August 2002

400 DIRECTOR OF FLIGHT PROGRAMS AND PROJECTS

Responsible for overall management and implementation of GSFC flight programs and projects including contracts management, technical and business management, mission design, fabrication integration test, qualification, readiness review management, launch operation, and orbital operations. The assignment is consistent with NPG 7120.5A, entitled "NASA Program and Project Management Processes and Requirements." Responsibilities include small, Earth and Science Programs/Projects like Earth Systems Science Pathfinders (ESSP), Explorers (EXP), and Solar Terrestrial Probes (STP) through large, Earth and Space Science Programs/Projects like Earth Observing Systems (EOS), Hubble Space Telescope (HST), Geostationary Operational Environmental Satellites (GOES) and Polar Operational Environmental Satellites (POES).

The Directorate manages the implementation, maintenance, and operations of end-to-end space operations architectures, including mission operations and tracking and data acquisition services for missions supported by GSFC. Additional responsibilities include the development of the Tracking and Data Relay Satellites (TDRS) and International Projects assigned by NASA Headquarters.

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.

400.1 ASSOCIATE DIRECTOR BUSINESS MANAGEMENT OFFICE

The Associate Director Business Management Office provides the full range of business management to the Associate Director (Code 100). The office provides procurement management and support; budget development, analysis, execution, and trace-ability of all Code 100 resources; configuration management, scheduling, space management, travel management, and institutional and multi-media support.

402 NASA INTEGRATED PROGRAM OFFICE

The NASA IPO serves as one of three members of the Integrated Program Office (IPO) for the National Polar-Orbiting Operational Environmental Satellite System (NPOESS). Management and implementation of the NPOESS program is accomplished by the IPO under a tri-agency Executive Committee (EXCOM) representing Department of Defense (DoD), National Oceanic and Atmospheric Administration (NOAA) and NASA. Through the coordinated use of earth observing satellite resources of each agency, the NPOESS program satisfies the U.S. Government's fundamental civil and national security requirements for collection and distribution of operational polar satellite-based, remotely-sensed meteorological, oceanographic, climatic, and space environmental data.

403 FLIGHT PROGRAMS AND PROJECTS BUSINESS MANAGEMENT OFFICE

Plans and directs the development, implementation, and administration of business management for the Flight Program and Projects Directorate. Provides Center overview of business activities within the Directorate, through which Center-level decisions are executed. Responsible for: implementing program and institutional operating plans; manpower utilization, logistics, determining planning and housing requirements; implementing ADP standards; travel requirements; health and safety issues; small minority business profiles; facilitates the Project Management Development Enterprise (PMDE) Program; and a variety of other functions which ensures operational effectiveness of the Flight Program and Projects Directorate. Provides expert advice and analysis to the Director and his immediate staff, and other project organization managers.

404 TECHNOLOGY MANAGEMENT PROGRAM OFFICE

The Technology Management Program Office manages and integrates Agency-level technology programs for NASA Headquarters. This office enables technologies to revolutionize NASA's future. It identifies advanced concepts and innovative systems architectures. It also seeks to foster breakthrough technologies and provides leadership in integrated technology planning, development, and infusion. The Technology Management Program Office also oversees integration of cross-Directorate technology activities.

405 INTEGRATED FINANCIAL MANAGEMENT PROJECTS (IFMP) OFFICE

The mission of IFMP is to improve the financial, physical, and human resources management processes throughout the Agency. The IFMP, under the auspices of the Office of the Chief Financial Officer (CFO), is reengineering NASA's business infrastructure and implementing enabling technology to provide better management information for decision making.

406 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 Indefinite Delivery/Indefinite Quantity (IDIQ) contracts. These contracts offer NASA and any other United States Government Agency extremely fast procurement of spacecraft and payload space for future mission.

407 EARTH SCIENCE TECHNOLOGY OFFICE

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

ESTO develops investment strategies and roadmaps for ESE 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 AEROSPACE TECHNOLOGY OFFICE

The Aerospace Technology Office (ATO) manages a number of Agency-level programs and tasks for the Headquarters Office of Aerospace Technology. These activities currently include; SBIR/STTR NASA Program Management Office, NASA Institute for Advanced Concepts, and the NASA Technology Inventory.

The SBIR/STTR NASA Program Management Office is responsible for the Agency-wide management of NASA's SBIR and STTR programs. The Office develops annual SBIR and STTR solicitations based on Headquarters Strategic Enterprise technology needs and requirements. It is responsible for managing the proposal evaluation process and making final selection recommendations to the Headquarters Source Selection Official.

