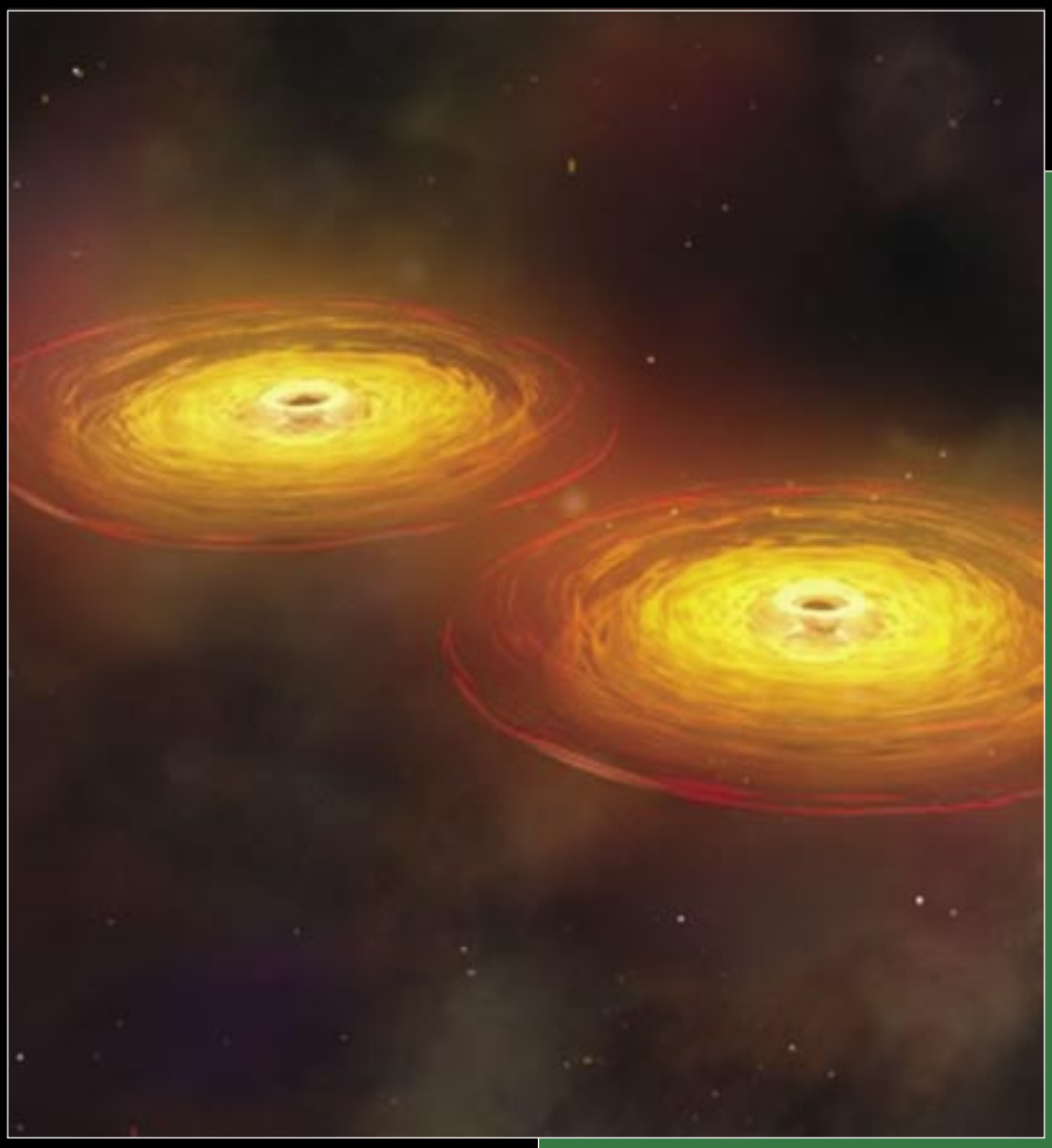

National Aeronautics and
Space Administration

Marshall Space Flight Center
2004 Implementation Plan

Cover image: This still image was taken from a simulated animation depicting a merger of two galaxies that forms a single galaxy with two centrally located supermassive black holes surrounded by disks of hot gas. The black holes orbit each other for hundreds of millions of years before they merge to form a single supermassive black hole that sends out intense gravitational waves.

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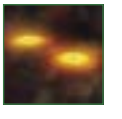
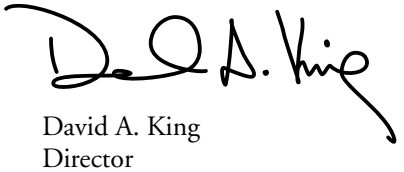


Director's Message

We have before us one of the most incredible and challenging times in the Agency's 45-year history—an opportunity to showcase our talents, expertise, and commitment beyond all measure. The attention NASA is receiving rivals that of the 1960s. So many have their eye on America's space program—nationally and internationally. We stand at the threshold of a new era in technology development, space flight, exploration, and discovery.

Since Sean O'Keefe became NASA Administrator, he has been carefully crafting the Agency to come together as One NASA. It is essential that we stand shoulder-to-shoulder with our sister Field Centers and commit ourselves totally to the Agency's leadership, mission, and vision. For Marshall's part, we will continue to work very hard to meet NASA's goals and objectives—aligning ourselves with the Agency's Strategic Plan and the NASA Implementation Plan for Return to Flight and Beyond. Returning to flight, safely, for all future missions, will demonstrate our genuine and unwavering commitment to comply with all recommendations outlined by the *Columbia* Accident Investigation Board. We will work very hard to understand all of our customers and their respective needs, and we will continue to execute our programs and projects, embrace our values, and ultimately build our future.

I am honored to lead this Field Center, and it is my privilege to present the Marshall Space Flight Center 2004 Implementation Plan—our blueprint for today and roadmap for the future.



David A. King
Director

NASA/Marshall Space Flight Center

NASA Vision

To improve life here,
To extend life to there,
To find life beyond.

NASA Mission

To understand and protect our home planet,
To explore the universe and search for life,
To inspire the next generation of explorers
…as only NASA can.

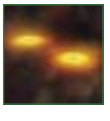
MSFC Mission

To enable, through our values-based culture, the unbounded access to and use of space to benefit humanity.

- We advance the state of, and implement technology in space transportation systems, space propulsion, microgravity science, and space systems;
- We promote scientific discovery and engineering excellence;
- We conceptualize, develop, integrate, and operate space flight and ground systems;
- We continually improve the way MSFC and NASA do business;
- We promote the benefits of the space program; and
- We inspire the next generation of explorers.

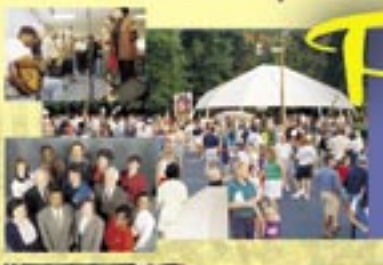
MARSHALL GOALS

- Establish MSFC as a world-class safety organization within NASA.
- Develop and maintain NASA's preeminence in space propulsion, enabling the exploration and development of space while dramatically increasing program and mission safety and reliability and reducing cost.
- Advance the research and development of space transportation technologies and systems that support our customers' needs—Strengthening the U.S. launch industry, dramatically increasing safety and reliability, and reducing overall cost.
- Advance NASA's Microgravity Research and Space Product Development Programs, and develop and maintain capabilities required to meet national research objectives.
- Advance the Agency in the development of lightweight, large–aperture space optics manufacturing technology for use in achieving the mission goals of NASA's strategic enterprises.
- Enhance and sustain a highly skilled, ethical, diverse, and motivated workforce committed to safety while working in a creative and productive environment in support of cutting–edge systems and technology development.
- Support Agency and other Center scientific and technical initiatives and various Agency infrastructure activities in assigned roles delegated to the Center.



MARSHALL VALUES

The Marshall Space Flight Center team is committed to these core values.



People

• We recognize that the people who work here are "most important"—and are our greatest strength. • We create a safe and healthy environment. • We encourage balance between personal and professional life. • We enable personal and professional growth. • We commit ourselves to the highest standards of integrity and ethical behavior. • We reward and celebrate our accomplishments. • We recognize individual and cultural differences and treat each other with dignity and respect.

Customers

• We are accountable to our customers and are committed to their satisfaction.
• Our customers can depend on us to deliver quality products and services.

Excellence

• We pursue excellence in our people and in everything we do.
• We promote continual learning and improvement.
• We hold one another accountable for doing what we commit to do.

Teamwork

• We are a unified and interdependent team.
• We cooperate, communicate openly and share ideas with each other for the common good.
• We seek and enable partnerships with other NASA Centers, other agencies, academia, industry and our local and global communities.

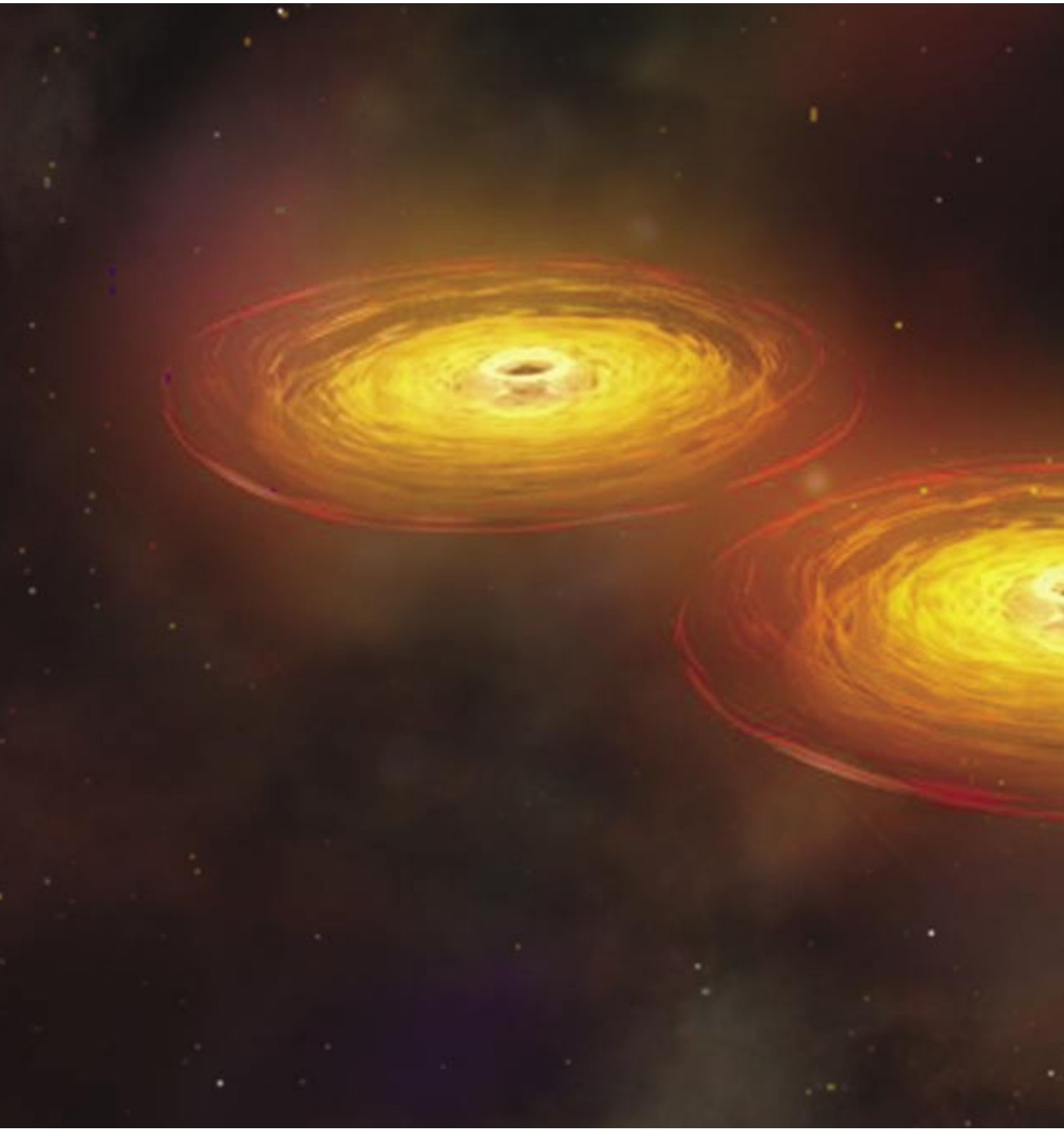
Innovation

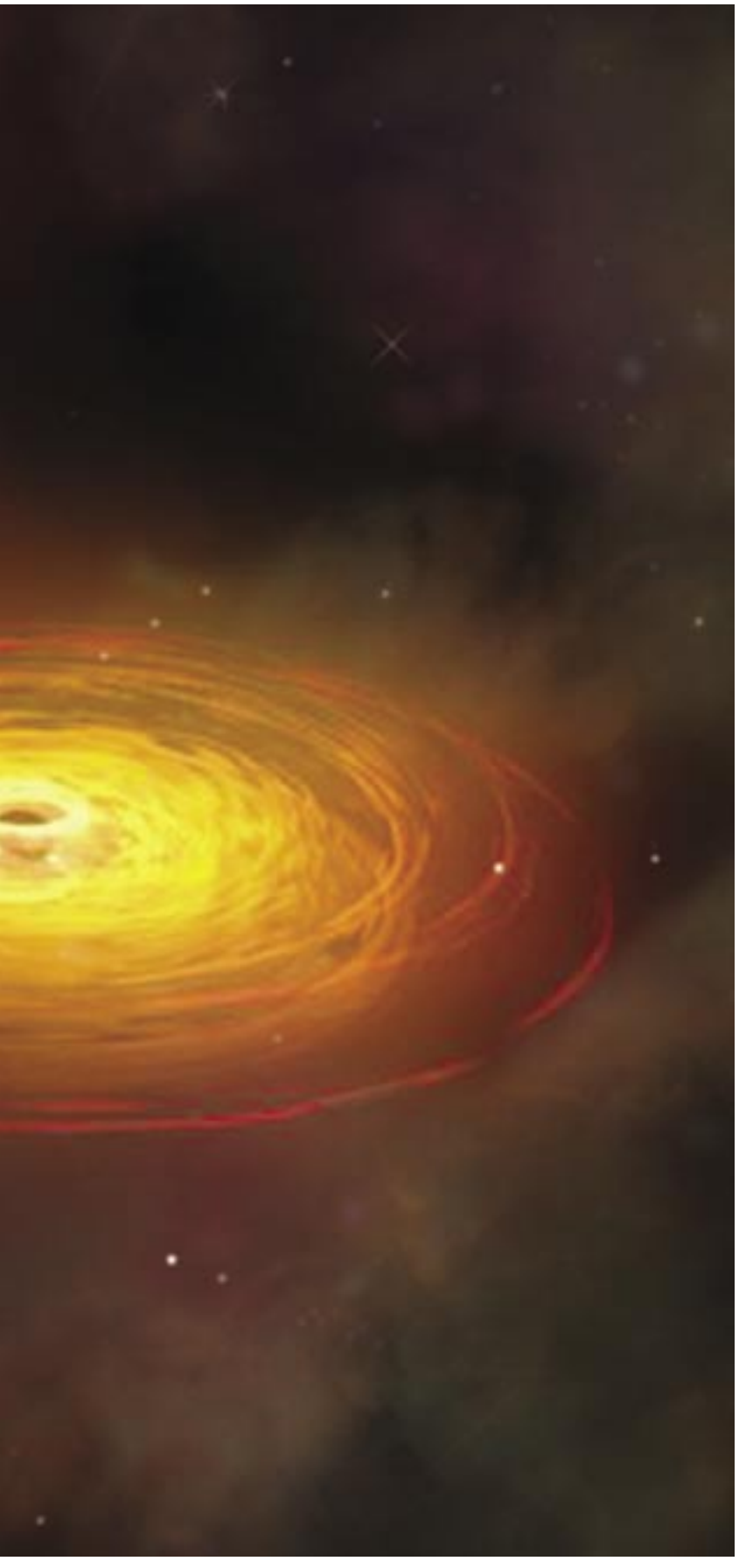
• We promote innovation and creativity.
• We seek different ideas and perspectives.
• We are committed to making a significant difference.
• We are willing to accept well-assessed, selected risks in the pursuit of our goals—but never at the expense of safety.

These values serve as the principles that guide our decisions and behaviors.

SAFETY IS A FRAME OF MIND.

1 Introduction





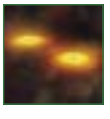
1 Introduction

The Marshall Space Flight Center (MSFC), a Field Center of the National Aeronautics and Space Administration (NASA), was established on July 1, 1960, with the transfer of land, buildings, property, space projects, and personnel from the United States Army.

