Updated February 2013

400 FLIGHT PROJECTS DIRECTORATE (FPD)

Responsible for overall management and implementation of GSFC flight projects including contracts management, technical and business management, mission design, fabrication, integration, test, qualification, readiness review management, launch operations, and orbital operations. The assignment is consistent with NASA Interim Directive for NPR 7120.5D NID, entitled "NASA Space Flight Program and Project Management Requirements."

The Directorate manages the implementation, maintenance, and operations of end-to-end space architectures, including mission operations and tracking and data acquisition services for missions supported by GSFC.

The Directorate assures that a strong and consistent program and project management approach is implemented on all projects including the establishment of overall requirements, design reviews, systems analysis, appropriate pre-launch test programs and science data delivery from operational systems.

The Directorate also provides Agency-wide management of areas of technology development for Earth orbiting space missions, and for Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs.

401 ADVANCED CONCEPTS AND FORMULATION OFFICE (ACFO)

The ACFO provides the project management expertise and leadership for the center's mission proposal and pre-formulation study teams. As such, the ACFO facilitates the identification and assignment of the project management members of each proposal and pre-formulation study team. In addition, the ACFO is responsible for establishing and providing the guidance and tools necessary to ensure the quality of the management plans for new missions as well as ensuring the readiness of selected missions for the implementation phase. This includes not only the technical feasibility and concept but also the congruence of the technical aspects with the cost and schedule aspects. The ACFO is responsible for the oversight and reporting of all projects in pre-formulation, and coordinates the Monthly Status Reviews for these activities.

401.1 RAPID SPACECRAFT DEVELOPMENT PROJECT OFFICE (RSDO)

The RSDO is responsible for the management and direction of a dynamic and versatile program directing the definition, competition, and acquisition of multiple fixed price Indefinite Delivery/Indefinite Quantity (IDIQ) contracts for acquisition of spacecraft buses, satellite integration and test, and spaceflight components. These contracts offer NASA and any other United States Government Agency extremely efficient procurement vehicles.

401.2 PROJECT MANAGEMENT EXCELLENCE AND INNOVATION OFFICE PME&IO

The mission of the Project Management Excellence and Innovation Office is to improve performance on NASA programs and projects by leading earned value management policy and implementation; developing and delivering foundational training to the agency workforce in project budgeting, scheduling, earned value management, and risk analysis; managing the annual PM Challenge to promote knowledge sharing among NASA stakeholders; coaching future project management teams in project planning and control concepts and processes; and providing project cost and schedule assessment support to agency review teams.

403 FLIGHT PROJECTS DIRECTORATE (FPD) BUSINESS MANAGEMENT OFFICE

The FPD Business Management Office plans and directs the development, implementation, and administration of business management for the Flight Projects Directorate (Code 400), the Associate Director's office (Code 100) and the New Opportunities office (Code 101). The FPD Business Management Office is responsible for: implementing program and institutional operating plans; budget development and execution for Code 403 and Code 100 resources; workforce utilization, logistics management; determining and planning housing requirements; travel management; health and safety issues; small minority business profiles; facilitating the Project Management Development Emprise (PMDE) Program; and a variety of other functions which ensures operational effectiveness of the organization. In addition, the FPD Business Management Office provides expert advice and analysis to the Director of and his immediate staff, and other project organization managers.

405 RESOURCE ANALYSIS OFFICE (RAO)

The Resource Analysis Office (RAO) will provide authoritative, independent cost and schedule assessments in support of the Center Director, the New Business Committee, the Flight Projects Directorate, and the Center Management Council (CMC). The office establishes and maintains appropriate databases and is

responsible for the collection, analyses and normalization of technical, programmatic, cost and workforce data for all GSFC's flight projects. RAO maintains records of Center performance in cost, schedule and workforce on all flight projects. The RAO develops automated cost, schedule, and workforce models that reflect the history of GSFC. Research is conducted to assure that its models are state of the art and reflect current trends at GSFC as well as the aerospace industry. Independent cost and schedule assessments are performed for all Center proposals, new start projects and others in the formulation and implementation phases. The independent assessments are presented to key stakeholders as authoritative predictions of cost, schedule, workforce, and resources necessary to ensure mission success.

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407 EARTH SCIENCE TECHNOLOGY OFFICE (ESTO)

The Earth Science Technology Office (ESTO) has the responsibility for integrating Earth Science technology development programs into a single comprehensive program, to effectively address Earth Systems science questions and to help stimulate new technology driven science programs necessary to meet future Earth Science goals.