The NASA Office of the Associate Administration for Aerospace Technology funds the contractor-managed NASA Institute for Advanced Concepts (NIAC). The NASA Coordinator and COTR of the NIAC coordinates with the NASA Enterprises, NASA Centers, NASA Associate Administrator for Aerospace Technology, and the NIAC Director to ensure functional and contractual goals are met.

The NASA Technology Inventory includes the technology inventory database, an accounting of the Agency-wide investment in technology which links the technology products to Enterprise challenges and needs. The Office manages an on-line state-of-the-art system and manages the data collection and other activities needed to support the inventory.

410 EXPLORERS (EXP) PROGRAM OFFICE

The EXP program provides the management of scientific exploration efforts involving a long-term series of space flight missions. These include Medium Class Explorer Missions (MIDEX), Small Explorer Mission (SMEX), and University Class Explorers Missions (UNEX). These medium to small size missions are characterized by frequent launches, relatively moderate cost, and the capability of being built, tested, and launched in a short time interval. The objective of the Explorers Program is to conduct space science research in Space Physics and Astrophysics by examination of the Earth's space environment and observing the universe beyond the Earth. The Explorers Program science objectives are encompassed by the objectives of the following NASA space science themes: Astronomical Search for Origins and Planetary Systems; The Sun-Earth Connection; Structure and Evolution of the Universe.

415 GEOSTATIONARY OPERATIONAL ENVIRONMENTAL SATELLITE/POLAR OPERATIONAL ENVIRONMENTAL SATELLITE (GOES/POES) PROGRAM OFFICE

The objectives of the GOES/POES Program are to procure, test and launch operational satellites that will meet the observational requirements as specified by the National Oceanic and Atmospheric Administration (NOAA). NOAA provides all ground segment spacecraft operations and data reduction support. The GOES/POES Program provides for the reception of early emergency distress signals to aid the Search and Rescue Satellite-Aided Tracking (SARSAT) operation. It also provides environmental data that will be used to produce and support routine meteorological analysis and forecasts to maintain continuity of services to the user agencies by providing data that will be used to assist in forecasting severe weather events. The program contributes to the development and enhancement of a domestic and international in-situ environmental warning service, provides real-time warning of solar disturbances and provides data that will be used to expand the knowledge and understanding of the atmosphere in order to improve short and long-term weather forecasts. The program will direct all efforts associated with the instrument design and development; spacecraft design and development; satellite integration and test; ground system modifications; and mission operations through post launch testing and delivery to NOAA.

GOES Series Projects (Codes 416 and 417)

The GOES Projects provide management and technical expertise for procuring spacecraft (including sensors), unique ground equipment, launch site payload processing, launch vehicle technical surveillance, launch operations, and initial satellite activation and evaluation in order for turnover to NOAA of the Department of Commerce, for operational use. Under continuing joint agreement between NASA and NOAA, GOES is funded by NOAA to provide an operational geostationary satellite system which will observe the eastern and western United States and the adjacent ocean areas, as well as coverage zones extending well into the southern hemisphere. The GOES spacecraft will also support the communications requirements imposed by the data collection systems and the SARSAT system.

GOES N Series Project (Code 416)

The GOES N Series Project is a follow on to the GOES I-M series of missions. The payload consists of clones of the GOES I-M Imager and Sounder, the Solar X-ray Imager, Space Environmental Monitoring instruments and various communications packages.

GOES R Series Project (Code 417)

The payload will consist of an Imager, Sounder, Solar X-ray Imager, Space Environmental Monitoring instrument and various communications packages. The payloads represent a significant improvement over the previous series capabilities and require the development of new instruments.

POES Series Project (Code 480)

The objectives of the POES Project are to procure, test, and launch an operational polar orbiting satellite system which will meet the observational requirements as specified by NOAA. NOAA provides all ground segment, spacecraft operations and data reduction support. Polar operational meteorological satellites (polar metsats) provide global coverage of numerous atmospheric and surface parameters. These data are used routinely in numerical weather forecast models. NASA is currently managing the development of a continuing series of

contiguous series of measurements for operational weather forecasting. After NASA has completed an on-orbit checkout of the spacecraft, they will be turned over to NOAA for routine operational use. Immediate plans call for the procurement of POES spacecraft and instruments for NOAA K-N and an additional set of POES instruments to fly on the European METOP satellite. Also included in the POES Project is the responsibility for management of a NASA-funded SARSAT system that involves an international effort to locate ships and aircraft in distress.

