

National Aeronautics and Space Administration



TO BENNU AND BACK

**OSIRIS-REx successfully
navigates the complex
terrain of asteroid
Bennu.**

2020 ANNUAL REPORT

Goddard
Space Flight Center

www.nasa.gov

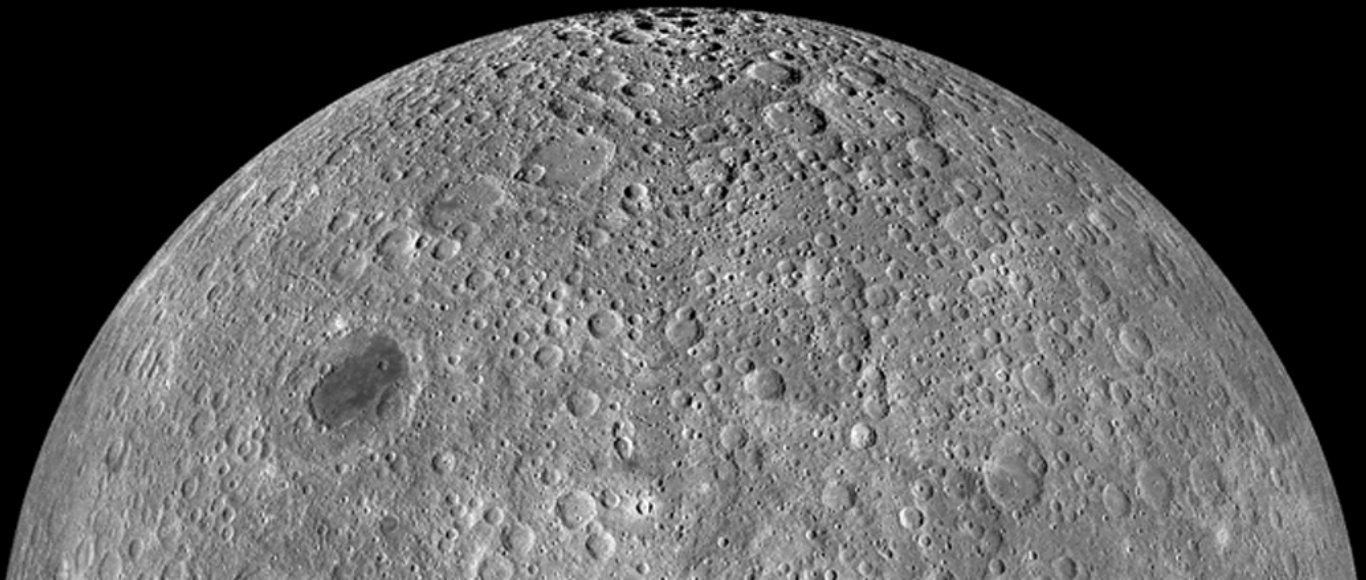
THE GODDARD PROJECT LIFE CYCLE



This icon indicates expanded multimedia content. An interactive version of this report is also posted at issuu.com/nasagsfc.

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SIX UNIQUE SITES



10,000+ PEOPLE

Expert in the study of our world, the solar system and beyond, NASA's Goddard Space Flight Center has been working since 1959 to increase scientific understanding, answer humanity's big questions, and benefit the society and communities we serve. The center's work in science, engineering, technology and communications strengthens our ability to envision the origins of life, preserve our way of living and chart our place in the universe. We identify requirements and innovations; design, build and launch spacecraft; and manage and support entire space missions. Our foundational communications infrastructure enables NASA and others to retrieve knowledge from space, share it with diverse stakeholders and apply it to society in countless ways.

A MESSAGE FROM THE DIRECTOR



Since opening our gates in 1959, NASA's Goddard Space Flight Center has addressed some of the most significant questions about the nature of the universe—ranging from the systems on Earth to the mysteries of the farthest galaxies. For six decades, we have redefined our understanding of the cosmos. Our exhaustive portfolio in astrophysics, Earth science, heliophysics and planetary science is now among the best in the world, with our employees continually undertaking new challenges on behalf of humanity.

This year, however, a new and unexpected challenge emerged: the COVID-19 pandemic. Early in 2020, the novel coronavirus disrupted our operations, and most of our workforce had to temporarily abandon their posts on center and begin a prolonged teleworking posture from their homes. This challenge notwithstanding, our personnel—including those who continue to work from home as well as the select mission-essential and mission-critical employees who have returned on center—have remained undeterred, pushing forward with NASA's mission without circumventing our elevated standards of health and safety.

This commitment has been evident in several achievements this year. Two heliophysics missions, ICON and Solar Orbiter, launched and have already returned valuable scientific data. The Hubble Space Telescope, one of Goddard's flagship missions, celebrated its 30th launch anniversary. One of its successors, the James Webb Space Telescope, cleared critical testing milestones prior to its launch in 2021. The world celebrated the 50th anniversary of Earth Day, and Goddard continues to serve as a global leader in surveying the climate and systems of our home planet. The OSIRIS-REx asteroid sample return mission made its way to its target and is en route to bringing the sample to Earth. As the agency pushes forward with its Commercial Crew Program and human exploration initiatives—back to the Moon and eventually to Mars—Goddard is making vital contributions to these new endeavors.

I encourage you to read the following pages, which highlight our accomplishments over the past year and outline how we are embarking on the challenges ahead. They also spotlight our people, who come from diverse backgrounds and whose diverse contributions are the centerpiece for everything that we achieve. As our namesake founder Robert H. Goddard famously said, "It is difficult to say what is impossible, for the dream of yesterday is the hope of today and the reality of tomorrow." For more than 60 years, our people have taken these words to heart, and they are the ones who are making the impossible possible.

On behalf of NASA's Goddard Space Flight Center, thank you for your interest in our work. We look forward to showing you how our center is pushing the boundaries of possibility in our universe.

A handwritten signature in black ink, reading "Dennis J. Andrucyk". The signature is fluid and cursive, with a large, sweeping flourish at the end.

Dennis J. Andrucyk
Center Director

GODDARD'S RESPONSE TO COVID-19



MAINTAINING THE MISSION

Late in 2019 and early in 2020, the world braced for the emergence and widespread impact of the novel coronavirus SARS-CoV-2, the cause of the respiratory illness COVID-19. The nature of the virus and the facility with which it spreads forced much of the world to go into lockdown, and NASA's Goddard Space Flight Center was no exception.

Immediately upon learning more about the virus, Goddard leadership—in consultation with medical professionals—implemented enhanced safety and health protocols to protect the center's employees. Most employees began working under a prolonged teleworking posture. Those considered mission-essential remained on campus to safeguard Goddard's resources. Months later, mission-critical personnel—particularly those assigned to missions with tight launch schedules—returned to center while being closely monitored under the stronger safety guidelines. We also completed the construction of the center's Instrument Development Facility. It will house much of Goddard's production of spaceflight hardware, planetary environments research and mass spectrometry instrument development, all while reducing our environmental footprint. Internships went forward, mostly via telework, continuing our center's long-

standing commitment to inspiring and nurturing future generations of space explorers.

Amid all these challenges, Goddard notched several achievements during the COVID-19 pandemic. Among many other accomplishments, we celebrated the [50th anniversary of Earth Day](#) with the rest of the world, highlighting the contributions of our Earth-observing missions to humanity's understanding of our home planet.

The Hubble Space Telescope, NASA's most successful scientific mission, celebrated its [30th launch anniversary](#), while one of its successors—the James Webb Space Telescope—[completed several testing milestones](#). We [supported the first commercial launch](#) from American soil of a crewed mission, the launch of the [next Mars rover](#) and [resupply missions](#) to the International Space Station. In NASA's first attempt since the Apollo program to collect a rock sample from space, a Goddard-led asteroid sample return mission [retrieved a sizable specimen](#) that will be brought back to Earth in 2023.

To address the impacts on society of COVID-19, NASA has funded [projects that explore the connections between the](#)



[environment and the pandemic](#). Several are using satellite images to help reveal how COVID-19 lockdown measures are impacting food security, fire ecology, urban surface heat, clouds and warming, air pollution and precipitation, and water quality and aquatic ecosystems. Others are exploring how the environment could be impacting how the virus is spread by monitoring dust and weather. NASA's Earth Science Division is managing these projects with significant contributions from Goddard. The center is also developing an innovative breathalyzer test to better detect

the presence of the virus in individuals.

Our commitment to NASA's mission goes on, even if some of our operations were disrupted in 2020, and we expect to emerge from the COVID-19 pandemic stronger than ever.



SEVENTY-FIVE YEARS

Our Celebration



WALLOPS FLIGHT FACILITY CELEBRATES DIAMOND ANNIVERSARY

Since its first launch in 1945, NASA's [Wallops Flight Facility](#) has grown from a small test range for guided missile research to supporting aerospace and science exploration and technology development worldwide as NASA's premier location for suborbital and small orbital activities.

"In its [75-year history](#), Wallops employees have adopted a can-do spirit in not only the execution of NASA's mission but also in conducting outreach and providing inspiration to our local community," said Wallops Director David L. Pierce.

In 1945, the National Advisory Committee for Aeronautics (NACA) established a launch range on a barrier island on Virginia's Eastern Shore. The island was granted to John Wallop through a patent from King Charles II of England in 1672. In 1889, the Wallops Island Association acquired the island and established a club house on the north end of the island.



and aircraft. The federal and state facilities on the island are now valued at more than \$1.2 billion. Wallops houses tracking facilities for a multitude of satellites, a research airport, and NASA's only owned rocket launch range for suborbital and orbital rockets. Wallops also supports the activities of government and commercial organizations, including the U.S. Navy, National Oceanic and Atmospheric Administration, U.S. Coast Guard, Mid-Atlantic Regional Spaceport, Northrop Grumman, and Rocket Lab.

For the test range, NACA leased land from the south end of Wallops Island from the association, later purchasing the entire island in 1949 for \$93,239. The island met three requirements to establish the test range: proximity to Langley, a 50-mile launch range unobstructed by people or shipping, and proximity to an existing military base for logistics support.

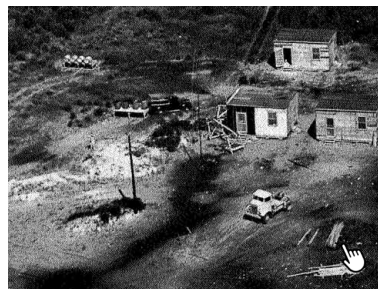
In roughly two months, the test range on Wallops Island was ready for its first eight launches on June 27, 1949. These rockets were used to test radar systems prior to the first unguided missile test from the island on July 4.

The facilities were sparse for these launches. The launch area consisted of a 50-by-50-foot concrete slab as the launching platform, an 8-by-10-foot observation station covered with sandbags, a rocket motor storage igloo and a final loading building. The launch area, now known as Launch Area 2, is

the location for three suborbital sounding rocket launchers and a block house. In 1958, NACA became NASA.

In 1959, Wallops expanded off the island to include the Naval Air Station on what is now known as the Wallops main base. With physical changes over the years, Wallops also took on new names. Originally the Auxiliary Flight Research Station, it became the Pilotless Aircraft Research Station, both under Langley. With the establishment of NASA, Wallops became an independent center, known as Wallops Station and then Wallops Flight Center. In 1981, Wallops became part of NASA's Goddard Space Flight Center and the name was changed to Wallops Flight Facility.

Today, more than 1,000 employees support scientists studying Earth and the universe using sounding rockets, scientific balloons, orbital launch vehicles, small spacecraft



AIRBORNE SCIENCE



SOUNDING ROCKETS



RESEARCH RANGE



SCIENTIFIC BALLOONS



SMALL SATELLITES



2020 IN FIGURES

ONE GODDARD
MORE THAN 10,000 PEOPLE

3,000+
CIVIL
SERVANTS

6,000+
ON-SITE
CONTRACTORS

1,000+
OTHERS

(Including off-site contractors, emeritus employees and interns)



BUDGET:
\$5.1B

Direct GSFC Budget: \$4.1B
Reimbursable GSFC Budget: \$1.0B

(From other government and nongovernment entities)

Hubble 30th Anniversary

17,000 Peer-Reviewed Papers

1.4M Observations

\$1 American
Innovation Coin



BEST PLACES
TO WORK IN THE FEDERAL
GOVERNMENT (2019 Rankings)

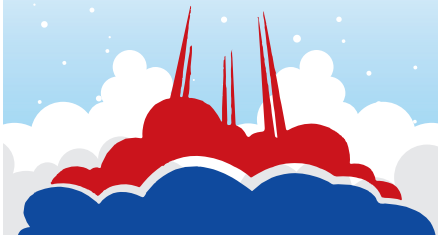
#1 NASA RANKED OUT OF
17 LARGE AGENCIES
(Eighth Consecutive Year)

#18 GODDARD RANKED OUT OF
420 AGENCY SUBCOMPONENT
ORGANIZATIONS
(Third-Highest Among NASA Centers)

1st COMMERCIAL
LAUNCH

of astronauts from U.S. soil
was supported by Goddard
in multiple capacities

#LaunchAmerica



OSIRIS-REX
ASTEROID SAMPLE RETURN MISSION



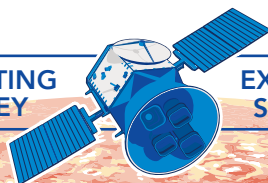
Spacecraft maps asteroid Bennu at
2 inches (5 cm) per pixel

(highest-resolution global map
of any planetary body)
and successfully collects NASA's

1st sample from the surface of an asteroid.