ESTO develops investment strategies and roadmaps for Earth Science technology programs and provides oversight and management of focused technology development programs in advanced information systems, advanced instruments and component (sensor and detector) technologies. It maintains planning tools to manage technology requirements and development activities and coordinates its activities with NASA Headquarters, participating centers, academia, industry and other relevant technology program developers.

408 SPACE SERVICING CAPABILITIES OFFICE (SSCO)

The Space Servicing Capabilities Office (SSCO) is responsible for the overall management, coordination, and implementation of robotic technology and satellite service development in support of NASA Space Operations Mission Directorate (SOMD). The objective of the SSCO is to develop and/or coordinate the technologies required to execute in-space servicing of existing and future observatory-class scientific spacecraft, to assess robotic approaches to service space systems and to expand NASA understanding of servicing capabilities. The

SSCO will meet these objectives by conducting studies, fostering service technology development, conducting demonstration experiments and managing satellite servicing missions.

410 GOES-R PROGRAM OFFICE

The Geostationary Operational Environmental Satellite (GOES) – "R" Series Program is responsible for the management, coordination and implementation of NOAA's next-generation geostationary satellite constellation. The GOES-R Program includes the Program Control Office, Program Systems Engineering, Program Contracts Office, Program Science Office, Program Mission Assurance and the Program General Counsel. The GOES-R Program is supported by the GOES-R Ground Segment Project and the GOES-R Flight Project. The first launch of the GOES-R series is scheduled for 2015, and the last launch of the expected 4 satellite series is planned in 2025.

416 GOES-R GROUND SEGMENT PROJECT OFFICE

The GOES-R Ground Segment Project (GSP works in support of the GOES-R program, and is responsible for the GOES-R ground segment acquisition, implementation and transition to operations. This includes all aspects of satellite command and control, and collection, generation and distribution of key performance parameters (KPP) and operational products. These responsibilities are carried out by a team of government, industry and academic institutions. The GSP includes development of product algorithms, scientific product code, product generation and distribution systems, mission management, antennae, telecommunications and facility infrastructure. It also includes the transition of these assets into operations. The Ground segment will operate two operational geostationary satellites, plus one in storage on orbit. These are operated from the Wallops Command and Data Acquisition Station (WCDAS) in Wallops, VA and NOAA's Satellite Operations Facility (NSOF) in Suitland, MD. A remote back-up located in Fairmont, WV ensures continuous operations of critical functionality in the event of an outage at the primary facility.

417 GOES-R FLIGHT PROJECT OFFICE

The GOES-R Flight Project, works in support of the GOES-R Program, and is responsible for the development of the GOES-R series of spacecraft and instruments, including design, development, integration and test, launch, and post-launch planning. These responsibilities are carried out by a team of NASA, NOAA, industry, and academic institutions. The GOES-R flight segment is composed of a spacecraft (satellite bus) along with a suite of advanced environmental and solar observing instruments.

420 EARTH SCIENCE PROJECTS DIVISION (ESPD)

The Earth Science Projects Division (ESPD) provides leadership and guidance for the development and operation of missions under the Earth Systematic Missions and Reimbursable Projects Program Office, with projects at GSFC, Langley and JPL. The ESPD's specific responsibilities include: managing Earth observing missions at GSFC, providing a high-level science and customer interface; supporting the New Business process; supporting Center competition initiatives; supporting mission studies; providing leadership and advice to projects and missions; analyzing and recommending adjustments to budgets within overall ESPD guidelines; coordinating reporting to Center management, NASA Headquarters and NOAA; coordinating major internal and external reviews; providing administrative infrastructure support to missions and projects; and coordinating cross-cutting activities and initiatives. The Division is responsible for directing all efforts associated with mission formulation, instrument design and development; spacecraft design and development; ground system design and development, satellite integration and test; and mission operations through post launch testing and/or operation, and disposal.

421 POLAR OPERATIONAL ENVIRONMENTAL SATELLITE (POES) PROJECT

The POES Project is a reimbursable project funded by the National Oceanic Atmospheric Administration (NOAA). The POES Project procures, develops, supports the launch, and provides operational support of instruments for the European Meteorological Operations (MetOp) satellites. The POES Project supports anomaly investigation and flight software maintenance of the NOAA-15 through NOAA-19 on-orbit satellites developed by the POES Project and launched between 1998 and 2009. The NASA Search and Rescue Mission Office is hosted in the POES Project.