The POES payloads consist of a polar-orbiting platform to support the environmental monitoring instruments for imaging and measurement of the Earth's atmosphere, its surface, and cloud cover, including Earth radiation, atmospheric ozone, aerosol distribution, sea surface temperature, vertical temperature and water profiles in the troposphere and stratosphere; and measurement of proton and electron flux at orbit altitude.

420 EARTH OBSERVING SYSTEM GODDARD (EOS-G) PROGRAM OFFICE

The Earth Observing System Goddard (EOS-G) Program Office is the designated program management office for flight, ground, and science performed at GSFC as part of the overall EOS program with the Earth Sciences Enterprise. The ESO-G Program Office is responsible for the management and coordination and support of NASA's Office of Earth Science (OES) program management. 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 advice to projects and missions; analyzing and recommending adjustments to budgets within overall ESO-G guidelines; coordinating reporting to Center management and NASA Headquarters; coordinating major internal and external reviews; providing administrative infrastructure support to missions and projects; and coordinating cross-cutting activities and initiatives. The EOS-G Program Office also provides administrative staff support to the OES program management and budgetary processes. The EOS-G Program Office represents GSFC in all matters pertaining to elements within the ESO-G activity.

420.2 EARTH SCIENCE FORMULATION OFFICE

The Earth Science Formulation Office (ESFO) is responsible for providing the prerequisite technical and business management expertise to Program/Project objectives/requirements for future Earth Science flight projects currently in the formulation sub-process. It consists of a team of specialists in the areas of technical, financial, budgetary, scheduling, pricing, logistics and configuration management.

422 EOS AFTERNOON (PM) PROJECT

The EOS Afternoon (PM) Project is responsible for management of the PM Observatory. The Project will direct all efforts associated with spacecraft development including conceptual design, development, hardware, fabrication and test, instrument integration and test, final verification, mission operations planning and related pre-launch activities. The PM Project is responsible for managing the design and development of scientific instruments to support the science objectives of NASA's Earth Science Enterprise. The instruments will investigate the process that governs and integrates the Earth system that includes the hydrological cycle, the biochemical cycles, climatological and geophysical processes. Investigations include remote sensing instruments and the conduct of interdisciplinary science using data from these instruments.

423 EARTH SCIENCE DATA AND INFORMATION SYSTEM (ESDIS) PROJECT

The ESDIS Project provides project management and technical direction for the design, development, test, and operations of the ground system for the specified Earth Science missions. The ESDIS Project will emphasize science community needs. Responsibility will include management of the development of operations control centers and data processing and analysis facilities that will advance systems technology capability. In addition, the ESDIS Project will provide the system for active archival and distribution of all NASA's Earth Science Data.

424 EOS CHEMISTRY (CHEM) PROJECT

The EOS Chemistry Project manages the Chemistry (CHEM) flight for the Earth Observing Systems in the Earth Science Enterprise. It will direct all efforts associated with spacecraft development from conceptual design to mission operations planning and related pre-launch activities. Similarly, the Project will manage the design and development of scientific instruments in support of NASA's ESE. The flight will focus on the measurement of atmospheric trace gases and their transformations. These gases play a critical role in regulating the Earth's climate. Understanding their distribution will help scientists analyze global climate change issues such as global warming and ozone depletion. The instrument complement planned for CHEM includes the High Resolution Dynamics Limb Sounder (HIRDLS), the Microwave Limb Sounder (MLS), the Tropospheric Emission Spectrometer (ODUS). The HIRDLS is a jointly funded and developed international instrument being undertaken by the United Kingdom and the United States. The MLS and TES are US-developed instruments. The ODUS is an international contribution from Japan. The CHEM is planning to be launched in late 2002 on a medium Launch Vehicle.

425 EOS ICE, CLOUD, AND LAND ELEVATION SATELLITE (ICESat) PROJECT

The ICESat Project manages the mission implementation to include the Geoscience Laser Altimeter System (GLAS) facility instrument development, the spacecraft procurement with Ball Aerospace, the science algorithm and computing facility procurement, the mission integration and test, and the launch and checkout. The purpose of the ICESat mission is to determine the mass balance of the polar ice sheets and their contributions to global sea-level change. In addition, ICESat will measure cloud heights and optical densities, atmospheric aerosols, and land surface and vegetation topographies.

426 SOLAR RADIATION AND CLIMATE EXPERIMENT (SORCE) PROJECT

The SORCE Project conducts mission implementation studies and technical and business planning leading to the development of the SOLSTICE and TSIM missions. As part of the Earth Science Enterprise, SOLSTICE and TSIM will

provide knowledge of the solar input to the Earth's climate. These measurements are a continuation of the long-term measurements of the solar forcing function to the Earth's climate.