TESS

TRANSITING
SURVEY



EXOPLANET
SATELLITE

67

EXOPLANETS
CONFIRMED

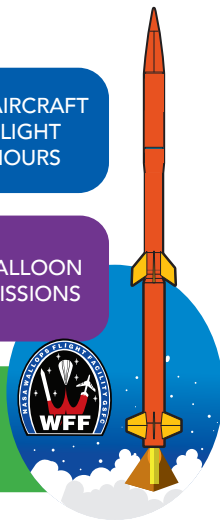
7 SOUNDING ROCKET LAUNCHES

436 AIRCRAFT FLIGHT HOURS

2 ISS RESUPPLY MISSIONS SUPPORTED

3 BALLOON MISSIONS

16,000+ LAUNCHES SINCE 1945



WALLOPS FLIGHT FACILITY



16 NASA MISSIONS SUPPORTED

10 SEVERITY-ONE ISSUES IDENTIFIED

Operation IceBridge

11 YEARS OF DATA COLLECTION



1,700+

BALLOONS LAUNCHED SINCE 1961 FOR:

35 Universities

23 Research Agencies

33 Foreign Groups

48 MILLION MILES AWAY

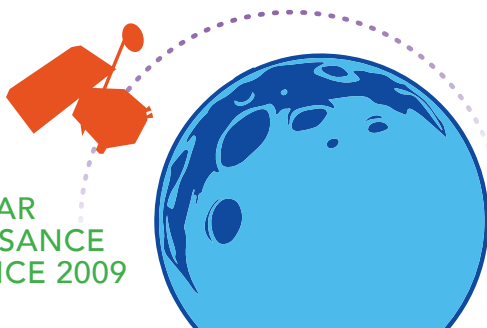
Closest-ever pictures of the Sun obtained by

SOLAR ORBITER



1.2+ PETABYTES

OF DATA DELIVERED BY THE LUNAR RECONNAISSANCE ORBITER SINCE 2009

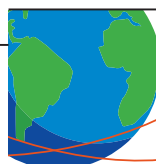


4000th COMET DISCOVERED

SOLAR AND HELIOSPHERIC OBSERVATORY



13 GODDARD-DEVELOPED TOOLS USED ON THE INTERNATIONAL SPACE STATION

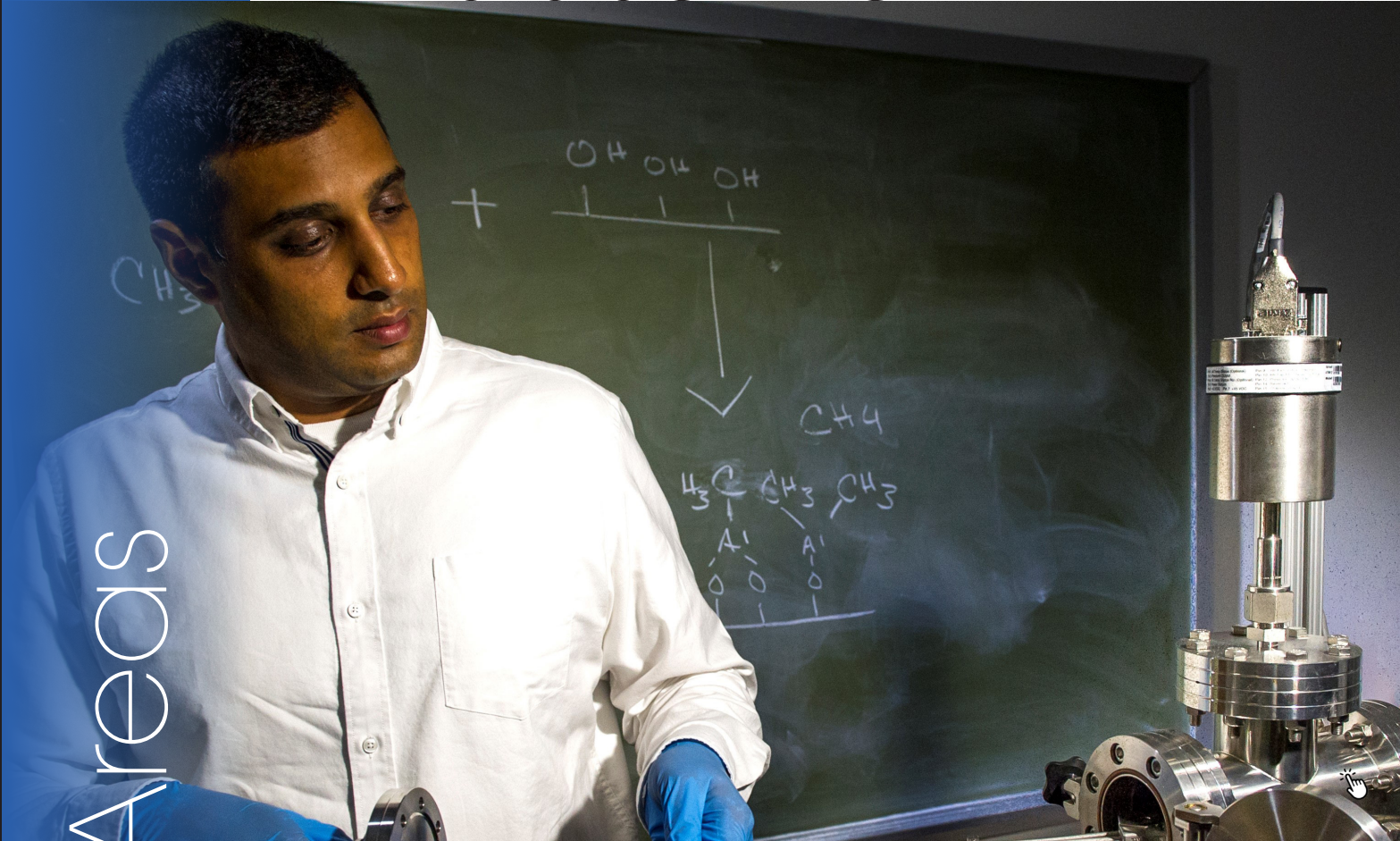


60 YEARS

of studying Earth's weather from space

THIS IS SCIENCE

Our Focus Areas



EARTH SCIENCE

We observe and study Earth's system to further scientific understanding of our home planet and to improve predictions of its evolving state due to human behavior and natural changes.

ASTROPHYSICS

We investigate the universe through astronomy, astrophysics and fundamental physics on issues such as dark matter and energy, life-harboring planets and black holes.

HELIOPHYSICS

We study the Sun and how it influences and affects the space environment—ours and those of the other planets in our solar system—and in turn, the technology we send into space.

PLANETARY SCIENCE

We investigate the planets, moons and small objects in the solar system and beyond, including their evolution, inner structures and forces that alter them.

SPACE COMMUNICATIONS AND NAVIGATION

We develop systems, technologies and services in support of science, exploration and space operations missions that are near Earth and in deep space.

SUBORBITAL PROGRAMS AND RANGE SERVICES

We manage programs and services for sounding rockets, balloons, aircraft and commercial space, including NASA's only owned-and-operated launch facility—Wallops Launch Range.

CROSS-CUTTING TECHNOLOGIES

Sensor Systems and Instrument Platforms

Goddard builds instruments for missions, ranging from subsystems—such as detectors and optical elements—to full instruments and complex instrument suites.

Large-Scale Scientific Information Systems, Data Processing and Dissemination

Goddard designs and implements custom, large-scale data systems and supercomputing applications for high-performance computing and archiving of a wide range of science data.

Orbital Servicing and Assembly

Goddard services enable extended mission operations, reconfiguration and recovery, including in-orbit spacecraft refueling and repair, assembling large structures in orbit, and enabling modular designs.

OTHER ENABLING CAPABILITIES

Program and Project Management

Goddard conducts effective, tailored management and cost estimation, maintains schedules, develops technology, manages risk, and ensures outcomes for missions and their supporting elements and services.

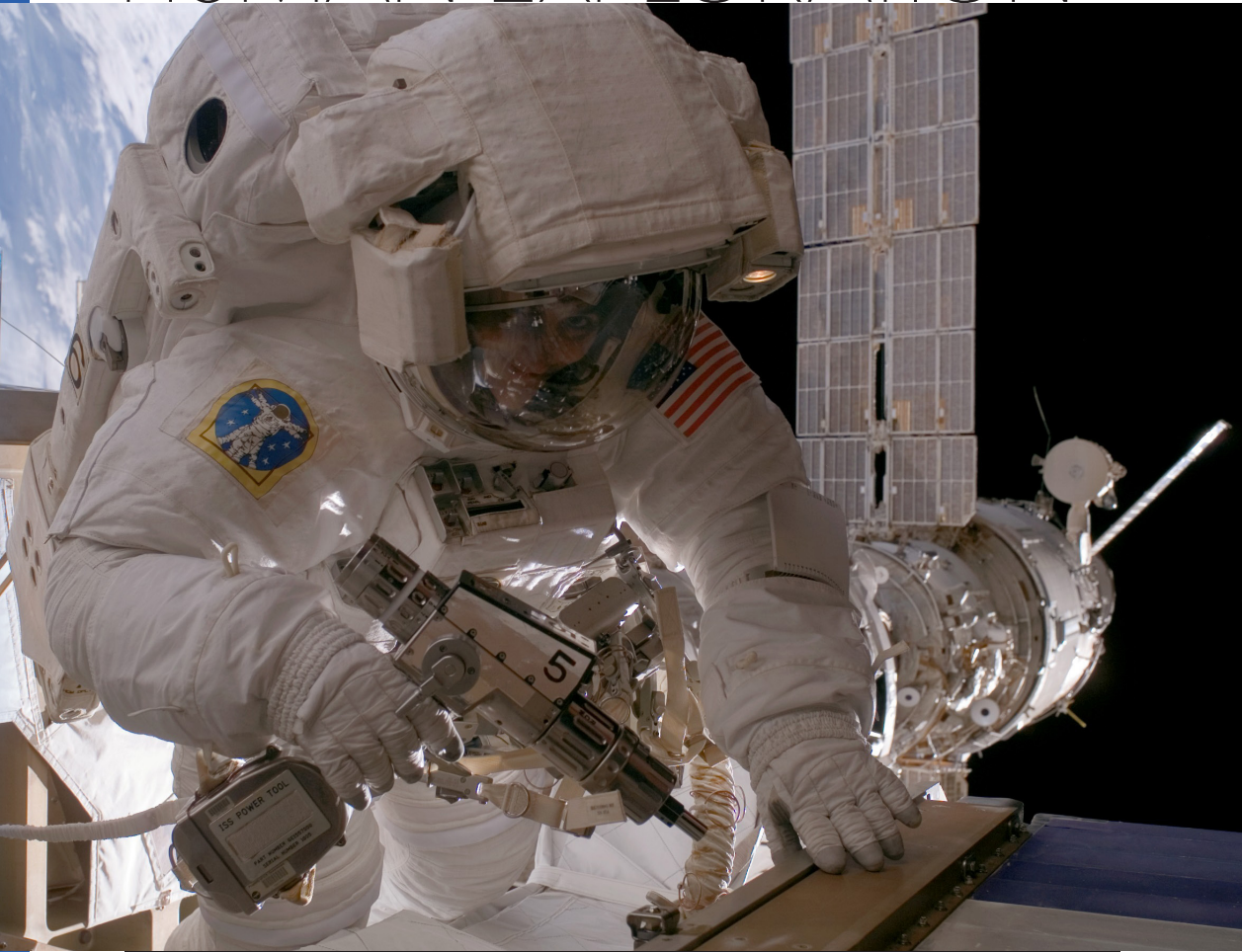
End-to-End Mission Systems Architecture and Engineering

Goddard addresses the full life cycles of science missions, spacecraft, in situ and remote-sensing instruments, and payloads, from advanced concepts through implementation.