422 GLOBAL PRECIPITATION MEASUREMENT (GPM) PROJECT

The GPM mission consists of NASA assets operating in partnership with other earth-observing satellites and instruments to produce global precipitation science data. The GPM Core Observatory will serve as a reference standard to calibrate a constellation of research and operational microwave sensors aimed at providing uniformly calibrated precipitation measurements around the globe every 2-4 hours for scientific research and societal applications. The GPM Project is responsible for providing the GPM Core Observatory, GPM Microwave Imager (GMI) radiometer, Mission Operations Center for the Core Observatory, Ground Validation System, and Precipitation Processing System (PPS) operations. All other elements are provided through internal NASA or external partnerships.

423 EARTH SCIENCE DATA AND INFORMATION SYSTEMS (ESDIS) PROJECT

The ESDIS Project provides leadership and expertise in the management and stewardship of Earth Science data for NASA's scientific community and partners around the world. ESDIS seeks to improve the quality of science data services, processes, and delivery of data products to enable NASA's Earth science objectives of improving the understanding of our home planet. ESDIS preserves and protects its data assets as a national resource and seeks to effectively and efficiently implement and operate science data systems that ultimately assist NASA to answer fundamental questions about our Earth environment. ESDIS maintains a liaison with other Governmental agencies on matters that assist with the operational use of science data for prediction of potentially harmful conditions within the Earth environment.

425 ICE, CLOUD, LAND ELEVATION SATELLITE (ICESat-2) PROJECT

The ICESat-2 Project is responsible for the management, design, development, integration, test, launch, and on-orbit commissioning of the ICESat-2 mission. ICESat-2 is an earth observatory designed to: determine polar ice sheet mass balance; understand controlling mechanisms; examine how ice sheets will impact global sea level and ocean circulation in a changing climate. Measure sea-ice thickness to understand ice/ocean/atmosphere exchanges of energy, mass and moisture. Determine vegetation cover and global biomass.

427 LANDSAT DATA CONTINUITY MISSION (LDCM) PROJECT

The Landsat Data Continuity Mission (LDCM) Project is a national asset making important contributions to U.S. economic, environmental, and national security interests. The LDCM is to continue the acquisition, archival, and distribution of multi-spectral imagery affording global, synoptic, and repetitive coverage of the Earth's land surfaces at a scale where natural and human-induced changes can be detected, differentiated, characterized, and monitored over time.

428 EARTH SCIENCE MISSION OPERATIONS (ESMO) PROJECT

The Earth Science Mission Operations (ESMO) Project is responsible for managing and administering and mission operations and data analysis phases of many of GSFC's Earth science missions. Mission operations and the safe maintenance of these spacecraft and their flight systems is the primary objective of ESMO. All flight and ground software and ground system facilities and spacecraft operations control centers will be maintained by the Project.

429 NPOESS PREPARATORY PROJECT (NPP)

The NPOESS Preparatory Project (NPP) is responsible for management of NASA's portion in the interagency NPP mission. It directs all efforts associated with spacecraft development; the Advanced Technology Microwave Sounder (ATMS) and Clouds and the Earth's Radiant Energy System (CERES) instrument development; mission systems engineering, integration, and test; launch services; and the Science Data Segment. It will also provide close coordination with the Joint Polar Satellite System (JPSS) program for mission integration of all JPSS-provided instruments and ground system components. NPP provides NASA with continuation of global change observations after the EOS Terra and Aqua Missions, prior to deployment of the JPSS, previously called the National Polar Orbiting Environmental Satellite System (NPOESS), to be developed by NASA and NOAA. NPP provides JPSS with a risk reduction demonstration and validation for three of the four critical JPSS instruments and related ground systems elements.

430 PLANETARY SCIENCE PROJECTS DIVISION (PSD)

The Planetary Science Projects Division (PSD) is the designated program management office for flight, ground, and science performed at GSFC as part of the overall Planetary Science Program sponsored by the NASA Science Mission Directorate. Specific responsibilities include: providing a high-level science and customer interface; supporting the New Business process; supporting Center competition initiatives; supporting mission studies; providing leadership and advise to projects and missions; coordinating reporting to Center management and NASA Headquarters; coordinating major internal and external reviews; providing administrative infrastructure support to mission and projects; and coordinating cross-cutting activities and initiatives.