427 LANDSAT DATA CONTINUITY MISSION (LDCM) PROJECT

The Landsat Data Continuity Mission (LDCM) Project, along with the United States Geological Survey (USGS), is responsible for extending the historical land-use/land cover data set of the Landsat Program beyond Landsat-7. This will be accomplished by acquiring seasonal, global, moderate resolution, multi-spectral imagery of the Earth's surface with an incremental improvement in performance over Landsat-8, and by maximizing the commercial remote sensing industry's opportunity to provide this data new, and in the future.

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 all Earth Science Enterprise (ESE) satellites. The ESMO Project interfaces with both ESE and the Space Operations Management Office (SOMO). Mission 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.

429 NPOESS PREPARATORY PROJECT

The NPOESS Preparatory Project (NPP) is responsible for management of NASA's portion in the interagency NPP mission. It will detect all efforts associated with spacecraft development; the Advanced Technology Microwave Sounder (ATMS) instrument development; mission systems engineering, integration, and test; launch services; and the Science Data Segment. It will also provide close coordination with the interagency Integrated Program Office (IPO) for mission integration of all IPO-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 National Polar Orbiting Environmental Satellite System (NPOESS) to be developed by IPO. NPP provides IPO with a risk reduction demonstration and validation for three of the four critical NPOESS instruments and related ground systems elements.

440 HUBBLE SPACE TELESCOPE (HST) PROGRAM OFFICE

The Hubble Space Telescope Program is responsible for the Hubble Space Telescope (HST) and other space science, facility-class, astronomical observatories. The objective of the HST Program is to provide mankind with an astronomical capability beyond the reach of all ground-based telescopes and to fulfill as many of the scientific and technological requirements within the lifetime of the observatories' mission. The HST Program provides project management, including mission and science operations, servicing missions, and all associated development activities. Four project offices provide HST and other space science astronomical observatories management and direction.

441 HST OPERATIONS & GROUND SYSTEMS PROJECT OFFICE

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 maintenance and operations ground system for at least 20 years. Responsibilities include developing and maintaining ground systems facilities and all flight and ground software; 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.

442 HST FLIGHT SYSTEMS & SERVICING PROJECT OFFICE

The HST Development Project plans, manages, and directs the HST orbital servicing program. The Projects develops the detailed mission requirements and plans and is responsible for the planning, managing, and directing and HST orbital-servicing program. The Project is responsible for the development of all the HST flight hardware (including replacement scientific instruments and spacecraft black-box orbital replacement units), shuttle space support equipment (including the carriers in the shuttle bay) and the HST-unique astronaut crew aids and tools. The Project is responsible for spacecraft hardware simulators and ground support equipment. The Project is also responsible for all Space Shuttle interfaces with the HST Observatory and shuttle servicing equipment.

442.1 SYSTEMS LAUNCH CARRIERS (SLC) OFFICE

The STS Launch Carriers Project Office designs, develops, integrates, and tests STS Carrier systems for the launch of flight spacecraft, instruments, and advanced technology demonstrations. This includes the development of unique STS compatible Carrier hardware that provides mission specific electrical and mechanical interfaces, command control & telemetry monitoring, and deployment capabilities. Development efforts are conducted in partnership with industry, academia, and other government organizations for getting small payloads to large spacecraft to orbit, as well as providing a breeding ground for technology spin-offs and commercialization opportunities.

443 JAMES WEBB SPACE TELESCOPE PROJECT (JWST)

The James Webb Space Telescope Project is advancing the state-of-the-art of large, facility-class space observatories through the advanced technologies and innovative systems engineering architectures. The JWST is a cosmological telescope, designed to unveil the fundamental processes of star and galaxy formation in the universe. To achieve this, the aperture is approximately 6 meters, in the form of a segmented deployable telescope, and the optical system will be optimized for the near infrared region of the spectrum. Instrumentation will include diffraction-limited cameras and spectrometers. The major JWST partners involved are European Space Agency (ESA) and the Canadian Space Agency (CSA). The Department of Defense is partnering on the technology development, primarily in the mirror and cryocooler areas. Participating Centers include Marshall Space Flight Center (MSFC), Ames Research Center (ARC), and Jet Propulsion Laboratory (JPL).

444 SPACE SCIENCE OPERATIONS (SSO) PROJECT

The SSO Project is responsible for managing and administering the mission operations and data analysis phases of all satellites assigned to it in the astrophysics and space physics disciplines. 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 center 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.