Dr. Wernher von Braun was named the Center's first Director, and there have been nine subsequent Directors culminating with the present Director, Mr. David King. Under von Braun's guidance, MSFC's Mercury-Redstone vehicle boosted America's first astronaut on a suborbital flight in 1961. Since that time, MSFC has been responsible for the Saturn/Apollo program, *Skylab*, America's first space station, the High-Energy Astrophysics Observatories, the Hubble Space Telescope, the Chandra X-ray Observatory, Spacelab, and the propulsion systems responsible for launching America's Space Shuttle fleet into orbit.

Today, the Center is involved in providing support to all of the Agency's Enterprises. In addition, MSFC is a force for NASA's Integrated Space Transportation Plan (ISTP) performing architectural studies for NASA's Space Architect. Within the Space Flight Enterprise, our parent Enterprise, MSFC is committed to returning the Space Shuttle fleet to flight, continuing sustained Shuttle operations and furthering the Service Life Extension Program (SLEP) to enable the Shuttle to fly safely into the next decade. MSFC also plays a major role in supporting the *International Space Station (ISS)* including providing the Environmental Control and Life Support System (ECLSS) and technical oversight of key components, as well as operating the Payload Operations Integration Center (POIC). Within the Aerospace Technology Enterprise, MSFC provides major support to ongoing activities to develop Expendable Launch Vehicle (ELV) technologies for launching NASA spacecraft, the Next Generation Launch Technology (NGLT) Program, and the Orbital Space Plane (OSP). Within the Space

This artist's representation, taken from a series of still images, depicts one stage during the merger of two supermassive black holes.



Science Enterprise, MSFC is actively supporting Prometheus and managing the In-space Propulsion Research Program, along with the operations of the Chandra X-ray Observatory. MSFC is also managing Gravity Probe-B and Solar-B as well as supporting the James Webb Space Telescope (JWST) Program in helping advance the optics technology development effort. MSFC continues to make significant contributions to astrophysics in x-ray and gamma-ray research and in solar physics research. In the Earth Science Enterprise, MSFC's Global Hydrology and Climate Center (GHCC) has created a critical mass by forming a collaborative venture with the academic community—the National Space Science and Technology Center (NSSTC). MSFC provides critical support to the Biological and Physical Research Enterprise in the areas of material science and structural biology. Finally, MSFC's Education Programs Office will play an important role in fulfilling NASA's Mission to inspire the next generation of explorers. MSFC will make a special effort to provide our citizens access to NASA's unique opportunities.

Overall, MSFC has a special core of capabilities, talents, skills, and facilities that has arisen out of the breadth and depth of its current work as well as its work in the decades past. The Center's leadership and employees embrace the One NASA spirit for the good of the Agency. In order to be a strong, successful team player for all of NASA's missions, endeavors, and enterprises, MSFC is working across the Agency and with the Enterprise codes to provide support and technical leadership as appropriate to the One NASA team. Our commitment to mission success is evidenced not only by our accomplishments in the past, but also by our dedication and focus on the future.

This image is of an artist's concept of the X–43B hypersonic flight vehicle.

2 Center Support to NASA's Themes

2 Center Support to NASA's Themes

MSFC Alignment with the NASA 2003 Strategic Plan

NASA Missions		NASA Goals	NASA Themes	NASA Enterprises: Space Science					Earth Science		Biological & Physical Research			Aero Tech	Ed	Space Flight			Aerospace Technology		
				Solar System Exploration (SSE)	Mars Exploration (MEP)	Astronomical Search for Origins (ASO)	Structure and Evolution of the Universe (SEU)	Sun-Earth Connection (SEC)	Earth System Science (ESS)	Earth Science Applications (ESA)	Biological Sciences Research (BSR)	Physical Sciences Research (PSR)	Research Partnerships and Flight Support (RPFS)	Aeronautics Technology (AT)	Education Programs (EP)	*International Space Station (ISS)*	Space Shuttle Program (SSP)	Space and Flight Support (SFS)	Space Launch Initiative (SLI)	Mission & Science Measurement Technology (MSM)	Innovative Technology Transfer Partnerships (ITTP)
Understand and protect our home planet	1	Understand Earth's system and apply Earth system science to improve the prediction of climate, weather, and natural hazards.		■				○	○	○						○	○	▒			
	2	Enable a safer, more secure, efficient, and environmentally friendly air transportation system.												■							
	3	Create a more secure world and improve the quality of life by investing in technology and collaborating with other agencies, industry, and academia.								○		●	●	■		○		▒	○		■
Explore the universe and search for life	4	Explore the fundamental principles of physics, chemistry, and biology through research in the unique natural laboratory of space.									○	●				○	○				
	5	Explore the solar system and the universe beyond, understand the origin and evolution of life, and search for evidence of life elsewhere.		○	■	○	○	○									○	▒			
Inspire the next generation of explorers	6	Inspire and motivate students to pursue careers in science, technology, engineering, and mathematics.		○	▒	○	○	○	○	○	○	○	○	▒	●	○	○	▒	○	▒	▒
	7	Engage the public in shaping and sharing the experience of exploration and discovery.		○	▒	○	○	○	○	○	○	○	○	▒	○	○	○	▒	○	▒	○
Enabling Goals	8	Ensure the provision of space access and improve it by increasing safety, reliability, and affordability.														○	●	▒	●		
	9	Extend the duration and boundaries of human space flight to create new opportunities for exploration and discovery.			▒						○	○				○	●	▒	●	▒	
	10	Enable revolutionary capabilities through new technology.												■				▒		■	○

Color and Symbol Key: Dark Blue= NASA Primary Contribution ■ Light Blue = NASA Supporting Contribution ▒ Black Dot = MSFC Major Contribution ● White Dot = MSFC Supporting Contribution ○

3 Current Center Capabilities

3 Current Center Capabilities

The wide range of programs and projects implemented by MSFC over the years has resulted in the Center workforce having one of the most broadly based sets of skills within the Agency. As a development Center, MSFC has enormous experience in the development and operation of major flight hardware elements, such as the Space Shuttle propulsion elements and major components of the *ISS*. At the same time, MSFC has—through supporting key elements of the Space Science, Earth Science, and Biological and Physical Research Enterprises—developed in-depth capabilities from basic research and technology development, to the development and operation of scientific spacecraft and payloads. MSFC's support to the Space Launch Initiative (SLI) ranges from the technology development of the NGLT program to the flight hardware development of the OSP. In short, MSFC provides major support to all of the Agency's Enterprises, including the most recently formed Education Enterprise.

3.1 Current State of the Workforce

MSFC understands the importance of recruiting, acquiring, and retaining a diverse workforce with world-class capabilities in the strategic competencies needed to support the Center and NASA's missions. Our workforce consists of civil servants and contractors with a wide range of education, national origins, ethnicity, and occupations.

The average employee age at the Center has increased over the last several years to 45.2. Our current workforce has over 800 employees 50 years of age or older, with approximately 60 employees under the age of 30.

To the left is an aerial view of the MSFC main complex on the Redstone Arsenal Military Base in Alabama.

MSFC's full-time permanent attrition rate in non-buyout years over the last 10 years is a little more than two percent. Presently 22 percent of MSFC's workforce is eligible to retire within the next five years, with some organizations having between 30 percent and 60 percent of their employees eligible within that period.

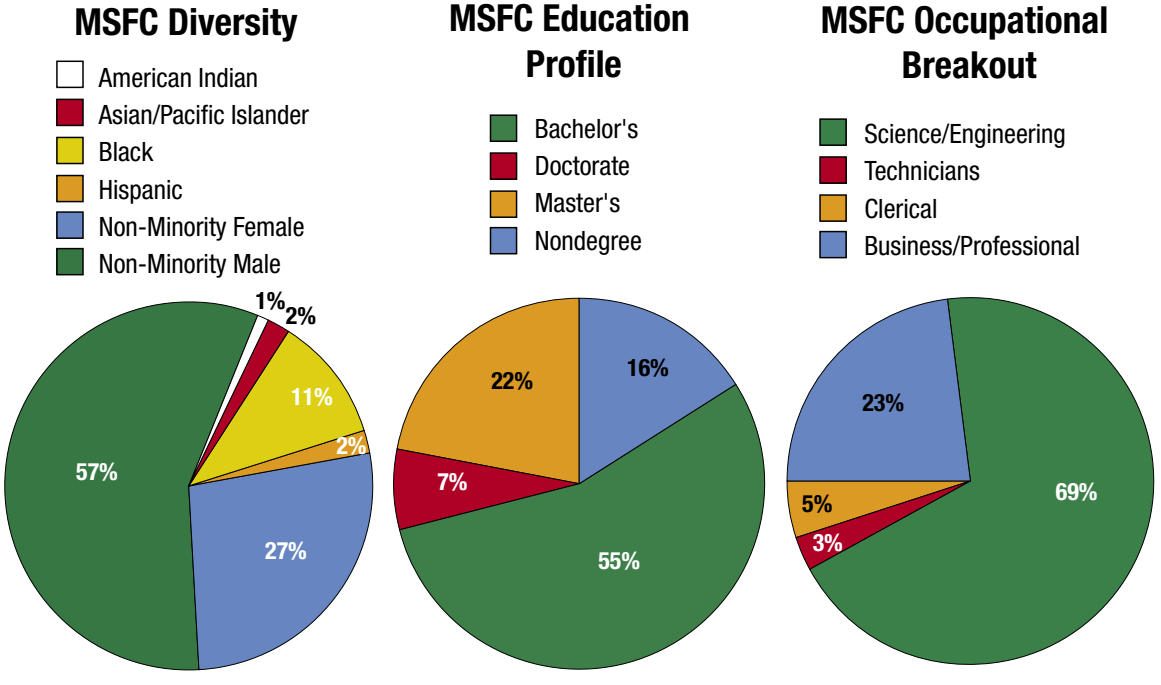
In support of the Center's mission areas, MSFC utilizes a wide array of the NASA competencies. These competencies include Systems Engineering, Propulsion Systems and Testing, Integration Engineering, Design and Development Engineering, Flight Dynamics, Avionics, Occupational and Environmental Health, Business Management, and Business Information Technology (IT) Systems.

The MSFC technical workforce can be represented as supporting three major lines of business—Space Transportation, Space Systems and Infrastructure, and Science Research and Instruments—with cross-cutting technical support providing the underlying capabilities for accomplishing assigned tasks.

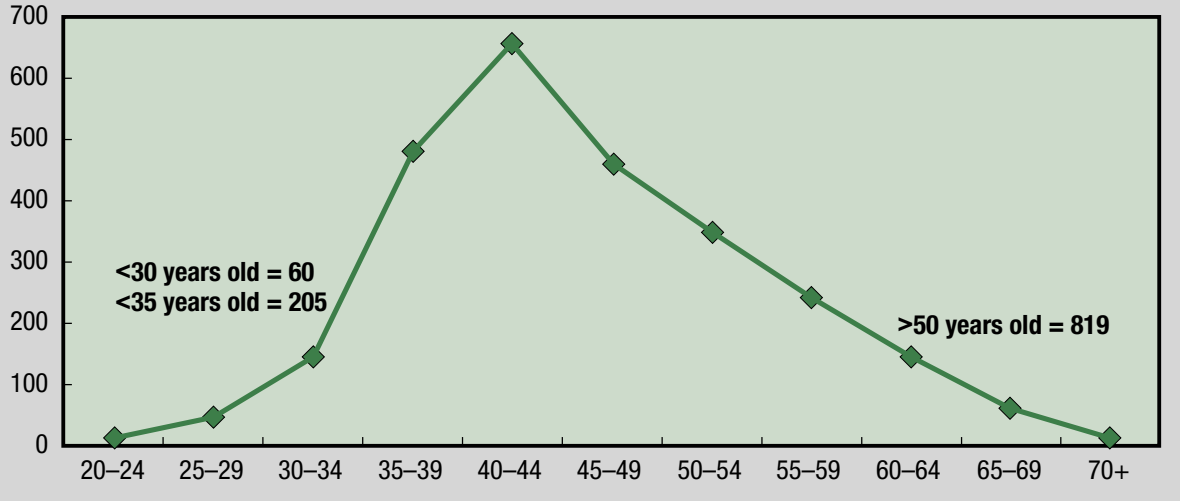
The subcategories, as shown in the chart describing MSFC Core Competencies on page 13, indicate the major capabilities within each grouping; however, they do not represent the entire set of technical subcategories necessary to fulfill Center roles and mission assignments. These subcategories can be grouped into the major NASA competencies as defined by the NASA competency dictionary.

Scientific competencies are applied to a wide range of NASA goals and missions. Research is performed in selected areas of astronomy, astrophysics, Earth science, large optics, and high-energy optics. Studies are underway to support long-duration human space flight missions by developing a clearer understanding of the effects of exposure to radiation and other space environmental effects on both biological and nonbiological materials.

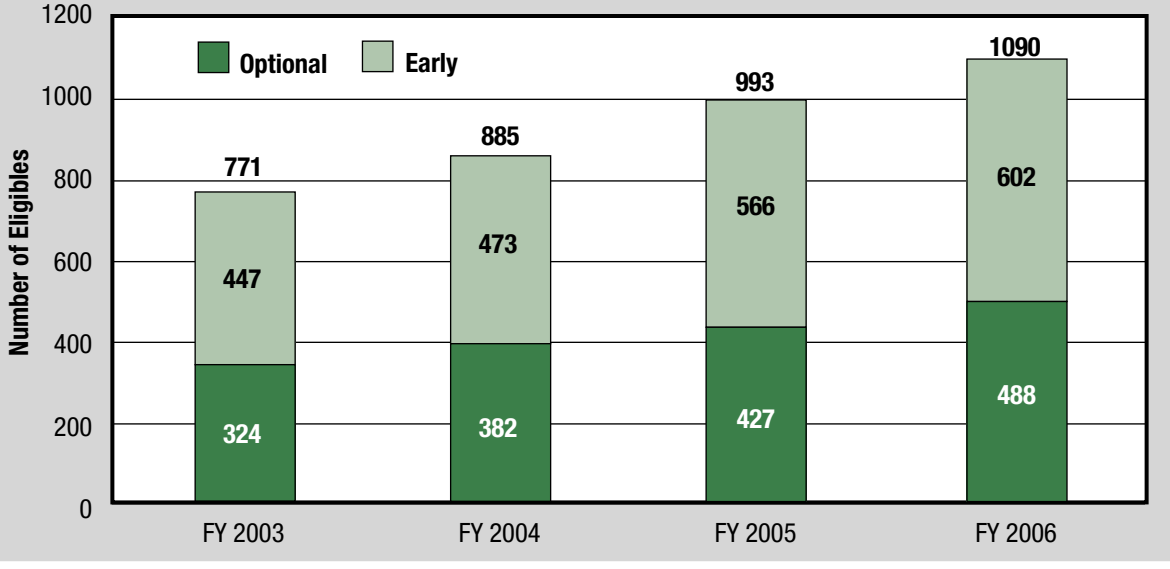
While MSFC employs a variety of organizational competencies, the Center has identified the core competencies required to support its areas of emphasis to include Propulsion Systems and Space Transportation Systems. In addition, the Center's engineering capabilities in Avionics, Advanced Materials and Processing Science, and Structural Systems not only support the Center's mission but also support the management of the NASA Technical Standards Program and the NASA Space Environments and Effects (SEE) Program.



MSFC Age Profile



MSFC Retirement Eligibles



3.2 Core Competencies

Propulsion Systems and Testing: Supplies the knowledge and capability to provide world-class engineering insight into NGLT, OSP, and existing Shuttle propulsion elements.

Systems Engineering and Integration: Provides a vital component to the success of MSFC programs and projects. The cause and effect relationships of requirements and space flight hardware are the difference between failure and success. Systems Engineering and Integration is employed to achieve efficient and effective results for the OSP Program, Space Shuttle Projects, and *ISS* Projects in support of the Space Flight Enterprise.

Design and Development Engineering: Supplies design and development expertise to a variety of projects. Science and microgravity experiments and missions are designed and developed for optimum performance. Keys to the success of these projects and the Science enterprises are the creativity and innovative nature of the advanced technologies researched and implemented.

Safety and Mission Assurance: Provides MSFC with the engineering discipline expertise required to assure personnel safety and hardware mission success through the development, implementation, and oversight of policies and procedures for systematically identifying and managing the numerous types of inherent risk associated with space flight.

Science: Supports the Earth Science, Space Science, and Physical Science goals of NASA with basic and applied scientific research. The MSFC capability to design and test large optical systems and optics for high-energy systems is vital to several planned Space Science missions. Basic research is performed on radiation effects on materials to support long-duration human space flight.