Safety and Mission Assurance

Goddard is a recognized leader in safety and mission assurance with a lengthy history of implementing effective and innovative approaches to reduce risk and enable mission success.

HUMAN EXPLORATION



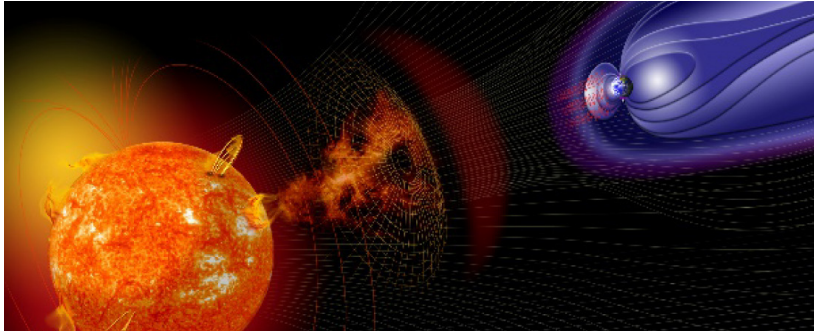
SUPPORTING THE PAST, PRESENT AND FUTURE OF HUMAN SPACEFLIGHT

Dating back to its beginnings, NASA's Goddard Space Flight Center has supported the agency's human spaceflight endeavors, from Project Mercury and the Apollo missions to the Space Shuttle Program and today's International Space Station expeditions. The center remains vital to NASA's human exploration initiatives, including the recent missions of the Commercial Crew Program and the upcoming missions of the Artemis program, which will send the first woman and next man to the Moon in 2024 and eventually a crew to Mars.

Scientific Research

Planetary Science

Data products from the [Lunar Reconnaissance Orbiter](#), including high-resolution images and topographic maps, will help determine safe landing sites and Artemis science objectives. [Our scientists are active in the lab and field](#), the results of which provide valuable input to the design of new science instruments, as well as hardware and strategies to be used by astronauts.



Space Weather Research

[Goddard heliophysics](#) missions provide detailed data about the space environment and radiation encircling the Sun, Earth and Moon. This helps scientists model conditions of the very space we travel through, which helps keep astronauts, instruments and spacecraft safe from harsh environments. Goddard is also building one of the [first instrument suites, HERMES](#), for the lunar Gateway to enhance our ability to forecast space weather.

In-orbit Servicing and Assembly

Goddard is developing [servicing technologies](#) that are critical to sustainable human exploration. The capabilities will allow spacecraft to live longer and journey farther. We also develop [important tools](#) that help enable a sustained human presence in space. From astronaut tools for instrument repairs to robotic tools for [leak detection](#) and other operations, we ensure NASA has the right tools to maintain astronaut habitats in space. Currently used aboard the International Space Station, these tools can be applied to future exploration missions and human habitats on the Moon, Mars and beyond.

Space Communications and Navigation

Network Integration

Goddard manages the Human Space Flight Communications and Tracking Network, which synthesizes network capabilities into comprehensive services for crewed missions, providing support to the Artemis and Commercial Crew programs as well as other human exploration initiatives.

Operational Communications Services

Goddard manages two of NASA's three major networks which provide services for human exploration. The [Near Earth Network](#), a global collection of NASA- and commercially owned and operated antennas, will support the Artemis missions through launch and early orbit from the newly built Launch Communications Segment. The [Space Network](#), a constellation of Tracking and Data Relay Satellites and associated ground stations, provides low-Earth orbit spacecraft and launch vehicles with near-continuous communications services. The Space Network supports the International Space Station, visiting vehicles, the Commercial Crew Program as well as the agency's Artemis program.

Navigation Services

Goddard's Flight Dynamics Facility provides crewed missions with comprehensive and reliable [navigation services](#). The facility uses tracking data to ensure the success and safety of human spaceflight missions. In the unlikely event of a launch abort, the facility has developed new tools, software and operations concepts to ensure astronauts maintain communications with mission control.

Search and Rescue

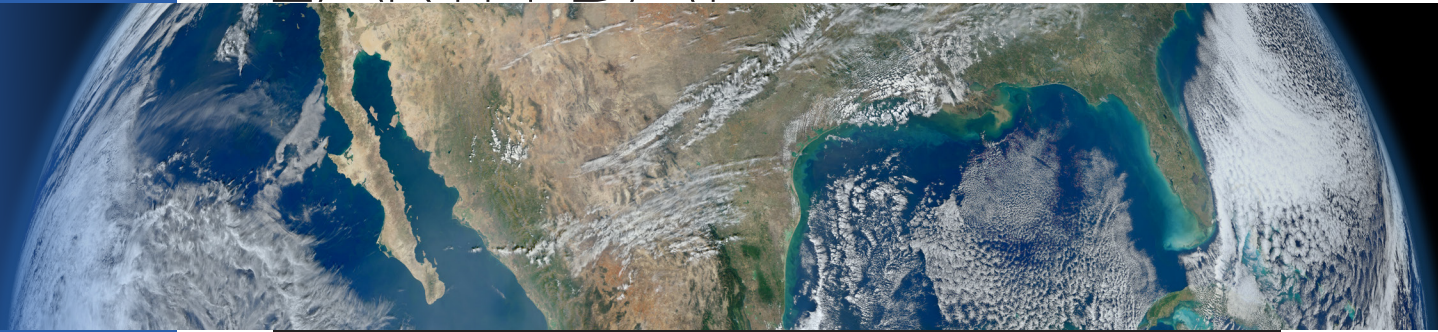
For the international satellite-aided search and rescue effort, Goddard's [Search and Rescue office](#) develops emergency beacon technologies and the flight and ground systems that support them. NASA leverages these technologies on all crewed missions to enhance astronaut safety.

Wallops Flight Facility Support

[Wallops Flight Facility](#) has long enabled NASA's human spaceflight efforts through telemetry and tracking support for the Space Shuttle Program and now the Commercial Crew Program. Since 2013, Wallops has launched resupply missions to the International Space Station, carrying scientific investigations, technology demonstrations and supplies to astronauts aboard the orbiting laboratory.



EARTH DAY



GODDARD CELEBRATES 50TH EARTH DAY

On April 22, 1970, millions of Americans mobilized for the first Earth Day—an event that would lead to the establishment of the Clean Air Act and Environmental Protection Agency, as well as become an annual day of global environmental awareness. The first Earth Day took place only months after Apollo astronauts viewed Earth for the first time from the surface of the Moon during the first lunar landing, and two years before the first of many Landsat satellites launched into orbit to provide us with continuous imagery of our home planet from above.

NASA's Goddard Space Flight Center was just over a decade old in 1970, but the center's engineers, communicators and scientists were already well into studying the complex environmental systems that make up our planet. Today, Goddard's [Earth Sciences Division](#) hosts the world's largest collection of Earth scientists who build, design, launch and operate various satellites, instruments and ground operations to observe and learn more about our planet. Their work has confirmed the existence of the ozone hole, improved weather forecasting and monitored climate over decades. By tracking the changes in ice, oceans, atmosphere, vegetation, pollution and natural disasters, Goddard has helped scientists, policymakers and the public better understand how these systems work, how they interact and what they may look like in the future.

Earth Day is not only an opportunity for NASA centers to share their discoveries in Earth sciences. Condensing the grand scope of these collective missions is a mammoth task in itself. This year, the novel coronavirus pandemic presented an additional challenge. To overcome self-isolation brought about by the pandemic, Goddard paid homage to the last five decades of knowledge, discovery and resultant environmental awareness by bringing [Earth Day home](#).

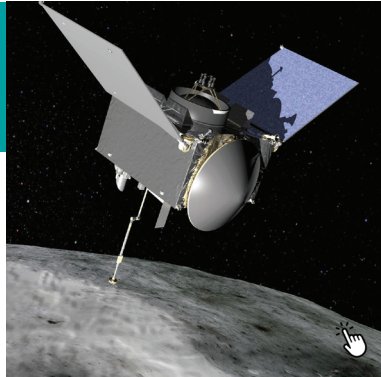
Digital resources featured in the [Earth Day Toolkit](#) provided educational content, citizen science projects, e-books, visuals and videos to engage and inspire those staying indoors. Earth science video producers filmed and edited nine videos of scientists sharing their expertise from home as a part of NASA's Earth Day at Home communications. Along with NASA's Scientific Visualization Studio, they also produced a [video timeline](#) of NASA's study of Earth, spanning from the iconic "Earthrise" image taken by Apollo 8 astronauts in 1968 to the current Earth-observing fleet of satellites. Goddard created more than 200 individual blog and social media posts for a "50 Days of Earth Day" countdown and published feature stories highlighting Goddard's past achievements and forward-looking projects.

Though this was an Earth Day spent apart, virtual resources and campaigns helped connect NASA communities both inside and outside the agency. The priorities of NASA's Earth research and exploration continue to resonate deeply this year as we reflect on our collective efforts at a distance.

HIGHLIGHTS OF FISCAL 2020

OSIRIS-REx

PLANETARY



The Origins, Spectral Interpretation, Resource Identification, Security-Regolith Explorer (OSIRIS-REx) launched in 2016 to return a sample from the near-Earth asteroid Bennu. The sample collection site—named “Nightingale”—on the asteroid was selected in December 2019. The sample was collected in October 2020 and will be returned to Earth by 2023, giving scientists greater insight into the formation and evolution of the solar system and the source of organic compounds that led to life on Earth.

Solar Orbiter

HELIO



Solar Orbiter, a collaborative mission between ESA (European Space Agency) and NASA, launched in February 2020 from Cape Canaveral Air Force Station in Florida en route to the Sun. The spacecraft completed its first close pass of the Sun in June, returning the closest pictures ever taken of our nearest star. The images will help scientists piece together the Sun’s atmospheric layers and better understand how it drives space weather near Earth and throughout the solar system.

Webb

ASTRO



The James Webb Space Telescope—an international project led by NASA with its partners, ESA (European Space Agency) and the Canadian Space Agency—will be the most powerful space telescope ever built upon its completion and launch in October 2021. Webb, which will observe how the first stars and galaxies evolved billions of years ago, accomplished many recent milestones: fully deploying its primary mirror in March, completing its first full observatory electrical test in July and completing the observatory environmental test.

Landsat 9

EARTH

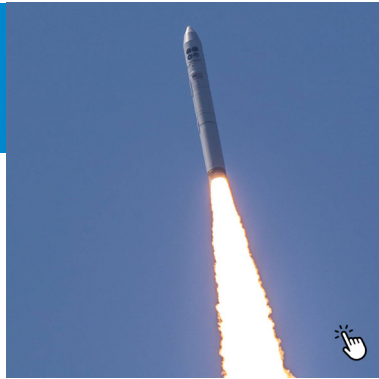


The Landsat program, a collaboration between NASA and the U.S. Geological Survey, is the longest-running enterprise for the acquisition of satellite images of Earth, providing actionable information to resource managers and policymakers worldwide. The ninth spacecraft in the series, Landsat 9, is scheduled to launch in September 2021. Its two science instruments—the Operational Land Imager 2 and Thermal Infrared Sensor-2—were mechanically integrated onto the spacecraft in January 2020. Engineers will next work on the electrical integration of the instruments.

HIGHLIGHTS OF FISCAL 2020

Minotaur IV Launch

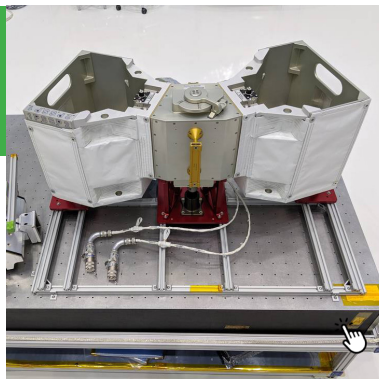
SUBORBITAL



For the first time since 2013, Wallops Flight Facility supported the launch of a Minotaur rocket on July 15, 2020. The rocket carried four classified payloads for the National Reconnaissance Office (NRO), and the U.S. Space Force (USSF) and Space and Missile Systems Center's Launch Enterprise Program provided launch services for the mission, named NROL-129. Northrop Grumman built and operated the launch vehicle. The mission was the first USSF mission from Wallops and NRO's first dedicated launch from the facility.