450 SPACE COMMUNICATIONS PROGRAM

The Space Communications Program provides overall organizational management, Program direction and strategic guidance for the provision of Space Communications systems and services which the Goddard Space Flight Center (GSFC) provides for NASA, other U.S. Government, commercial and International space missions. These responsibilities include definition of the end to end communication and tracking data architecture (including development of appropriate standards and technology), implementation and operations for the GSFC Ground Network (GN) and Space Network (SN); technical analysis, spectrum management, studies, planning, systems engineering and requirements analysis necessary to support space missions and supporting systems; definition, specification and acquisition of continuation spacecraft for the Tracking and Data Relay Satellite System (TDRSS); management and systems engineering support for the development and operation of the Mars Laser Communication Demonstration Project; and management of the GSFC contracts and contactors necessary to meet these responsibilities. The Program works in partnership with NASA programs and projects at GSFC and other NASA centers, commercial industry, other government agencies, International organizations, and academia to accomplish its mission.

451 CUSTOMER COMMITMENT OFFICE

The Customer Commitment Office (CCO) 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 CCO Provides Principal Investigators and Mission Formulation Managers with options and planning assistance to effectively meet the mission tracking and data acquisition (T&DA) needs. 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. Provides mission project mangers with the ability to secure contract vehicles and services to implement and operate their mission most effectively.

452 SPACE NETWORK PROJECT

The Space Network Project manages 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 (TDR'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 Explorations and Development of Space Enterprises, as well as other government agencies, international civilian agencies, and commercial entities. The two primary services are Multiple Access (MA) and Single Access (SA). MA service operates on a fixed frequency in the S-Band, and is designed to support multiple low rate customers. SA service is available in both S-Band and Ku-Band frequency for TDRS-1 through TDRS-7, and S-Band and either Ku-Band or Ka-Band frequencies for TDRS-8 through TDRS-10, and is designed to support high data rate customers. Furthermore, the project is responsible for two additional functions; Providing the orbit determination and acquisition data generation services for the International Space Station, the Shuttle, and the missions supported by the Ground and Space Networks and providing testing services for satellite-ground and satellite-satellite RF communications compatibility for the current and future user satellites. These tests are often conducted at user-specified sites by developing one of the mobile vans in order to assure that fully functional communications link is established and maintained throughout the mission life cycle.

453 GROUND NETWORK PROEJCT

The Ground Network Project manages the Ground Network used to provide tracking communications, and data system services to customers identified in the NASA mission set. The Ground Network provides services to orbital spacecraft, sub-orbital vehicles (including balloons, sounding rockets, and launch vehicles), and the Space Shuttle (including pre-flight, launch, orbital, landing, and post flight activities). Customers include the NASA Earth Science, Space Science, and Human Explorations and Development of Space Enterprises, as well as other government agencies, international civilian space agencies, and commercial entities. The Ground Network Project integrates a diverse set of resources to provide high quality services at the lowest cost to NASA. These resources include NASA owned orbital and sub-orbital tracking systems, commercial orbital tracking stations, scheduling systems, test systems, and range data systems.

454 TRACKING & DATA RELAY SATELLITE PROJECT

The Tracking and Data Relay Satellite (TDRS) Project is responsible for the management of the procurement, design, development, test, launch, on-orbit evaluation of TDRS spacecraft. In addition, the project provides sustaining engineering support to the Space Network Project to develop constellation management and operational recommendations, and for anomaly resolution for all of the on-orbit TDRS spacecraft. The TDRS spacecraft include the Basic Program (TDRS-1-6), the Replacement Program (TDRS 7), which replaces the TDRS-B spacecraft destroyed in the Challenger accident and TDRS replenishment program (TDRS-8, 9, & 10).

The TDRS system consists of in-orbit telecommunications satellites stationed at geosynchronous altitude and associated ground stations comprise the TDRS portion of the Space Network that provides mission services for near Earth user satellites and orbiting vehicles. Because the TDRS is a basic agency capability and a national resource, with the Space Shuttle and many near-Earth spacecraft being totally dependent upon it for communications, the Project is especially critical in regards to schedule and performance.

The TDRS Continuation Program is currently in a pre-formulation study phase and will provide follow-on spacecraft required to maintain and potentially evolve the Space Network services.