Business IT Systems: Provides MSFC and the Agency timely access to information needed to make key business decisions. MSFC expertise supports the improvement of financial, physical, and human resources through the implementation of the Integrated Financial Management Program (IFMP), the knowledge enabling the Agency to achieve management and institutional excellence that is comparable to NASA's technical excellence. The IFMP serves as a key aspect of MSFC's Business IT System.

3.3 Current State of the Facilities

MSFC comprises 1,841 acres of land on the U.S. Army's Redstone Arsenal. There are 238 total buildings and structures comprising approximately 4.2 million square feet of gross floor space. The total replacement value of these facilities is $1.2 billion. Of the Center's buildings/structures, 75 are rated world-class, and 191 are over 20 years old.

Many of MSFC's facilities have exceeded their 30-year service life and are in need of replacement. They are costly to operate and maintain and are creating growing backlog of maintenance and repair (BMAR) requirements that exceed our ability to correct within our existing maintenance and repair budget. Changes must be made in order to effectively and efficiently manage the Center and Agency's resources. MSFC's proposed solution is identified in Section 4—Support to Real Property Strategies.

Marshall Space Flight Center Technical Core Competencies

Space Transportation

Launch Systems

Main Prop Sys DD&I
- Adv Concept Develop
- Adv MPS Comp D&D

Solid Rocket Motor
- Design
- Performance Assessment
- Internal Ballistics

Liquid Rocket Engine D&D
- Systems Design
- Combustion Devices
- Lines, Ducts, and Valves
- Turbomachinery
- Electromechanical Controls (thrust vector control)
- CFD and Experimental Fluid Flow
- Health Monitoring
- Fluid Dynamics

RBCC

In-space Systems

- Advanced Concepts Develop
- Propulsion Systems Develop
- Chemical & Non-Chem Prop
- Cryo Fluid Mgt
- Nonnuclear Reactor Test

- Advanced Concepts Develop
- Propulsion Systems Develop
- Chemical & Non-Chem Prop
- Cryo Fluid Mgt
- Nonnuclear Reactor Test

Propulsion Research (Fundamental & Applied)
- Advance Chemical
- Plasma
- Nuclear

Propulsion Component Device Testing

Crosscutting

Flight Program/Project Mgt

Failure Analysis & Problem Resolution

Systems Engineering
- Systems Analysis (ISEAP)
- Systems Requirements
- Systems Integration
- Cost Estimation

Information Tech
- Networks
- Computing
- Applications & Data
- Multimedia

Safety & Mission Assurance
- Safety
- Quality
- Reliability

Payloads
- Cargo Integration
- Payload Ops & Integration
- Ground Support Sys Dev & Ops

Space Systems & Infrastructure

- Science Space Craft DD&I
- Human Space Flight Support
- ECLS Development
- Fluid Management
- AR&C
- Space Environ Definition
- Space Environmental Effects
- Radiation Shielding
- Microfluidics
- Environ Character & Control
- Fluid Management

Engineering
- Avionics
- GN&C
- Flight Mech/Trajectory D&A
- Mfg. Process Development
- Materials Applications
- Heat Transfer
- High-speed Video/Photo Analysis
- Video Systems Development
- EEE Parts/Failure Analysis
- RF Analysis & Test
- Computer/Data Systems Dev
- Flight Software Development
- Electronics Packaging
- Large Structural Test
- Environmental Test
- EMI/EMC Analysis& Test
- Collaborative Engr Environments
- Mechanical Design
- Manufacturing Services
- Acoustics
- NDE
- Tribology
- Structural Assessment: strength stress, fatigue, fracture, buckling, loads, dynamics

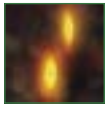
Science Research & Instruments

Space Science
- Gamma Ray Astron
- X-ray Astronomy
- Solar/Space Physics
- Cosmic Rays
- Astrobiology
- Large Optics Mfg & Test

Earth Science
- Observation/Analysis of Global Climate and Weather
- Atmospheric Electricity
- Urban Landscape
- Land-use Research

Microgravity Research
- Materials Science
- Strategic Biomolecular Research
- Microfluidics

Science Instrument Dev
- Power & Electronics
- Structures & Mechanics
- Thermal
- Optics
- Controls
- Test & Analysis



4 Strategic Capabilities for the Future

4 Strategic Capabilities for the Future

4.1 Support to Strategic Objectives from Institutional Program Office

MSFC is one of four Space Flight Centers that are core components of the Space Flight Enterprise. The Center Director serves on the Leadership Council for the Space Flight Enterprise and, in that capacity, contributes to the overall direction and leadership for the Enterprise.

To ensure alignment between programs and institutional capabilities, the Enterprise Associate Administrator (EAA) of the predominant activity at each Center is designated by the NASA Administrator as that Center's Institutional Program Officer (IPO). Serving in the role of IPO, the EAA is responsible for ensuring that the Center has the capability to meet its programmatic and functional commitments, as well as long-term mission responsibilities, in a safe and effective manner. The EAA/IPO is also responsible for implementation, conformance, and the assurance of safe and efficient functional operations.

Each IPO also ensures a broad perspective by providing the opportunity for all the Enterprises that have work at the Center to participate in institutional decision processes. These processes encompass policy decisions, allocation of common resources, approval of the Center's institutional operations budgets, and recommendations on proposed capital investments, including determining fund sources.

The IPO works to ensure effective management of Center resources to support programs and missions. This will assure an Agency-level strategic and integrated view of institutional needs and priorities.

Artist's concept of the X–37 orbital vhicle, a follow-on to the autonomous landing and technology vehicle.

4.1.1 Support to Space Flight Leadership

Commitment to Flight
MSFC's commitment to space flight is resolute. We are beginning a new chapter in NASA's history. We are recommitting to excellence in all aspects of our work, strengthening our culture, and improving our technical capabilities. In doing so, we will ensure that the legacy of *Columbia* guides us as we strive to make human space flight as safe as we can. Through outstanding engineering and international cooperation, we will continue to explore as judicious risk-takers. As explorers and pioneers, our commitment to human and robotic space exploration is firm. We will launch NASA science missions on ELVs, and our Shuttle fleet will resume regular flight. Through outstanding engineering and international cooperation, we will complete the assembly of the *ISS* and create a world-class research laboratory in microgravity for the United States and our international partners. Much as the Gemini program allowed us to leap to the Moon in Apollo spacecraft, we will use the *ISS* to learn how to overcome human limitations in space and create a springboard for exploration beyond Earth's orbit.

Corporate Focus
We are an integrated organization with a common purpose. Our common focus is to provide space flight capabilities that further NASA's goals, now and in the future. The Space Flight Enterprise is a large, integrated unit that provides space access for all other components of our Agency. This entails a focus on customer service so that we provide space flight services that enable scientific accomplishment as well as educate and inspire future explorers. We share our operational expertise with NASA Enterprises engaged in engineering some of our essential future capabilities. In partnership with the rest of NASA, we create, test, and deploy building blocks for future exploration, discovery, and understanding.

Management Excellence
We will maximize the taxpayers' return on investment by deploying state-of-the-art management tools to allocate resources responsibly and enable constructive leadership of our programs. To manage with excellence, we employ a portfolio of capabilities and allocate resources judiciously. We aim to enhance financial performance and enable constructive leadership of programs, field Centers, and facilities. We encourage innovation, supported by new practices drawn from the forefront of technology and management science.

Reaching for a Vibrant Future
Through a refined focus and management excellence, we will respond to new opportunities with flexibility and agility. In partnership with the NASA Space Architect and other NASA Enterprises, we will define our future. A major component and driver of MSFC's future is the ISTP. The ISTP is the long-range investment strategy to revolutionize space transportation, thus ensuring our Nation's leadership in space. The ISTP provides the framework for research and develops a suite of advanced technologies vital to new space transportation systems.

4.1.2 Support to Space Flight Enterprise Themes

Space Shuttle Program
MSFC is a contributor to the NASA Space Shuttle Program (SSP) theme, ensuring access to space and improving the safety, reliability, and affordability of the Shuttle propulsion elements. This goal is traceable to the SSP mission: to provide safe, reliable, and efficient human access to Low Earth Orbit and the *ISS*, optimizing scientific research, demonstrating advances in technology, and stimulating National interest in education and exploration.

The *Columbia* Accident Investigation Board (CAIB) has provided NASA with a roadmap for moving forward with our return-to-flight efforts. It has provided a set of comprehensive recommendations to improve the safety of the SSP. Our initiatives to support the Space Flight Enterprise strategies include implementation of design and process changes recommended by the CAIB. Other priorities include reducing accepted vehicle risks and hazards; maintaining critical safety checks and balances; maintaining process and hardware quality control; providing a reliable facility infrastructure; identifying and resolving obsolescence concerns; and maintaining environmental compliance.

MSFC will continue to support the Space Flight Enterprise by providing technical insight and support to the SSP return-to-flight effort and subsequent operation of the Space Shuttle. Partnering in NASA's SLEP, we will assure that all critical assets are in place to safely and efficiently fly the Space Shuttle through at least the middle of the next decade. We will help to identify and prioritize safety, supportability, performance enhancements, and infrastructure initiatives.

This artist's digital concept depicts the completely assembled *ISS* passing over Florida.

In addition, we provide and manage the Huntsville Operations Support Center (HOSC) ground-based systems in support of the SSP. The HOSC supports the SSP theme by providing real-time data from the Shuttle Transportation System (STS) propulsion systems during the critical launch phase.

International Space Station

MSFC supports the Agency's need for flight systems development and cargo integration with launch vehicles for the *ISS* theme. We support the design, development, and operation of major *ISS* flight system elements. MSFC provides the *ISS* Node 3 assembly, the ECLSS to implement revolutionary regenerative life support capabilities for *ISS* crew, and sustaining engineering support for the *ISS* Multipurpose Logistic Module (MPLM).

MSFC also provides certified flight controllers to manage the *ISS* payloads around the clock, every day of the year, from the POIC. The POIC is the critical facility to monitor, control, and execute payload operations for the *ISS*. We provide new and innovative management tools to continually improve the management of the real-time operation of the *ISS* science payloads and allow greater flexibility for the science investigation teams to accomplish their objectives.

The OSP Program will develop a new vehicle that will provide a multipurpose utility for the Agency. The primary OSP Program Goal is to support the *ISS* by providing Crew Rescue Vehicle (CRV) capabilities, Crew Transfer Vehicle capabilities, and limited cargo capability. Initially the CRV will be launched on an ELV, with design flexibility that will enable a transition path to future reusable launch vehicle systems.

The OSP and *ISS* Programs will identify all interfaces required by an OSP vehicle performing *ISS* operations. Both programs will conduct integration reviews, manifesting, and operations planning and execution. Additionally, both programs will share the responsibility for the development, execution, and verification of OSP traffic models and OSP modes of operation in support of *ISS*. Collaborative program forums will be created, when necessary, to help guide joint activities, manage change dispositions, and provide a joint decision-making process.

Space Flight Support

MSFC provides advanced concept support to the Space Flight Support theme's Advanced Systems Office (ASO) for future investment decisions that will accelerate the development of new revolutionary technologies. We develop innovative tools and

models to accomplish advanced concept studies for future human and robotic exploration and development of space, and we provide support for the development of concepts relative to future infrastructure for space assembly, flight demonstration planning, and professional workshops on transforming systems capabilities.

4.2 Support to Strategic Objectives from Enterprises/Themes

4.2.1 Aerospace Technology Enterprise

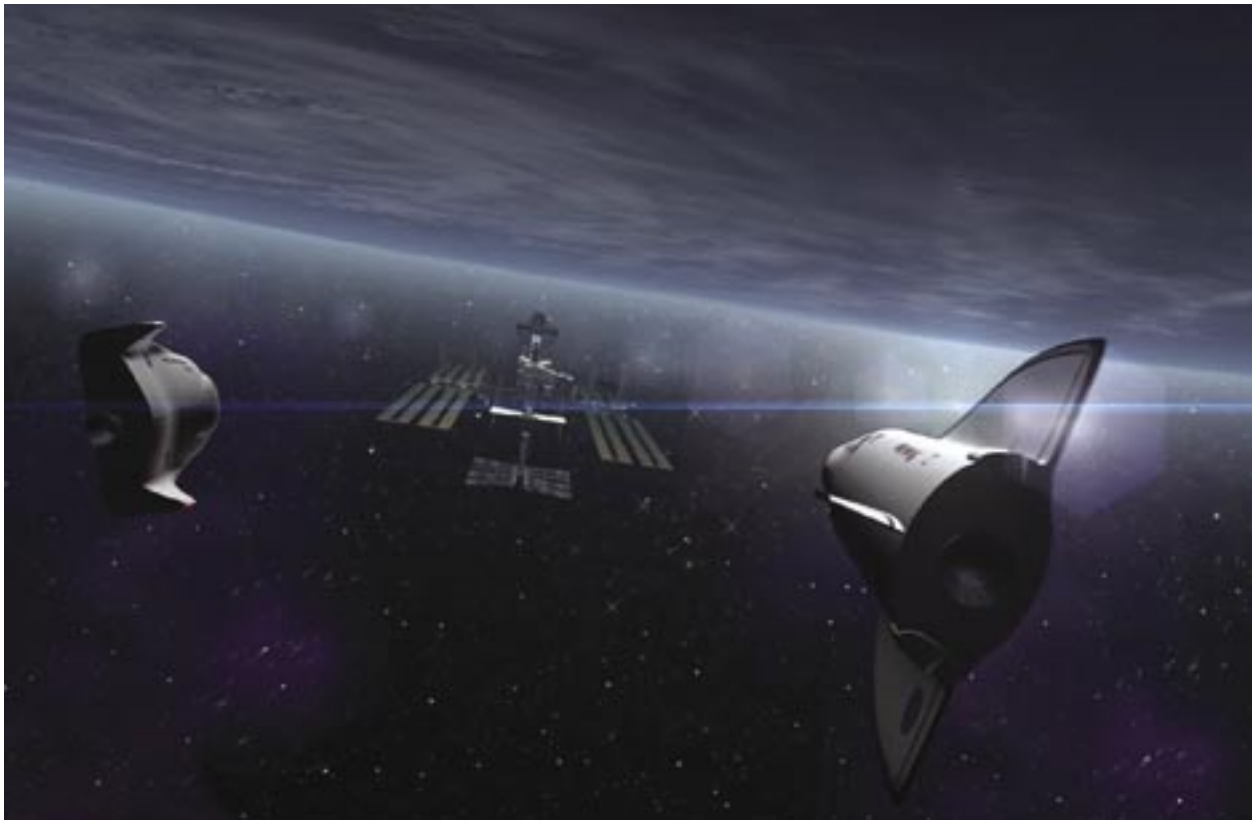
The Center is committed to achieving its diverse mission through focused and relevant strategic planning processes with commensurate actions/plans and implementation. MSFC is committing its current resources and future competencies towards advancing space propulsion technologies utilized through focused research efforts, the ISTP, and key inter-Agency relation alliances such as those with the Departments of Defense (DOD), Energy (DOE), Commerce (DOC), and Transportation (DOT). Strategies will assess and address the whole systems architecture in order to meet the strategic needs of the Center and the Agency.

Space Launch Initiative

MSFC supports the SLI theme in the areas of flight system cargo integration design requirements support, flight operations integration support, environmental control design requirements support, flight systems development, and ground systems development. MSFC develops operations and cargo integration requirements for the OSP and the NGLT. MSFC also develops the flight demonstration requirements for NGLT payloads. The HOSC capabilities and expertise will be used to support NASA's next generation of flight vehicles such as the OSP.

MSFC provides technical leadership in the areas of Propulsion Research; Subsystem and Component Development; Vehicle and Systems Development; and Component and Systems Testing and Evaluation. Within these categories, the Center conducts activities such as Space Shuttle propulsion element engineering and support; In-space Propulsion Research and Development; Hypersonics (3rd Generation Reusable Launch Vehicle) Research and Technology; NGLT advanced development; component and small-scale propulsion systems testing; Aerodynamic Research and Testing; and

This image depicts an artist's concept of a future second-generation launch vehicle during launch.



The primary OSP Program Goal is to support the *ISS* by providing CRV capabilities, Crew Transfer Vehicle capabilities, and limited cargo capability.

multifaceted Propulsion Research in such areas as Antimatter Containment, Combustion Physics, Plasmas, and Nuclear Propulsion Systems.

MSFC will demonstrate scientific proof-of-principle for extremely energetic and enabling propulsion technologies. The Center will work closely with the OSP, NGLT, In-space, and Prometheus programs, as well as the NASA Exploration Team (NEXT), to mature emerging propulsion technologies when appropriate as low Technology Readiness Level (TRL) Feeders. Within these broad areas, MSFC manages projects as varied and diverse as the Rocket-based Combined Cycle (RBCC) hypersonic propulsion system known as the Integrated System Test of an Air-breathing Rocket (ISTAR), the Next Generation Ion Engine, Solar and Plasma Sails, ELV Support activity, and an electrodynamic tether called the Propulsive Small Expendable Deployer System (ProSEDS).

