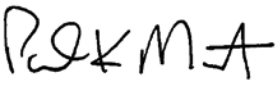
In addition to our focus on the Agency's human exploration efforts, the OIG issued audits this reporting period examining a variety of other important programs and missions:

- plans to send a satellite "fly by" mission to explore Europa, a moon of Jupiter that may have a large liquid ocean suitable to sustain life;
- management of the process for transferring Agency-developed technology to the commercial sector; and
- compliance with federal mandates regarding reporting of improper payments made to Agency contractors, vendors, and grantees.

Also during the reporting period, we concluded our investigation of a decades-long scheme by a metal fabricating company to defraud NASA and the Missile Defense Agency by altering test results for parts manufactured for use in rockets and military hardware. In April 2019, the NASA subcontractor entered into a global settlement to resolve civil and criminal claims under which the company agreed to pay

$34.1 million in restitution to NASA, the Missile Defense Agency, and commercial customers and forfeit $1.8 million in ill-gotten gains. In addition, the NASA subcontractor and its parent company pleaded guilty to one count of mail fraud.

This Semiannual Report summarizes the OIG's activities and accomplishments from April 1, 2019, through September 30, 2019. We hope that our audits and reviews, together with our investigative work over the past 6 months that includes dozens of successful criminal and administrative investigations, will help inform and improve decision-making at NASA and enhance congressional oversight of the Agency.



Paul K. Martin
Inspector General
October 31, 2019

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This artist's concept shows how the identical Van Allen Probes followed similar orbits around Earth through both the inner and outer radiation belts

SPACE OPERATIONS AND 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), managing commercial crew and cargo programs in support of the ISS, making plans to facilitate the commercialization of low Earth orbit, and planning for future exploration beyond low Earth orbit using the Space Launch System (SLS) rocket and Orion Multi-Purpose Crew Vehicle (Orion) capsule.

ONGOING AUDIT WORK

NASA's Management of the Mobile Launcher

Located at Kennedy Space Center, NASA's mobile launcher is a critical piece of equipment required to stack, transport, and launch the mated SLS rocket and Orion capsule. Rocket components are integrated on the mobile launcher inside the Vehicle Assembly Building and then transported via the Crawler Transporter to the launch site. Originally, the sole mobile launcher—now known as Mobile Launcher 1—was designed to launch the Constellation rocket. It is being modified to launch the first test flight of the integrated SLS/Orion system (now known as Artemis 1) in 2019 or 2020 and will then be upgraded to launch a larger version of the SLS for the second Artemis mission between 2021 and 2023. In NASA's 2018 appropriations legislation, Congress gave the Agency more than $350 million to build a second launcher—Mobile Launcher 2—with a delivery date of no later than 2023. This audit will examine the status of Mobile Launcher 1 as well as NASA's development plans for Mobile Launcher 2 relative to meeting cost, schedule, and performance goals.

The SLS's liquid hydrogen tank test article is positioned in the test stand at NASA's Marshall Space Flight Center

NASA's Efforts to Manage Space Launch System Program Costs and Contracts

The SLS Program is developing NASA's next heavy-lift rocket to send humans and payloads to the Moon and beyond. The SLS is a two-stage rocket with a newly developed Core Stage that incorporates four RS-25 engines and five-segment solid boosters modified from the Space Shuttle Program. For its first three missions, the SLS's upper stage will use an Interim Cryogenic Propulsion Stage—a modified second stage of a Delta IV rocket. In 2014, after completion of the SLS's preliminary design, NASA established a baseline cost commitment of $9.7 billion for the SLS Program and a November 2018 launch readiness date. Since then, the launch date for Artemis 1 has been delayed to at least June 2020 and all program costs are expected to exceed $17 billion by launch. This audit is a follow-on to our past work on the SLS Core Stages contract and

Dr. Patrick Shea inspects a 1.3 percent scale model of the second generation of NASA's Space Launch System in a wind tunnel for ascent testing at Ames Research Center

will examine NASA's management of SLS Program costs and schedule for four major contracts, including the RS-25 engines, solid rocket boosters, and upper stage, along with an update on the Core Stages contract. In addition, we will evaluate NASA's overall SLS Program cost and schedule goals for Artemis 1 and determine whether the Agency is tracking and reporting cost and schedule goals appropriately.

NASA's Ground and Flight Application Software

NASA's Exploration Ground Systems (EGS) Program is developing the Ground Flight and Application Software (GFAS), critical software needed to launch the integrated SLS/Orion system and allow it to interface with flight systems and ground crews. In this audit, we are evaluating the Agency's efforts to prepare GFAS for the Artemis 1 launch, the accuracy of current cost projections, and impacts of SLS/Orion schedule delays on development efforts. We are also assessing risks that may contribute to or inhibit GFAS's full functionality.

NASA's Management of Crew Transportation to the International Space Station

Since the Space Shuttle Program ended in 2011, the United States has lacked a domestic capability to transport crew to the ISS, instead relying on the Russian Soyuz spacecraft to ferry astronauts at a cost of more than $82 million per astronaut. The goal of NASA's Commercial Crew Program is to provide safe, reliable, and cost-effective crew transportation to and from the ISS. After a commitment of $7.1 billion and a delay of more than 3 years, two commercial crew providers—The Boeing Corporation (Boeing) and Space Exploration Technologies Corporation (SpaceX)—are scheduled to make crewed and uncrewed flights to the ISS in late 2019 or 2020. However, both providers face technical challenges that could result in additional delays. This audit will examine NASA's progress in transporting astronauts to the ISS aboard commercial vehicles.

On November 1, 2018, the USS John P. Murtha recovered the test version of the Orion capsule at sunset in the Pacific Ocean

Audit of the Orion Multi-Purpose Crew Vehicle Program

Orion is the crew capsule that will carry up to four astronauts to destinations beyond low Earth orbit on the SLS. Since fiscal year (FY) 2012, NASA has spent $1.2 billion annually, or about 7 percent of its overall budget, on the Orion Program. Overall, the Agency has spent more than $9 billion on the Program with a cost baseline of $11.3 billion. Orion faces a series of technical challenges leading up to the capsule's first crewed flight as well as funding issues, with NASA expecting the Program to exceed its cost baseline in 2019. This audit will examine the Agency's management of the Orion Program.

NASA astronauts Eric Boe, foreground left, and Nicole Mann, foreground right, along with Boeing astronaut Chris Ferguson, background, pose for a photograph inside the Boeing Mockup Trainer at NASA's Johnson Space Center

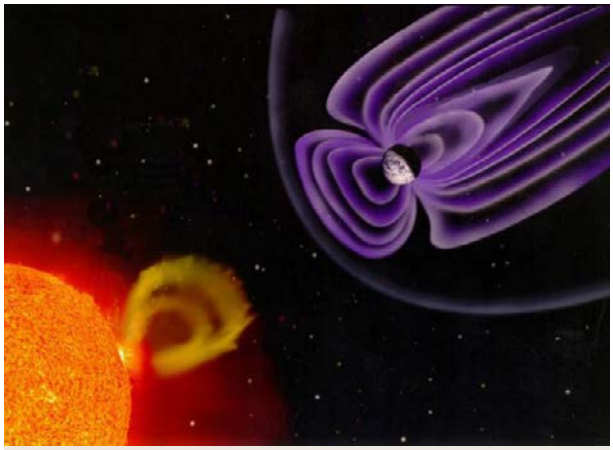
NASA astronaut Mike Fincke works through a checklist inside a mockup of Boeing's CST-100 Starliner during a simulation at NASA's Johnson Space Center

ACQUISITION AND PROJECT MANAGEMENT

Effective contract, grant, and project management are ongoing challenges for NASA. Through its comprehensive audits, the OIG examines NASA's procurement and acquisition practices to ensure the best possible value is provided to the Agency and taxpayers.

NASA's Heliophysics Portfolio

NASA's Heliophysics Division (HPD)—which had an FY 2018 budget of $689 million—is currently managing 30 missions in various stages of operation and development to advance our understanding of the Sun and its interaction with Earth's atmosphere. In this audit, we assessed the Agency's management of its heliophysics portfolio. We found that HPD has developed a comprehensive strategy to successfully manage NASA's heliophysics science capabilities and maintain its portfolio of missions. That said, we noted that the Division's 2014 roadmap has not been updated to account for changes in HPD's portfolio and subsequent-year budgets. In addition, although NASA has generally controlled costs for all of its operational HPD missions, the Division's three missions in implementation have missed planned launch dates and collectively incurred almost $41 million in cost growth. NASA also has not completed 19 of its assigned National Space Weather Action Plan tasks, 1 recommendation from the National Research Council's (NRC) 2003 Heliophysics Decadal Survey, and 6 recommendations from NRC's 2013 Heliophysics Decadal Survey. Finally, while NASA has established a successful working relationship with the National Oceanic and Atmospheric Administration, the Agency could more effectively collaborate with the Department of Defense and the commercial space industry on heliophysics-related issues. We made four recommendations; the Agency concurred with three and partially concurred with one.



This illustration shows how coronal mass ejections from the Sun interact with the terrestrial magnetosphere to produce geospace storms

NASA's Heliophysics Portfolio (IG-19-018, May 7, 2019)

(Report)

Management of NASA's Europa Mission

Scientists believe that Europa, one of Jupiter's 79 known moons, may have a large liquid ocean, suitable for sustaining life, below its icy surface. In 2011, the NRC determined that an orbiter mission to Europa should be NASA's second

priority flagship planetary science mission. In response, Congress directed the Agency to plan two separate missions to Europa: (1) a flyby orbiter known as Clipper and (2) a Lander intended to place scientific instruments on the moon's surface. Congress also directed NASA to use the SLS as the launch vehicle for both missions with launch dates of no later than 2023 for the Clipper and 2025 for the Lander. In this audit, we examined NASA's management of the Europa mission relative to achieving technical objectives, meeting milestones, controlling costs, and addressing congressional requirements. We found that the Clipper is at risk of not meeting its 2023 launch date due to challenges NASA faces in developing the Clipper's science instruments, addressing technical workforce gaps, choosing a launch vehicle, and overcoming funding risks that could delay the Clipper or impact other projects in the Agency's planetary science portfolio. We also found workforce and schedule risks render a 2025 launch date for the Lander unfeasible; requiring the Agency to pursue the Lander at the same time as the Clipper is inconsistent with the NRC's process of strategically selecting and prioritizing flagship missions and would preclude NASA from producing optimal science. We also found that the Lander would require substantial and ongoing funding for at least the next 10 years and could adversely affect the Agency's planetary science portfolio. We made 10 recommendations; the Agency concurred with nine and did not concur with one.