455 MARS LASER COMMUNICATIONS DEMONSTRATION PROJECT

The Mars Laser Communication Demonstration (MLCD) Project is responsible for the managing the procurement, design development, test, delivery and on-orbit operation of both the Mars Flight and Ground Terminals. The MLCD Project Office coordinates project activities at the Massachusetts Institute of Technology Lincoln Laboratory (MIT/LL) and the Jet Propulsion Laboratory (JPL). Together, these organizations will develop and deliver a flight-qualified laser and an operational ground station capable of high data rate laser communications between Mars and Earth. The flight laser will be part of an instrument suite on board the Mars Telecommunications Orbiter (MTO), set for launch in the fall of 2009. The MTO Project office is located at JPL. The MLCD Project Office also serves as the management interface to the MTO Project Office, to ensure proper technical and programmatic coordination, resulting ultimately in mission success.

460 SUN-EARTH CONNECTION PROGRAM OFFICE

The Sun-Earth Connection (SEC) Program Office is part of NASA's Office of Space Science's (OSS) SEC Science Theme. The goal of the SEC theme is to understand out changing Sun and its effects on the Solar System, life and society. The GSFC is delegated Lead Center responsibility for two programs: Solar Terrestrial Probes (STP) and Living With a Star (SWS). The management of these programs reflects a new way of doing business that will provide program insight and innovative teaming arrangements. The Program Office will support OSS in the development of Announcements of Opportunities, acquisition strategy, mission concepts and definition, and design studies related to the STP and LWS investigations.

461 SOLAR TERRESTRIAL PROBES PROGRAM

The Solar Terrestrial Probes (STP) missions are a strategic element of the Sun-Earth Connections Science Roadmap. They are a continuous sequence of flexible, low-cost missions designed for the sustained study of critical aspects of the Sun-Earth system. They are a creative blend of in-situ and remote sensing observations from multiple platforms, addressing focused science objectives. These objectives include describing the system behavior of the Sun and its interaction with the Solar System, understanding the physics that link the Sun, Earth, and interstellar medium, and understanding the processes and dynamics of geospace and the earth's space environment.

The initial community-selected Solar Terrestrial Probes are: Thermosphere, Ionosphere, Mesosphere, Energetics and Dynamics (TIMED), Solar-B, Solar Terrestrial Relations Observatory (STEREO), Magnetosphere Multi-scale, Global Electrodynamics Connections, and Magnetospheric Constellation. TIMED is the first NASA Solar Terrestrial Probe and is expected to launch in FY0_. Solar-B is a joint mission with the Japanese Institute of Astronomical Science (ISAS) that provides optical, EUV, and X-ray instrument components to measure the Sin's magnetic field and UV/X-ray radiation. Solar-B's expected launch date is FY05. The STEREO mission will go into implementation phase in FY02 (See Code 463 below). The remaining STP missions are in formulation phase.

462 LIVING WITH A STAR PROGRAM

The LWS missions will address the effects of solar variability on life and society including human technology, humans in space, and terrestrial climate. In addition, the missions will address both scientific understanding and applications to provide a predictive capability for space weather in partnership with academic, government, and industrial communities. The LWS program will establish a Solar Dynamics Observatory (SDO) as follow-on to the SOHO mission (See

Code 464 below). The Solar Sentinels missions will provide a global view of the heliosphere and describe the transition and evolution of eruptions and flares from the Sun to Earth. The Geospace Science missions will provide a network of measurements around the Earth to increase our understanding of the origin and dynamics of the radiation belts and ionosphere. Activities within the Space Environment Test bed project will provide modeling products for space weather, and characterize the effects of solar variability on spacecraft subsystems and components.

463 STEREO PROJECT

STEREO is a project under the Solar Terrestrial Probes Program that will go into implementation phase in FY02. The objective of this mission is to understand the origin of mass ejections from the Sun's corona and the consequences including intense solar energetic particle events. STEREO's launch is planned for FY05.

464 SOLAR DYNAMICS OBSERVATORY (SDO) PROJECT

The SDO will be the first mission to be launched under the Living With a Star Program. SDO will characterize the dynamic state of the Sun enhancing the understanding of solar processes and space weather. SDO's launch is planned for FY07.

470 EARTH EXPLORERS PROGRAM

The Earth Explorers Program (EEP) is responsible for the management and direction of a dynamic and versatile set of multiple and independent Earth system science space flight missions. The EEP missions and projects perform world class Earth science investigations. These missions typically are providing pathfinder exploratory and process driven measurements answering innovate and unique Earth Science questions. These missions are capable of supporting a variety of scientific objectives related to earth science, including the atmosphere, oceans, land surface, polar ice regions and solid Earth. Investigations will include development and operation of remote sensing instruments and investigations utilizing data from these instruments. The missions are of a relatively short-term duration, demonstrating process measurements, which may lead to eventual earth science systematic measurements and data set goals. These missions are characterized by relatively low to moderate cost and are small to medium sized missions that are capable of being designed, developed, integrated, tested and launched in a short time interval. All missions and projects utilize innovative management processes and techniques. The missions and projects consist of earth System Science Pathfinder (ESSP) science investigations, university class earth system science missions (UnESS), quick reaction/turnaround missions that address unique and specific Earth science measurements (QuikTOMS and Triana) and Earth science experiments of opportunity. In addition, the Program is responsible for the Atmospheric Effects of Aviation Project (AEAP).