432 MARS ATMOSPHERE AND VOLATILE EVOLUTION (MAVEN)

The MAVEN Project is responsible for the design, manufacture, integration and test, launch, and mission and science operations of a spacecraft mission to Mars that will answer definitive questions about the climate history of Mars. MAVEN will launch in November 2013, carrying eight scientific instruments; arrive at Mars in September 2014; and obtain detailed measurements of Mars' upper atmosphere, ionosphere, planetary corona, solar wind, solar extreme ultra-violet and solar energetic particles over a 1-year period. MAVEN will perform 5 "deep-dip campaigns" to altitudes near 125km during its 1-year mission, capturing previously unobtainable science measurements. MAVEN will comprehensively address key science objectives for upper atmosphere, solar-wind interaction, and escape to space, as defined by the Mars Exploration Program Analysis Group (MEPAG, 2006) and the National Research Council (NRC, 2003). NASA

Headquarters selected MAVEN to be the next Mars Scout under the 2006 Announcement of Opportunity (AO) NNH06ZDA002O dated May 1, 2006. MAVEN is a Principal-Investigator-mode mission led by Dr. Bruce Jakosky of the University of Colorado at Boulder, Laboratory for Atmospheric Physics (LASP). MAVEN partners include LASP; the University of California, Berkeley's Space Science Laboratory; Lockheed Martin Space Systems Company; NASA's Jet Propulsion Laboratory and NASA's Goddard Space Flight Center.

433 ORIGINS SPECTRAL INTERPRETATION RESOURCES IDENTIFICATION SECURITY REGOLITH EXPLORER (OSIRIS-REX)

The OSIRIS-Rex Project is responsible for the design, manufacture, integration and test, and launch of a spacecraft mission to an asteroid. The project manages mission and science operations, and sample return activities. Data from OSIRIS-Rex will significantly enhance our understanding of the initial stages of planet formulation and the sources of organics that may have ultimately led to the origin of life on Earth. OSIRIS-Rex will launch in September 2016, arrive at asteroid 1999 RQ36 in December 2019, and return a sample to Earth in September 2023. OSIRIS-Rex will carry four scientific instruments and a student collaboration experiment to map the global properties, and measure the Yarkovsky effect in order to better understand the orbit of a potentially hazardous asteroid. The mission will also return to earth a sample of pristine carbonaceous asteroid regolith to analyze the chemistry and mineralogy of a carbonaceous asteroid to characterize its geologic and dynamic history.

This mission is in accordance with the NASA Solar System Exploration Roadmap (SSER, 2006) and the NRC New Frontiers in the Solar System (NFSS, 2003) document. NASA Headquarters selected OSIRIS-Rex as the New Frontiers-3 mission under the 2009 Announcement of Opportunity (AO) NNH09ZDA007O dated April 20, 2009. OSIRIS-Rex is a Principal Investigator mode mission led by Dr. Dante Lauretta of the University of Arizona Lunar and Planetary Laboratory (UA/LPL). OSIRIS-Rex partners include UA/LPL, NASA'a Goddard Space Flight Center, Lockheed Martin Space Systems Company, Arizona State University, KinetX, Canadian Space Agency, NASA's Johnson Space Center, NASA's Langley Research Center, NASA's Ames Research Center, and the Jet Propulsion Laboratory. The student collaboration instrument is being developed by the Massachusetts Institute of Technology, and the Harvard College Observatory.

440 ASTROPHYSICS PROJECTS DIVISION (APD)

The Astrophysics Project Division (APD) is responsible for the management of the Hubble Space Telescope (HST), International X-Ray Observatory (IXO),

Gamma-ray Large Area Space Telescope (GLAST), Laser Interferometer Space Antenna (LISA), International Dark Energy Cosmology Survey (IDECS), and other space science astronomical observatory missions. The objective of the APDO is to provide mankind with astronomical capabilities beyond the reach of ground-based telescopes and to fulfill the scientific and technological requirements within the lifetime of the observatories' missions. The APD provides project management for all associated mission development, mission and science operations, and HST servicing mission development and execution. Six project offices; HST Operations, Space Science Mission Operations (SSMO), IXO, GLAST, LISA, and IDECS provide management and direction.

441 HST OPERATIONS PROJECT

The HST Operations Project conducts Hubble Space Telescope (HST) operations and the maintenance and operation of the HST ground systems. The HST Operations Project will conduct all HST Observatory science operations, missions operations and the operations ground system for the life of the HST mission. Responsibilities include developing and maintaining ground systems facilities and all flight and ground software to support HST mission operations and HST servicing mission operations and HST servicing mission operations; operating the Space Telescope Operations Control Center (STOCC); and safely and productively operating the HST Observatory (scientific instruments); and overseeing the activities of the Space Telescope Science Institute (STScI) operated by the Association of Universities for Research in Astronomy (AURA) for NASA. STScI responsibilities include soliciting observation proposals, allocating telescope time, implementing observations, and creating processed data products.