Management of NASA's Europa Mission (IG-19-019, May 29, 2019)

(Report)

(Video)

NASA's Technology Transfer Process

Throughout its 60-year existence, NASA has shared its inventions and scientific breakthroughs with the public, academia, and private industry. This transfer of technology—consistent with the legislation that created NASA—can happen in a variety of ways including through the publishing of information and, more formally, through partnerships or licensing of intellectual property. NASA's FY 2018 budget to promote technology transfer was $18.2 million. In this audit, we assessed the Agency's management of its processes for transferring technology to the commercial sector. We found that NASA has made concerted efforts in recent years to improve overall awareness of its Technology Transfer Program through increased communication and outreach, resulting in a considerable increase in the numbers of New Technology Reports submitted, patent applications filed, and licenses negotiated—effectively increasing the Agency's overall commercialization efforts. However, Goddard Space Flight Center (Goddard) was experiencing poor technology transfer performance outcomes when compared to the other three Centers we reviewed, to include a lower percentage of licenses as well as delays in processing of New Technology Reports and patent applications. Further, we noted that Goddard's technology transfer process was hindered by a lack of adequate controls and poor collaboration between its Technology Transfer Office and the Office of Patent Counsel. The Agency concurred with all four of our recommendations.

NASA's Technology Transfer Process (IG-19-016, April 15, 2019)

(Report)

Letter to Congress: Follow-up to May 2019 Audit of Europa Mission, Congressional Launch Vehicle Mandate

On August 27, 2019, we issued a memorandum asking Congress to consider removing language in NASA's appropriation legislation that requires the Agency to launch the Europa Clipper satellite on the yet-to-be-completed SLS rocket and allow NASA to decide whether to use an SLS or a commercial vehicle based on cost, schedule, vehicle availability, and impact on science requirements. As a result of developmental delays and, more significantly, NASA's plans to use the first three SLS rockets produced for its Artemis lunar program, an SLS will not be available until 2025 at the earliest. Consequently, if completed on its projected schedule, the approximately $3 billion dollar Europa Clipper will need to be stored for at least 2 years at a cost of $3 to $5 million per month until an SLS becomes available. In August 2019, NASA added $250 million in Headquarters-held reserves to the project to address these storage and related personnel costs. In our letter, we noted that Congress could reduce risks to both the Europa mission and Artemis program while potentially saving taxpayers up to $1 billion by providing NASA the flexibility in forthcoming FY 2020 appropriations legislation to determine the most cost-effective and timely vehicle to launch the Europa Clipper mission in 2023 or whenever the satellite is completed.

Letter to Congress: Follow-up to May 2019 Audit of Europa Mission, Congressional Launch Vehicle Mandate (August 27, 2019)

(Letter)

ONGOING AUDIT WORK

Audit of the Space Science Institute

The Space Science Institute is a nonprofit 501(c)(3) corporation established to expand humankind's understanding of Earth, our solar system, and the universe. In FY 2018, the Institute had 49 active awards with NASA totaling about $22 million. This audit will assess the Institute's use of NASA funds and the extent to which its efforts support NASA's science goals and objectives.

Management of the Stratospheric Observatory for Infrared Astronomy Airborne Observatory

In February 2014, NASA's Stratospheric Observatory for Infrared Astronomy (SOFIA) reached full operational capability after a problematic 23-year development history, a cost of $1.1 billion—more than 300 percent over original estimates—and yearly operational costs of $75 to $85 million. In a July 2014 report, we recommended NASA establish a timeline to evaluate SOFIA within a Senior Review, or similar, process during its primary operational phase because its planned initial phase is

The New Horizons spacecraft captured this enhanced-color view of Pluto on July 14, 2015

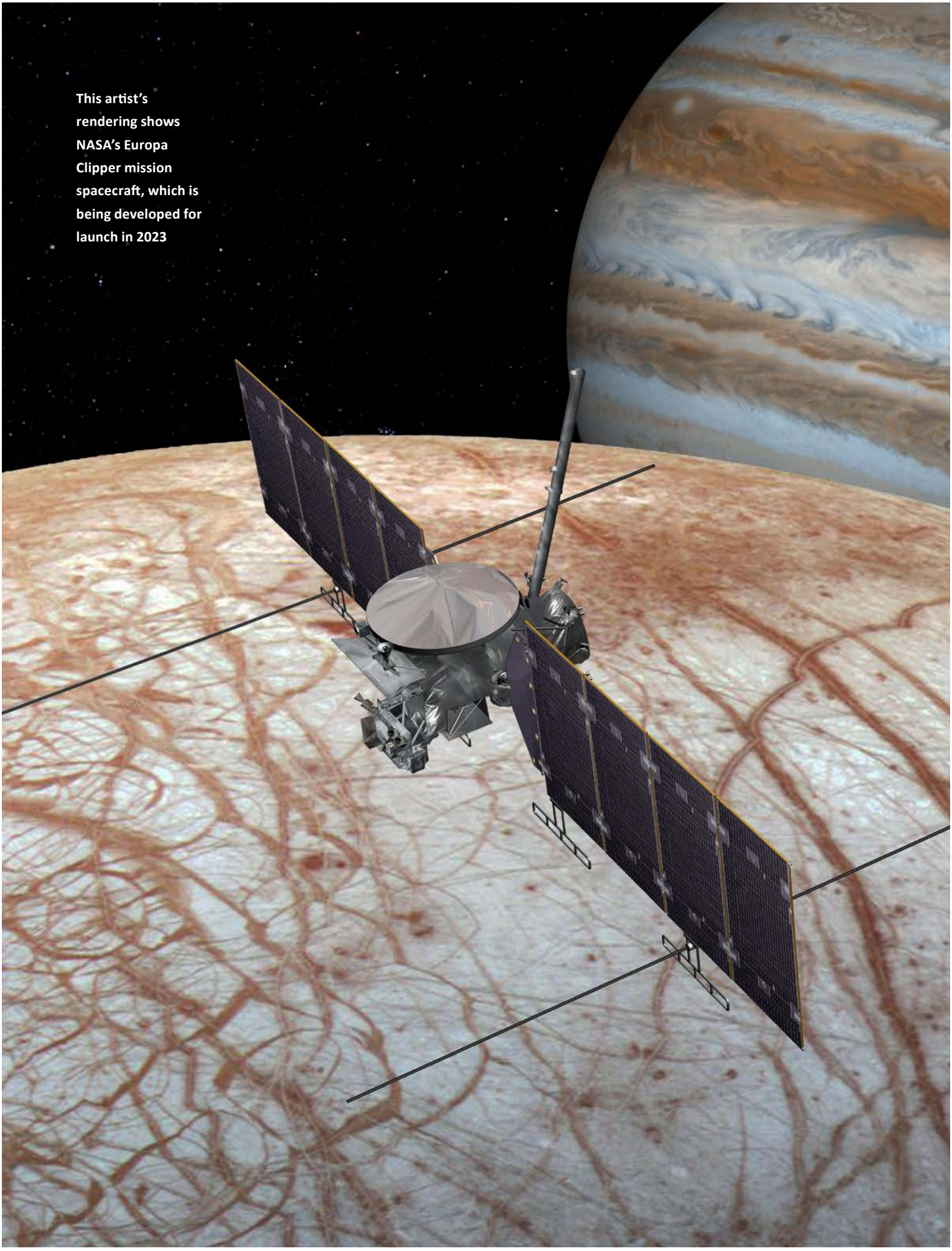
inordinately long in comparison to most science missions—20 years compared to 5 years. However, soon after NASA proposed a timeline for such a review, Congress directed NASA not to include SOFIA in the 2016 Astrophysics Senior Review and has included this restriction with each subsequent SOFIA appropriation. Given the high costs and extraordinary efforts expended to develop SOFIA, maximizing its scientific research capabilities and output remains an important responsibility for the Program. Accordingly, we are assessing the Agency's management of SOFIA during its ongoing prime operations phase relative to cost, technical performance, and scientific achievements.

Management of NASA's Planetary Science Portfolio

NASA's Planetary Science Division manages several high-profile programs such as Lunar Discovery and Exploration, Mars Exploration, Outer Planets and Ocean Worlds, and Planetary Defense. The Division's budget for the next 5 years is forecast to average more than $2.5 billion a year, which is almost double its budget from 10 years ago. Against this backdrop, the Division is challenged to manage its portfolio under competing mandates from the President and Congress, while meeting stakeholder needs and science community priorities. The overall objective of this audit is to assess NASA's management of its planetary science portfolio and examine whether it is achieving established goals and priorities set by the President, Congress, and science community stakeholders.

Management of the Low-Boom Flight Demonstrator Project

According to the International Air Transport Association, the Air Transport Action, and Boeing, worldwide annual commercial passenger trips are projected to increase from 3.3 billion in 2014 to 11 billion by 2050. To address the anticipated challenges associated with meeting this increase in demand, in April 2016 the NASA Administrator announced the New Aviation Horizon Initiative with the intent to build five X-planes over the next 10 years. These experimental aircraft will investigate technologies for reducing fuel use, carbon-dioxide emissions, and noise pollution, and overcoming the hurdles to efficient, low-noise supersonic flight. The first X-plane NASA is building is the Low-Boom Flight Demonstrator—a $583 million project estimated to be completed in October 2023. The first new X-plane development in decades, the goal of the Low-Boom Flight Demonstrator Project is to perform supersonic operations with a reduction in sonic-boom noise emissions in order to convince the Federal Aviation Administration to change regulations to allow supersonic flight over land. Our audit is assessing whether NASA is effectively managing the Low-Boom Flight Demonstrator Project to accomplish its technical objectives while meeting established milestones and controlling costs.