471 EARTH SYSTEM SCIENCE PATHFINDER (ESSP) PROJECT

The ESSP Project is responsible for the management and direction of a set of space flight missions designed to accomplish frequent, high quality earth science investigations utilizing innovative, streamlined, and efficient management approaches. ESSP class missions are small to medium size, low to moderate cost and typically lead by a Principal Investigator (PI). ESSP investigations are peer missions encompass the entire project life-cycle from definition through design, development, integration and test, launch, operations, science data analysis and data distribution. Investigations will include development and operation of remote sensing instruments and investigations utilizing data from these instruments. A small cadre of project personnel provides innovative teaming arrangements and mission success will be placed on the science PI and his team, with standard industry procedures and practices encouraged.

The current set of ESSP missions consists of: Vegetation Canopy Lidar (VCL) Mission Gravity and Recovery Climate Experiment (GRACE) Mission, Pathfinder Instruments for Cloud and Aerosol Space Observations (PICASSO-CENA), CloudSat, and Volcanic Ash Mapper (VOLCAM).

473 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 Indefinite Delivery/Indefinite Quantity (IDIQ) contracts. These contracts offer NASA and any other United States Government Agency extremely fast procurement of spacecraft and payload space for future mission.

474 TRIANA PROJECT OFFICE

The TRIANA Project is responsible for the design, development, integration and test, launch and operation of an observatory that will take advantage of the unique vantage point available at the Sun-Earth L1 point to continuously observe the Earth. The goals of the project are both scientific and educational, including scientific investigations and student participation. TRIANA will include three scientific instruments: the Earth Polychromatic Imaging Camera (EPIC); an advanced whole Earth radiometer; and a small, next-generation space weather monitoring instrument. TRIANA will be from the Space Shuttle cargo bay.

The EPIC instrument will provide visible (red, green, blue), color imaging the full Earth in near real time, with resolution roughly equivalent to that of a high definition TV (HDTV) image. In addition, the EPIC instrument will observe the Earth's vegetation canopy structure and evolution by taking advantage of the retro-reflectance, or "hot spot", view that will be available by being in-line between the Earth and the Sun. The EPIC will also observe clouds and aerosols.

The NISTAR advanced radiometer will provide, by looking at the whole sunlit side of the Earth at once, the first direct measurements of the radiant power reflected by the planet, and thereby contribute to our knowledge of how much of the Sun's energy is absorbed in the Earth's atmosphere.

The small, next-generation space weather-monitoring instrument will contribute to our understanding of how solar events affect Earth-orbiting spacecraft, such as communication satellites.

480 POES Series Project (Code 480)

The objectives of the POES Project are to procure, test, and launch an operational polar orbiting satellite system which will meet the observational requirements as specified by NOAA. NOAA provides all ground segment, spacecraft operations and data reduction support. Polar operational meteorological satellites (polar metsats) provide global coverage of numerous atmospheric and surface parameters. These data are used routinely in numerical weather forecast models. NASA is currently managing the development of a continuing of series of contiguous series of measurements for operational weather forecasting. After NASA has completed an on-orbit checkout of the spacecraft, they will be turned over to NOAA for routine operational use. Immediate plans call for the procurement of POES spacecraft and instruments for NOAA K-N and an additional set of POES instruments to fly on the European METOP satellite. Also included in the POES Project is the responsibility for management of a NASA-funded SARSAT system that involves an international effort to locate ships and aircraft in distress.

The POES payloads consist of a polar-orbiting platform to support the environmental monitoring instruments for imaging and measurement of the Earth's atmosphere, its surface, and cloud cover, including Earth radiation, atmospheric ozone, aerosol distribution, sea surface temperature, vertical temperature and water profiles in the troposphere and stratosphere; and measurement of proton and electron flux at orbit altitude.

490 STRUCTURE AND EVOLUTION OF THE UNIVERSE (SEU) PROGRAM

The SEU Office is responsible for management of the GLAST, LISA, CON-X, MAXIM, EXIST, and OWL Projects. These projects have three fundamental, scientific quests:

1. To explain the structure of the universe and forecast our cosmic destiny
2. To explore the cycles of matter and energy in the evolving universe
3. To examine the ultimate limits of gravity and energy in the universe

The Program will direct all efforts associated with spacecraft development including conceptual design, development, hardware fabrication, integration and test, satellite environmental testing, mission operations development and planning, conduct of the launch campaign, and conduct of mission operations.