443 JAMES WEBB SPACE TELESCOPE (JWST) PROJECT

The JWST Project is responsible for the management of the design, development, integration, test, launch, commissioning and operation of the JWST. JWST is a 6-m class infrared (IR) telescope that is being developed to study and answer fundamental astrophysical questions ranging from the formation and structure of the Universe to the origin of planetary systems and the origins of life. JWST will be used by international teams of astronomers to conduct imaging and spectroscopic observations in the wavelength range 0.6-27 µm. The Observatory will be located in an orbit near the second Lagrange point (L2), approximately 1.5 million km from Earth. The telescope and instruments will be cold (~30K) and shielded from the heat of the Sun by a large Sunshield. As a result of the low background, the Observatory will achieve unprecedented sensitivity over its entire wavelength range. A telescope with a segmented primary mirror will deliver IR light to the three main scientific instruments of the Observatory:

- A wide-field Near-Infrared Camera (NIRCam), providing wide-field medium and narrow-band imaging from a 0.6-5µ.
- A 0.6 to 5 µm wide-field multi-object Near-Infrared Spectrograph (NIRSpec)
- A Mid-Infrared Instrument (MIRI) that combines a mid-infrared imager and integral field spectrograph, for the wavelength range 5 to 27 µm.

In addition, the Fine Guidance Sensor (FGS), which provides fine pointing updates to the Observatory, will contain an optical channel that can be used for narrow-band imaging in the near infrared. The JWST international partners include the European Space Agency and the Canadian Space Agency.

444 SPACE SCIENCE MISSION OPERATIONS (SSMO) PROJECT

The SSMO Project is responsible for managing and administering the mission operations and data analysis phases of all satellites assigned to it in space science disciplines. SSMO is involved in the operations concept development, ground system development, integration and test, and operations readiness preparations for those missions it will manage in the operations phase. Mission operations encompass spacecraft flight operations and science operations and maintaining the safe and productive operations of these spacecraft and their flight systems. All flight and ground software and ground system facilities and spacecraft operations control centers will be maintained by the Project. The Project oversees the science programs and activities of the various Principle Investigators and Guest Observers associated with each spacecraft to ensure the proper solicitation of observation and experiment proposals, allocation of spacecraft and science instrument time, implementation of observations and experiments, and the creation of processed data products.

445 INTERNATIONAL X-RAY OBSERVATORY (IXO) PROJECT

The IXO Project is responsible for the management, design, development, integration, test, launch, and on-orbit commissioning of the IXO mission. IXO is a space observatory that provides high throughput broadband X-ray spectroscopy for exploration of black holes, dark matter and dark energy, and cycles of matter and energy. NASA intends to enter a partnership agreement with the European Space Agency for the development of the IXO.

446 GAMMA-RAY LARGE AREA SPACE TELESCOPE (GLAST) PROJECT

The GLAST Project manages the procurement, development, integration, test, launch, and initial checkout of the GLAST Observatory. The Observatory includes

the GLAST science instruments and spacecraft. The GLAST Project also manages the procurement, development integration, test, initial checkout, and staffing of all ground system elements including a Mission Operations Center, Instrument Operations Centers, Science Support Center, and ground stations. The project is responsible for working with domestic and international partners in ensuring the scientific integrity of the resultant GLAST data as well as ensuring the development of systems for the distribution of that data to the scientific community.

447 LASER INTERFEROMETER SPACE ANTENNA (LISA) PROJECT

The LISA Project is responsible for the management of design, development, integration, test, launch, commissioning and operation of the LISA mission. The mission includes a constellation of 3 spacecraft flying in an equilateral triangular formation with 5x106 km arms. The constellation will "trail" the earth by 20 degrees with the center of the triangle on the ecliptic, and approximately 1 Astronomical Unit from the Sun. The constellation will maintain this triangular configuration throughout the mission. LISA is a highly integrated Project amongst 3 primary partners GSFC, JPL, and ESA. LISA will rely on a technology demonstration flight, called LISA Path Finder for proof-of-concept and technology maturation to Technology Readiness Levels (TRLs) acceptable to implementation of the mission. Responsibilities are divided amongst the partners roughly as follows: GSFC has responsibility for overall Project Management, Project Science, Mission Systems Engineering, with equal representation from ESA and JPL, and the spacecraft bus, the JPL has the Mission Science, LISA Instrument Metrology and Avionics System and mission operations responsibility, and the ESA has primary responsibility for LISA Optical Core System and propulsion module.