This artist's rendering shows NASA's Europa Clipper mission spacecraft, which is being developed for launch in 2023

INFORMATION TECHNOLOGY SECURITY AND GOVERNANCE

Information technology (IT) plays an integral role in NASA's space, science, and aeronautics operations. In fiscal year 2019, the Agency spent more than $2.1 billion on a portfolio of IT assets that included hundreds of information systems used to control spacecraft, collect and process scientific data, provide security for IT infrastructure, and enable NASA personnel to collaborate with colleagues around the world. Through audits and investigations, the OIG has identified systemic and recurring weaknesses in NASA's IT security program that adversely affect the Agency's ability to protect the information and information systems vital to its mission. Achieving the Agency's IT security goals will require sustained improvements in NASA's overarching IT governance and management practices.

CYBERSECURITY MANAGEMENT AND OVERSIGHT AT THE JET PROPULSION LABORATORY

NASA's Jet Propulsion Laboratory (JPL) is a federally funded research and development center in Pasadena, California. Since 1959, the California Institute of Technology (Caltech) has been under contract with NASA to manage JPL, most prominently its research and development activities, but also its network security controls.

In August 2012, NASA/JPL ground controllers reacted to learning the Curiosity rover had landed safely on Mars

Under the contract, NASA retains responsibility for ensuring Agency data and systems at JPL are secure from hackers or other forms of unauthorized access. Over the past 10 years, JPL has experienced several serious cybersecurity incidents that have compromised major segments of its IT network. In this audit, we assessed the effectiveness of JPL's cybersecurity management and oversight. We found that weaknesses in JPL IT security controls expose Agency systems, data, and applications to exploitation by hackers and cyber criminals and risk loss of data. We also found that NASA lacks adequate oversight of JPL's network security, including management of security controls for data, systems, and applications maintained on the JPL network. We made ten recommendations; the Agency concurred with nine and did not concur with one.

Cybersecurity Management and Oversight at the Jet Propulsion Laboratory (IG-19-022, June 18, 2019)

(Report)

ONGOING AUDIT WORK

Audit of NASA's Distributed Active Archive Data Centers

The Earth Observing System Data and Information System (EOSDIS) is a core capability in NASA's Earth Science Data Systems program that provides end-to-end capabilities for managing NASA's Earth science data from various sources—satellites, aircraft, field measurements, and other programs. EOSDIS is designed as a distributed system, with major facilities at 12 Distributed Active Archive Centers (DAAC) located throughout the United States. These institutions are custodians of Earth Observing System mission data and they process, archive, document, and distribute data from NASA's past and current Earth-observing satellites and field measurement programs. This audit will assess NASA's management of the DAACs and EOSDIS's cloud transition efforts.

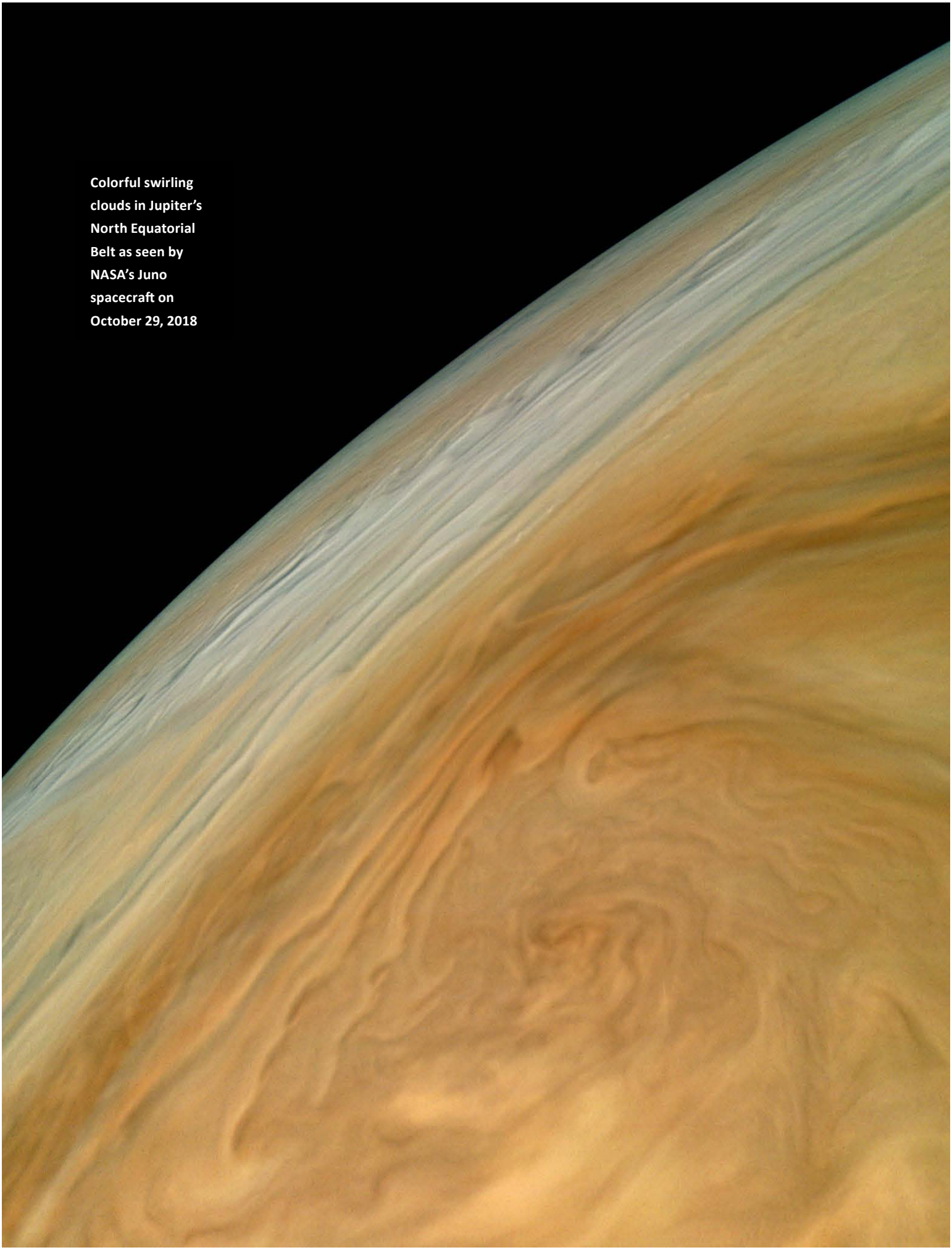
Evaluation of NASA's Information Security Program under the Federal Information Security Modernization Act for Fiscal Year 2019

In this required annual review, we will evaluate NASA's IT security program against the 2019 Federal Information Security Modernization Act (FISMA) metrics. Specifically, we will review a sample of NASA- and contractor-owned information systems to assess the effectiveness of information security policies, procedures, standards, and guidelines. Additionally, we will evaluate whether NASA has addressed the deficiencies identified in our prior FISMA reviews.

The ISS is viewed from the departing Soyuz MS-08 spacecraft on October 4, 2018

NASA's Policy and Practices Regarding the Use of Non-Agency IT Devices

In an April 2018 memorandum, the NASA Chief Information Officer clarified existing policy to no longer allow IT devices—such as smartphones, tablets, and laptop computers—to connect to NASA networks or systems unless they have been preapproved for Agency business or receive a waiver. Further, the policy clarification stated that all IT devices must have an approved authorization to operate from a NASA authorizing official prior to accessing, storing, processing, or transmitting NASA data. Additionally, Agency requirements mandate that all IT devices—regardless of their ownership—used to access NASA networks and systems undergo sanitation and data disposition that includes a factory reset upon change in their usage. However, because smartphones and other IT devices are integral to NASA employees' and contractors' work, it is unclear how the Agency intends to enforce these requirements. This audit is evaluating NASA's policy and practices regarding the use of non-Agency IT devices for Agency business, assessing Center-level impacts from the changes in policies and practices, and identifying any risks and challenges that may be associated with implementing these policies and practices.



Colorful swirling clouds in Jupiter's North Equatorial Belt as seen by NASA's Juno spacecraft on October 29, 2018

INFRASTRUCTURE

NASA's real property includes more than 5,000 buildings and other structures such as wind tunnels, laboratories, launch pads, and test stands that occupy 45 million square feet and are valued at more than $38.8 billion. However, over 75 percent of NASA's facilities are more than 50 years old and reaching the end of their original design life spans. Managing its expansive portfolio is an ongoing challenge for the Agency and one we continue to monitor.

Ames Research Center Protective Services Contract

In July 2015, Ames Research Center (Ames) awarded a contract to American-Paragon Protective Services, LLC, for protective services. The contract provides the Center with security, fire, dispatch, and emergency management services. As part of the OIG's ongoing assessment of NASA's management of security services across the Agency, we found that Ames contracting officials did not follow established contract terms or federal regulations, made improper contract administration decisions, and did not maintain required supporting documentation. Further, lax oversight by contracting officials resulted in inappropriate and unnecessary costs to the government. Because these issues were significant and warranted immediate attention, we issued this memorandum prior to completion of our broader audit so that NASA management could take timely action to ensure good stewardship of government funds. The Agency concurred with our recommendation.

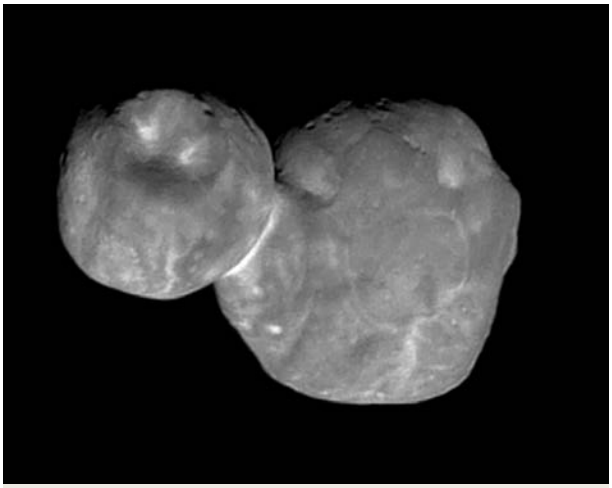
Final Memorandum, Ames Research Center Protective Services Contract
(IG-19-017, April 25, 2019)
(Report)

ONGOING AUDIT WORK

Audit of NASA's Security Management

The federal government requires a secure environment to protect its facilities, provide for the safety of its employees and the public, and maintain essential functions. For the past several years, the Government Accountability Office has reported that the federal government faces significant challenges protecting its facilities from potential attacks and deems management of federal property a high risk. For its part, NASA's high-profile mission and extensive physical footprint in multiple venues make its facilities

Technicians at Michoud Assembly Facility moved the largest piece of structural test hardware for the SLS from the factory to the dock for loading onto NASA's barge Pegasus on December 14, 2018



This image of Arrokoth, a Kuiper Belt object, was compiled from data gathered by the New Horizons spacecraft in January 2019

an attractive target for those who wish to do harm to the Agency. Ensuring the continuous operation of NASA and its missions; the protection of its property and equipment; and the safety of the employees, contractors, and members of the public who enter NASA facilities on a daily basis are essential Agency responsibilities. We initiated this audit to assess the effectiveness of NASA's management of its security operations—specifically, physical security, law enforcement, and fire services operations—across the Agency.