RiTS

ORBITAL



Robotic Tool Stowage (RiTS), a protective storage unit for robotic tools, was among the items launched to the International Space Station as part of SpaceX's 19th commercial resupply services mission in December 2019. As part of a spacewalk on July 21, 2020, NASA astronauts installed the "robot hotel" where Robotic External Leak Locator tools are stored to the station's Mobile Base System. In addition to providing thermal and physical protection for tools, RiTS allows them to be accessed more quickly. The unit was developed by NASA's Exploration & In-space Services projects division at Goddard.

Hubble

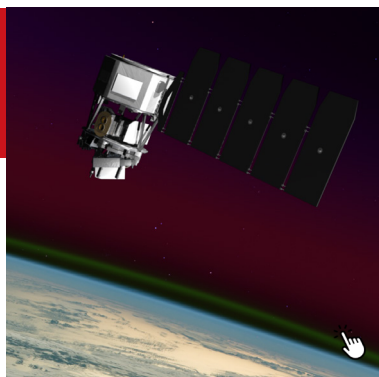
ASTRO



Since its launch 30 years ago on April 24, 1990, the Hubble Space Telescope has revolutionized modern astronomy by providing insights about the universe—from nearby planets to the farthest galaxies—while taking the public on a journey of exploration and discovery through its iconic images. Hubble has yielded more than 1.4 million observations to date and has been used to write more than 17,000 peer-reviewed scientific publications, making it the most prolific space observatory in history.

ICON

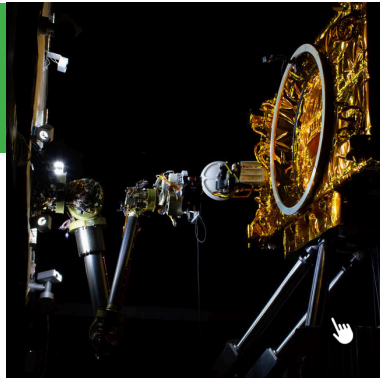
HELIO



NASA's Ionospheric Connection Explorer (ICON) launched in October 2019 from Cape Canaveral Air Force Station in Florida for a first-of-its-kind mission to study the ionosphere—a region of space where changes can disrupt communications and satellite orbits and even increase radiation risks to astronauts. ICON's first data were released in June 2020, giving scientists better insight into the connection between Earth's atmosphere and the nearby dynamic space environment. These first images captured the vibrant swaths of light emanating from the upper atmosphere.

OSAM-1

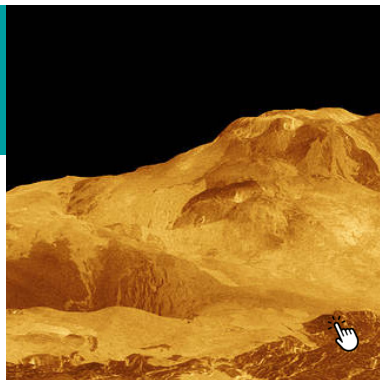
ORBITAL



The On-orbit Servicing, Assembly, and Manufacturing 1 (OSAM-1) mission successfully passed Key Decision Point-C in May 2020. This approval allows the OSAM-1 team to begin implementation and establishes the mission's official schedule and budget. Formerly known as Restore-L, OSAM-1 is equipped with the tools, technologies and techniques needed to extend the life spans of satellites, even if they were not originally designed to be serviced in orbit. The mission will also establish assembly and manufacturing capabilities by building a functional communications antenna and manufacturing a beam.

DAVINCI+

PLANETARY



Designed by Goddard scientists and engineers, proposed mission DAVINCI+—named after visionary Renaissance artist and scientist Leonardo da Vinci—could one day fly the first U.S. spacecraft since 1978 to study the atmosphere of Venus. In February 2020, NASA announced DAVINCI+ as one of four teams to develop concept studies for new missions in this decade to various destinations within the solar system. The agency will select one or two missions for flight by summer 2021.

ICESat-2

EARTH



Scientists have made precise measurements of how the elevation of the Greenland and Antarctic ice sheets have changed over 16 years. The findings compare results from NASA's Ice, Cloud and land Elevation Satellite 2 (ICESat-2), which launched in 2018, with those of its predecessor, ICESat, to see how the measurements changed over time. The goal of ICESat-2 is to make detailed global elevation measurements, including over Earth's frozen regions. The study found that Greenland's ice sheet lost an average of 200 gigatons of ice per year, and Antarctica's ice sheet lost an average of 118 gigatons of ice per year.

ISS Resupply Missions

RANGE SERVICES



As part of a long-standing relationship with Northrop Grumman, NASA's Wallops Flight Facility launched the company's 12th, 13th and 14th resupply missions to the International Space Station in November 2019, February 2020 and October 2020, respectively. All three missions used Northrop's Antares rocket for launch, as well as its Cygnus spacecraft for delivery. Resupply missions provide thousands of pounds of commercial products, scientific investigations, technology demonstrations and other cargo to astronauts aboard the orbiting laboratory.

THIS IS WHAT WE DO

of Business

Our Lines



A PLACE FOR SUCCESS

We help answer crucial science questions through complex missions that depend on dedicated and innovative teams to develop pioneering technologies. Goddard is one of the few organizations worldwide that manages missions from the concept phase through operations, utilizing internal, partner and industry expertise and resources along the way.

The depth and expertise of our scientists, engineers, technologists, project managers and support personnel form the foundation of our unique strength. With our leadership in scientific research and instrument and spacecraft development, the center has a renowned capability to conceive and manage advanced science, technology and space systems through the entire mission life cycle.

EARTH SCIENCE

science.gsfc.nasa.gov/earth

The Goddard Earth Sciences Division plans, organizes, evaluates and implements a broad program of research on our planet's natural systems and processes to meet the challenges of environmental change and to improve life on Earth. The largest Earth sciences unit within NASA, the division looks at Earth as an environmental system, addressing questions related to how the components of that system have developed, how they interact and how they continue to evolve.

Missions & Instruments

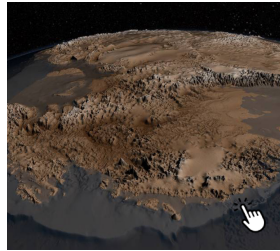
IN DEVELOPMENT

- Climate Absolute Radiance and Refractivity Observatory (CLARREO) Pathfinder
- Geostationary Carbon Cycle Observatory (GeoCarb)
- Joint Polar Satellite System-2 (JPSS-2)*
- Landsat 9*
- Ozone Mapping and Profiler Suite (OMPS)-Limb profiler*
- Plankton, Aerosol, Cloud, ocean Ecosystem (PACE)
- Total and Spectral Solar Irradiance Sensor-2 (TSIS-2)

OPERATIONAL

- Aqua
- Aura
- Deep Space Climate Observatory (DSCOVR)*
- Global Ecosystem Dynamics Investigation (GEDI)
- Global Precipitation Measurement Mission (GPM)*
- GOES-13*, GOES-14*, GOES-15*, GOES-16*, GOES-17*
- Ice, Cloud, and land Elevation Satellite-2 (ICESat-2)
- Joint Polar Satellite System-1 (JPSS-1/NOAA-20)*
- Landsat 7*, Landsat 8*
- Meteorological operational satellite-C (Metop-C)*
- NOAA-20*
- Soil Moisture Active Passive (SMAP) Radiometer
- Suomi-National Polar-orbiting Partnership (Suomi-NPP)*
- Terra
- Total and Spectral Solar Irradiance Sensor (TSIS-1)

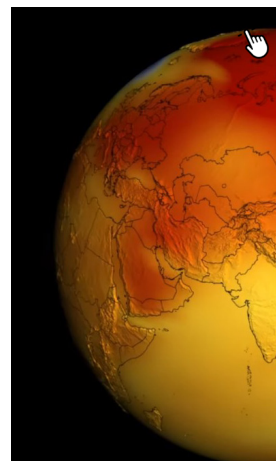
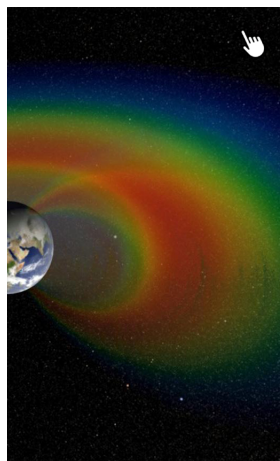
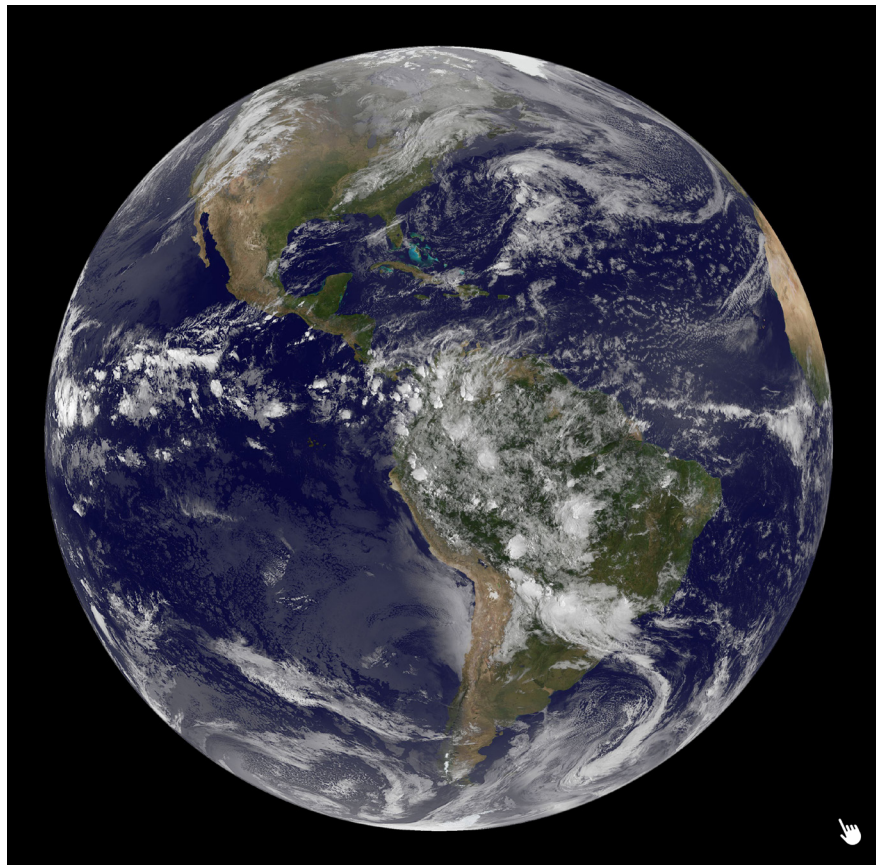
*Joint Agency Satellite



Combined Budget: \$1.6B

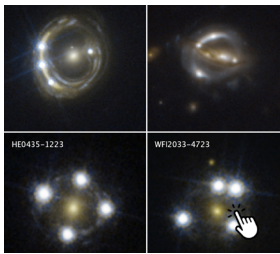
Combined Goddard Budget Percentage: 31.8%

- Facilities:
 - Greenbelt
 - Wallops
 - GISS
- 13 Labs/Offices
- 1,400+ Staff



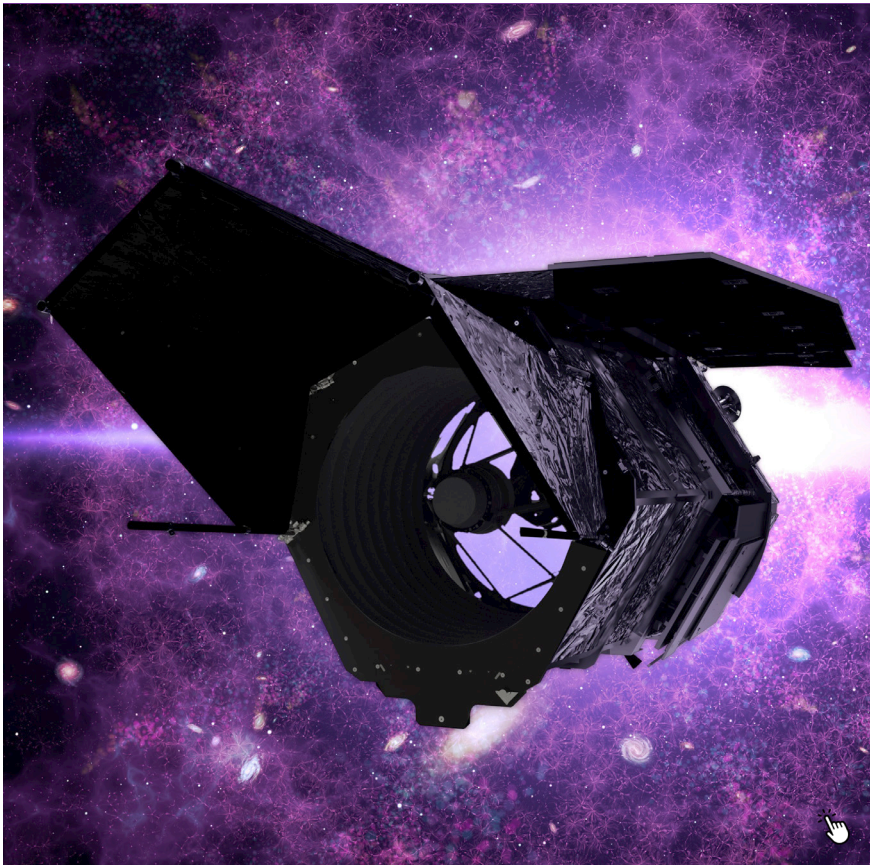
ASTROPHYSICS

science.gsfc.nasa.gov/astrophysics



Budget: \$1.2B

Goddard Budget Percentage: 24.3%



The Goddard Astrophysics Science Division comprises eight specialized laboratories and offices. Its major focus areas include the nature of dark matter and dark energy, the search for habitable planets outside our solar system, the origin and evolution of the universe, and the nature of space and time at the edges of black holes.