Orbital Space Plane

As a key component of NASA's SLI, the OSP Program is committed to strategic support of the *ISS*, the primary OSP System customer. The OSP Program is dedicated to clear, concise requirements that do not dictate design solutions, but reflect the true needs of its customers—especially the ultimate end-users, the astronauts who live and work aboard the *ISS* and their operational support teams. The OSP Program is responsible for the system design, development, and operations of this new space transportation, including spacecraft vehicle design, development, and operations—both ground and flight. The necessary flight demonstrations and technology development activities of the X–37 and Demonstration of Autonomous Rendezvous Technology (DART) will enable development of an OSP System.

OSP senior leadership is aware that NASA and other agencies within the National Security Space Community (NSSC) are working diligently to establish intra-Agency and inter-Agency programs to capitalize on synergy, enhance interoperability, and ensure effective use of resources to foster National space control strategies. As the National Space Policy evolves, the OSP Program's focus on strategic capability development fully supports NASA-unique missions such as the *ISS*, as well as the Agency's NSSC role.

The OSP Program Management Office executes, per direction of the OSP Program Manager, all activities required to meet the Program objectives and NASA Level 1 Requirements, and provides an integration hub for the OSP Program workforce that spans the Agency. Specific responsibilities of the Program Management Office are allocated

according to function—technical direction and program assurance (via the Chief Engineer and Mission Success Office), Program Planning and Control, Requirements Management, Acquisition Management, Program Integration, and Technology and Flight Demonstrations.

The Office of the Chief Engineer provides technical direction and recommendations to the Program on any advanced development needs that would be required of any OSP design in time to support budget planning. It also ensures that NASA safety and program assurance guidelines are addressed. The Program Planning and Control Office manages the external interface and liaison with NASA Headquarters Enterprises and other governmental offices and agencies. It defines and manages the systems for effecting accountability, discipline, and integration in the OSP Program. The Acquisition Management Office, in collaboration with the MSFC Procurement Office, ensures compliance with standard procurement practices and defines OSP Program acquisition processes, documentation, management requirements, and key strategic decisions. The OSP Program Integration Office provides overall technical integration for the Program and leads formulation contract activities.

Aeronautics Technology

The NGLT Program combines the remaining technology development activities from the former Second Generation Reusable Launch Vehicle (RLV) program with the Space Transfer and Launch Technology Program (3rd Generation Hypersonics) to ensure a coordinated technology development effort. The NGLT Program will focus its efforts on the most critical technology development and risk reduction activities, continuing to aggressively pursue commonality with the DOD through the National Aerospace Initiative (NAI).

Launch Systems Technology

A key element of the NGLT Program is the development and demonstration of vehicle technologies that provide a significant reduction in the cost of space transportation systems, dramatically improve safety and operability, and reduce future operational vehicle development risk. This will be accomplished through the execution of an affordable plan focused on key technologies, not only using existing designs, analysis methods, and databases, but also existing hardware to the maximum practical extent.

Next Generation Launch Technology

The NGLT Program is working towards future demonstrations and flight validation of two hydrocarbon fuel-cooled, dual-mode scramjet-propelled, hypersonic vehicles in steady maneuvering flight. Ground and flight data will be provided in order to validate computational methods, analytical predictions, test techniques, and propulsion operability to enable design of future operational vehicles. Development of the hydrocarbon fuel-cooled propulsion system is a joint effort between NASA and the United States Air Force (USAF), using technologies developed in the USAF Hypersonic Technology (HyTECH) Program. The ultimate customer will be the public, who will benefit from the incorporation of new technologies into next generation aerospace vehicles as well as possible technology spin-offs to other air-breathing systems.

Systems Engineering and Analysis

The NGLT Program will implement a systems analysis process that will provide systems analyses to integrate the activities within the NGLT Program. The objective of the systems analysis process is to apply a disciplined systems analysis process to support NGLT research and technology development investment decisions. These analyses will focus and guide the technology investments. An integrated team composed of the best available talent from government, industry, and academia will execute a disciplined, annual process of top-down, requirements-driven system analysis. This process will produce and deliver a set of linked missions, concepts of operation, system requirements, characteristics, architectures, and conceptual system designs. This will serve as the basis for evaluating the impact of investing in various portfolios of advanced technologies. These technology evaluations will provide invaluable information to the NGLT Program for prioritizing and allocating funding to develop hypersonic air-breathing vehicle technologies.

NGLT Propulsion Element Builds on Shuttle Legacy

Propulsion hardware is a major investment in any Earth-to-orbit system. The overall goal of the NGLT Propulsion element is to clearly demonstrate significant improvements in propulsion safety, operations, and development costs as compared with the Space Shuttle—the Nation's best and most extensive basis of experience. It will focus on the most critical technology development and risk reduction activities, including studies, design, manufacture, analysis, and test of advanced propulsion systems and subsystems that will help the Agency make future full-scale development decisions. Ultimately, this work supports NASA's mission to explore our universe and improve life on Earth, which will be enabled by safe, affordable, and reliable access to space.

Advances in the NGLT program will eventually lead to new forms of space travel.

4.2.2 Space Science Enterprise

Structure and Evolution of the Universe, Sun-Earth Connection, and Solar System Exploration
MSFC's Space Optics Manufacturing Technology Center (SOMTC) will continue to develop new and innovative technologies to meet the projected need for increasing apertures as well as lightweight optics as a key requirement to reducing launch costs for space-based systems. MSFC will support Goddard Space Flight Center (GSFC) by advancing the development of ultralight optics for the JWST and will perform optical testing in support of this and other programs.

MSFC will complete its management of the preparation of Gravity Probe-B, leading to a successful launch to test two extraordinary predictions of Einstein's General Theory of Relativity, namely geodetic precession and frame dragging, both of which describe distortions in the space-time continuum. MSFC will also continue its management of the U.S. contribution to the Japanese Solar-B mission and its support to the Gamma-ray Large-Area Space Telescope (GLAST) mission, which is scheduled for flight in 2006.

As one of seven research partnerships in the NSSTC, MSFC will continue to compete for and conduct peer-reviewed research in multiple areas to include X-ray and Gamma-ray Astronomy, Cosmic-ray Astrophysics, and Solar and Space Plasma Physics.

In addition, MSFC provides support to the Structure and Evolution of the Universe theme. The Center also provides program management for the Chandra X-ray Observatory and technical management and integration of Chandra program activities.

4.2.3 Earth Science Enterprise

Earth System Science and Earth Science Applications
MSFC will continue to perform basic and applied research to better understand the Earth's climate and global water and energy cycles, and how that understanding can be applied to our quality of life and our stewardship of the planet. MSFC's Earth Science Department is located in the NSSTC and is part of the GHCC, a joint venture among NASA, the University of Alabama in Huntsville, and the Universities Space Research Association (USRA). Knowledge gained is applied toward understanding basic questions about the Earth system, operational meteorology, urban planning, agriculture, water resource management, and climate change. The continued acquisition of global lightning data from

the Lightning Imaging Sensor (LIS) onboard the Tropical Rainfall Measuring Mission (TRMM) will contribute to an understanding of the relationship between lightning flash rate and severe storm onset.

4.2.4 Biological and Physical Research Enterprise

MSFC is making significant contributions towards understanding the challenges of human exploration of space. The Center will draw upon the expertise of its staff and unique facilities to better understand the space flight environment, its dangers, and devise mitigation techniques.

Biological Sciences Research

MSFC will continue to explore avenues to make significant contributions to the study of molecular biophysics and biochemistry. MSFC is refining its direction of research to concentrate specifically upon problems associated with space exploration and includes such areas as bone loss, radiation effects, and muscle deterioration. MSFC also provides innovative research facilities for the Biological Sciences Research theme by developing the Expedite the Processing of Experiments to the Space Station (ExPRESS) Human Research Facility (HRF).

Physical Sciences Research

To address future space flight challenges, MSFC materials scientists will initiate new research programs into key areas that support the NASA goals of deep space exploration and long-term manned habitation at extraterrestrial destinations. These new initiatives are the development of new materials and techniques for shielding astronauts and equipment from space radiation damage, basic research into high-performance materials required to support advanced propulsion systems, scientific studies of approaches to in-space fabrication and repair of flight system components, and research into the utilization of naturally occurring resources on other planetary bodies as building materials. Discipline investigators will accomplish experiments in the *ISS* Microgravity Science Glovebox (MSG) to further our understanding of the behavior of the microstructure of materials in low gravity.

Research Partnerships and Flight Support

MSFC will continue its effort to identify and strengthen areas within NASA that offer opportunities for partnering with the Research Partnership Centers and their industrial partners. MSFC will continue to work with its partners to enable key research in the low gravity environment.

In preparation for experiment operations, Expedition Six Science Officer Don Pettit dons gloves in the Microgravity Science Glovebox (MSG).

MSFC supports the integration, management, and execution of the utilization activities and payload operations onboard the *ISS* in support of the Research Partnerships and Flight Support (RPFS) theme. The Center serves as the focal point for integration of all payload operations, including the *ISS* international partners and the U.S.-based payloads. The HOSC supports the RPFS payload operations by providing real-time data processing, flight systems command capabilities, and state-of-the-art ground support facilities. MSFC provides the crew training requirements, operations planning, operations control, and management of science experiment execution. We also provide sustaining engineering of the ExPRESS rack systems in support of the RPFS theme, as well as providing and managing the HOSC ground-based systems.

Expedition Five crewmember and flight engineer Peggy Whitson displays the progress of soybeans growing in the Advanced Astroculture (ADVASC) Experiment aboard the *ISS*.

4.2.5 Education Enterprise

From the excitement of the countdown to the awe-inspiring images of planets and galaxies, space exploration has a unique capacity to ignite the imaginations of young and old alike. The road to the planets does not begin at the launch pad, however; it begins at the classroom door. NASA's Mission—to understand and to explore—depends upon educated, motivated people with the ingenuity to invest in tools and solve problems and the courage to always ask the difficult questions. It is not enough to depend on the excitement generated by our images. We must capitalize on our progress and achievements in understanding and exploration. To do so, we must provide the meaningful, educational, and content-rich programs that inspire and motivate students to pursue careers in science, technology, engineering, and mathematics. To support student learning, we must provide educators with the tools, knowledge, and materials to capitalize on the excitement of NASA's discoveries to spark student interest and involvement. Finally, we must engage the public in shaping and sharing the experience of exploration and discovery.

The new Education Enterprise will play a leading role in NASA's Mission to inspire the next generation of explorers. Under One NASA, the Education Enterprise establishes and communicates the strategic objective and outcomes, as well as the program priorities, initiatives, and messages required to achieve the NASA Mission to inspire the next generation of explorers. Within that context, MSFC has the responsibility and accountability for coordination and implementation of various Enterprise policies and strategies.

MSFC is directly responsible for establishing collaborations with local, regional, and state-level customers to ensure NASA is responsive to identified needs. MSFC will work with the Education Enterprise to create a national strategy that will accomplish our mission to inspire the next generation of explorers in support of NASA's overarching vision.

MSFC is positioned to nurture student experiences through participation in cutting-edge scientific discovery and exploration. Involvement in MSFC's education programs provides skill development and the practical application of science, mathematics, engineering, and technology. MSFC will apply effective implementation and assessment strategies to determine how successful the approach has been and if it has led to improvements in human capital recruitment, retention, and programmatic outcomes.

Our education strategy also pays particular attention to students, teachers, faculty, and researchers from underrepresented communities—including minorities, persons with disabilities, and low-income families. Special efforts will be directed to provide citizens from all communities with access to NASA's unique opportunities. We will use the excitement of our missions and programs to inspire more students to pursue the study of science, technology, engineering, and mathematics, and ultimately to pursue careers in aeronautics and space…as only NASA can.

4.3 Support to Enabling Goals

4.3.1 MSFC Commitment to Safety and Mission Success

MSFC has a comprehensive safety program to promote a safe working environment, thus assuring the safety of the public, workforce and astronauts, and MSFC-managed high-value equipment and property. Key to this function is assuring the implementation of NASA, MSFC, Occupational Safety and Health Administration (OSHA), Federal, and state safety policies and guidelines at MSFC. In addition, worksite safety analyses are performed and verified, and support is provided for worksite hazard prevention and control. Safety awareness and safety training promote management commitment and employee involvement.

Industrial safety provides extensive functional support to the MSFC Safety, Health, and Environmental (SHE) Committee and its various subcommittees. The SHE Committee is structured to integrate our management and nonsupervisory personnel—both civil service and contractor workforce—into a unified Centerwide team that empowers all MSFC employees to take personal accountability for their health and safety, as well as that of their coworkers. The SHE Committee is also designed to make optimal use of available resources in managing risk and assuring mission success.

To guarantee quality engineering and assurance at MSFC, external and internal audits provide a review of the Marshall Management System (MMS) processes and procedures in compliance with ANSI/ISO/ASQ 9001:2000 standards and other applicable documents. These audits identify areas for improvement. Additionally, the design, development, production, installation, and servicing of flight hardware, flight software, and associated ground support equipment interfacing with flight hardware and flight software are conducted in compliance with AS9100 requirements.

The Marshall Quality Council (MQC) manages the quality of MSFC processes and documentation. Processes and products are continually improved through employee innovation and standard processes for improvement. Employees are encouraged and rewarded for their contributions. Senior management provides a customer focus, and each office/directorate solicits customer feedback to enhance customer satisfaction.

This image was taken of the Space Shuttle *Endeavour* during the night launch of STS–113.

Reliability and Maintainability (R&M) engineering at MSFC involves planning, organizing, performing, facilitating, directing, and implementing various R&M qualitative and quantitative processes and performing tasks using uncertainty analysis like Probabilistic Risk Assessment, Sensitivity Analysis, Failure Mode and Effects Analysis/Critical Items List, Design for R&M, and other trade studies in support of various programs and projects.

Best-in-class Integrated Reliability, Maintainability, and Supportability processes from the DOD, commercial industry, and within NASA are being identified and are planned for implementation on new and existing programs and projects. These innovative R&M processes and tools provide risk-based and analysis-based decision solutions that are necessary to achieve NASA's goal of significantly improving safety and reliability.

MSFC will continue to establish and monitor practices for safety and mission success. We will promote safe practices in all that we do. Safety is our first priority at MSFC, and people are our first core value. For the MSFC team, protecting the public, our workforce and astronauts, our facilities, and our products are prerequisites for assuring safety and success of MSFC and NASA missions. MSFC will continue to explore innovative quality, reliability, and maintainability processes and tools that provide risk- and analysis-based solutions to achieve NASA's goal of significantly improving safety and mission success of programs and projects, as well as reducing the Program Life Cycle Cost.

With mission areas in Space Transportation Development, Microgravity, and Space Optics Manufacturing, safety and mission assurance functions are critical to every NASA work activity and team member. MSFC will strive to provide value-added support to its internal and external customers, aiding their efforts to efficiently accomplish Center and NASA missions without loss or incident. Continually enhancing the safety knowledge and skill of the MSFC team is a key strategy of this endeavor.

MSFC will continue to be committed to the NASA goal to continuously improve methodologies for safety risk identification and assessment. These enhanced systems and processes will be used to continually identify, manage, and mitigate risk to maintain critical safety checks and balances.

MSFC will provide safety implementation for all Center organizations, incorporating safety and mission assurance functions as intrinsic process elements during the development of new technologies, work planning, and performance. Fostering employee expertise and actively involving them in the improvement of systems, processes, and procedures will yield increasingly effective methods of mission assurance.

MSFC continues to refine its integrated systems management approach to improve the safety of the public, the astronauts and pilots, the NASA workforce, and high-value equipment and property.

4.3.2 Engineering Mission and Core Strategies

In partnership with our customers and stakeholders, MSFC provides engineering excellence in research, technology, development, and support essential to mission success and safety and built upon our core values.

MSFC provides highly skilled engineering services for the Center's product line directorates and offices and Agency leadership for select crosscutting engineering functions. Their long-term vision, mission, and five core engineering strategies are in furtherance of the NASA Strategic Plan and the MSFC Implementation Plan. The five core engineering strategies are:

Engineering Products and Services
MSFC will pursue excellence in providing crosscutting engineering products and services responsive to our customers' needs. Strategic alliances throughout the technical community and integrated engineering solutions will be utilized to enable our customers' success.

New Technology Development
MSFC will create new and enabling technologies that advance our customers' visions, meet their goals, and enhance U.S. competitiveness.