NASA's Management of Hazardous Materials

NASA's spaceflight and aeronautics programs require that scientists and engineers utilize hazardous materials. A hazardous material is any item or agent (biological, chemical, radiological, or physical) that has the potential to cause harm to humans, animals, or the environment. Consequently the management, storage, and disposal of hazardous materials is heavily regulated. Typically, a material is classified as hazardous when it exhibits at least one of four characteristics—ignitibility, corrosivity, reactivity, or toxicity—or because it has been listed by the U.S. Environmental Protection Agency as hazardous. Given the potential damage, health hazards, and the long-term, costly clean-up efforts that often result from poor management of these substances, we are examining the Agency's management of hazardous materials.

The back shell of the InSight spacecraft is lowered onto the lander in a clean room at Lockheed Martin

FINANCIAL MANAGEMENT

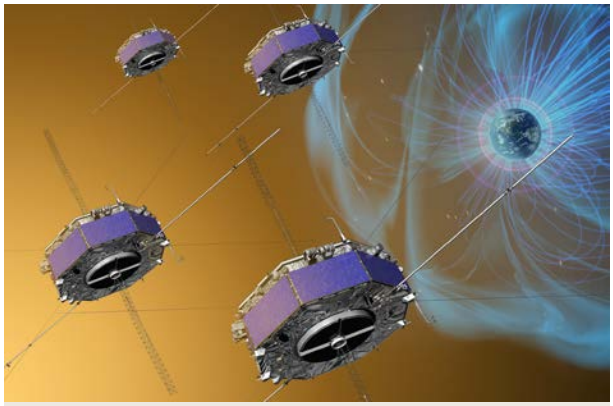
The OIG continues to assess NASA's efforts to improve its financial management practices by conducting and overseeing a series of audits to assist the Agency in addressing weaknesses.

NASA's Compliance with the Improper Payments Information Act for Fiscal Year 2018

As mandated by the Improper Payments Elimination and Recovery Act, we assessed NASA's compliance with the Improper Payments Information Act (IPIA) in FY 2018, evaluated the completeness and accuracy of the Agency's IPIA reporting, and reviewed its implementation of recommendations made in our prior IPIA reports. We found that NASA complied with IPIA in FY 2018; however, similar to our findings in prior years, NASA could improve its risk assessment process and reporting of its recapture audit program and could expand the scope of its recapture audit program. The Agency concurred with our three recommendations.

NASA's Compliance with the Improper Payments Information Act for Fiscal Year 2018 (IG-19-020, June 3, 2019)

(Report)



Artist depiction of the Magnetospheric Multiscale Mission spacecraft

ONGOING AUDIT WORK

Audit of NASA's Compliance with the Digital Accountability and Transparency Act for Fiscal Year 2019

The Digital Accountability and Transparency Act of 2014 expanded the reporting requirements for federal agencies to report financial and award data in accordance with the established government-wide financial data standards. As mandated, we are assessing NASA's compliance with the Act.

Audit of NASA's Fiscal Year 2019 Financial Statements

The Chief Financial Officers Act of 1990, as amended by the Government Management Reform Act of 1994, requires an annual audit of NASA's consolidated financial statements. We are overseeing the FY 2019 audit conducted by the independent public accounting firm CliftonLarsonAllen LLP.

NASA's Curiosity Mars rover took this selfie on May 12, 2019 (the 2,405th Martian day, or sol, of the mission)

STATISTICAL DATA

TABLE 1: AUDIT PRODUCTS AND IMPACTS

Report No. and Date Issued	Report Title	Impact
Acquisition and Project Management		
8/27/2019	Letter to Congress: Follow-up to May 2019 Audit of Europa Mission, Congressional Launch Vehicle Mandate	Identified the potential for Congress to reduce risks to both the Europa mission and Artemis program while potentially saving taxpayers up to $1 billion by providing NASA the flexibility in determining the most cost-effective and timely vehicle to launch the Europa Clipper mission
IG-19-019 5/29/2019	Management of NASA's Europa Mission	Provided recommendations to aid the Europa Clipper mission and prospective Lander mission to achieve technical objectives, meet milestones, and control costs
IG-19-018 5/7/2019	NASA's Heliophysics Portfolio	Provided recommendations to help NASA improve management of its heliophysics portfolio
IG-19-016 4/15/2019	NASA's Technology Transfer Process	Provided recommendations to improve the effectiveness of the Technology Transfer Program, and to improve efficiency and effectiveness in pursuing patents for inventions developed by NASA employees and licensing those technologies to commercial customers
Information Technology Security and Governance		
IG-19-022 5/18/2019	Cybersecurity Management and Oversight at the Jet Propulsion Laboratory	Provided recommendations to improve JPL network security controls and provide NASA greater oversight
Infrastructure		
IG-19-017 4/25/2019	Ames Research Center Protective Services Contract	Identified a need for NASA to gain a complete understanding of the issues surrounding the Ames protective services contract and the implications that the contract's improper management has had on the government
Financial Management		
IG-19-020 5/3/2019	NASA's Compliance with the Improper Payments Information Act for Fiscal Year 2018	Provided specific areas of focus to ensure the Agency complies with the Improper Payments Information Act of 2002, as amended

TABLE 2: 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		
Acquisition and Project Management						
IG-19-019 5/29/2019	Management of NASA's Europa Mission	8/8/2019	9	1	2/28/2020	$0
IG-19-018 5/7/2019	NASA's Heliophysics Portfolio	5/7/2019	4	0	5/31/2021	$0
IG-19-016 4/15/2019	NASA's Technology Transfer Process	4/15/2019	3	1	12/30/2019	$0

Report No. and Date Issued	Report Title	Date Resolved	Number of Recommendations		Latest Target Completion Date	Potential Cost Savings
			Open	Closed		
Information Technology Security and Governance						
IG-19-022 6/18/2019	Cybersecurity Management and Oversight at the Jet Propulsion Laboratory	—	9	1	1/15/2020	$0
Financial Management						
IG-19-020 6/3/2019	NASA's Compliance with the Improper Payments Information Act for Fiscal Year 2018	6/3/2019	3	0	5/31/2020	$0

TABLE 3: AUDIT RECOMMENDATIONS YET TO BE IMPLEMENTED, PREVIOUS SEMIANNUAL REPORTS

Report No. and Date Issued	Report Title	Date Resolved	Number of Recommendations		Latest Target Completion Date	Potential Cost Savings
			Open	Closed		
Space Operations and Human Exploration						
IG-19-001 10/10/2018	NASA's Management of the Space Launch System Stages Contract	4/28/2019	11	5	1/31/2020	$63,646,137
IG-18-021 7/30/2018	NASA's Management and Utilization of the International Space Station	7/30/2018	3	2	12/31/2020	$0
IG-18-016 4/26/2018	Audit of Commercial Resupply Services to the International Space Station	8/9/2018	1	4	1/31/2020	$4,384,395
IG-17-017 4/13/2017	NASA's Plans for Human Exploration Beyond Low Earth Orbit	8/10/2017	2	4	4/30/2020	$0
IG-17-012 3/9/2017	NASA's Management of Electromagnetic Spectrum	3/9/2017	1	1	11/30/2019	$0
IG-16-025 6/28/2016	NASA's Response to SpaceX's June 2015 Launch Failure: Impacts on Commercial Resupply of the International Space Station	10/17/2016	2	4	1/31/2020	$0
IG-16-015 3/28/2016	Audit of the Spaceport Command and Control System	3/28/2016	1	0	2/14/2021	$0
IG-16-014 3/17/2016	NASA's Management of the Near Earth Network	8/10/2016	1	13	12/31/2019	$0

Report No. and Date Issued	Report Title	Date Resolved	Number of Recommendations		Latest Target Completion Date	Potential Cost Savings
			Open	Closed		
Space Operations and Human Exploration						
IG-15-023 9/17/2015	NASA's Response to Orbital's October 2014 Launch Failure: Impacts on Commercial Resupply of the International Space Station	12/2/2015	1	6	1/31/2020	$89,000,000
IG-14-026, 7/22/2014	Audit of the Space Network's Physical and Information Technology Security Risks	7/22/2014	1	3	10/28/2019	$0
Acquisition and Project Management						
IG-19-014 3/26/2019	NASA's Engineering and Technical Services Contracts	3/26/2019	3	0	11/20/2020	$0
IG-18-015 4/5/2018	NASA's Management of GISS: The Goddard Institute for Space Studies	4/5/2018	3	5	6/30/2020	$1,617,744
IG-18-011 1/17/2018	NASA's Surface Water and Ocean Topography Mission	1/17/2018	1	5	12/31/2019	$0
IG-18-010 1/11/2018	NASA's Management of the Center for the Advancement of Science in Space	5/30/2018	1	6	10/31/2019	$0
IG-18-001 10/5/2017	NASA's Management of Space Parts for its Flight Projects	10/5/2017	2	5	12/31/2021	$0
IG-17-025 9/18/2017	NASA's Research Efforts and Management of Unmanned Aircraft Systems	9/18/2017	1	5	10/31/2019	$17,308
IG-17-016 3/29/2017	NASA's Parts Quality Control Process	3/29/2017	2	6	2/28/2020	$0
IG-17-003 11/2/2016	NASA's Earth Science Mission Portfolio	11/2/2016	1	1	11/30/2019	$0
IG-16-013 2/18/2016	Audit of NASA Space Grant Awarded to the University of Texas at Austin	2/18/2016	1	3	1/31/2020	$325,028
Information Technology Security and Governance						
IG-18-019 5/24/2018	Audit of NASA's Information Technology Supply Chain Risk Management Efforts	5/24/2018	2	5	9/17/2020	$142,875
IG-18-020 5/23/2018	Audit of NASA's Security Operations Center	6/5/2018	4	2	1/31/2020	$0
IG-18-002 10/19/2017	NASA's Efforts to Improve the Agency's Information Technology Governance	12/14/2017	1	4	11/15/2019	$0