Missions & Instruments

IN DEVELOPMENT

- Advanced Telescope for High Energy Astrophysics (ATHENA)*
- BurstCube
- EXperiment for Cryogenic Large-Aperture Intensity Mapping (EXCLAIM)
- James Webb Space Telescope (JWST)
- Laser Interferometer Space Antenna (LISA)*
- Nancy Grace Roman Space Telescope (RST)
- X-Ray Imaging and Spectroscopy Mission (XRISM)*

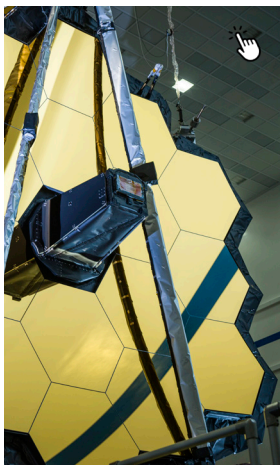
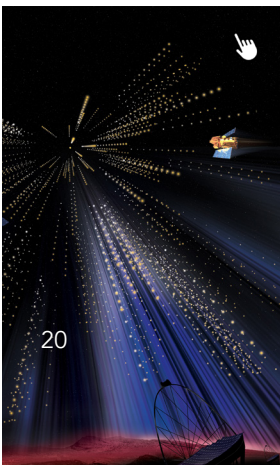
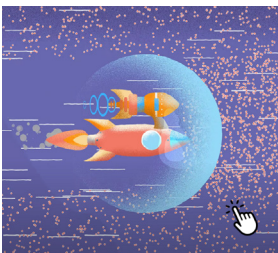
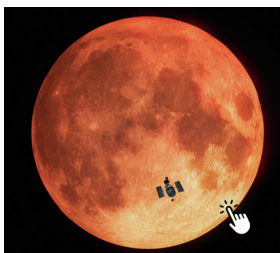
OPERATIONAL

- Balloon-borne Cryogenic Telescope Testbed (BOBCAT)
- CALorimetric Electron Telescope (CALET)*
- Fermi Gamma-ray Space Telescope
- Hubble Space Telescope
- International Gamma-Ray Astrophysics Laboratory (INTEGRAL)*
- High-Resolution Microcalorimeter X-ray (Micro-X)
- Neil Gehrels Swift Observatory
- Neutron star Interior Composition Explorer (NICER)
- Nuclear Spectroscopic Telescope Array (NuSTAR)
- Primordial Inflation Polarization Explorer (PIPER)
- Super Trans-Iron Galactic Element Recorder (SuperTIGER)
- Transiting Exoplanet Survey Satellite (TESS)
- X-ray Multi-Mirror Mission (XMM-Newton)*

*Joint Agency Satellite

• **Facility:**

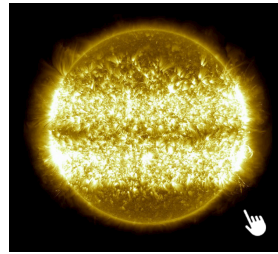
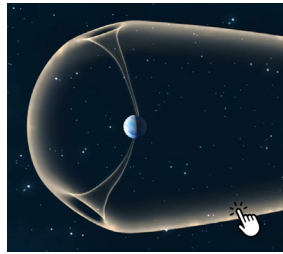
- Greenbelt
- 8 Labs/Offices
- 370 Staff



HELIOPHYSICS

science.gsfc.nasa.gov/heliophysics

Space seethes with energy, magnetic fields and countless particles, many of which come from the Sun. This radiation and magnetic energy can affect Earth's atmosphere, spacecraft, radio communications and astronauts. Understanding the environment surrounding Earth is critical for protecting satellites and helps us learn more about the space through which astronauts travel. Goddard conducts research on the Sun and how its output modifies space throughout the solar system.



Budget: \$412.5 M

Goddard Budget Percentage: 8.1%

Missions & Instruments

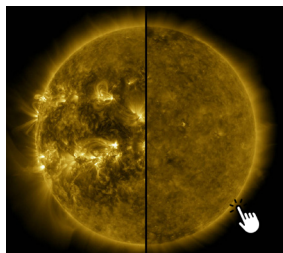
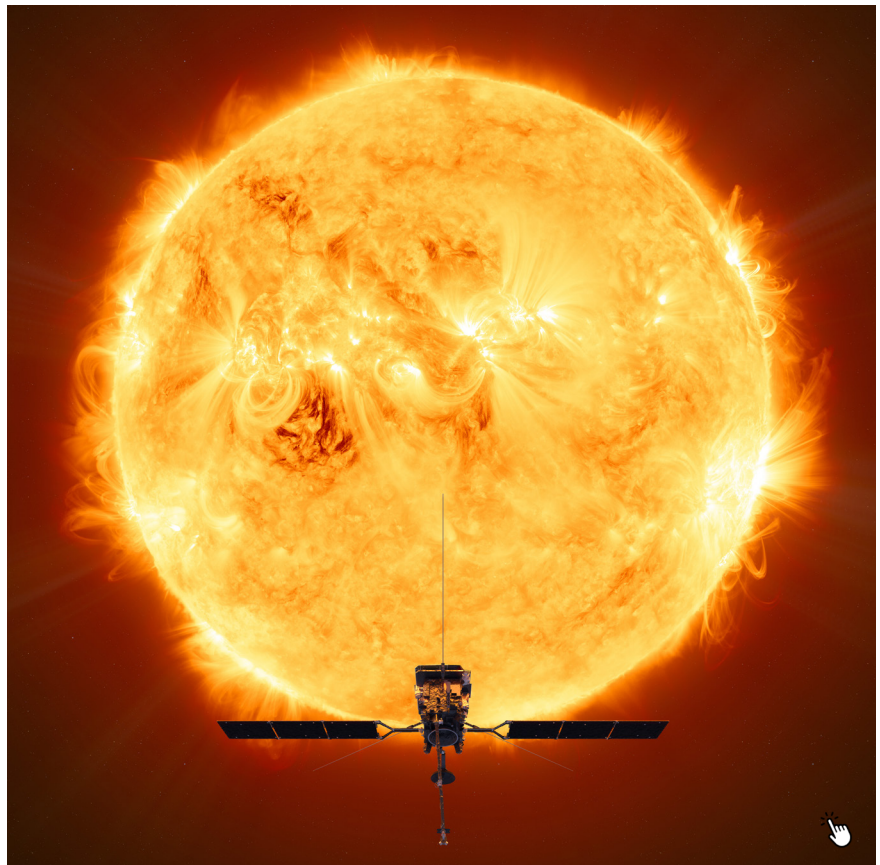
IN DEVELOPMENT

- Atmospheric Waves Experiment (AWE)
- Heliophysics Environmental and Radiation Measurement Experiment Suite (HERMES)
- Polarimeter to Unify the Corona and Heliosphere (PUNCH)
- Tandem Reconnection and Cusp Electrodynamics Reconnaissance Satellites (TRACERS)

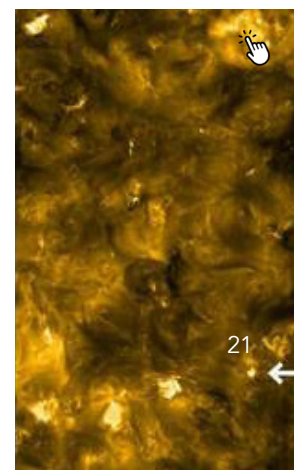
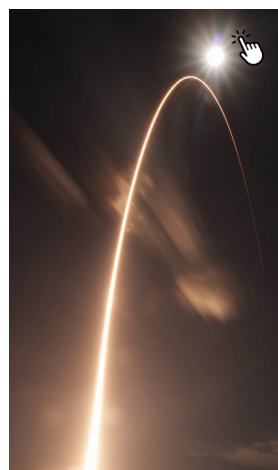
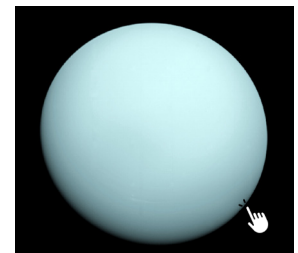
OPERATIONAL

- Advanced Composition Explorer (ACE)
- Aeronomy of Ice in the Mesosphere (AIM)
- Deep Space Climate Observatory (DSCOVR)*
- Geotail*
- Global Observations of the Limb and Disk (GOLD)
- Hinode*
- Interface Region Imaging Spectrograph (IRIS)
- Interstellar Boundary Explorer (IBEX)
- Ionospheric Connection Explorer (ICON)
- Magnetospheric Multiscale (MMS)
- Parker Solar Probe (managed by Johns Hopkins University Applied Physics Laboratory)
- Solar and Heliospheric Observatory (SOHO)*
- Solar Dynamics Observatory (SDO)
- Solar Orbiter*
- Solar Terrestrial Relations Observatory (STEREO)
- Thermosphere Ionosphere Mesosphere Energetics and Dynamics (TIMED)
- Time History of Events and Macroscale Interactions during Substorms (THEMIS/ARTEMIS)
- Wind

*Joint Agency Satellite

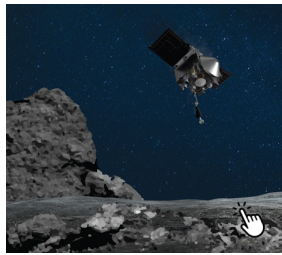
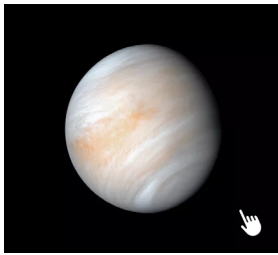