To better achieve this goal, a portion of MSFC's engineering personnel and skill investments will be continually focused in selected technology thrust areas. These technology thrust areas are intended to be crosscutting, high-impact, and high-value investments for MSFC and its customers. Thrust areas include:

- Space Environmental Effects.
- Advanced Avionics.
- Advanced Cryogenic Tanks.
- Advanced Structures and Materials.
- Advanced Manufacturing.

People
MSFC will build a learning organization through professional development. Employees actively involved in continuous learning will ensure a highly qualified and motivated workforce with the proper skills and customer focus to achieve mission success.

Infrastructure
MSFC will upgrade and maintain the proper infrastructure of facilities, tools, and equipment to ensure customer success and enhance our competitive posture.

Business
MSFC will utilize efficient and effective internal processes and business practices to integrate our solutions with our customers' needs, market our capabilities, and maximize the percentage of resources available to perform engineering work.

MSFC Engineering Initiatives
To better serve customers, stakeholders, and its workforce, MSFC is taking a synergistic approach to continuous learning and innovation by implementing three engineering initiatives—Learning Organization, Integrated Engineering Solutions (IES), and Integrated Engineering Capabilities (IEC). These initiatives seek to enhance collaborative engineering performance and more efficiently deliver quality engineering services while strengthening engineering competencies.

Learning Organization
The Learning Organization initiative will create an environment that promotes and nurtures the objectives of a learning organization where all employees value the sharing of knowledge and skills to the betterment of the team. This only happens when employees demonstrate a passion to actively communicate and receive knowledge, knowledge flows easily across organizational boundaries, and knowledge is captured and made easily accessible.

Integrated Engineering Solutions
The IES initiative will refine the process for in-house developed systems through the implementation of system process improvements. This documentation process will enable the production of quality products, in accordance with advertised schedules, and within approved budgets.

Integrated Engineering Capabilities
The IEC initiative will establish an advanced engineering environment that fully integrates the engineering process throughout the life cycle of the product. This integrated environment will serve to significantly improve the quality process and support collaboration within MSFC and with other Centers.

4.4 Support to Human Capital Strategies

4.4.1 Desired Future Workforce

Our goal is to have a workforce balanced in competencies and skills to support Space Transportation and Propulsion, the *ISS*, Science, Education, and our other Agency Support Activities. In order to fulfill these requirements, as we know them today, we are looking at an increase in competencies to support a growing emphasis for Prometheus, Biological and Physical Research, *ISS*, Space Shuttle, and OSP. These competencies will include Advanced In-space Propulsion as well as Nuclear Propulsion. The desired future state would also have a stabilized Center indirect workforce, an independent research and development (IR&D) account established to maintain critical/core competencies, a flexible workforce positioned to react to budgetary and program changes and opportunities, and the ability to replace attrition with needed competencies while emphasizing fresh-outs and diversity.

4.4.2 Gaps, Other Workforce Issues, and Approaches to Address Gaps

MSFC is currently undergoing changes in workforce due, in part, to the shift of emphasis in work demand for new initiatives such as OSP, NGLT, and Prometheus, as well as the competencies needed to support the CAIB findings and recommendations for return to flight. Critical at-risk positions have been identified across MSFC that—due to attrition, limited hiring abilities, and shifts in programs—have not been filled. These gaps encompass shortages in 40 critical competencies. The most affected competencies are Propulsion Systems and Test, Advanced In-space Propulsion, and Business IT Systems. The programs most affected by this shortage are Space Propulsion and the IFMP.

MSFC, in coordination with the Office of Space Flight, identified additional long-term full-time employees (FTEs) for Space Shuttle return-to-flight. Those competencies identified as the greatest need were Propulsion Systems & Testing, Design and Development Engineering, and Safety Engineering and Assurance.

By using Agency workforce planning and analysis tools and the Agency Competency Management System (CMS), gaps are being identified in mission critical competencies. By incorporating these workforce planning and analysis tools into the strategic planning process, MSFC will have a more comprehensive look at the needs of our workforce and how to best address those needs. The Center is implementing strategies identified in the Strategic Human Capital Plan to help in developing an integrated workforce planning capability at the Center. Maintaining competencies that are mission critical is paramount to our success as a Center in carrying out the Agency's mission. MSFC is doing this by making effective use of human resource tools such as the Federal Career Intern Program and NASA Excepted appointments, addressing skill imbalances through training and cross-training, utilizing the co-op and education programs as a pipeline for targeted hiring needs, and investing Center General and Administrative (G&A) funds in Independent Research and Development (IR&D) to develop core competencies. The Center will also conduct targeted buyouts to address skill mix issues as appropriate.

NASA wishes to ensure training and development programs build needed competencies, including knowledge sharing and mentoring in the development of employees. MSFC has responded by developing the Cultural Roadmap, which is designed to create a values-based, empowered, high-performance organization. The Center has also established a knowledge management function in the Systems Management Office.

4.5 Support to Real Property Strategies

MSFC's new 20-year Facilities and Land Use Master Plan is nearing completion and will serve as the framework within which future construction projects and related operations will evolve over the next 20 years. The plan reflects MSFC's gradual migration away from large-scale testing and heavy industrial and production manufacturing functions and toward enhancement of MSFC's roles in research, engineering, and development of systems to support the exploration and development of space. The result will be a transformation of the facility from an austere industrial appearance to a more academic, campus-type configuration and appearance. The plan reflects a strategy of replacing or retaining only those mission essential facilities that are required to provide services that cannot practicably be obtained from other NASA Centers or from the commercial sector.

Our Master Plan and Construction of Facilities (CoF) Program define our plans to close and abandon or demolish over one million square feet of aging facilities that are costly to operate and maintain and have a significant amount of BMAR. Construction is then planned for approximately 850,000 square feet of new highly efficient replacement facilities that will have a much lower annual operation and maintenance cost. Construction of these replacement facilities will support MSFC's capability to meet our mission requirements for the next 30 years.

Recurring reviews of MSFC's facilities inventory are conducted to identify those facilities that are excess to our short- or long-term needs. Those facilities that are not needed in the near term, but for which a future need is identified, are mothballed to reduce operating costs. Those facilities for which no future need is identified are offered for return to the Army or are abandoned and scheduled for demolition, if their condition warrants. We plan to utilize demolition funds provided by Code JX to demolish those excess facilities that are not included in our replacement program. This combination of replacement of essential facilities and demolition of excess ones will result in a significant reduction in our growing BMAR, as well as a sizeable cost avoidance in our annual maintenance and operations costs.

5 Implementing Strategies

5 Implementing Strategies

5.1 IS–1. Achieve management and institutional excellence comparable to NASA's technical excellence.

Integrated Financial Management Program
The mission of IFMP is to improve the Agency's management of its financial, physical, and human resources through the implementation and utilization of multiple enterprise module applications. Through IFMP, NASA is implementing enabling technology to provide necessary management information to support implementation of the Agency's Strategic plan.

Logistics Business Systems Operations
MSFC provides leadership in implementing and sustaining Agency logistics systems that provide the necessary, automated tools to professionals that support all NASA Strategic Enterprises, business partners, and logistics business process customers.

IFMP Administration Systems Implementation Project
MSFC has been asked to manage the implementation of the remaining IFMP projects that will utilize the SAP software suite. The IFMP Administrative Systems Implementation Project will provide the management and technical leadership for the Agencywide implementation of standard systems and processes necessary to support the Agency's administrative activities.

The IFMP Administrative Systems Implementation Project is responsible for improving and streamlining the NASA financial management system to enhance accuracy, timeliness, and accountability, as well as continuous improvement and upgrading of the Agency's standard financial management processes and system.

This image of the Space Shuttle *Columbia* was taken during the launch of STS–83.

Improving the institutional management of capital assets ensures that NASA's real property, personal property, processes, and systems are sustained and optimized to support NASA's missions and the capabilities required for today and tomorrow. This provides the technical leadership and management of the implementation of standard, reengineered processes and systems to manage the Agency's assets.

The IFMP Budget Formulation Module will unify the processes for strategic and budget planning, budget reporting, and performance planning and reporting, and will implement Agencywide processes to facilitate budget planning and reporting.

Earned Value Management (EVM) will unify the processes for strategic and budget planning, budget reporting, and performance planning and reporting. The NASA EVM Program is implementing Agencywide processes to facilitate project management, project planning, and performance reporting.

MSFC will develop a FY 2004 recruitment initiative in order to expand the pool of diverse candidates applying to enter the MSFC workforce. A focus will be to recruit at three Historically Black and Other Minority Universities (HBCU/OMU). MSFC will also resolve discrimination complaints at the earliest possible stage. A goal is to reduce the number of discrimination complaints from the FY 2003 baseline by increased use of the Alternative Dispute Resolution process.

MSFC will coordinate accessibility accommodations in four buildings as indicated in the FY 2003 multiyear accessibility survey. MSFC will provide mandatory Phase 2, Agencywide Accessibility Training—classroom and online—for MSFC supervisors and managers.

5.2 IS–2. Demonstrate NASA leadership in the use of information technologies.

NASA Integrated Services Network
The NASA Integrated Services Network (NISN) is the result of consolidating management responsibility for various NASA-wide area telecommunications networks. NISN provides voice, video, data, and messaging services to Agency customers, including mission, Center, programmatic, administrative, and scientific communications. NISN consists of NASA's administrative network, NASA's Mission Operations Network, and various other NASA networks into a single Agencywide network. MSFC has been delegated the responsibility for all wide area networking within NASA.

NASA Computing and Communications System
The NASA Computing and Communications System (NCCS) is an Agencywide IT infrastructure that includes a secure intranet and information mission control center with the capability to provide software distribution, help desk services, performance management, and visibility into networks, desktops, servers, and applications end-to-end. Key components provide:

- Enhanced monitoring and reporting capabilities.
- Information surveillance to ensure data integrity.
- Network services improvements that yield lower cost, higher throughput.
- Data centers that consolidate servers and mainframe systems to host applications for customers.
- Application implementation and sustaining support.

NCCS is to be the foundation for the Agency's new IT Strategy and will facilitate the move to One NASA.

NASA Automated Data Processing Consolidation Center
The purpose of the NASA Automated Data Processing Consolidation Center (NACC) is to centrally locate, operate, and manage non-mission critical mainframe computers, midrange systems, and Agency software contracts required to support the Agency's strategic enterprises. The NACC provides consolidation services and operations for migration of various NASA Centers' automated data processing (ADP) workloads to a consolidated location. Since the initial workload migrations, NACC has focused on increasing efficiencies. This focus includes optimum utilization of resources, technology upgrades, and standardization.

Agency Digital Television
The Agency Digital Television (DTV) mission is to provide policy dissemination, planning, and implementation guidelines for the efficient transition of NASA's current analog television and video systems architecture to the U.S. digital standard. Emphasis is to be placed on all systems intended to produce video for public dissemination, as well as those where DTV will enhance NASA's scientific, engineering, and operational effectiveness. High-definition Television (HDTV) testing is scheduled for STS–114, to provide enhanced imagery of liftoff.

Communications Architecture and Providing Agency WAN Services
MSFC provides an Agencywide communications architecture to support NASA's Enterprises that

The Extreme Universe Space Observatory (EUSO) will examine the interaction between the Earth's atmosphere and Extremely Energetic Cosmic Rays using a curved double-sided fresnel lens 2.5 meters (8.2 feet) in diameter.

incorporates flexibility of technologies, efficiency in sustaining costs, and ensures full interoperability through standards.

Sustaining Engineering Support for Agencywide Administrative Systems (SESAAS)
MSFC provides sustaining engineering support to maintain Agencywide administrative application software and documentation in a current and operational state.

5.3 IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.

MSFC provides systems management consulting, leadership, and technical expertise to ensure consistency across programs, projects, and product lines. MSFC offers training, mentoring, and independent evaluation in systems engineering and program/project management to aid personnel in the development of tailored systems management processes for programs and projects in formulation and implementation. MSFC also provides assistance to Agency and Center management in the conduct of independent evaluation and for Program Management Council support.

The MSFC Export Control Office provides guidance to programs, projects and departments at MSFC to ensure Center compliance to the Export Control Regulations and NASA policy.

MSFC continually refines its integrated systems management approach to improve the safety of the public, the astronauts and pilots, the NASA workforce, and high-value equipment and property. Innovative quality, reliability and maintainability processes and tools provide risk- and analysis-based solutions to achieve NASA's goal of significantly improving safety and mission success of programs and projects as well as reducing the Program Life Cycle Cost.

5.4 IS–4. Ensure that all NASA work environments, on Earth and in space, are safe, healthy, environmentally sound, and secure.

Center for Review of Clean Air Act Regulations
MSFC serves as the Center of support of NASA's review of Clean Air Act regulations. As such, MSFC

is assessing the potential impacts of approximately 25 national air emission standards on NASA programs, facilities, and hardware.

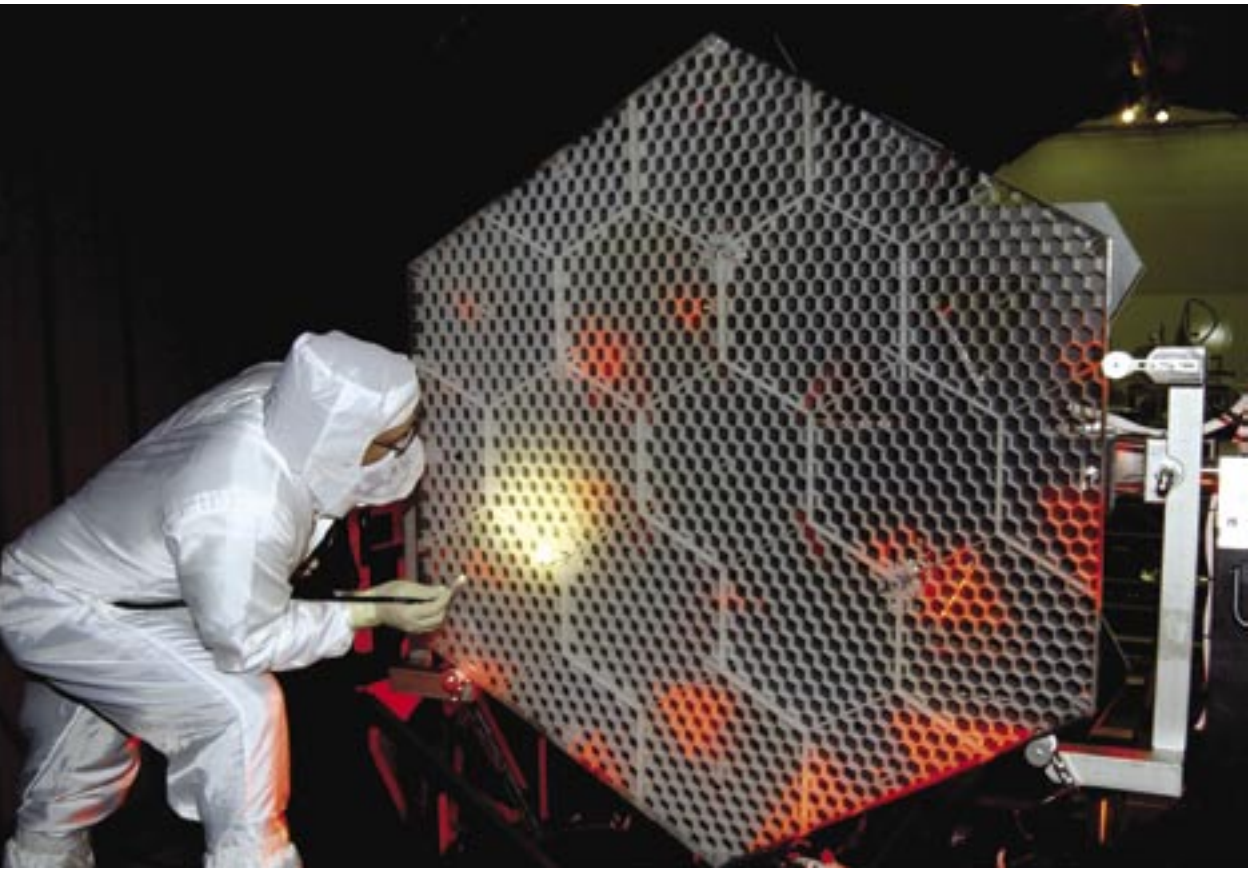
Environmental Assessments Impact Statements
MSFC provides leadership in implementing the National Environmental Policy Act for all new MSFC programs and projects.

5.5 IS–5. Manage risk and cost to ensure success and provide the greatest value to the American public.

Integrated Financial Management Program
The mission of IFMP is to improve the Agency's management of its financial, physical, and human resources through the implementation and utilization of multiple enterprise module applications. Through IFMP, NASA is implementing enabling technology to provide necessary management information to support implementation of the Agency's Strategic Plan.