Report No. and Date Issued	Report Title	Date Resolved	Number of Recommendations		Latest Target Completion Date	Potential Cost Savings
			Open	Closed		
Information Technology Security and Governance						
IG-17-011 2/8/2017	Industrial Control System Security within NASA's Critical and Supporting Infrastructure	2/8/2017	5	1	9/30/2020	$0
IG-17-010 2/7/2017	Security of NASA's Cloud Computing Services	6/9/2017	4	2	6/30/2020	$0
IG-12-017 8/7/2012	Review of NASA's Computer Security Incident Detection and Handling Capability	8/7/2012	2	1	3/31/2020	$0
Infrastructure						
IG-19-013 3/19/2019	NASA's Progress with Environmental Remediation Activities at the Santa Susana Field Laboratory	3/19/2019	2	0	6/30/2020	$211,742,117
IG-19-002 10/22/2018	Audit of NASA's Historic Property	2/5/2019	5	0	10/30/2020	$0
IG-17-021 5/17/2017	Construction of Test Stands 4693 and 4697 at Marshall Space Flight Center	10/5/2017	3	0	7/31/2020	$17,115,009
IG-17-015 3/21/2017	NASA's Efforts to "Rightsize" its Workforce, Facilities, and Other Supporting Assets	3/21/2017	1	3	5/31/2019	$0
Financial Management						
IG-19-010 12/12/2018	Fiscal Year 2018 Financial Accounting Management Letter	12/12/2018	29	0	12/31/2019	$0
IG-19-009 12/12/2018	Fiscal Year 2018 Financial Statement Audit Information Technology Management Letter	12/12/2018	16	0	12/31/2019	$0
IG-19-007 11/28/2018	NASA's Management of Extended Temporary Duty Travel	11/28/2018	3	0	12/31/2020	$108,304
IG-19-004 11/15/2018	Audit of NASA's Fiscal Year 2018 Financial Statements	11/15/2018	8	0	11/30/2019	$0
IG-19-003 10/30/2018	Fiscal Year 2018 Vulnerability Assessment and Penetration Testing of NASA's Financial Network	10/30/2018	8	0	12/31/2019	$0
IG-18-018 5/29/2018	NASA's Management of Reimbursable Agreements	5/29/2018	8	3	10/31/2019	$0

Report No. and Date Issued	Report Title	Date Resolved	Number of Recommendations		Latest Target Completion Date	Potential Cost Savings
			Open	Closed		
Financial Management						
IG-18-017 5/14/2018	NASA's Compliance with the Improper Payments Information Act for Fiscal Year 2017	5/14/2018	3	0	5/31/2020	$0
IG-18-014 2/28/2018	Review of NASA's Purchase and Travel Card Programs	2/28/2018	1	4	3/30/2020	$0
IG-17-020 5/15/2017	NASA's Compliance with the Improper Payments Information Act for Fiscal Year 2016	11/7/2017	1	8	5/31/2020	$0
IG-16-021 5/12/2016	NASA's Compliance with the Improper Payments Information Act for Fiscal Year 2015	10/28/2016	1	4	5/31/2020	$0
IG-15-015 5/15/2015	NASA's Compliance with the Improper Payments Information Act for Fiscal Year 2014	5/15/2015	1	9	5/31/2020	$0

TABLE 4: AUDITS WITH QUESTIONED COSTS

	Number of Audit Reports	Total Questioned Costs	Total Unsupported Costs
Management decisions pending, beginning of reporting period	2	$65,116,137	$0
Issued during period	0	$0	$0
Needing management decision during period	2	$65,116,137	$0
Management Decision Made During Period			
Amounts agreed to by management	1	$65,116,137	$0
Amounts not agreed to by management	1	$0	$0
No Management Decision at End of Period			
Less than 6 months old	0	$0	$0
More than 6 months old	0	$0	$0

Notes: "Questioned Costs" (the Inspector General Act of 1978, as amended) 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.

"Management Decision" (the Inspector General Act of 1978, as amended) is the evaluation by management of the findings and recommendations included in an audit report and the issuance of a final decision by management concerning its response to such findings and recommendations, including actions that management concludes are necessary.

TABLE 5: AUDITS WITH RECOMMENDATIONS THAT FUNDS BE PUT TO BETTER USE

	Number of Audit Reports	Funds to Be Put to Better Use
Management decisions pending, beginning of reporting period	1	$211,742,117
Issued during period	0	$0
Needing management decision during period	1	$211,742,117
Management Decision Made During Period		
Amounts agreed to by management	1	$211,742,117
Amounts not agreed to by management	0	$0
No Management Decision at End of Period		
Less than 6 months old	0	$0
More than 6 months old	0	$0

Note: 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 6: STATUS OF SINGLE AUDIT FINDINGS AND QUESTIONED COSTS RELATED TO NASA AWARDS

Audits with Findings	22	
Findings and Questioned Costs		
	Number of Findings	Questioned Costs
Management decisions pending, beginning of reporting period	16	$9,141
Findings added during reporting period	38	$43,198
Management decisions made during reporting period	(46)	
Agreed to by management		($10,493)
Not agreed to by management		($41,846)
Management decisions pending, end of reporting period	8	$0

Note: The Single Audit Act, as amended, requires federal award recipients to obtain audits of their federal awards. The data used to prepare 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 35 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 7: DCAA AUDIT REPORTS WITH QUESTIONED COSTS AND RECOMMENDATIONS THAT FUNDS BE PUT TO BETTER USE

	Amounts in Issued Reports	Amounts Agreed To
Questioned costs	$0	$0
Funds to be put to better use	$46,735,000	$14,758,000

Note: This data is provided to 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.

Sunrise serves as the backdrop for Mobile Launcher 1 at NASA's Kennedy Space Center

OFFICE OF INVESTIGATIONS

This image from Parker Solar Probe's WISPR instrument shows a coronal streamer, seen over the east limb of the Sun

The Office of Investigations investigates criminal activity, fraud, and misconduct involving NASA personnel and contractors.

PROCUREMENT, ACQUISITION, AND GRANT FRAUD

Aerospace Parts Company Settles Fraud Charges

A multi-year joint investigation by NASA OIG, Defense Criminal Investigative Service (DCIS), and the Federal Bureau of Investigation (FBI) resulted in a lab supervisor of a NASA subcontractor pleading guilty to mail fraud for his participation in a decade-long scheme to defraud NASA and the Missile Defense Agency. The criminal behavior involved the fraudulent alteration of material properties test results for parts manufactured for use in rockets and military hardware. As part of the guilty plea, the supervisor admitted that he trained and directed lab technicians to falsify mechanical properties test results for extrusions (metal) used in rockets and military hardware that failed to meet industry standards. The extrusions were believed to be the cause for the loss of two NASA satellite missions valued in excess of $580 million. The supervisor also admitted that the NASA subcontractor and others made over 4,000 alterations on aluminum extrusion test results allowing the subcontractor to gross more than $6.8 million in total sales based on the altered test results. The supervisor was sentenced to 37 months imprisonment, 2 years of supervised release, and ordered to pay $170,000 in restitution.

Also as a result of the investigation, the NASA subcontractor entered into a global settlement resolving civil and criminal claims whereby the company agreed to pay $34.1 million in combined restitution to NASA, the Missile Defense Agency, and commercial customers. The subcontractor also agreed to forfeit $1.8 million in ill-gotten gains. The NASA subcontractor and its parent company agreed to plead guilty to one count of mail fraud, and the parent company entered into a deferred prosecution agreement.

NASA's InSight Mars lander spacecraft deployed its solar arrays in a Lockheed Martin clean room near Denver

Parts Supplier Agrees to a Civil Settlement

Based on a Qui Tam filed with the Department of Justice and an investigation by NASA OIG and DCIS, a major parts supplier agreed to pay $11 million in a civil settlement to resolve claims it charged the government for various electrical components that were not manufactured and/or screened properly. The affected components were used by NASA and other government agencies, though no resulting failures were identified.

NASA Contractor Settles Civil Allegations

Following an investigation by NASA OIG, a Kennedy Space Center contractor agreed to pay $500,000 to settle claims that it violated the False Claims Act by failing to meet Small Business Administration requirements for labor participation and work performance over a 3-year period.

Small Business Agrees to Civil Settlement

As a result of a joint investigation by the NASA OIG and the Small Business Administration OIG, a Cleveland, Ohio, small business agreed to pay $490,710 in a civil settlement to resolve allegations that it engaged in capabilities misrepresentation to secure NASA contracts, and then outsourced most of its business.

Houston Company Settles Criminal Allegations

Following a joint investigation by NASA OIG and DCIS, a Houston-area robotics company agreed to pay $300,000 to resolve allegations that two of its employees attempted to steer robotics work to the company from NASA and the Department of Defense in 2014 to 2015 while still employed by NASA.

Research Association Agrees to Cost Reimbursement

As the result of a joint investigation by NASA OIG and the National Science Foundation (NSF) OIG, a research institution agreed to reimburse NASA and NSF $218,857 to resolve allegations that four of its researchers used funds from two NASA grants for unauthorized expenses. Of the total amount, NASA was reimbursed $180,524.

Contractor Employee Convicted of Theft

Following a joint investigation by NASA OIG and the Greenbelt (Maryland) Police Department, a former contractor employee was sentenced to 3 days imprisonment, 5 years of supervised release, and ordered to pay $21,422 in restitution to his former employer for stealing IT components and selling them online.