- **Facilities:**
 - Greenbelt
 - Wallops
- **5 Labs/Offices**
- **350+ Staff**



PLANETARY SCIENCE

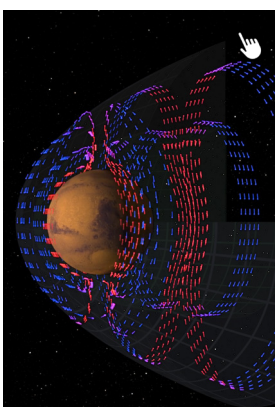
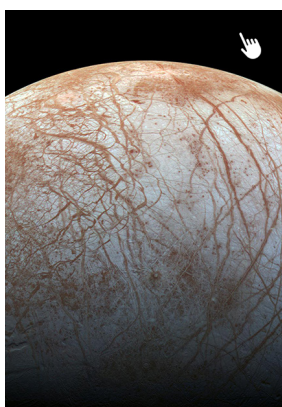
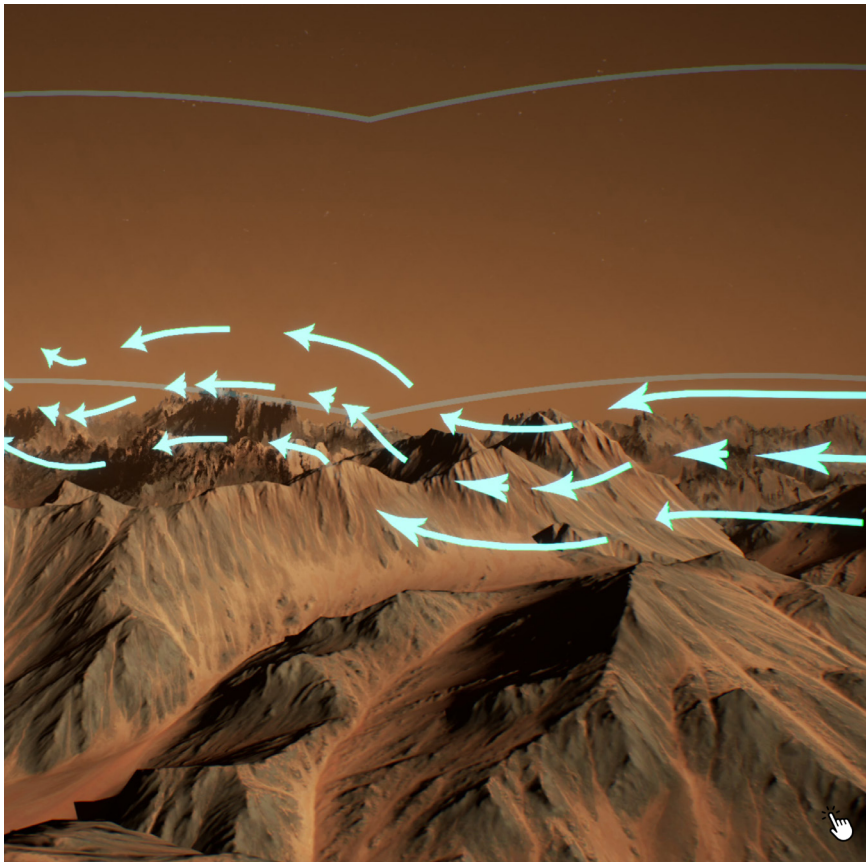
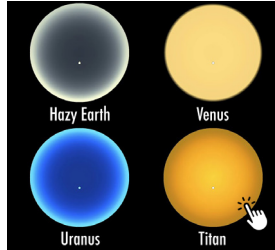
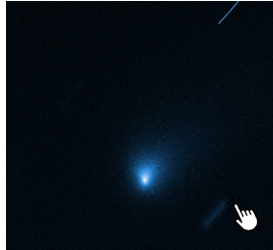
science.gsfc.nasa.gov/solarsystem



Budget: \$441.9M

Goddard Budget Percentage: 8.7%

- Facility: - Greenbelt
- 6 Labs/Offices
- 323 Staff



With more than 50 years of experience in designing and building instruments for spaceflight, the Goddard Solar System Exploration Division conducts theoretical and experimental research to explore the solar system and understand the formation and evolution of planetary systems. Its research encompasses areas as diverse as astrochemistry, planetary atmospheres, extrasolar planetary systems, planetary geology and comparative planetary studies.

Missions & Instruments

IN DEVELOPMENT

- Commercial Lunar Payload Services instruments (4)
- Dragonfly Gamma-Ray and Neutron Spectrometer (DraGNS)
- Dragonfly Mass Spectrometer (DraMS)
- Geostationary Operational Environmental Satellites-T (GOES-T) magnetometer
- Lucy mission and L'Ralph
- Mars Organic Molecule Analyzer (MOMA)
- Search coils on Beam Plasma Interaction Experiment (BeamPIE)
- Search coils on Space Measurement of A Rocket-release Turbulence (SMART) mission
- Thermal Infrared Sensor-2 (TIRS-2)

OPERATIONAL

- Linear Etalon Imaging Spectral Array (LEISA)
- Lunar Reconnaissance Orbiter (LRO) and Lunar Orbiter Laser Altimeter (LOLA)
- Magnetometers on Deep Space Climate Observatory (DSCOVR), Advanced Composition Explorer (ACE), Juno, Van Allen Probes, Voyager and Parker Solar Probe
- Mars Atmosphere and Volatile Evolution mission (MAVEN), Neutral Gas and Ion Mass Spectrometer (NGIMS), Magnetometer (MAG)
- Origins, Spectral Interpretation, Resource Identification, Security-Regolith Explorer (OSIRIS-REx) and OSIRIS-REx Visible and Infrared Spectrometer (OVIRS)
- Sample Analysis at Mars (SAM)
- Search coils on U.S. Air Force Demonstration and Science Experiments (DSX)
- Thermal Infrared Sensor (TIRS)

SPACE COMMUNICATIONS AND NAVIGATION

esc.gsfc.nasa.gov

Space communications and navigation enable NASA's mission for exploration and science. Together, the two capabilities empower astronauts and spacecraft to reach their destinations and establish the critical connection needed to communicate valuable data back to Earth.

Goddard manages the operations of space communications networks, supporting missions up to a million miles from Earth. These networks collectively transmit and receive 98% of NASA's data through a series of space and ground assets around the world. This support plays a critical role in NASA's human exploration initiative, providing services to the International Space Station, all visiting vehicles, Commercial Crew Program and more.

Goddard also innovates through cutting-edge research to advance communications, navigation and search and rescue technologies in support of NASA and other partners, such as other government agencies and countries.

Missions & Instruments

IN DEVELOPMENT

- Integrated LCRD LEO User Modem and Amplifier Terminal (ILLUMA-T)
- Laser Communications Relay Demonstration (LCRD)
- Orion Artemis II Optical Communications System (O2O)

OPERATIONAL

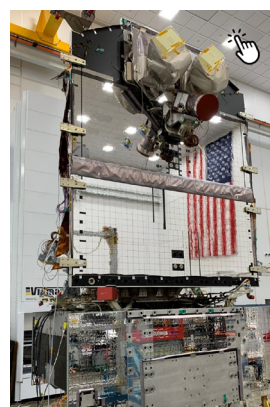
- Tracking and Data Relay Satellite-3, 5-13 (TDRS-3, 5-13)



Budget: \$257.4M

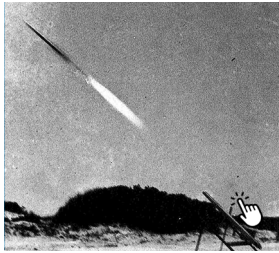
Goddard Budget Percentage: 5.0%

- **Facilities:**
 - Greenbelt
 - Wallops
 - White Sands
- **3 Labs/Offices**



SUBORBITAL PROGRAMS AND RANGE SERVICES

nasa.gov/wallops



Budget: \$150.3M
Goddard Budget Percentage: 2.9%

- **Facilities:**
 - Columbia Scientific Balloon Facility
 - Wallops
 - White Sands
- 4 NASA Aircraft
- 1,100+ Staff



Thanks to NASA's Wallops Flight Facility, Goddard provides agile, low-cost flight and launch range services for meeting government and commercial sector needs for accessing flight regimes, from Earth's surface to the Moon and beyond. Assets range from research aircraft, unmanned aerial systems, high-altitude balloons, and suborbital and orbital rockets.

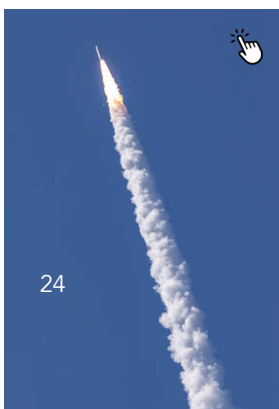
Missions & Instruments

IN DEVELOPMENT

- International Space Station cargo resupply missions (2)
- National Reconnaissance Office launch
- Rocket Lab's first flight from Wallops
- Scientific balloon missions (23)
- Sounding rocket missions (23)

OPERATIONAL

- Commercial cargo resupply missions for the International Space Station (3)
- Commercial Crew Program airdrop deployment tests
- Investigation of Microphysics and Precipitation for Atlantic Coast-Threatening Snowstorms (IMPACTS)
- National Reconnaissance Office L-129 Minotaur IV launch
- Perseverance rover cargo mission
- Scientific balloons (SuperTIGER, BLAST, TRAVALB)
- Small satellite program management and development
- Sounding rockets (DUST 1 and 2, SUBTEC 8, FORTIS, CHI, PolarNOx)
- Tracking and telemetry support for Commercial Crew launches

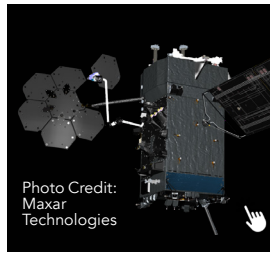


ORBITAL SERVICING AND ASSEMBLY

nexis.gsfc.nasa.gov

Goddard is pioneering in-orbit servicing, assembly and manufacturing capabilities to enable exploration and science missions, from extending the life spans of satellites via refueling and repair, to assembling massive life-seeking telescopes in space, to upgrading and augmenting observatories via cooperative, modular interfaces.

The center is collaborating with and transferring these technologies to civil, security and commercial stakeholders to usher in a new era of more sustainable, affordable and resilient spaceflight and jump-start new U.S. industries.

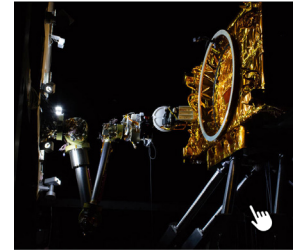
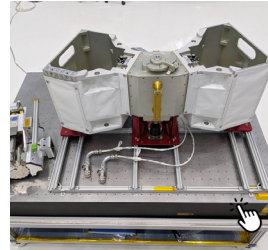


Cross-Cutting Technologies and Capabilities

Budget: \$318.4M

Goddard Budget Percentage: 6.2%

- **Facility:**
- **Greenbelt**



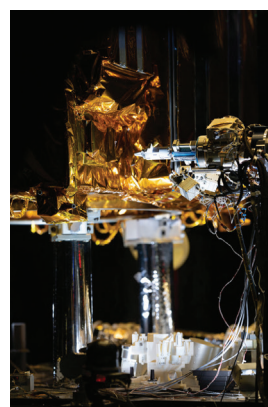
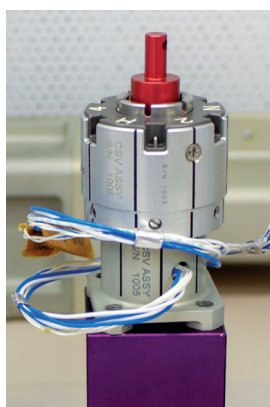
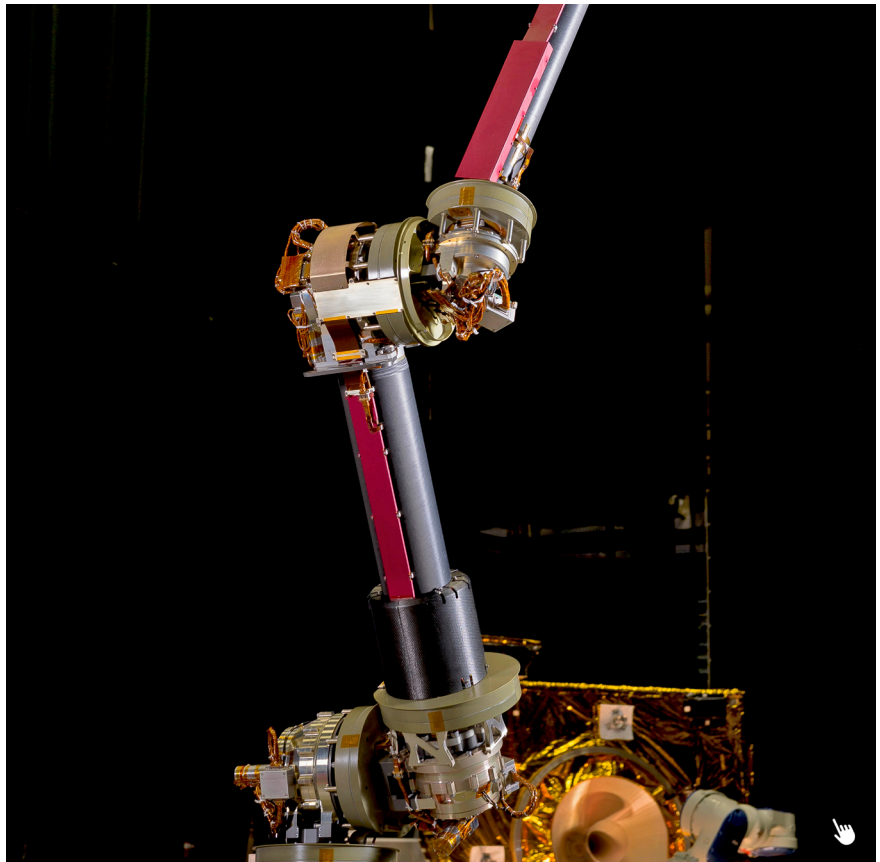
Missions & Instruments

IN DEVELOPMENT

- On-orbit Servicing, Assembly, and Manufacturing 1 (OSAM-1) mission

OPERATIONAL

- Raven
- Robotic External Leak Locator (RELL)
- Robotic Refueling Mission 3 (RRM3)
- Robotic Tool Stowage (RiTS)



WHY IT MATTERS



A PLACE FOR SERVICE

Our talented people, driven by passion toward a common and worthy purpose, have made possible countless improvements to our knowledge and way of life. We safeguard the long-term public trust by cultivating our workforce, ensuring a safe and sustainable workplace, effectively meeting our mission commitments and applying our scientific breakthroughs to stimulate economic growth, foster education, inspire the nation and impact the world. All of this is accomplished through a broad spectrum of institutional support efforts, including:

- Legal
- Procurement
- Information technology
- Financial management
- Human capital management
- Equal opportunity programs
- Diversity and inclusion
- Conflict management
- Protective services
- Logistics
- Environmental and medical management
- Facilities management and transportation
- Knowledge and information management
- Government and community relations
- Proposal development
- Education and public outreach
- Public communication

PUBLIC COMMUNICATION

**Click on an image to view original post.*

The commitment by the Goddard Office of Communications to public engagement and communications ensures that the public—our most important stakeholder—remains informed and engaged in our missions and projects. The visitor centers on the Greenbelt and Wallops campuses, tours, and public engagement events provide an opportunity to directly engage with our work.