448 IDECS INTERNATIONAL DARK ENERGY COSMOLOGY SURVEY (IDECS) PROJECT

The IDECS Project is a medium class strategic mission that will significantly advance dark energy research. IDECS will perform precision studies of the history of the expansion of the universe, shedding light on the nature of dark energy. IDECS will probe dark energy through astrophysical observations that enable the measurement of expansion that is essential to progress in the understanding of these theories. The goal of the IDECS is to provide a factor of ten increase over the current accuracy of key dark energy parameters. Wide field optical and near infrared surveys required for dark energy studies will create science data sets useful for other astrophysics studies. IDECS capabilities in the near infrared could strengthen dark energy constraints by studying supernovae and weak lensing of galaxies. For measuring baryon acoustic oscillations, IDECS will be capable of sky surveys. For the IDECS mission, NASA is formulating

potential partnership agreements with the Department of Energy and the European Space Agency.

450 EXPLORATION & SPACE COMMUNICATIONS (ESC) PROJECTS DIVISION

The Exploration & Space Communications (ESC) Projects Division is a division within the Flight Projects Directorate. The ESC Division is responsible for the management, development, implementation and operation of communications and navigation related to flight and ground systems. The ESC Projects support NASA's Science Mission Directorate as well as Human Exploration and Operations Mission Directorate, and the Office of the Chief Technologist. These projects support advanced scientific and human exploration missions through the application of enabling communication and navigation capabilities.

450.1 NETWORK INTEGRATION MANAGEMENT OFFICE (NIMO)

The Network Integration Management Office (NIMO) provides its spacecraft and scientific customers with a complement of mission services. The group provides best value tracking and data acquisition options, assistance with mission-unique communications requirements, and assistance in requirements definition. The NIMO provides Principal Investigators and Mission Formulation Managers with options and planning assistance to effectively meet the mission tracking and data acquisition (T&DA) needs. The NIMO also supports the mission throughout the life cycle for its T&DA needs - from trade studies and cost analysis during the formulation phase, to project management during development and operations. In addition, the NIMO provides Mission Integration Managers with the ability to secure contract vehicles and services to implement and operate their mission most effectively.

450.2 LUNAR LASER COMMUNICATIONS DEMONSTRATION (LLCD) OFFICE

The Lunar Laser Communications Demonstration (LLCD) Office has the responsibility to manage the LLCD mission flight and ground systems. Optical communication technology enables new capability for data-intensive instrument and high-precision laser ranging on small spacecraft, including destinations beyond Earth's orbit. The primary objective of the LLCD mission will be to demonstrate a high data rate between the Earth and the LADEE spacecraft in lunar orbit using a reliable optical terminal that places minimal resource burden on the spacecraft for mass, power, and pointing. The LLCD mission will be NASA's first step in demonstrating high performance laser communication systems for future operational missions.

450.3 SEARCH & RESCUE (SAR) MISSION OFFICE

The Search and Rescue (SAR) Mission Office supports the National Search and Rescue Plan, and serves as the designated agency to perform SAR Research and Development (R&D) in an effort to meet search and rescue needs. The Office provides technical support to NOAA, US Coast Guard, US Air Force, and other federal agencies in their operation and use of the international COSPAS-SARSAT satellite based SAR system. NASA is also the national agency responsible for the development of the next generation of emergency beacon signals and the hardware needed to process the 406 MHz signal to calculate an accurate position of the distress, whether it's in the air, on land, or sea. The NASA SAR Office contains a multi-function laboratory, which consolidates all research and development activities of the SAR Mission into one unit. The lab consists of a search planning station and two combined ground stations – one for the current operational SARSAT system comprised of Low Earth Orbiting and Geostationary Orbiting spacecraft containing the SAR payload, and the other for the next generation of Mid-Earth Orbiting GPS spacecraft housing the payload.

451 LASER COMMUNICATIONS RELAY DEMONSTRATION (LCRD) PROJECT

The Laser Communications Relay Demonstration (LCRD) Project manages development, integration, test and operations of a flight demonstration of an Office of the Chief Technologist (OCT), Technology Demonstration Mission (TDM). The LCRD will demonstrate a laser communications bi-directional link from a hosted payload on a commercial communications satellite. Elements of this demonstration include the development of two optical communication flight terminals and two Earth stations. The Project team reports to the flight TDM Program Office at Marshall Space Flight Center.

452 SPACE NETWORK (SN) PROJECT

The Space Network (SN) Project manages the TDRS fleet operations and sustaining engineering as well as the tracking and data acquisition services to support a wide range of near-Earth missions using the constellation of the Tracking and Data Relay Satellites (TDRS's), and the facilities located at the White Sands Complex, New Mexico, and the Guam Remote Ground Terminal, in the U.S. territory of Guam. SN customers include the NASA Earth Science, Space Science, and Human Spaceflight organizations, as well as other government agencies, international civilian space agencies, and commercial entities. Data acquisition services are provided via S-band Multiple Access and S-band, Ku-band, and Ka-band Single Access antennas.