Former Contract Security Officer Pleads Guilty to Theft

Following an investigation by NASA OIG, a Goddard Space Flight Center contract security officer pled guilty to one count of theft after he stole numerous low-value items over the course of a year. As a result, he was sentenced to 2 years of probation, ordered to forfeit the NASA property seized from his home valued at $5,940, and pay restitution to NASA of $12,061. In addition, he was debarred from government contracting for a period of 3 years.

Small Business Sentenced for Theft

As the result of a joint investigation by NASA OIG and NSF OIG, the owner of a Chicago, Illinois, design firm was sentenced to 3 months imprisonment, 1 year of supervised release, and ordered to submit to a mental health evaluation for creating a false third-party investment company in order to receive $150,000 in supplemental funding under NASA's Small Business Innovation Research (SBIR) Phase II-E program, and $50,000 under NSF's SBIR Phase IB program. Both programs required a matching contribution from an outside investor.

NASA OIG Recovers Apollo Lunar Surface Drill Core Stems

A NASA OIG investigation confirmed a set of Apollo Lunar Surface Drill Core Stems was listed for bid/purchase through an online auction house. The contractor employee listed the stems with the auction house and estimated their value at $40,000 to $50,000. However, after NASA determined the items were not authorized for release outside the Agency's control, NASA OIG recovered them from auction and provided them to the historian at Goddard Space Flight Center.

SpaceX Subcontractor Employee Charged

Following an investigation by NASA OIG and the FBI, a quality inspection engineer for a SpaceX subcontractor was charged with falsifying inspection reports and non-destructive testing certifications for flight-critical components to be used on SpaceX Falcon 9 and Falcon Heavy rockets.

Businesses and Individuals Debarred from U.S. Contracts

As the result of several NASA OIG investigations, eight individuals and/or firms, including a former NASA official, were debarred from participating in future government contracts for their involvement in SBIR fraud. In addition, a former NASA official was debarred for attempting to manipulate an Intergovernmental Personnel Act agreement in order to secure post-NASA employment.

Former NASA Contractor Employee Indicted

Following a joint investigation by NASA OIG and the Internal Revenue Service, a former contract economist was indicted for wire and income tax fraud for fabricating documents to allegedly expense costs incurred for escorts and prostitutes while on official travel. Trial has been set for March 2020.

NASA's Magnetospheric Multiscale observatories are processed for launch in a clean room in Titusville, Florida

Former Lab Manager Pleads Guilty

A former contract lab manager pled guilty to one count of false statements for falsifying analyses of wastewater treatment samples at Wallops Flight Facility, which she submitted to the Virginia Department of Environmental Quality.

Former SLS Subcontractor Employee Found Guilty

Following a two-day jury trial in Orlando, Florida, a former NASA subcontractor was found guilty in August 2019 of mail fraud and making false statements related to supplying inferior product to the NASA SLS program and concealing the country of origin. Sentencing is set for December 2019.

Former NASA Contractor Employee Pleads Guilty

As the result of an investigation by NASA OIG, a Johnson Space Center contractor employee pled guilty to one count of theft of government property for selling NASA flight jackets and other NASA property on eBay. Sentencing is set for November 2019.

Five Recharged in 33-count Indictment for Defrauding Federal Agencies

In September 2019, a federal grand jury in Cleveland, Ohio, returned a 33-count indictment charging five individuals with various frauds involving NASA, Department of Veterans Affairs, and Department of Defense contracts. A NASA OIG investigation revealed numerous individuals and companies conspired to defraud the government by obtaining over $15 million in contracts under programs designed to grant government contracts to disabled veterans and socially and economically disadvantaged people or entities. In March 2019, five individuals were charged with false claims and conspiracy to commit both honest services wire fraud and wire fraud. The charges related, in part, to a construction contract at NASA's Plum Brook Station. Relatedly, in January 2019, the owner of a Florida-based construction company and the

company's former vice president pled guilty to wire fraud and conspiracy to commit wire fraud for their roles in the conspiracy.

COMPUTER CRIMES

Former Contractor Employee Sentenced for Child Pornography

A NASA OIG investigation into a former Kennedy Space Center contractor employee revealed the subject had downloaded child pornography. On May 23, 2019, the subject was sentenced to 60 months' imprisonment.

Former Contractor Employee Charged for Child Pornography

On July 10, 2019, a former contractor employee at the Marshall Space Flight Center was charged with possession of child pornography. This is a joint investigation by NASA OIG, the Department of Homeland Security, and the Madison County, Alabama, Sheriff's Office.

Contractor Employee Indicted and Arrested for Child Pornography

As the result of a joint investigation by NASA OIG, Immigration and Customs Enforcement, and the Department of Homeland Security, a contractor employee at Goddard Space Flight Center was arrested and indicted in September 2019 for possession of child pornography.

The United Launch Alliance Delta IV Heavy rocket launched NASA's Parker Solar Probe on August 12, 2018, from Cape Canaveral Air Force Station, Florida

EMPLOYEE MISCONDUCT

Former Civil Servant Sentenced for Theft and Receiving Gratuities

In December 2018, a former senior Wallops Flight Facility employee was sentenced to 12 months of home confinement, 3 years of supervised release, and ordered to pay $37,289 in restitution for accepting gratuities in exchange for official acts performed in his capacity as a government official and stealing funds from a government contract.

TABLE 8: OFFICE OF INVESTIGATIONS COMPLAINT INTAKE DISPOSITION

Source of Complaint	Zero Files[a]	Administrative Investigations[b]	Management Referrals[c]	Preliminary Investigations[d]	Total
Hotline	4	6	2	16	**28**
All others	37	25	—	66	**128**
Total	**41**	**31**	**2**	**82**	**156**

[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 9: FULL INVESTIGATIONS OPENED THIS REPORTING PERIOD

Full Criminal/Civil Investigations[a]	19

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

TABLE 10: INVESTIGATIONS CLOSED THIS REPORTING PERIOD

Full, Preliminary, and Administrative Investigations	109

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

TABLE 11: CASES PENDING AT END OF REPORTING PERIOD

Preliminary Investigations	69
Full Criminal/Civil Investigations	121
Administrative Investigations	71
Total	**261**

TABLE 12: QUI TAM INVESTIGATIONS

Qui Tam Matters Opened This Reporting Period	2
Qui Tam Matters Pending at End of Reporting Period	4

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

TABLE 13: JUDICIAL ACTIONS

Total Cases Referred for Prosecution[a]	51
Individuals Referred to the Department of Justice[b]	47
Individuals Referred to State and Local Authorities[b]	4
Indictments/Informations[c]	16
Convictions/Plea Bargains	10
Sentencing/Pretrial Diversions	13
Civil Settlements/Judgments	4

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

[b] 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 14: ADMINISTRATIVE ACTIONS

Referrals	
Referrals to NASA Management for Review and Response	4
Referrals to NASA Management—Information Only	9
Referrals to the Office of Audits	0
Referrals to Security or Other Agencies	9
Total	**22**
Recommendations to NASA Management	
Recommendations for Disciplinary Action	
Involving a NASA Employee	3
Involving a Contractor Firm	2
Involving a Contractor Employee	1
Other	0
Recommendations on Program Improvements	—
Matters of Procedure	4
Total	**10**
Administration/Disciplinary Actions Taken	
Against a NASA Employee	5
Against a Contractor Employee	5
Against a Contractor Firm	2
Procedural Change Implemented	5
Total	**17**
Suspensions or Debarments from Government Contracting	
Involving an Individual	**8**
Involving a Contractor Firm	6
Total	**14**

TABLE 15: INVESTIGATIVE RECEIVABLES AND RECOVERIES

Judicial	$59,719,681
Administrative[a]	$916,761
Total	$60,636,442
Total NASA[b]	$26,478,392

[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.