Multimedia resources give external news organizations and others access to Goddard’s activities and subject matters experts, further allowing us to communicate our work to the masses. These include TV media outreach campaigns, including several we supported on behalf of the entire agency in 2020, such as those covering the launch of the Mars 2020 Perseverance rover and Demo-2, the first commercial launch of astronauts from U.S. soil.

Since the advent of social media about 15 years ago, Goddard has been at the forefront of developing these platforms into a major component of NASA’s communications efforts. Goddard-based teams operate or contribute to about 100 official NASA social

media accounts. Goddard is a major leader for the agency’s flagship social media accounts for science:

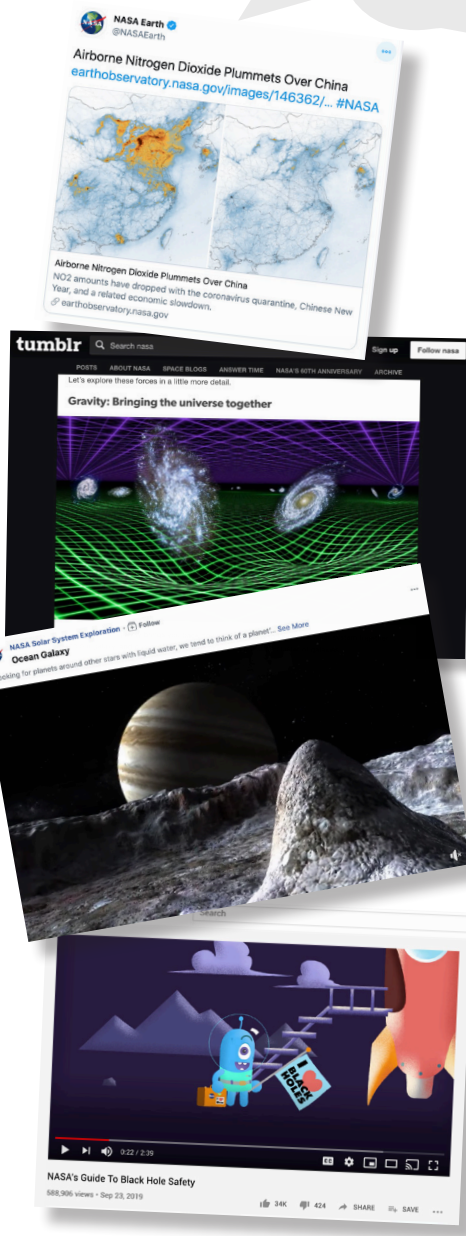
- @NASAEarth**
- @NASASun**
- @NASAMoon**
- @NASASolarSystem**
- @NASAUniverse**

New NASA Spanish-language social media accounts, largely managed by Goddard-based staff, have joined the agency portfolio. Our center is home to about a half-dozen of the agency’s top 20 accounts, measured in followers, including:

No. 4:
@NASAEarth on Facebook
(10.6 million)

No. 5
@NASAHubble on Twitter
(6.7 million)

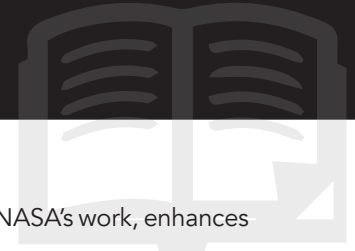
Goddard’s flagship accounts on [Instagram](#), [Facebook](#), [Twitter](#) and [YouTube](#) each have upwards of 600,000 followers, with Instagram leading the pack at 2.5 million—the highest of any of the centers. Goddard YouTube videos have been viewed more than 228 million times, second in the agency only to @NASA.



SOCIAL MEDIA FOLLOWERS

- 1.2+ MILLION**
- 2.5+ MILLION**
- 682,000+**
- 764,000+**

STEM ENGAGEMENT



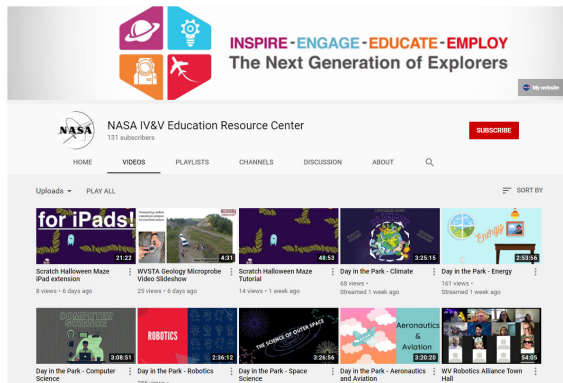
The [Goddard Office of STEM Engagement](#) immerses students and educators at all levels of NASA's work, enhances STEM literacy and inspires the next generation to explore.



Thirty-one students from 15 minority-serving community colleges in five states participated in the NASA Community College Aerospace Scholars program (NCAS) in March 2020 at Wallops Flight Facility. NCAS engages students in NASA's missions and provides connections to STEM degrees and careers.



The NASA Space Science Education Consortium's STEAM Innovation Lab held an open house at Goddard's Greenbelt campus to highlight the educational technologies that are developed in the lab, such as virtual reality, 3D printing and mobile sensors. These events enable the lab to expand its reach to local and national audiences.



The Katherine Johnson Independent Verification & Validation Facility Educator Resource Center turned challenges posed by the COVID-19 pandemic into opportunities by live-streaming workshops and events and recording them for a new YouTube channel.



Student Experiential Learning Opportunities provided rich experiences—such as hands-on STEM activities, NASA's engineering design process exercises and career exploration—to students from elementary school through college.



Goddard reliability engineer Orson John, a member of the Navajo Nation, represented NASA's Office of STEM Engagement at the American Indian Science and Engineering Society's (AISES) 2020 virtual national conference.

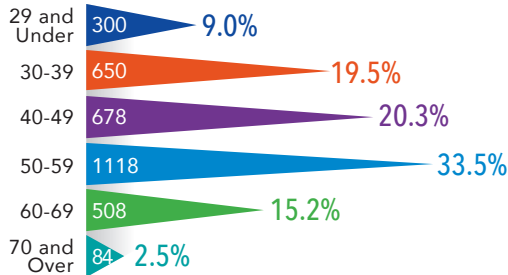
AISES is a national, nonprofit organization focused on substantially increasing the representation of American Indians, Alaska Natives, Native Hawaiians, Pacific Islanders, First Nations and other indigenous groups of North America in science, technology, engineering and math and related careers.

OUR PEOPLE

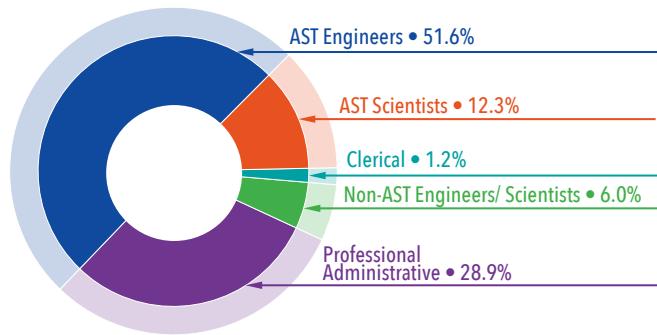


State of the Workforce 2020

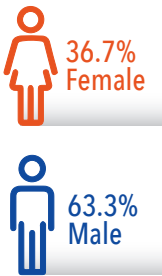
GODDARD CIVIL SERVANTS by Age Group



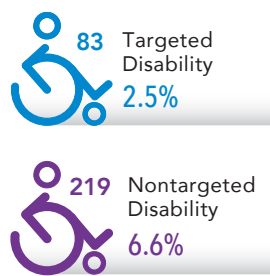
GODDARD CIVIL SERVANTS by Skill Mix



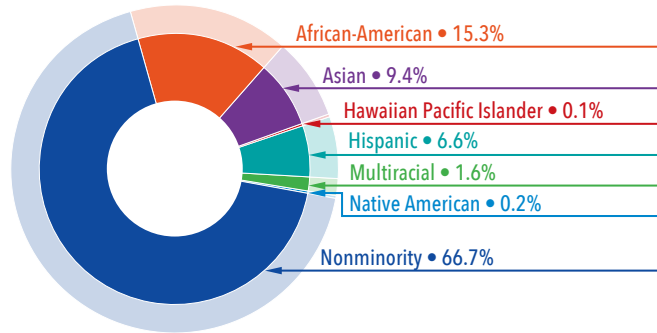
GODDARD CIVIL SERVANTS by Gender



GODDARD CIVIL SERVANTS by Disability



GODDARD CIVIL SERVANTS by Ethnicity



NASA's Goddard Space Flight strives to enable a culture of inclusion in which all employees feel welcome, respected, connected and engaged in alignment with NASA's Unity Campaign and its latest core value of inclusion. Diversity, inclusion and equal opportunity are vital to the center's mission, unlocking innovation, collaboration and creativity along the path to mission success.

Ten advisory committees—representing and inclusive of employees from all backgrounds—provide benefits for both employees and the center, such as creating safe spaces to build connections, welcoming new employees and interns, promoting recruitment and retention efforts, enabling engagement, and fostering an inclusive work environment.