IFMP Administration Systems Implementation Project
MSFC has been asked to manage the implementation of the remaining IFMP projects that will utilize the SAP software suite. The IFMP Administrative Systems Implementation Project will provide the management and technical leadership for the Agencywide implementation of standard systems and processes necessary to support the Agency's administrative activities. Individual projects will be initiated based upon direction of the IFMP Steering Council. The scope of the first project will include Integrated Asset Management and the upgrade of the Core Financial systems.

In support of IFMP Administrative Systems Implementation, MSFC will provide tools, techniques, and expertise that will enable all elements of the Agency to make well-informed decisions on matters of critical mission importance. The IFMP Administrative Systems Implementation Project is responsible for identifying and developing management information needs in support of the IFMP Information Delivery Strategy.



An MSFC technician in a clean suit inspects the Advanced Mirror System Demonstrator for NASA's JWST, prior to installation in the test chamber for optical performance tests.

The IFMP Administrative Systems Implementation Project supports the Performance Plan Missions by streamlining, automating, and improving the Agency's business processes, systems, and information.

Earned Value Management
EVM provides tools, techniques, and expertise that will enable all elements of the Agency to make well-informed decisions on matters of critical mission importance. The NASA EVM Program is providing program and project planning and analytical tools and techniques, as well as skilled expertise through EVM training courses. The Program also provides effective management processes for assessing, integrating, and managing project risks for improved project management and assessment, via improved processes for cost estimation and the management of major NASA projects and programs.

The NASA EVM Program supports the Agency's missions by enhancing Program and Project integrated planning and control.

Agency Payroll Function
The President's Management Agenda is requiring all Federal agencies to use a Payroll Service Provider for payroll services by September 2004. NASA has selected the Department of Interior to provide payroll services for its employees beginning August 2004. The Department of Interior will process NASA's payroll, provide retirement and benefits data to the Office of Personnel Management and the Thrift Savings Board, as well as issue W–2s to employees. NASA will maintain a payroll liaison office for employees.

MSFC desires to increase collaboration or renew beneficial agreements with Government agencies at all levels, and promotes alliances with academia, industry, and national and regional associations to utilize ongoing research and technologies developed at the Center.

MSFC strives to involve the educational community in our endeavors to inspire students, create learning opportunities aligned with goals established by the educational community, and enlighten inquisitive minds striving to reach underrepresented groups.

The Center has a strategic workforce planning capability in-line with the Strategic Human Capital Plan using NASA's CMS, and provides a staffing and recruitment program that maintains a level of civil service FTEs to adequately support Center missions and maintains diversity in the Center's workforce. MSFC also conducts a nationwide recruiting program that seeks out the best and brightest college graduates for the Center's workforce, incorporating a strategy into the recruiting program to increase the representation of minorities and individuals with disabilities in the Center's workforce.

MSFC can develop innovative technology transfer partnerships that support NASA's Enterprise programs. By promoting alliances with academia, industry, and national and regional associations to utilize ongoing research and technologies developed at the Center, MSFC can improve the Nation's economic strength and quality of life by facilitating the innovative use of NASA technology through licensing agreements and partnership opportunities. This transfer of NASA's technology and innovation helps engage the public in shaping and sharing the experience of exploration and discovery.

MSFC provides an integrated Center Program Operating Plan (POP) for use in developing the Agency Budget request, and budget planning that provides for consideration of funding and related schedule impacts.

Budget Formulation Module
MSFC is responsible for Center implementation of the Agency Budget Formulation Module designed to provide an integrated budget planning tool across the Agency. The Budget Formulation Team at MSFC, in conjunction with the Agency Team, will provide the local process management and necessary training for Centerwide implementation of the system. Full Cost processes will be a major factor in the Budget Formulation. The first phase of the Budget Formulation activity is termed release 0.5, with a go-live date planned for the fall of 2003. Functionality includes bottom-up planning for projects/service pools/G&A, phasing plans, FTE costs/rates/distribution, travel, security, attachment of documentation, standard reports, and versioning. Phase 2 is officially release 1.0, with scheduled release in February 2004. Functionality for release 1.0 includes guidelines, top-down changes, Headquarters reporting, OMB interface via flat file, CoF planning, extended reporting, and planned consumption data to Core Financial.

The IFMP Budget Formulation Module supports the Agency Performance Plan Missions by streamlining, automating, and improving the Agency's business planning processes, systems, and reporting, demonstrating a link between budget and mission performance.

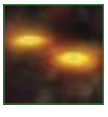
DCAS Financial Management Support
The consolidation of accounting for the Agency Contract Administration function in 1997 was a step in utilization of a smaller number of resources to perform a very large function. The link to the Performance Plan is demonstrated by the fact that the $70 million budget for the Agency Contract Administration is paid through one consolidated effort at MSFC, thus benefiting all Programs within NASA. MSFC is now performing this service for the Agency with the new Core Financial System.

Satellite imagery has provided incredibly detailed images of our Earth.

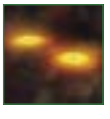
6 Acronym List

6 Acronym List

ADP	Automated Data Processing
ADR	Alternative Dispute Resolution
ADVASC	Advanced Astroculture
AR&C	Automated Rendezvous and Capture
ASO	Advanced Systems Office
AT	Aerospace Technology
BMAR	Backlog of maintenance and repair
BPR	Biological and Physical Research
BSR	Biological Sciences Research
CAIB	*Columbia* Accident Investigation Board
CDR	Critical Design Review
CFD	Computational Fluid Dynamics
CMS	Competency Management System
CRV	Crew Rescue Vehicle
D&A	Development and Acquisition
D&D	Design and Development
DART	Demonstration of Autonomous Rendezvous Technology
DD&I	Design, Development, and Integration
DOD	Department of Defense
DOE	Department of Energy
DOC	Department of Commerce
DOT	Department of Transportation
DTV	Digital television
EAA	Enterprise Associate Administrator
ECLS	Environmental Control and Life Support
ECLSS	Environmental Control and Life Support System
EDU	Education
EEE	Electronic, Electrical, and Electromechanical
ELV	Expendable Launch Vehicle
EMI/EMC	Electromagnetic interference/electromagnetic compatibility
ESS	Earth System Science
EUSO	Extreme Universe Space Observatory
EVM	Earned Value Management
ExPRESS	Expedite the Processing of Experiments to the Space Station
FTE	Full-time employee
G&A	General and Administrative
GHCC	Global Hydrology and Climate Center
GLAST	Gamma-ray Large Area Space Telescope
GN&C	Guidance, Navigation, and Control
GP–B	Gravity Probe-B
GSFC	Goddard Space Flight Center
HBCU/OMU	Historically Black Colleges and Universities/Other Minority Universities
HDTV	High-definition television
HHR	Habitat Holding Rack
HOSC	Huntsville Operations Support Center
HRF	Human Research Facility
HyTECH	Hypersonic Technology
IEC	Integrated Engineering Capabilities
IES	Integrated Engineering Solutions
IFMP	Integrated Financial Management Program
IPO	Institutional Program Officer

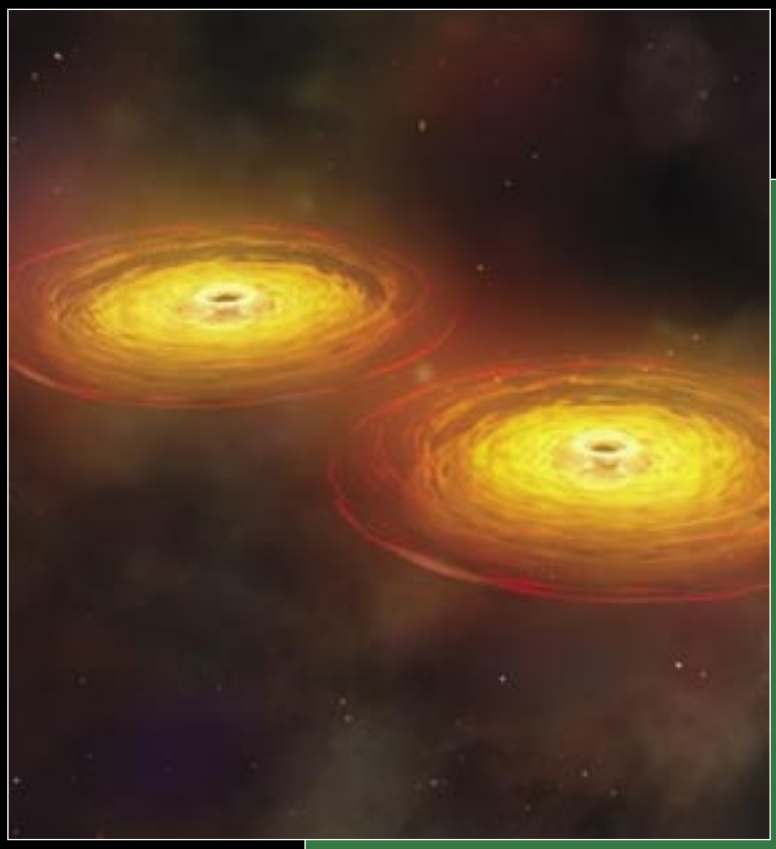


IR&D	Independent Research and Development
ISEAP	Integrated Systems Engineering and Analysis Processing
ISS	*International Space Station*
ISTAR	Integrated System Test of an Air-breathing Rocket
ISTP	Integrated Space Transportation Plan
IT	Information Technology
ITTP	Innovative Technology Transfer Program
JWST	James Webb Space Telescope
LIS	Lightning Imaging Sensor
MMS	Marshall Management System
MPLM	Multipurpose Logistics Module
MPS	Main Propulsion System
MQC	Marshall Quality Council
MSFC	Marshall Space Flight Center
MSG	Microgravity Science Glovebox
MSM	Mission and Science Measurement Technology
NACC	NASA Automated Data Processing Consolidation Center
NAI	National Aerospace Initiative
NASA	National Aeronautics and Space Administration
NCCS	NASA Computing and Communications System
NDE	Nondestructive evaluation
NEXT	NASA Exploration Team
NGLT	Next Generation Launch Technology
NISN	NASA Integrated Services Network
NSSC	National Security Space Community
NSSTC	National Space Science and Technology Center
OSHA	Occupational Safety and Health Administration
OSP	Orbital Space Plane
POIC	Payload Operations Integration Center
POP	Program Operating Plan
ProSEDS	Propulsive Small Expendable Deployer System
PSR	Physical Sciences Research
R&M	Reliability and Maintainability
RBCC	Rocket-based Combined Cycle
RF	Radio frequency
RLV	Reusable Launch Vehicle
RPFS	Research Partnerships and Flight Support
S&MA	Safety and Mission Assurance
SEC	Sun-Earth Connection
SEE	Space Environments and Effects
SESAAS	Sustaining Engineering Support for Agencywide Administrative Systems
SEU	Structure and Evolution of the Universe
SFS	Space Flight Support
SHE	Safety, Health, and Environmental
SLEP	Service Life Extension Program
SLI	Space Launch Initiative
SOMTC	Space Optics Manufacturing Technology Center
SSE	Solar System Exploration
SSP	Space Shuttle Program
SSPO	Space Shuttle Propulsion Office
STEM	Science, Technology, Engineering, and Mathematics
STS	Shuttle Transportation System
TRL	Technology Readiness Level
TRMM	Tropical Rainfall Measuring Mission
USAF	United States Air Force
USRA	Universities Space Research Association



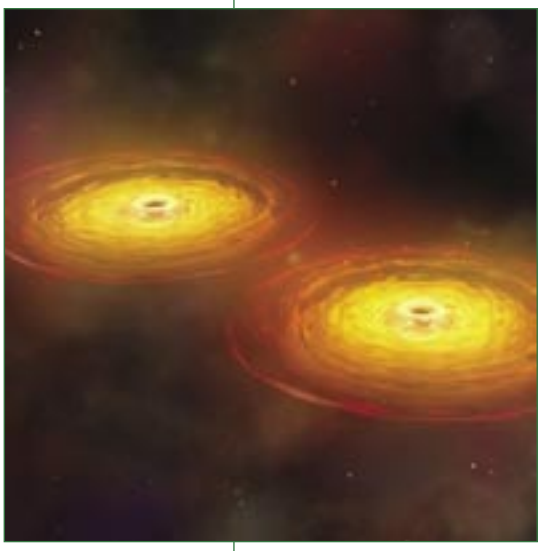
National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812



Marshall Space Flight Center 2004 Annual Plan

Cover image: This still image was taken from a simulated animation depicting a merger of two galaxies that forms a single galaxy with two centrally located supermassive black holes surrounded by disks of hot gas. The black holes orbit each other for hundreds of millions of years before they merge to form a single supermassive black hole that sends out intense gravitational waves.



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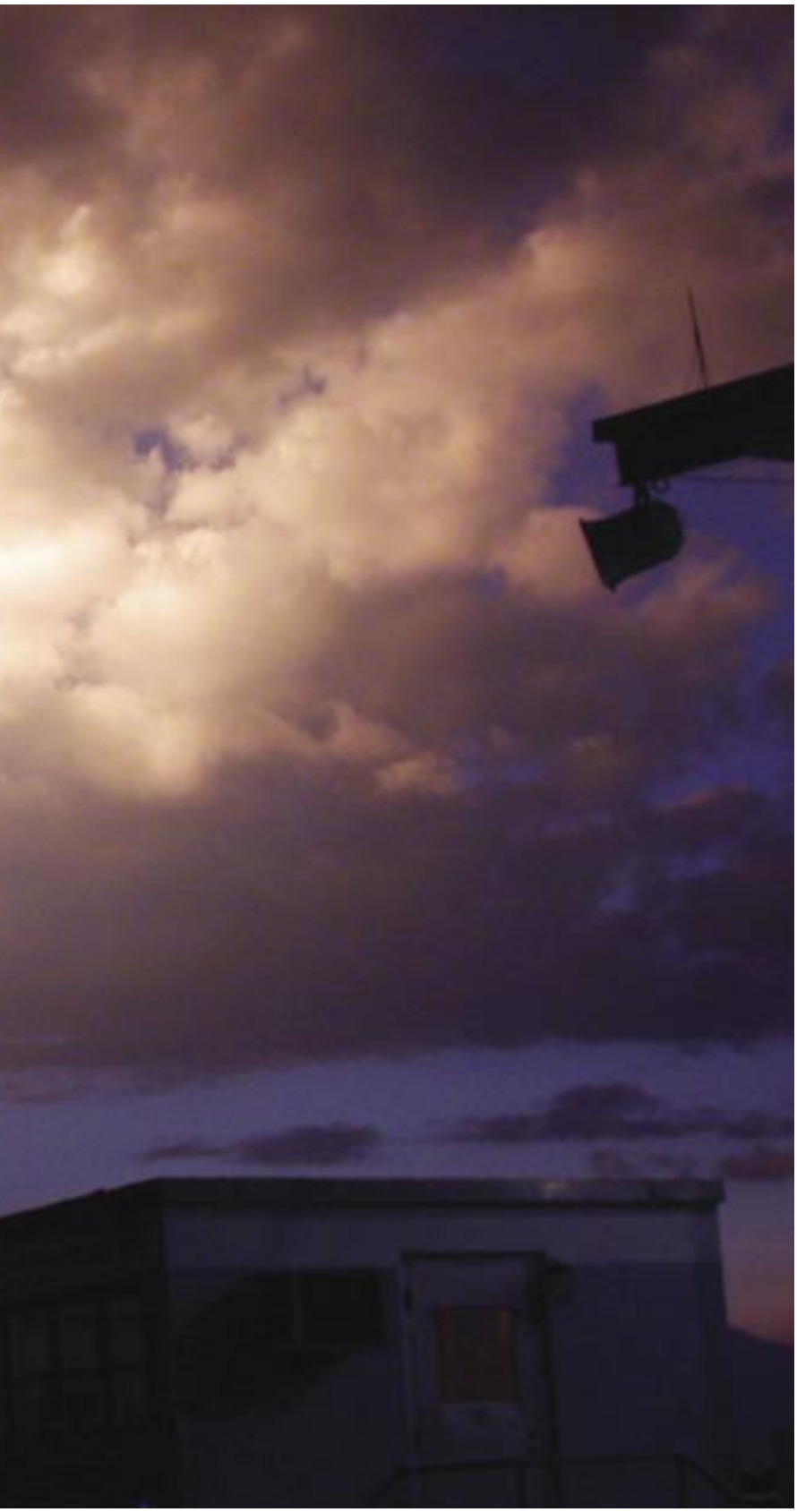


Introduction

The following pages detail the specific metrics that MSFC will perform in FY 2004 in support of NASA's missions and goals. MSFC is committed to furthering the aims of the Agency through the development and utilization of scientific missions, propulsion research, next generation vehicle design, and educational outreach. The Center also supports the Return-to-Flight initiative, and will work diligently towards the goal of returning NASA's shuttle fleet to operation as quickly and safely as possible.