The NMP will be managed by the SEU Program Office.

490.1 NEW MILLENNIUM PROGRAM (NMP) OFFICE

The NMP is responsible for the management of the 1st NMP Earth Observing (EO-1) Mission and 5th Space Techology (ST) Mission. The Program will direct all efforts associated with spacecraft development including conceptual design, development, hardware fabrication, integration, and test, satellite environmental testing, mission operations development and planning, conduct of the launch campaign, and conduct of mission operations. The management of this program will reflect new ways of doing business consisting of a small cadre of Program/Project personnel that will provide program insight and innovative teaming arrangements with industry. The responsibility for mission success will be placed on the spacecraft and instrument development teams along with the science team that compares the imagery with standard industry procedures and practices.

491 NMP EARTH OBSERVING 1 (EO-1) PROJECT

The NMP EO Project is responsible for missions characterized by relatively low-cost, small-sized spacecraft for demonstrating new technology that will be flown in the future at a lower cost than present missions. The NMO EO-1 mission will fly an advanced land-imaging detector that is a prototype for post Landsat-7 visible/infrared land imaging instrumentation. Space investigations will compare coordinated Landsat-7 imagery to verify if EO-1 imagery is as good or better than current Landsat imagery.

492 GAMMA-RAY LARGE AREA SPACE TELESCOPE 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.

493 LASER INTERFEROMETER SPACE ANTENNA

The LISA Project is responsible for the management of design, development, integration, test, launch, and on-orbit commissioning of the LISA mission. The mission includes a constellation of 3 spacecraft flying in an equilateral triangular formation with $5x10^6$ 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 also is dependent upon technology demonstration flights 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, Systems Engineering and certain payload components, the JPL has primary payload and operations responsibility, and the ESA has primary responsibility for spacecraft and science team activities. Launch is currently planned for 2010, with technology demonstration flights in 2005-06.

494 CONSTELLATION-X

The CON-X Project is responsible for the management, design, development, integration, test, launch, and on-orbit commissioning of the CON-X mission. Constellation-X is a team of powerful X-ray telescopes that will orbit close to each other in space. These telescopes will work in union to simultaneously observe the same distant objects, combining their data and becoming 100 times more powerful than any single X-ray telescope that has come before it. CON-X will begin to address the mysteries of black holes, recycling, and missing matter.

495 SPACE TECHNOLOGY 5 (ST-5) PROJECT

The ST-5 Project is responsible for the design, manufacture, integration, test, launch, and mission operations of 3 full functioning 20-kilogram class spacecraft. The ST-5 Project has 3 principle goals: 1) design development, integration and test, and operation of a full service 20-kg class spacecraft through the use of multiple new technologies; 2) ability to achieve research quality measurements with this class of spacecraft; and 3) design, development, and operation of multiple spacecraft to act as a single constellation rather than as individual elements. The ST-5 Project spacecraft will provide approximately an order of magnitude reduction in spacecraft mass and power applicable to a wide range of Earth and Space Science missions. ST-5 specifically will mitigate the risk for future nanosat (less than 10 kilograms) constellation missions by validating key enabling technologies.

496 MICROARCSECOND X-RAY IMAGING MISSION

The MAXIM is responsible for the formulation efforts involved with the MAXIM mission. The primary goal of the MAXIM mission, a proposed NASA X-ray observatory that will have the resolution to image a black hole, will be to capture a picture of a black hole. It will employ an emerging technology called X-ray interferometry to demonstrate the feasibility in space of X-ray interferometry for astronomical applications and will provide an imaging of celestial X-ray sources with resolution of 100 micro-arcseconds, 5000 times better than the Chandra Observatory.

497 ORBITING WIDE-ANGLE LIGHT COLLECTORS

The OWL Project is responsible for the formulation efforts associated with the OWL mission. The OWL mission will use the Earth's atmosphere as a vast calorimeter and observe nitrogen fluorescence light of giant air showers and perform measurements of shower energy profile and determine depth of interaction in atmosphere, required for particle identification.

498 ENERGETIC X-RAY IMAGING SURVEY TELESCOPE

The EXIST project is responsible for the formulation activities involved in planning the EXIST mission. EXIST will conduct the 1st high sensitivity all-sky imaging survey (5-600keV) with a wide-field coded aperture telescope array.