BUDGET



Goddard Program Year 2020 Budget Categorized by Lines of Business (as of Sept. 30, 2020)

BUDGET: \$5.1B

DIRECT GODDARD BUDGET: \$4.1B

REIMBURSABLE GODDARD BUDGET: \$1.0B

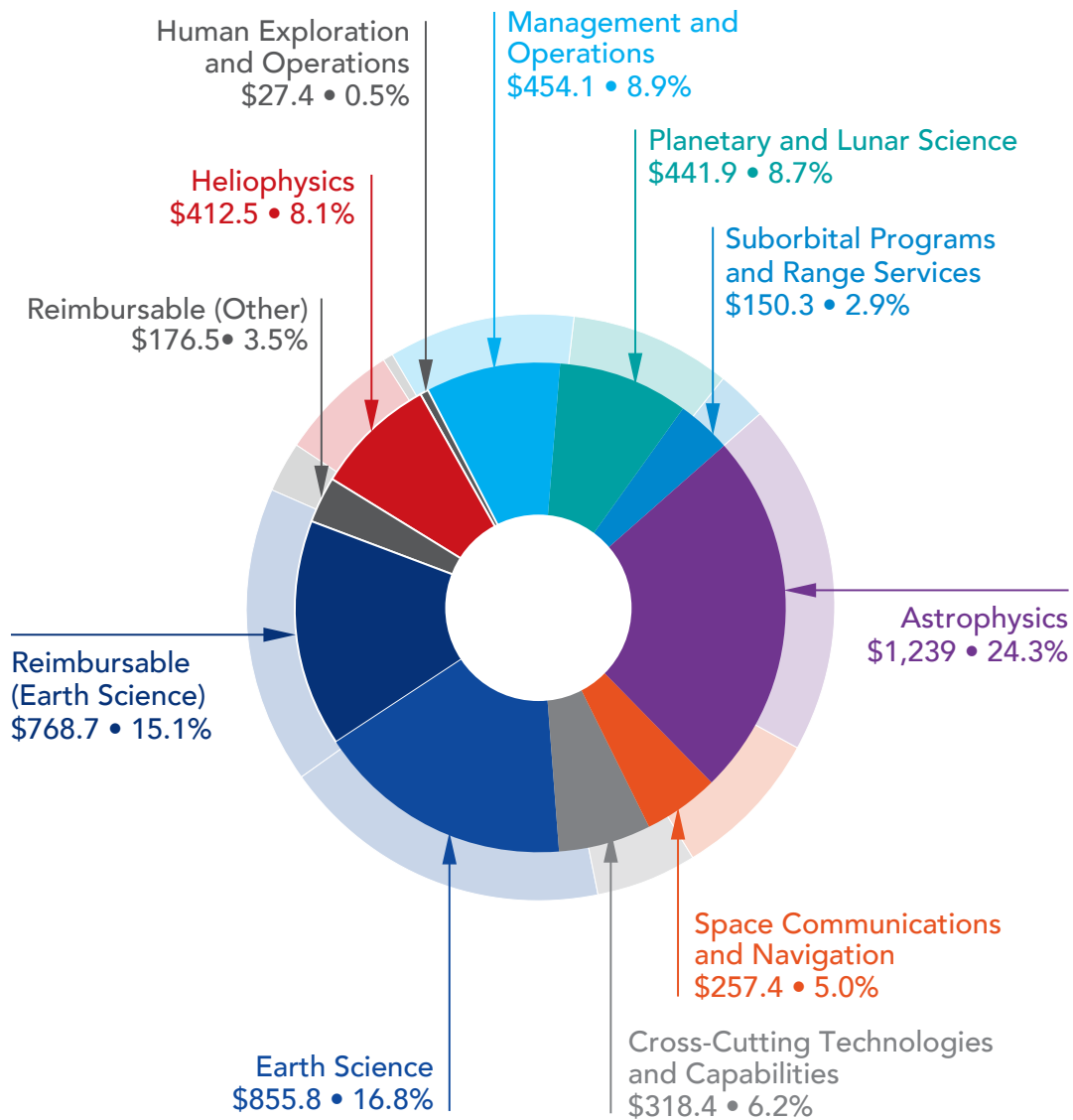


CHART IS IN \$Ms

ECONOMIC IMPACT



Goddard's success in enabling NASA missions and applying these scientific achievements to society is evident. Each of Goddard's six locations supports the center's ability to stimulate and strengthen economic activity by:

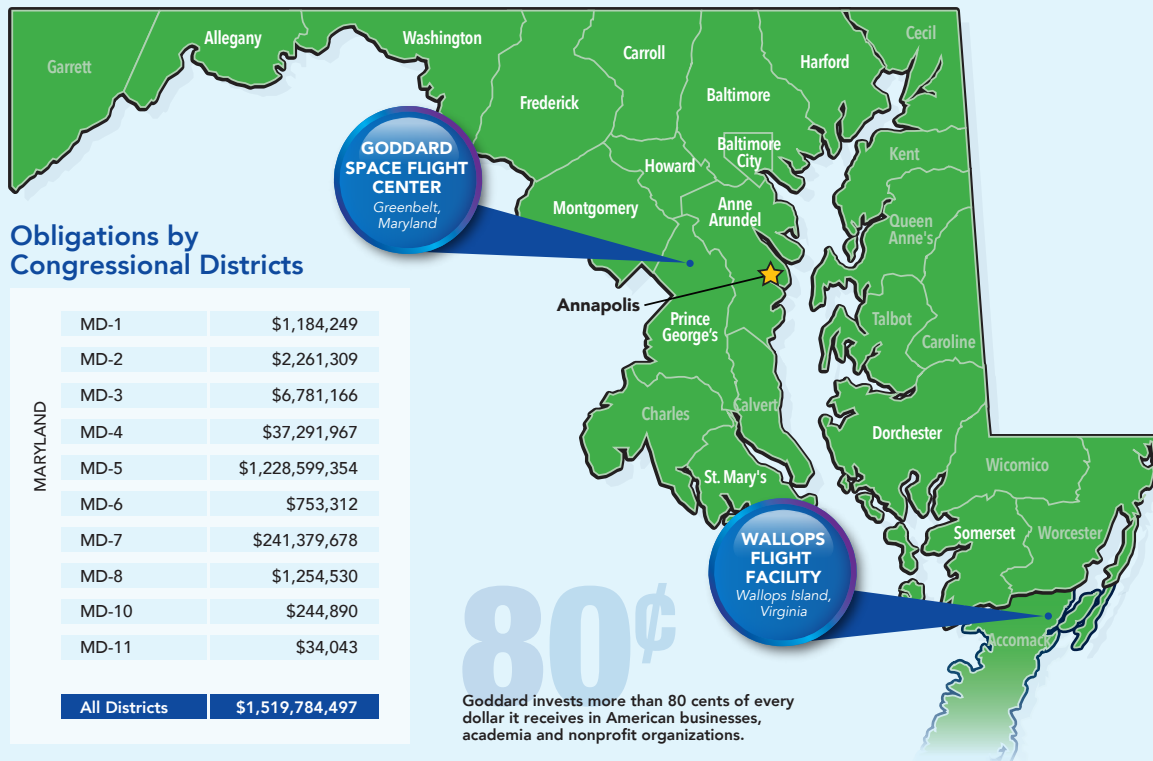
- Expending goods and services to perform its mission.
- Generating technology transfer and spinoff activities.
- Broadening small business opportunities through its robust contracting program.

Obligations by State

| | |
|----------------------|-----------------|
| District of Columbia | \$11,966,350 |
| Delaware | \$1,232,688 |
| Maryland | \$1,519,784,497 |
| New Jersey | \$16,055,294 |
| New York | \$110,777,010 |
| Pennsylvania | \$12,828,004 |
| Virginia | \$300,462,892 |
| West Virginia | \$43,628,261 |

Obligations by Maryland County

| | | | |
|------------------------------|---------------|-----------------|-----------------|
| Anne Arundel | \$2,355,549 | Harford | \$95,455 |
| Baltimore | \$12,136,708 | Howard | \$10,132,258 |
| Baltimore City | \$225,905,855 | Montgomery | \$2,004,916 |
| Carroll | \$497,465 | Prince George's | \$1,265,947,384 |
| Charles | \$16,081 | St. Mary's | -\$10,221 |
| Dorchester | \$645,284 | Somerset | \$27,500 |
| Frederick | \$900 | Washington | \$29,362 |
| Total \$1,519,784,496 | | | |



Obligations by Congressional Districts

| | |
|----------------------|------------------------|
| MD-1 | \$1,184,249 |
| MD-2 | \$2,261,309 |
| MD-3 | \$6,781,166 |
| MD-4 | \$37,291,967 |
| MD-5 | \$1,228,599,354 |
| MD-6 | \$753,312 |
| MD-7 | \$241,379,678 |
| MD-8 | \$1,254,530 |
| MD-10 | \$244,890 |
| MD-11 | \$34,043 |
| All Districts | \$1,519,784,497 |

Goddard's Top Contractors

| | | | |
|---|-----------|---|-----------|
| 1. Northrop Grumman Systems Corporation | \$226.6 M | 6. KBRwyle Technology Solutions, LLC | \$155.8 M |
| 2. Science Systems and Applications, Inc. | \$224.4 M | 7. Peraton Inc. | \$154.5 M |
| 3. Association of Universities for Research in Astronomy Incorporated | \$207.3 M | 8. Orbital Sciences Corporation | \$143.5 M |
| 4. Lockheed Martin Corporation | \$194.0 M | 9. ATA Aerospace, LLC | \$142.1 M |
| 5. Science Applications International Corporation | \$156.1 M | 10. Ball Aerospace & Technologies Corporation | \$97.9 M |

All numbers are based on NASA Procurement Data View and Federal Procurement Data System obligation data for fiscal 2020 as of Oct. 13, 2020. Obligated funds, both Goddard and NASA Shared Services Center.

AWARDS



AIAA
SHAPING THE FUTURE OF AEROSPACE

American Institute of
Aeronautics and Astronautics

*Small Satellite
Mission of the Year*
Vanderlei Martins



PennState
College of Agricultural Sciences

The Pennsylvania State
University College of
Agricultural Sciences

Outstanding Alumni Award
James Irons



AMS
American Meteorological Society

American Meteorological
Society


Editor Award
Jackson Tan

Special Award
OMI International Team



Clarivate[™]
Clarivate Analytics

Highly Cited Researchers
Greg Faluvegi
Joanna Joiner
Jeff Masek
Doug Morton
Benjamin Poulter
Matthew Rodell
Cynthia Rosenzweig
Alex Ruane




AGU ADVANCING
EARTH AND
SPACE SCIENCE

American Geophysical
Union

Carl Sagan Lecture
Compton Tucker

Editors Citation for Excellence
Jie Gong



ADASS
conference series

Astronomical Data Analysis
Software and Systems

ADASS Prize
Bill Pence



**PARTNERSHIP
FOR PUBLIC SERVICE**

Partnership for
Public Service

*Samuel J. Heyman Service
to America Medal
(Career Achievement)*
Claire Parkinson (finalist)



AAS
AMERICAN
ASTRONOMICAL
SOCIETY

American Astronomical
Society

Fellows
Alice Harding
Sangeeta Malhotra
Maxim Markevitch
John Mather
Bill Pence
Tod Strohmayer
Jean Hebb Swank
Kimberly Weaver



Université
de Lille

International APOLO
Project/University of Lille


Arago Award
Michael Mishchenko



SASE
SOCIETY OF ASIAN SCIENTISTS & ENGINEERS

Society of Asian Scientists
and Engineers

*Engineer/Scientist of the Year
(Government)*
Gordon Chin



National Oceanic and
Atmospheric Administration


Bronze Medal
Edward Kim



EGU

European Geophysical Union


*Outstanding Early
Career Scientist*
Lauri Holappa



USGS
science for a changing world

United States Geological
Survey

William T. Pecora Award
Terra Team



APS
physics

American Physical Society

Fellow
Rita Sambruna

IN MEMORIAM



As we celebrate our collective achievements, we also honor all of those who have contributed to Goddard and are no longer with us.

Your dedication and talent will never be forgotten.

Active civil servants who passed away from October 2019 through September 2020 include:

KENNETH DEARTH
DAVID HARDISON
RONALD JOHNSON
MICHAEL MISHCHENKO
JEANNINE SHIRLEY
MICHAEL TALLEY
J. SCOTT WEBB
JOSEF WONSEVER

‡Contractors, former civil servants and others whose reported passing occurred from October 2019 through September 2020 include:

| | |
|--------------------------|------------------------|
| BARBARA ALLEN | CHARLES P. MADISON |
| STUART ALLEN | CHARLES H. MARCUS |
| SHARON D. ARNESON | KEVIN MCDONNELL |
| ORMAN O. BLOXOM | JAMES A. MULLINS |
| NANCY E. BOGGESS | JOHN J. OVER JR. |
| WALT BRADLEY | WILLIAM M. PEACOCK JR. |
| LEROY BROWN JR. | BRUCE R. PINCUS |
| MICHAEL A. BUNDICK | ROGER B. RATLIFF |
| EMMETT W. CHAPPELLE | JACOB S. ROSENBERG |
| JOHN CHITWOOD | BRUNO SEPPI |
| JAMES L. COOLEY | RALPH B. SHAPIRO |
| DONNELL CURTIS | GEORGE B. SMITH |
| RICHARD A. GOLDBERG | NEDRA SMITH |
| LAVERNE F. HALL | MARK STOKRP |
| CAROLYN C. JONES | MARVIN SWARTZ |
| PAUL KARPISCAK | CLARENCE L. WADE JR. |
| WILLIAM FRANKLIN LAU JR. | RONALD WALLACE |
| MICHAEL LAURENTE | GREGORY T. WARNER |

‡NASA does not have access to this information for former civil servants, contractors and other affiliated with Goddard. The report authors have been informally notified of some individuals. An earnest attempt was made to manually collect this information. However, the nature of the process could result in an incomplete list.

"JUST REMEMBER,
WHEN YOU THINK
ALL IS LOST,
THE FUTURE
REMAINS."

-Dr. Robert H. Goddard



For more information, please visit our website:
www.nasa.gov/goddard

NP-2020-10-617-GSFC

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