The metrics contained in this document reflect the Center's diverse capabilities and skills, as well as the leadership that drives the MSFC forward. The team at MSFC will work continuously to align itself with NASA's vision and the goal of One NASA. Our commitment to mission success is evidenced not only by our accomplishments in the past, but also by our dedication and our focus on the future.

Launched March 1, 2002, the Space Shuttle Orbiter *Columbia* soared through some predawn clouds into the sky as it began its 27th flight, STS–109.

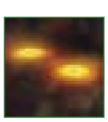
Space Flight Enterprise

Primary and Supporting Theme	NASA Mission	NASA Goal	NASA Objective
ISS	Space Flight Capabilities	Extend the duration and boundaries of human space flight to create new opportunities for exploration and discovery.	Demonstrate the ability to support a permanent human presence in Low Earth Orbit as a steppingstone to a human presence beyond.
ISS	Space Flight Capabilities	Ensure the provision of space access and improve it by increasing safety, reliability, and affordability.	Assure capabilities for world-class research on a laboratory in Low Earth Orbit.
ISS	To Understand and Protect Our Home Planet	Create a more secure world and improve the quality of life by investing in technologies and collaborating with other agencies, industry, and academia.	Resolve scientific issues that enrich life on Earth by leading to better design tools in energy, materials, medical, and communication technologies.
SFS	Space Flight Capabilities	Extend the duration and boundaries of human space flight to create new opportunities for exploration and discovery.	Develop innovative concepts for systems, infrastructures, and missions to extend the duration and boundaries of human space flight.
BSR	Explore the Universe and Search for Life.	Explore the fundamental principles of physics, chemistry, and biology through research in the unique natural laboratory of space.	Understand how life responds to gravity and the space environment and the role of gravity in the processes of life.
AT	To Inspire the Next Generation of Explorers.	Improve the capacity of science Centers.	Improve public understanding and appreciation of science and technology.
AT	To Inspire the Next Generation of Explorers.	Improve the capacity of science Centers.	Improve public understanding and appreciation of science and technology.

Enterprise Code	Annual Performance Goal	MSFC Metric	MSFC Implementation
M		Manage the *ISS* Node 3 development by completing the delivery of the government furnished equipment in 4th quarter of FY 2004.	Flight Projects (FD01)
M		Manage the development of the *ISS* Regenerative ECLSS by completing the Functional Configuration Audit/Physical Configuration Audit for the Water Processor Assembly, and Oxygen Generator Assembly by the 3rd quarter FY 2004.	Flight Projects (FD01)
M		Manage the SSP/RPFS HOSC by completing the deployment of the *ISS* Downlink Enhancement Architecture to White Sands in the 2nd quarter of FY 2004.	Flight Projects (FD01)
M		Provide support for SFS Advanced Systems Office by supporting a technical and management workshop for related products and activities in 3rd quarter of FY 2004.	Flight Projects (FD01)
M		Manage the development of the BRP/HHR by completing the HHR in the 2nd quarter of FY 2004.	Flight Projects (FD01)
M		Enhance public knowledge of MSFC programs and activities by conducting a monthly national media campaign.	Media Relations Department (CD01)
M		Take MSFC to the American public by conducting exhibit events that reach 200,000 people nationwide.	Media Relations Department (CD01)

Aerospace Technology Enterprise

Primary and Supporting Theme	NASA Mission	NASA Goal	NASA Objective
ITTP	To Understand and Protect Our Home Planet	Create a more secure world and improve the quality of life by investing in technologies and collaborating with other agencies, industry, and academia.	Improve the Nation's economic strength and quality of life by facilitating the innovative use of NASA technology and partnerships across industry and academia.
ITTP	To Understand and Protect Our Home Planet	Create a more secure world and improve the quality of life by investing in technologies and collaborating with other agencies, industry, and academia.	Improve the Nation's economic strength and quality of life by facilitating the innovative use of NASA technology and partnerships across industry and academia.
ITTP	To Understand and Protect Our Home Planet	Create a more secure world and improve the quality of life by investing in technologies and collaborating with other agencies, industry, and academia.	Improve the Nation's economic strength and quality of life by facilitating the innovative use of NASA technology and partnerships across industry and academia.



Enterprise Code	Annual Performance Goal	MSFC Metric	MSFC Implementation
R		Increase the number of collaborations with industry, academia, and other Government agencies that compliment NASA's enterprise technology needs and leverage the limited resources available to the Agency.	Technology Transfer (CD01)
R		Increase the number of agreements that will enable the innovative use of the technologies developed at the Center in revolutionary ways to improve the strength of our Nation's economy and improve our quality of life.	Technology Transfer (CD01)
R		Increase NASA's technology portfolio via streamlining the technology disclosure processes, and increase the number of opportunities to share our breakthrough innovations with the public.	Technology Transfer (CD01)

Space Science Enterprise

Primary and Supporting Theme	NASA Mission	NASA Goal	NASA Objective
SEC	To Explore the Universe and Search for Life.	Explore the solar system and the universe beyond, understand the origin and evolution of life, and search for evidence of life elsewhere.	Learn how the solar system originated and evolved to its current diverse state.
SEC	To Explore the Universe and Search for Life.	Explore the solar system and the universe beyond, understand the origin and evolution of life, and search for evidence of life elsewhere.	Learn how the solar system originated and evolved to its current diverse state.
SSE	To Explore the Universe and Search for Life.	Explore the solar system and the universe beyond, understand the origin and evolution of life, and search for evidence of life elsewhere.	Learn how the solar system originated and evolved to its current diverse state.
SSE	To Explore the Universe and Search for Life.	Explore the solar system and the universe beyond, understand the origin and evolution of life, and search for evidence of life elsewhere.	Learn how the solar system originated and evolved to its current diverse state.
SSE	To Explore the Universe and Search for Life.	Explore the solar system and the universe beyond, understand the origin and evolution of life, and search for evidence of life elsewhere.	Agency Objective Codes: 5.2, 5.5, 5.6, 5.7, 5.8, 5.11,5.12
SEU	To Explore the Universe and Search for Life.	Explore the solar system and the universe beyond, understand the origin and evolution of life, and search for evidence of life elsewhere.	Agency Objective Codes: 5.6, 5.8, 5.9, 5.10, 5.11, 5.12
SEU	To Explore the Universe and Search for Life.	Explore the solar system and the universe beyond, understand the origin and evolution of life, and search for evidence of life elsewhere.	Agency Objective Codes 5.6, 5.7,5.8

Enterprise Code	Annual Performance Goal	MSFC Metric	MSFC Implementation
S, M	Understand the changing flow of energy and matter throughout the Sun, heliosphere, and planetary environments.	Deliver Solar–B Focal Plane Package to Japan's Institute on Space and Astronautical Science (ISAS) in April 2004.	Solar–B (SD01)
S, M	Understand the changing flow of energy and matter throughout the Sun, heliosphere, and planetary environments.	Solar–B X-ray Telescope delivered to ISAS in June 2004.	Solar–B (SD01)
S, M	Understand the changing flow of energy and matter throughout the Sun, heliosphere, and planetary environments.	Launch GP–B in November 2004.	Gravity Probe B (SD01)
S, M	Understand the changing flow of energy and matter throughout the Sun, heliosphere, and planetary environments.	GP–B mission lifetime of 16 months.	Gravity Probe B (SD01)
S	Determine the characteristics of the solar system that led to the origin of life.	Submit 30 articles during FY 2004, with either an author or co-author from MSFC, in refereed scientific journals.	Space Science Research (SD01)
S	Discover what powered the Big Bang and the nature of the mysterious dark energy that is pulling the Universe apart.	JWST/Advanced Mirror System Demonstrator: Complete all supplemental mirror testing and metrology for the Advanced Mirror System Demonstrator by September 2004.	Space Optics Manufacturing Technology Center (SD01)
S	Understand the development of structure and explore the cycles of matter and energy in the evolving Universe.	Manage the SEU/Chandra Program by completing the viewing efficiency to be greater than 50 percent for FY 2004.	Flight Projects (FD01)

Earth Science Enterprise

Primary and Supporting Theme	NASA Mission	NASA Goal	NASA Objective
ESS	To Understand and Protect Our Home Planet.	Understand Earth system and apply Earth-system science to improve the prediction of climate, weather, and natural hazards.	Understand how Earth is changing, better predict change in three key areas by 2010 and nine others by 2014, and understand the consequences for life on Earth.
ESS	To Understand and Protect Our Home Planet.	Understand Earth system and apply Earth-system science to improve the prediction of climate, weather, and natural hazards.	Understand how Earth is changing, better predict change in three key areas by 2010 and nine others by 2014, and understand the consequences for life on Earth.

Enterprise Code	Annual Performance Goal	MSFC Metric	MSFC Implementation
Y, M	Observe, analyze, and model the Earth system to discover how it is changing and the consequences for life on Earth.	Perform peer-reviewed documentation of scientific research on Earth's climate/ weather system, including submission of at least six journal articles.	Earth Science (SD01)
Y, M	Observe, analyze, and model the Earth system to discover how it is changing and the consequences for life on Earth.	Create at least one product to improve short-term weather prediction using NASA Earth Science Enterprise observations and modeling technologies. Transition them into National Weather Service forecast operations via the Short-term Prediction Research and Transition Center by the end of FY 2004.	Earth Science (SD01)

Biological and Physical Science Enterprise

Primary and Supporting Theme	NASA Mission	NASA Goal	NASA Objective
PSR	To Explore the Universe and Search for Life.	Explore the fundamental principles of physics, chemistry, and biology through research in the unique natural laboratory of space.	Expand understanding of the laws of nature through the unique opportunities for research in space.
PSR	To Explore the Universe and Search for Life.	Explore the fundamental principles of physics, chemistry, and biology through research in the unique natural laboratory of space.	Expand understanding of the laws of nature through the unique opportunities for research in space.
PSR	To Explore the Universe and Search for Life.	Explore the fundamental principles of physics, chemistry, and biology through research in the unique natural laboratory of space.	Expand understanding of the laws of nature through the unique opportunities for research in space.
PSR	To Understand and Protect Our Home Planet.	Create a more secure world and improve the quality of life by investing in technologies and collaborating with other agencies, industry, and academia.	Resolve scientific issues that enrich life on Earth by leading to better design tools in energy, materials, medical, and communication technologies.
RPFS	To Understand and Protect Our Home Planet.	Create a more secure world and improve the quality of life by investing in technologies and collaborating with other agencies, industry, and academia.	Improve the Nation's economic strength and quality of life by facilitating the innovative use of NASA technology and partnerships across industry and academia.

Enterprise Code	Annual Performance Goal	MSFC Metric	MSFC Implementation
U	Use the unique low-gravity environment to resolve scientific issues that impact Earth-based technological and industrial applications.	Develop and publish comprehensive summaries and results from the macromolecular biotechnology and materials science research programs in conference proceedings and peer-reviewed science journals, as well as in the public media.	Microgravity Science Research (SD01)
U	Advance the scientific understanding of complex biological and physical systems.	Perform two materials science investigations installed in the MSG on the *ISS*.	Materials Science (SD01)
U	Advance the scientific understanding of complex biological and physical systems.	Complete development of three relevant flight macromolecular biotechnology experiments' hardware.	Macromolecular Biotechnology (SD01)
U		Provide Utilization Support for *ISS*/RPFS payloads by providing certified controllers for 24×7×365 operations and the enhanced/certified ground system.	Flight Projects (FD01)
U	Advance NASA's vision and mission by leveraging industry investment in space-based commercial activity through active partnerships with industry and academia.	Enable industry research in space that allows them to bring one commercial product to market in FY 2004.	Space Product Development (SD01)

Implementing Strategies

Implementing Strategy	Strategic Objective	NASA Mission	NASA Goal	NASA Objective
IS–1. Achieve management and institutional excellence comparable to NASA's technical excellence.	NASA will define and adopt procedures to improve competitive acquisition of programs, services, and assets to benefit the NASA Mission and the American taxpayer.	Space Flight Capabilities		
IS–1. Achieve management and institutional excellence comparable to NASA's technical excellence.	NASA will define and adopt procedures to improve competitive acquisition of programs, services, and assets to benefit the NASA Mission and the American taxpayer.	Space Flight Capabilities		
IS–1. Achieve management and institutional excellence comparable to NASA's technical excellence.	NASA will define and adopt procedures to improve competitive acquisition of programs, services, and assets to benefit the NASA Mission and the American taxpayer.	Space Flight Capabilities		
IS–1. Achieve management and institutional excellence comparable to NASA's technical excellence.	NASA will define and adopt procedures to improve competitive acquisition of programs, services, and assets to benefit the NASA Mission and the American taxpayer.	Space Flight Capabilities		
IS–1. Achieve management and institutional excellence comparable to NASA's technical excellence.	NASA will define and adopt procedures to improve competitive acquisition of programs, services, and assets to benefit the NASA Mission and the American taxpayer.	Space Flight Capabilities		
IS–1. Achieve management and institutional excellence comparable to NASA's technical excellence.	Provide all NASA operations with secure, highly reliable, interoperable information systems.	Space Flight Capabilities		
IS–1. Achieve management and institutional excellence comparable to NASA's technical excellence.	Improve the institutional management of capital assets to ensure that NASA's real property, personal property, processes, and systems are sustained and optimized to support NASA's missions and the capabilities required for today and tomorrow.	Space Flight Capabilities		
IS–1. Achieve management and institutional excellence comparable to NASA's technical excellence.	Improve the institutional management of capital assets to ensure that NASA's real property, personal property, processes, and systems are sustained and optimized to support NASA's missions and the capabilities required for today and tomorrow.	Space Flight Capabilities		

Enterprise Code	Primary and Supporting Theme	Annual Performance Goal	MSFC Metric	MSFC Implementation
M			MSFC will obligate 80 percent of available funds to performance-based contracts in FY 2004.	Procurement Office (PS01)
M			MSFC will award 16 percent of its dollars available for contracting to Small Business concerns in FY 2004.	Procurement Office (PS01)
M			MSFC will award six percent of its dollars available for contracting to Small Disadvantaged Businesses in FY 2004.	Procurement Office (PS01)
M			MSFC will award three percent of its dollars available for contracting to Women-Owned Small Businesses in FY 2004.	Procurement Office (PS01)
M			Conduct a semiannual assessment to determine the level of satisfaction of all customers supported through the use of an automated Customer Satisfaction System.	Procurement Office (PS01)
M			Maintain 90 percent customer satisfaction.	Center Operations (AD01)
M			Ensure a minimum 90 percent availability rate for primary mission-related facilities.	Center Operations (AD01)
M			Finalize updates to the MSFC Facilities Master Plan to optimize the Center's resources for future facilities development.	Center Operations (AD01)

Implementing Strategies continued

Implementing Strategy	Strategic Objective	NASA Mission	NASA Goal	NASA Objective
IS–1. Achieve management and institutional excellence comparable to NASA's technical excellence.	Attract and maintain a workforce that is representative of the Nation's diversity and includes the competencies that NASA needs to deliver the sustained levels of high performance that the Agency's challenging Mission requires.			
IS–1. Achieve management and institutional excellence comparable to NASA's technical excellence.	Attract and maintain a workforce that is representative of the Nation's diversity and includes the competencies that NASA needs to deliver the sustained levels of high performance that the Agency's challenging Mission requires.			
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IS–1. Achieve management and institutional excellence comparable to NASA's technical excellence.	NASA will improve and streamline the NASA financial management system to enhance accuracy, timeliness, and accountability.	Space Flight Capabilities		
IS–1. Achieve management and institutional excellence comparable to NASA's technical excellence.	NASA will improve and streamline the NASA financial management system to enhance accuracy, timeliness, and accountability.	Space Flight Capabilities		
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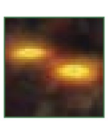

Enterprise Code	Primary and Supporting Theme	Annual Performance Goal	MSFC Metric	MSFC Implementation
M			Resolve discrimination complaints at the earliest possible stage. Reduce the number of discrimination complaints from the FY 2003 baseline by increased use of the Alternative Dispute Resolution (ADR) process.	Equal Opportunity Office (OS01)
M			In collaboration with the Facilities Engineering Department, coordinate accessibility accommodations in four MSFC buildings as indicated in the FY 2003 multiyear accessibility survey.	Equal Opportunity Office (OS01)
M			In collaboration with Employee and Organizational Development Department, provide Phase 2, Agencywide Accessibility Training (mandatory) (classroom and online) for MSFC supervisors and managers.	Equal Opportunity Office (OS01)
M			In collaboration with the Human Resources Department, contribute to MSFC's FY 2004 recruitment initiative in order to expand the pool of diverse candidates applying to enter the MSFC workforce. Recruit at three Historically Black and Other Minority Universities.	Equal Opportunity Office (OS01)
M			Serve as stewards of Government resources. Develop and maintain processes and systems that ensure accurate financial control and accountability across the Center.	Office of Chief Financial Officer (RS01)
M			Provide an integrated Center Program Operating Plan (POP) for use in developing the Agency budget request. Budget planning provides for consideration of funding and related schedule impacts.	Office of Chief Financial Officer (RS01)
M			Develop strategic outreach activities to educate key stakeholders on benefits of MSFC contributions to NASA.	Government and Community Relations (CD01)
M			Facilitate opportunities to engage government officials and the public in sharing the experience of exploration and discovery.	Government and Community Relations (CD01)

Implementing Strategies continued

Implementing Strategy	Strategic Objective	NASA Mission	NASA Goal	NASA Objective
IS–1. Achieve management and institutional excellence comparable to NASA's technical excellence.	Attract and maintain a workforce that is representative of the Nation's diversity and includes the competencies that NASA needs to deliver the sustained levels of high performance that the Agency's challenging Mission requires.			
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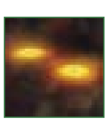
IS–1. Achieve management and institutional excellence comparable to NASA's technical excellence.	Attract and maintain a workforce that is representative of the Nation's diversity and includes the competencies that NASA needs to deliver the sustained levels of high performance that the Agency's challenging Mission requires.	To Inspire the Next Generation of Explorers.	Inspire and motivate students to pursue careers in science, technology, engineering, and mathematics.	By 2010, develop and fully implement the infrastructure of e-education as a learning support system for NASA's elementary/secondary, higher education, and informal objectives.
IS–1. Achieve management and institutional excellence comparable to NASA's technical excellence.	Attract and maintain a workforce that is representative of the Nation's diversity and includes the competencies that NASA needs to deliver the sustained levels of high performance that the Agency's challenging Mission requires.	To Inspire the Next Generation of Explorers.	Inspire and motivate students to pursue careers in science, technology, engineering, and mathematics.	By 2008, increase by 20 percent the number of elementary and secondary students from diverse backgrounds who are involved in NASA-related STEM courses in targeted schools.