453 NEAR EARTH NETWORK (NEN) PROJECT

The Near Earth Network (NEN) Project manages the Ground Network used to provide tracking, communications, and data system services to customers identified in the NASA mission set. The NEN provides services to support both robotic and human spaceflight missions in Earth-Moon space. Customers include the NASA Earth Science, Space Science, and Human Spaceflight organizations, as well as other government agencies, international civilian space agencies and commercial entities. The NEN Project integrates a diverse set of resources to provide high quality services at the lowest cost to NASA. These resources include NASA owned orbital tracking systems, commercial orbital tracking stations, scheduling systems, and test systems. The NEN project also manages the operations of the Space Laser Ranging (SLR) network. The SLR network includes a series of ground stations that perform laser ranging of satellites in Earth-Moon space. The SLR data is used to support space geodesy studies and to provide highly accurate orbit solution for satellites requiring this orbit knowledge precision.

454 TRACKING & DATA RELAY SATELLITE (TDRS) PROJECT

The Tracking and Data Relay Satellite (TDRS) Project manages the procurement, design, development, launch, and on-orbit evaluation of TDRS communications satellites. These satellites, stationed at geosynchronous altitude, make up the on-orbit asset of the Space Network. The on-orbit fleet consists of two generations of TDRS spacecraft: TDRS 1, 3-7 of the original build, and TDRS 8-10 of the second generation. These satellites provide near-continuous mission services for near Earth user satellites and orbiting vehicles. The TDRS system is a key agency capability and a national resource, with many low-Earth orbiting spacecraft, including the Space Shuttle, the International Space Station, and many scientific spacecraft such as the Hubble Space Telescope dependent upon it for mission critical communications. The TDRS Project is currently procuring, designing, developing, and planning the launch of the third generation of TDRS spacecraft. This procurement is for the two new spacecraft (K & L) with options for two additional spacecraft (M & N).

455 EXPLORATION SYSTEMS PROJECTS

The mission of the Exploration Systems Projects is to identify, communicate, and implement Goddard's contribution to NASA's Exploration and human spaceflight activities by leveraging Goddard's expertise in the development and management of space flight missions to further the Nation's human exploration plans.

458 SPACE NETWORK GROUND SEGMENT SUSTAINMENT (SGSS) PROJECT

The mission of the SN Ground Segment Sustainment (SGSS) Project is to implement a flexible and extensible ground segment that will allow the Space Network (SN) to maintain the high level of service in the future, accommodate new users and capability requirements, and reduce the effort required to operate and maintain the system in the future.

The SGSS Project has the responsibility to refurbish the SN ground segment. This involves two ground stations at the White Sands Complex, one at the Blossom Point Ground Terminal, and a TDRSS Terminal at the Guam Remote Station. The hardware and software at these sites is becoming increasingly difficult to sustain and maintain. This poses substantial risks to the highly reliable service that has been provided for two decades – and requires replacement. Additionally, the ground system architecture is dated, operation and maintenance staff-intensive, and unable to accommodate future demands for expanded capabilities in the management and movement of information.

460 EXPLORERS AND HELIOPHYSICS PROJECTS DIVISION

The Explorers and Heliophysics Projects Division (EHPD) is responsible for the management, coordination, and implementation of missions in support of the NASA Headquarters Science Missions Directorate (SMD). The EHPD encompasses three Programs: (1) Explorers, (2) Living With A Star (LWS), and (3) Solar Terrestrial Probes (STP). The objective of the Explorers Program is to provide frequent flight opportunities for world-class scientific investigations from space within NASA Heliophysics and Astrophysics Space Science goals. The objective of the LWS Program is to provide missions to improve our understanding of how and why the Sun varies, how the Earth and solar system respond, and how the variability and response affects humanity in space and on Earth. The objective of the STP Program is provide missions to understand the fundamental physics processes from the Sun to Earth, to outer planets, and beyond to the interstellar medium. The Division Office also supports SMD in the development of Announcements of Opportunities, acquisition strategies, mission concepts and definition, and design studies related to Heliophysics and Astrophysics investigations.

461 MAGNETOSPHERIC MULTISCALE (MMS) PROJECT

The MMS Project is responsible for implementation of the MMS mission, including design, development, integration, test, launch, and post-launch planning. These responsibilities are carried out by a team of government, industry, and

academic institutions. The mission will consist of a complement of spacecraft carrying identical instrument suites, which will seek to explore and understand the fundamental plasma physics processes of reconnection, particle acceleration, and turbulence on the micro-and mesoscale in the Earth's magnetosphere.