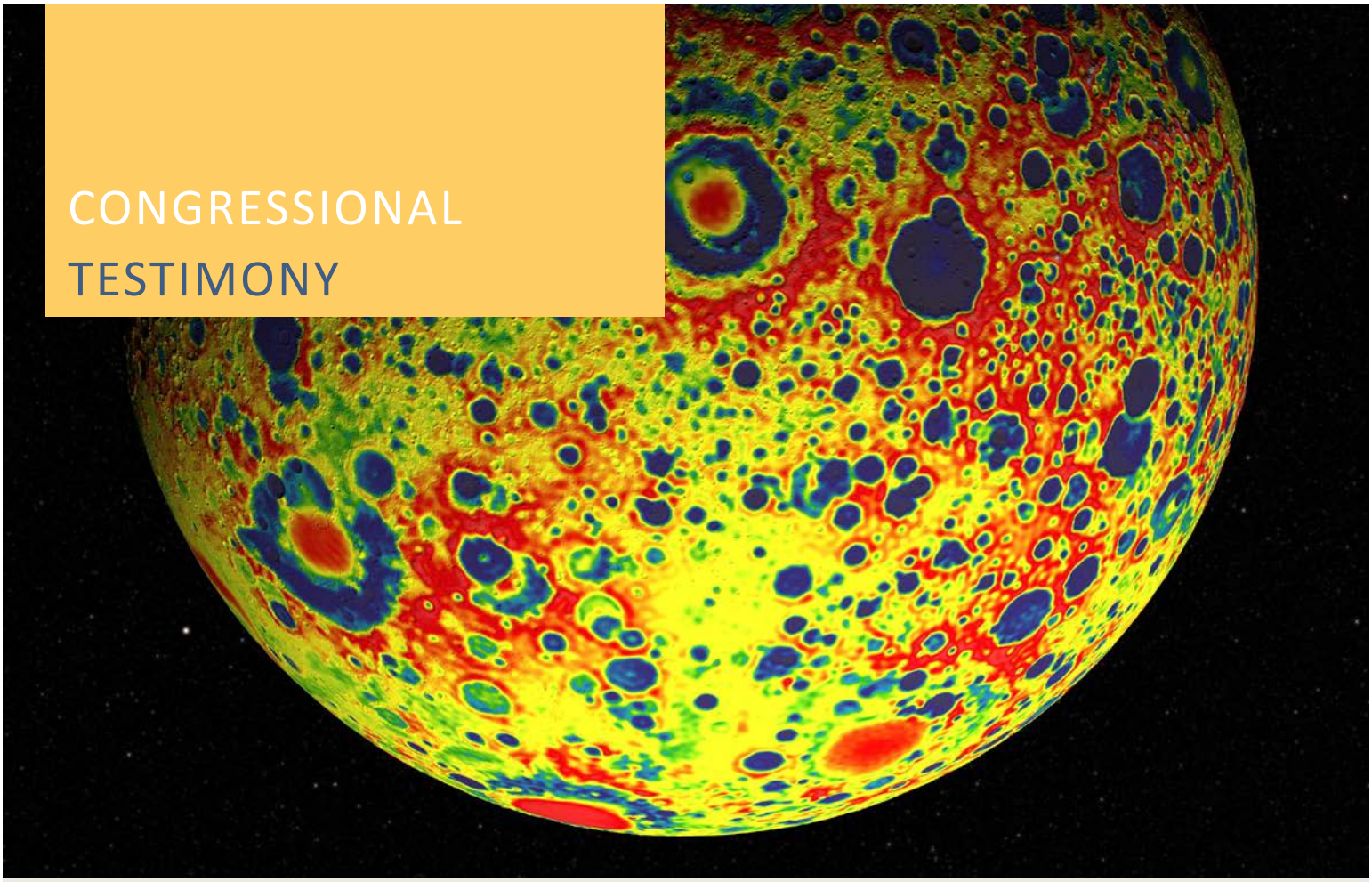
TABLE 16: SENIOR GOVERNMENT EMPLOYEE INVESTIGATIONS REFERRED FOR PROSECUTION

Case Number	Allegation	Referral Date	Disposition
19-0045-HL-P	Misuse of Resources/Abuse of Position	08/05/2019	Department of Justice declined prosecution
17-0293-O	Conflict of Interest	04/01/2019	Department of Justice declined prosecution

TABLE 17: SENIOR GOVERNMENT EMPLOYEE CASES NOT DISCLOSED TO THE PUBLIC

Case Number	Allegation	Closure Date	Disposition
17-0235-O	Conflict of Interest/ Procurement Irregularities	05/01/2019	NASA will take additional steps to monitor future contract awards.
17-0293-O	Conflict of Interest	05/28/2019	No action by Agency. Employee retired prior to investigation.
19-0025-S	Travel Abuse/Irregular Hiring Practices	4/22/2019	Unsubstantiated.
19-0049-S	Timecard, Travel and Procurement Abuse	07/22/2019	Unsubstantiated. The Agency was aware of allegations and closely monitored all division activities.

CONGRESSIONAL TESTIMONY



One of several gravity maps created from data gathered by NASA's Gravity Recovery and Interior Laboratory (GRAIL) mission, which launched in 2011

Examining NASA's Plans for the International Space Station and Future Activities in Low Earth Orbit

On July 10, 2019, IG Martin testified before the U.S. House Committee on Science, Space, and Technology's Subcommittee on Space and Aeronautics about NASA's future plans for the ISS and its efforts to promote private commercial activities in low Earth orbit. IG Martin noted that, as NASA turns its attention to returning humans to the Moon by 2024, concrete plans for the future of the space station need to be resolved. Specifically, IG Martin noted that whether future ISS operations include extension, increased commercialization, or retirement, the timing of each of these decisions will have a cascading effect on the funding NASA can dedicate to space flight operations in low Earth orbit, its ambitions for establishing a permanent presence on the Moon, and ultimately sending humans to Mars. IG Martin concluded his opening statement saying: "The sooner NASA, the Administration, and Congress agree on a definitive path forward for the future of the ISS, the better NASA will be able to plan the future of on-board research and commercialization in low Earth orbit."

(Testimony)
(Video)

As the ISS orbited above the southern Indian Ocean about halfway between Madagascar and Antarctica, the crew snapped this image of the Aurora Australis, also known as the Southern Lights

LEGAL ISSUES

The ISS is seen in silhouette as it transits the Moon at roughly five miles per second on Tuesday, January 30, 2018

WHISTLEBLOWER PROTECTION EFFORTS

During this 6-month period, the Office of Counsel spent considerable efforts strengthening our whistleblower protection program, to include recertification of the OIG by the Office of Special Counsel under 5 U.S.C. 2302(c). In addition, legal staff developed protocols for whistleblower disclosures involving classified information, updated NASA notices to all employees and contractors concerning prohibited personnel practices as well as proper handling by supervisors of whistleblower disclosures, and proposed revisions to the whistleblower protection chapter of the Office of Investigations manual. Significantly, we benchmarked other OIG webpages before updating the NASA whistleblower protection webpage, where we introduced the new NASA Whistleblower Protection Coordinator, Cedric D. Campbell. The new webpage provides resources to both civil servants and contractors on whistleblower protection, including a form for filing a whistleblower retaliation complaint. The updated website was unveiled on July 30, National Whistleblower Appreciation Day. The whistleblower protection webpage can be accessed at: *https://oig.nasa.gov/whistleblower.html*

WHISTLEBLOWER RETALIATION CASE

In a long-running whistleblower retaliation case, NASA responded to an OIG recommendation that it take corrective action in the case of a task monitor who interfered with contractor employee management in contravention of the Federal Acquisition Regulation (FAR). During this semiannual period, NASA responded that remedial training provided to the task monitor served as sufficient corrective action in this instance.

NASA Procedural Requirements (NPR) 8621.1D, *NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping*. This NPR sets forth the requirements to report, investigate, and document mishaps, close calls, and resulting corrective actions to prevent occurrence of similar work-related injury, property damage, or mission failure. It describes how NASA complies with the accident investigation and corrective action requirements of 29 CFR Part 1960, *Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters* and contains requirements for classifying mishaps, establishing investigating authorities, and performing investigations. NASA made significant revisions to the NPR, by adding chapters on *Requirements for Commercial Launch Mishap and Close Call Investigations* and *NASA Aircraft Mishap and Close Call Investigations*. The two new chapters are intended to provide more detailed requirements concerning the investigative aspects of the Commercial Launch program and the Aircraft program. The OIG submitted several comments on the revised NPR intended to more clearly define the scope of the failures, mishaps, and other incidents to which the NPR and NASA investigative authority extends. In addition, we included comments intended to ensure that NASA was effectively implementing recommendations from OIG Audit Report IG-16-025, *NASA's Response to SpaceX's June 2015 Launch Failure: Impacts on Commercial Resupply of the International Space Station* (June 28, 2016).

NASA Policy Directive (NPD) 7120.6A, *Knowledge Policy on Programs and Projects*. NPD 7120.6, which establishes the NASA roles, responsibilities, and requirements for knowledge management on programs and projects was revised to streamline the document, improve readability and meaning, and define and update knowledge management practices. The OIG submitted comments intended to ensure that a critical piece of NASA's knowledge culture—the knowledge and lessons learned from mishaps and other safety-related incidents—is appropriately integrated into NASA's knowledge management process.

NASA Interim Directive (NID), *Use of International Space Station (ISS) for Commercial and Marketing Activities*. NASA Strategic Objective 2.1 directs the Agency to "lay the foundation for America to maintain a constant human presence in low Earth orbit enabled by a commercial market." As part of developing this economy, NASA is using the ISS to stimulate the supply and demand of a robust commercial marketplace, with the vision of a sustained low-Earth orbit human spaceflight presence where NASA could be one of many customers. As part of this vision, NASA issued an Interim Directive (NID) which establishes ISS Program policies governing the Commercial and Marketing Activities that can be carried out on the ISS by U.S. entities. The OIG submitted several comments on the NID intended to clarify concepts mentioned in the document such as the metrics

NASA's BARREL Mission team members run under the payload as the balloon first takes flight at the SANAE IV research station in Antarctica

by which program "success" will be measured, and to address legal and financial implications of unplanned mission contingencies.

This illustration shows NASA's OSIRIS-REx spacecraft proceeding towards orbit around an asteroid

NPR 9090.1B, *Partnership Agreements-Financial Requirements and Administration*. This NPR establishes financial management requirements for partnership agreements related to financial management and administrative procedures, such as determining the partner-estimated price based on full cost, monitoring and recording agreement execution, and reporting requirements under the agreement activity. NASA revised the document to clarify policy requirements that have evolved since initial publication in February 2013. The OIG submitted several comments intended to ensure that the revised NPR was consistent with other applicable NASA policies and to ensure that NASA was effectively implementing recommendations from OIG audit report IG-18-018, *NASA's Management of Reimbursable Agreements* (May 29, 2018).

STATISTICAL DATA

TABLE 18: LEGAL ACTIVITIES AND REVIEWS

Freedom of Information Act Matters	22
Appeals	1
Inspector General Subpoenas Issued	40
Regulations Reviewed	22