463 GRAVITY AND EXTREME MAGNETISM (GEMS) PROJECT

The GEMS Project is responsible for implementation of the GEMS mission, including design, development, integration and test, launch, and post-launch planning. These responsibilities are carried out by a team of government, industry, and academic institutions, including the development of an in-house instrument. GEMS is a tailored Class D, high heritage, PI-led, SMEX-class mission. The GEMS mission flight segment is composed of a science payload, which measures the polarization of numerous astronomical X-ray sources, and a spacecraft, which will provide power, structural support, data downlink, and point the payload to the selected astronomical targets.

464 SOLAR DYNAMICS OBSERVATORY (SDO) PROJECT

The SDO Project is responsible for implementation of the SDO mission, including design, development, integration, test, launch, and post-launch planning. These responsibilities are carried out by a team of government, industry, and academic institutions, including development of an in-house spacecraft. SDO is a single spacecraft mission which will characterize the dynamic state of the Sun, enhancing the understanding of solar processes and space weather.

466 APPLIED PHYSICS LABORATORY (APL) PROJECTS

The APL Projects office is responsible for oversight of Heliophysics missions, where implementation responsibility is assigned to APL. This Office is responsible for programmatic oversight of the missions, which includes assuring all contractual, procedural, funding, and budget actions are completed in accordance with mission schedules and monitoring technical progress. The office provides status and recommendations to the GSFC Explorers and Heliophysics Projects Division and the HQ Heliophysics Division, regarding the missions lead by APL.

470 JOINT POLAR SATELLITE SYSTEM (JPSS) PROGRAM

The Joint Polar Satellite System (JPSS) Program, Code 470, is responsible for NASA's portion of the development of the JPSS spacecraft, development of the JPSS ground system, and operation of the JPSS spacecraft. NASA is partnered with the National Oceanic and Atmospheric Administration sharing primary responsibility for the development of the National Polar-orbiting Operational

Environmental Satellite System (NPOESS) Preparatory Project (NPP) mission and the follow-on JPSS missions (afternoon orbit). The Department of Defense is also a partner with NASA and NOAA and has primary responsibility for development of the morning orbit missions.

The objective of the JPSS Program is to provide crucial weather forecasting, storm-tracking, and climate-monitoring utilizing on-orbit and ground system capabilities. The program is to provide technology leadership so that the system utilizes technologies that are cost effective, mature and proven in flight.

The JPSS Program provides management of all associated mission spacecraft and ground system development, mission systems engineering, and mission and science operations. Three project offices; JPSS Flight Project and JPSS Ground Project, and JPSS Free Flyer Project provide management and direction.

472 JPSS FLIGHT PROJECT

The JPSS Flight Project, Code 472, is responsible for the management of NASA's portion of the JPSS spacecraft development. The JPSS Flight Project directs all efforts associated with the JPSS spacecraft development (afternoon orbit); instrument development; mission systems engineering, integration, and test; launch services; and on-orbit commissioning. It will also provide close coordination with the interagency partners for mission integration of all JPSS science instruments. The JPSS missions provide NASA with a continuation of global change observations after the EOS Terra, Aqua, and National Polar-orbiting Operational Environmental Satellite System Preparatory Project (NPP) missions. NPP provides JPSS with a risk reduction demonstration and validation for critical instruments and related ground systems elements.

474 JPSS GROUND PROJECT

The JPSS Ground Project, Code 474, is responsible for the management of NASA's portion of the interagency JPSS ground system and the operation of the JPSS spacecraft missions. Responsibilities include the development of NASA's portion of the interagency JPSS ground system, development of test-bed facilities for ground system development and maintenance, integration of the JPSS ground system within the overall JPSS, development of JPSS mission operations plans and procedures, development of JPSS science data calibration algorithms and procedures, support of JPSS launch simulations and launch operations, and safely and productively operating the JPSS spacecraft and scientific instruments; maintenance support of the JPSS mission facilities; and support for the generation and delivery of mission and science data products.

476 JPSS FREE FLYER PROJECT

The JPSS Free Flyer Project, Code 476, is responsible for the development of the JPSS free flyer missions. The free flyer spacecraft will accommodate a subset of weather and climate survey scientific instruments specified by the JPSS Level-1 requirements, but flown as missions separate from the JPSS spacecraft missions. The JPSS Free Flyer Project directs the efforts for free flyer spacecraft development, instrument development and accommodation, mission systems engineering, integration and test, payload launch integration, and on-orbit commissioning. The project will also provide close coordination with the interagency partners for mission activities. The JPSS free flyer missions provide continuation of global change observations.