INSPECTOR GENERAL
NASA
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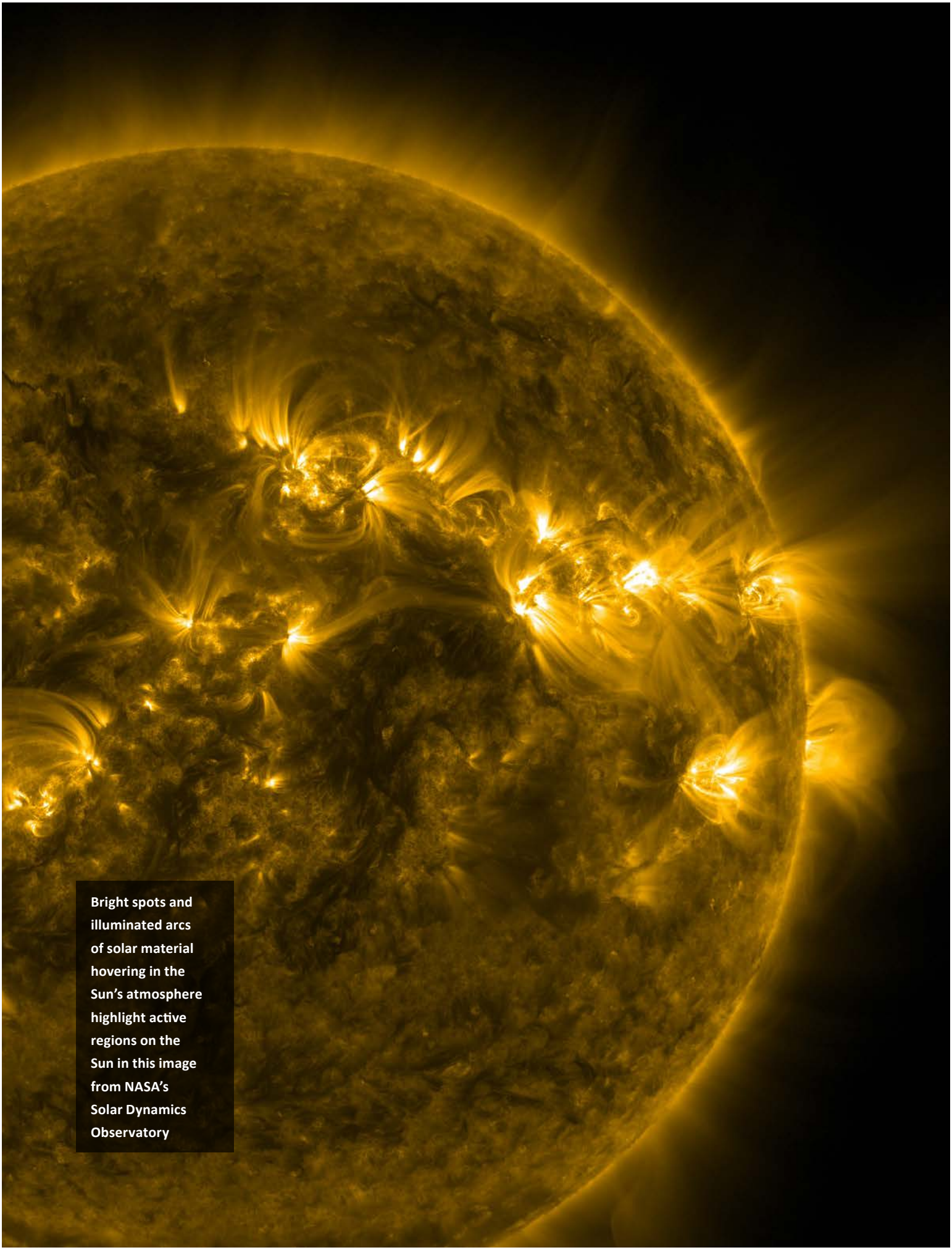
APPENDIXES

Appendixes



Bright spots and illuminated arcs of solar material hovering in the Sun's atmosphere highlight active regions on the Sun in this image from NASA's Solar Dynamics Observatory

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	39–41
Section 5(a)(1)	Significant problems, abuses, and deficiencies	4–18
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	20–26
Section 5(a)(8)	Total number of reports and total dollar value for audits with questioned costs	25
Section 5(a)(9)	Total number of reports and total dollar value for audits with recommendations that funds be put to better use	25
Section 5(a)(10)	Summary of audit, inspection, and evaluation reports issued before this semiannual reporting period	—
Section 5(a)(10)(A)	Summary of prior audit products for which no management decision has been made	—
Section 5(a)(10)(B)	Reports for which no Agency comment was provided within 60 days	—
Section 5(a)(10)(C)	Unimplemented recommendations and associated potential cost savings	21–24
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	47
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	29–32
Section 5(a)(17)(B)(C) and (D)	Matters referred to prosecutive authorities	34
Section 5(a)(18)	Descriptions of table metrics	33-35
Section 5(a)(19)(A) and (B)(i)(ii)	Summary of investigations involving senior government employees	35
Section 5(a)(20)	Summary of whistleblower investigations	39
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	—
Section 5(a)(22)(B)	Closed investigations of senior government employees not disclosed to the public	35

APPENDIX B. 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 3 years. In compliance with the Act, we provide the following information.

OFFICE OF AUDITS

No external peer reviews were conducted of or performed by the Office of Audits during this semiannual period. The date of the last external peer review of NASA OIG was August 13, 2018, and it was conducted by the Office of Personnel Management OIG. NASA OIG received a peer review rating of "pass," and there are no outstanding recommendations from the review.

On March 15, 2018, we completed a peer review of the Department of Commerce OIG. There are no outstanding recommendations from that review.

OFFICE OF INVESTIGATIONS

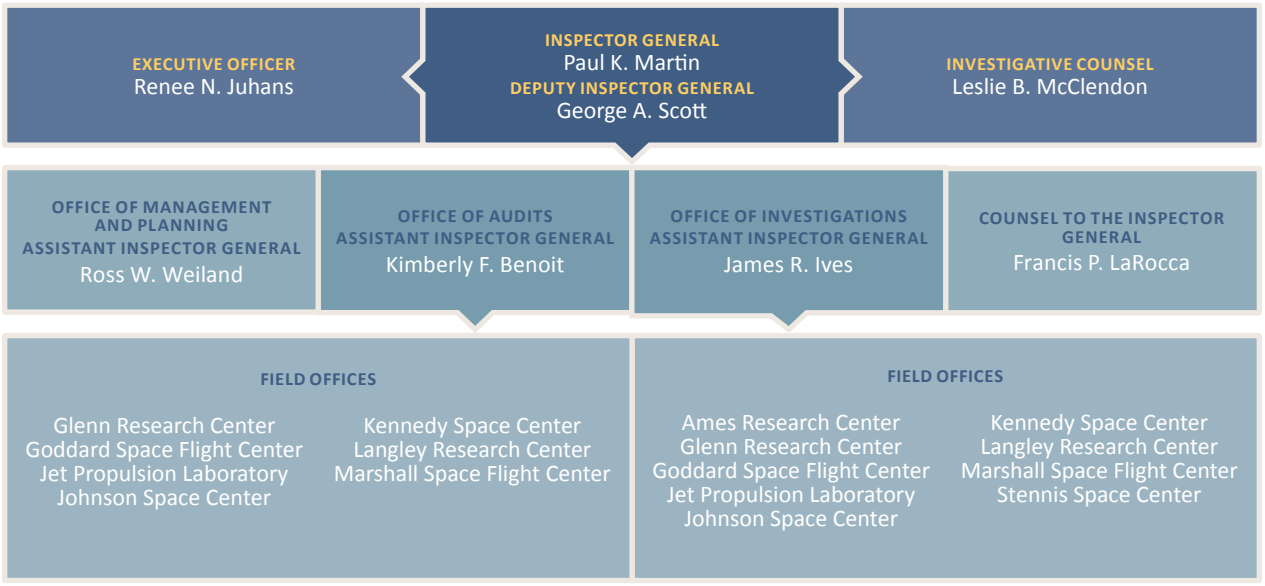
No external peer reviews were performed by the Office of Investigations during this semiannual period. In October 2017, the Office of the Special Inspector General for the Troubled Asset Relief Program reviewed NASA OIG's Office of Investigations and found the office to be in compliance with all relevant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

APPENDIX C. ACRONYMS

DAAC	Distributed Active Archive Center
DCAA	Defense Contract Audit Agency
DCIS	Defense Criminal Investigative Service
EGS	Exploration Ground Systems
EOSDIS	Earth Observing System Data and Information System
FAR	Federal Acquisition Regulation
FBI	Federal Bureau of Investigation
FISMA	Federal Information Security Modernization Act of 2014
FY	fiscal year
GFAS	Ground Flight and Application Software
HPD	Heliophysics Division
IPIA	Improper Payments Information Act
ISS	International Space Station
IT	Information Technology
JPL	Jet Propulsion Laboratory
NID	NASA Interim Directive
NPD	NASA Policy Directive
NPR	NASA Procedural Requirements
NRC	National Research Council
NSF	National Science Foundation
OIG	Office of Inspector General
SBIR	Small Business Innovation Research
SLS	Space Launch System
SOFIA	Stratospheric Observatory for Infrared Astronomy

APPENDIX D. OFFICE OF INSPECTOR GENERAL ORGANIZATIONAL CHART

The OIG is currently funded under a continuing resolution through November 21, 2019, at the FY 2019 level of $39.3 million. This budget supports the work of 181 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 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 and 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.

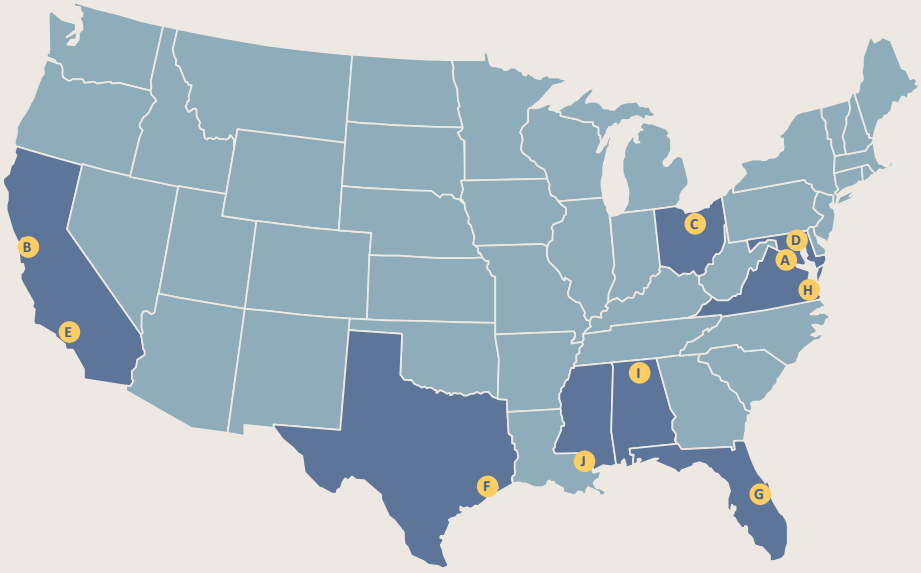
THE OFFICE OF COUNSEL TO THE INSPECTOR GENERAL provides legal advice and assistance to OIG managers, auditors, and investigators. The Office serves as OIG counsel in administrative litigation and assists the Department of Justice when the OIG participates as part of the prosecution team or when the OIG 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 E. MAP OF OIG FIELD OFFICES

NASA OIG OFFICES OF AUDITS AND INVESTIGATIONS



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OIG Whistleblower Protection Coordinator to learn more about your rights:
https://oig.nasa.gov/whistleblower.html

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