Enterprise Code	Primary and Supporting Theme	Annual Performance Goal	MSFC Metric	MSFC Implementation
M			Increase training and development opportunities for employees by equipping, staffing, and operating a modern training facility on the Intergraph campus.	Employee and Organizational Development (CD01)
M			Focus cultural change efforts at MSFC by gaining Center management approval for and beginning implementation of a Cultural Roadmap for MSFC.	Employee and Organizational Development (CD01)
M			Increase 2004 Customer Satisfaction results by 10 percent above 2003 results.	Internal Relations and Communication (CD01)
M			Develop Center Strategies with senior management pursuant to MSFC Strategic Planning Process by 1st quarter of FY 2004.	Internal Relations and Communication (CD01)
M			Incorporate Agency Competency Management System into the POP cycle.	Plans and Systems Analysis Office (CD01)
N, R, S, M	EDU		In collaboration with the Education Department, support a rigorous research and education program with HBCU/OMU. Coordinate one visit to a HBCU/OMU for senior managers.	Equal Opportunity Office (OS01)
N, U, R, S, M	EDU		Establish a baseline of the number of diverse elementary and secondary students involved in NASA STEM activities from our six-state geographical service region (AL, TN, LA, AR, MO, IA) no later than September 30, 2004.	Education Programs Office (CD60)

Implementing Strategies continued

Implementing Strategy	Strategic Objective	NASA Mission	NASA Goal	NASA Objective
IS–1. Achieve management and institutional excellence comparable to NASA's technical excellence.	Attract and maintain a workforce that is representative of the Nation's diversity and includes the competencies that NASA needs to deliver the sustained levels of high performance that the Agency's challenging Mission requires.	To Inspire the Next Generation of Explorers.	Inspire and motivate students to pursue careers in science, technology, engineering, and mathematics.	By 2008, strengthen NASA's involvement in higher education to enhance the Nation's science and technology capability in NASA-related fields to help meet NASA's future personnel needs.
IS–1. Achieve management and institutional excellence comparable to NASA's technical excellence.	Attract and maintain a workforce that is representative of the Nation's diversity and includes the competencies that NASA needs to deliver the sustained levels of high performance that the Agency's challenging Mission requires.	To Inspire the Next Generation of Explorers.	Inspire and motivate students to pursue careers in science, technology, engineering, and mathematics.	By 2010, develop and fully implement the infrastructure of e-education as a learning support system for NASA's elementary/secondary, higher education, and informal objectives.
IS–2. Demonstrate NASA leadership in the use of information technologies.	Provide all NASA operations with secure, highly reliable, interoperable information systems.	Space Flight Capabilities		
IS–2. Demonstrate NASA leadership in the use of information technologies.	Provide all NASA operations with secure, highly reliable, interoperable information systems.	Space Flight Capabilities		
IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.	Use peer review to ensure that NASA's scientific research is of the highest quality.	Space Flight Capabilities		
IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.	Improve our systems engineering capability and ensure that all NASA programs follow systems engineering best practices throughout their life cycles.	Space Flight Capabilities		
IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.		Space Flight Capabilities	Enable revolutionary capabilities through new technology.	Create novel aerospace concepts and technology in support of the future human and robotic exploration and development of space.
IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.		Space Flight Capabilities	Enable revolutionary capabilities through new technology.	Create novel aerospace concepts and technology in support of the future human and robotic exploration and development of space.
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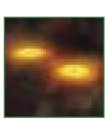

Enterprise Code	Primary and Supporting Theme	Annual Performance Goal	MSFC Metric	MSFC Implementation
N, Y, S, M	EDU		Establish a baseline of scope of MSFC involvement with higher education institutions no later than September 30, 2004.	Education Programs Office (CD60)
N, R, S, M	EDU		Compile an inventory of existing programs and partnerships to establish a baseline database to assess and prioritize high-leverage and critical informal educational programs no later than September 30, 2004.	Education Programs Office (CD60)
M			Maintain at a minimum a 95 percent availability rate for all information technology (IT) services.	Center Operations (AD01)
M			Meet established targets for IT security awareness training for all NASA employees, managers, and system administrators.	Center Operations (AD01)
M			Conduct independent evaluations—e.g. independent assessment, independent annual reviews, non advocated reviews—of at least six project/programs.	Systems Management Office (VS01)
M			Conduct one Center Export Representative training course and two Systems Engineering courses per year.	Systems Management Office (VS01)
M	SFS		Complete construction of Propulsion Research Laboratory as scheduled in 3rd quarter of FY 2004.	Propulsion Research Center (TD01)
M	SFS		Move all Propulsion Research Center experiments out of current lab buildings and start PRL operation by 4th quarter of FY 2004.	Propulsion Research Center (TD01)
M	SFS	APG-4SSE2	Allocate 70 percent of In-space Propulsion Project funding competitively in FY 2004, contributing to the Office of Space Science's goal of allocating 75 percent of research project funding competitively.	In-space Propulsion Technology Project Office (TD01)

Implementing Strategies continued

Implementing Strategy	Strategic Objective	NASA Mission	NASA Goal	NASA Objective
IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.		Space Flight Capabilities	Enable revolutionary capabilities through new technology.	Create novel aerospace concepts and technology in support of the future human and robotic exploration and development of space.
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IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.		To Understand and Protect Our Home Planet	Create a more secure world and improve the quality of life by investing in technologies and collaborating with other agencies, industry, and academia.	Enhance the Nation's security through partnerships with DOD and other U.S. and international government agencies.
IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.		To Understand and Protect Our Home Planet	Create a more secure world and improve the quality of life by investing in technologies and collaborating with other agencies, industry, and academia.	Enhance the Nation's security through partnerships with DOD and other U.S. and international government agencies.
IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.	Apply methods and technologies to ensure that designs are safe and have a high likelihood for success.			

Enterprise Code	Primary and Supporting Theme	Annual Performance Goal	MSFC Metric	MSFC Implementation
M	SFS	APG-4SSE4 through 4SSE12	Base the FY 2004 reprioritization of in-space propulsion technologies on a set of flight missions that support Office of Space Science, Solar System Exploration Division's annual performance goals.	In-space Propulsion Technology Project Office (TD01)
M	SFS	APG-4SFS23, 4SFS24 & 4SFS26	Develop, with other MSFC organizations and NASA Centers, space transportation technology roadmaps, and a systems analysis and investment evaluation plan, that enable improved space transportation investment decisions in accord with Space Architect planning for transformational space capabilities.	In-space Propulsion Technology Project Office (TD01)
S	SFS	APG-4SFS5 & 4SFS6	Complete research in critical technology areas: light-weight xenon tank, large flexible space structure, nuclear thermal propulsion cycles, nonnuclear testing of fission technologies, advanced avionics, and very high-power electric propulsion. Research should be initiated by the end of FY 2003.	High-power Propulsion Systems Office Prometheus (TD01)
S	SFS	APG-4SFS5 & 4SFS6	Participate in the downselect of a prime contractor to manufacture Jupiter Icy Moon Orbiter. Selection will take place at the end of FY 2004 and the beginning of FY 2005.	High-power Propulsion Systems Office Prometheus (TD01)
R, M, S	SLI	APG-4SLI8	Establish the NGLT program office and plan by the 1st quarter of FY 2004.	Next Generation Launch Technology Program (NP01)
R, M, S	SLI	APG-4SLI8	Define vehicle architecture trade study options for the Common Booster by the 2nd quarter of FY 2004.	Next Generation Launch Technology Program (NP01)
R			File at least 10 patent applications.	Legal Support (LS01)

Implementing Strategies continued

Implementing Strategy	Strategic Objective	NASA Mission	NASA Goal	NASA Objective
IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.	Apply methods and technologies to ensure that designs are safe and have a high likelihood for success.	Space Flight Capabilities	Enable revolutionary capabilities through new technology.	Create new system concepts and demonstrate technologies that enable new scientific measurements.
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IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.	Apply methods and technologies to ensure that designs are safe and have a high likelihood for success.	Space Flight Capabilities	Ensure the provision of space access and improve it by increasing safety, reliability, and affordability.	Improve the safety, affordability, and reliability of future space transportation systems.
IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.	Apply methods and technologies to ensure that designs are safe and have a high likelihood for success.	Space Flight Capabilities	Ensure the provision of space access and improve it by increasing safety, reliability, and affordability.	Improve the safety, affordability, and reliability of future space transportation systems.
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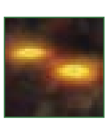

Enterprise Code	Primary and Supporting Theme	Annual Performance Goal	MSFC Metric	MSFC Implementation
R	MSM	10.2.1 Identify high-payoff mission enabling technologies to guide program investment decisions.	Maintain full scope ANSI/ISO/ASQ Q9001: 2000 registration	Safety and Mission Assurance (QS01)
M	MSM	10.2.1 Identify high-payoff mission enabling technologies to guide program investment decisions.	Deliver timely, technically accurate, and value-added S&MA products and services to customers to maintain 90 percent customer satisfaction as indicated by customer surveys.	Safety and Mission Assurance (QS01)
R	SLI	APG-4SFS19	Develop and document qualification requirements for new commercial launch vehicles with little to no flight history by 1st quarter of FY 2004.	Expendable Launch Vehicle Projects (TD01)
R	SLI	APG-4SSP2 or 4SFS17	Develop and document the certification requirements for risk mitigation of Risk Category 1 payloads/spacecraft/instruments by 1st quarter of FY 2004.	Expendable Launch Vehicle Projects (TD01)
R	SLI	APG-4SLI9	Complete Interim Design Review for the RS–84 lox/RP engine design 2nd quarter of FY 2004.	NGLT Propulsion (TD01)
R	SLI	APG-4SLI19	Perform subscale preburner test for the RS–84 1st quarter of FY 2004.	NGLT Propulsion (TD01)
R	SLI	APG-4SLI16	Complete CDR for the Dual Thrust Reaction Control Engine 3rd quarter of FY 2004.	NGLT Propulsion (TD01)
R	SLI	APG-4SLI16	Perform vernier and primary test of the Aerojet Reaction Control Engine by 1st quarter of FY 2004.	NGLT Propulsion (TD01)
R	SLI	APG-4AT5	Perform Oxygen-rich Turbopump component tests for the Integrated Powerhead Demonstrator by 1st quarter of FY 2004.	NGLT Propulsion (TD01)

Implementing Strategies continued

Implementing Strategy	Strategic Objective	NASA Mission	NASA Goal	NASA Objective
IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.	Apply methods and technologies to ensure that designs are safe and have a high likelihood for success.	Space Flight Capabilities	Ensure the provision of space access and improve it by increasing safety, reliability, and affordability.	Improve the safety, affordability, and reliability of future space transportations systems.
IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.	Establish a process management approach that can be tailored to the needs of all projects and programs based on safety, scope, complexity, cost, and acceptable risk.	To Understand and Protect Our Home Planet	Create a more secure world and improve the quality of life by investing in technologies and collaborating with other agencies, industry, and academia.	Enhance the Nation's security by developing and demonstrating critical access-to-space technologies that benefit NASA, DOD, and other Government agencies.
IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.	Apply methods and technologies to ensure that designs are safe and have a high likelihood for success.	Space Flight Capabilities	Ensure the provision of space access and improve it by increasing safety, reliability, and affordability.	Improve the accessibility of space to better meet research, Space Station assembly, and operations requirements.
IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.	Establish a process management approach that can be tailored to the needs of all projects and programs based on safety, scope, complexity, cost, and acceptable risk.	Space Flight Capabilities	Ensure the provision of space access and improve it by increasing safety, reliability, and affordability.	Improve the accessibility of space to better meet research, Space Station assembly, and operations requirements.
IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.	Implement collaborative engineering capabilities and integrated design solutions to reduce the life-cycle cost and technical, cost, and schedule risk of major programs.	Space Flight Capabilities	Ensure the provision of space access and improve it by increasing safety, reliability, and affordability.	Create concepts, technologies, and capabilities for transportation beyond Low Earth Orbit and define plans to enable affordable future infrastructure.
IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.	Apply methods and technologies to ensure that designs are safe and have a high likelihood for success.	Space Flight Capabilities	Enable revolutionary capabilities through new technology	Create novel aerospace concepts in support of the future human and robotic exploration and development of space.
IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.	Apply methods and technologies to ensure that designs are safe and have a high likelihood for success.	Space Flight Capabilities	Enable revolutionary capabilities through new technology.	Create novel aerospace concepts in support of the future human and robotic exploration and development of space.
IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.	Apply methods and technologies to ensure that designs are safe and have a high likelihood for success.	Space Flight Capabilities	Ensure the provision of space access and improve it by increasing safety, reliability, and affordability.	Assure safe, affordable, and reliable U.S.-based crew access and return from the *ISS*.
IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.	Apply methods and technologies to ensure that designs are safe and have a high likelihood for success.	Space Flight Capabilities	Ensure the provision of space access and improve it by increasing safety, reliability, and affordability.	Assure safe, affordable, and reliable U.S.-based crew access and return from the *ISS*.

Enterprise Code	Primary and Supporting Theme	Annual Performance Goal	MSFC Metric	MSFC Implementation
R	SLI	APG-4SLI16	Complete component designs for TR 107 combustion device technologies by 2nd quarter FY 2004.	NGLT Propulsion (TD01)
M	SLI	4SLI17	Achieve a score of 90 percent or better for customer satisfaction as determined by ED customer surveys of MSFC Product Line Directorates.	Engineering Directorate (ED01)
M	SSP	4SSP15	Increase the number of Agencywide full-text technical standards accesses by 15 percent by 4th quarter of FY 2004.	Engineering Directorate (ED01)
M	SSP	4SSP15	Design, develop, test, and deploy the second phase of configuration and data management and the first phase of the engineering database in accordance with the IEC schedule.	Engineering Directorate (ED01)
M	SFS	4SSP20	Identify and implement one new manufacturing collaborative partnership by the 4th quarter of FY 2004.	Engineering Directorate (ED01)
M	SFS	4SFS24	Refine engineering processes for in-house projects and document in the form of a handbook by the 1st quarter of FY 2004.	Engineering Directorate (ED01)
M	SFS	4SFS24	Implement a Web-based version of the existing Comprehensive System Skills Initiative by the 4th quarter of FY 2004.	Engineering Directorate (ED01)
R	SLI	An OSP that provides safe, affordable, and reliable access to and from the *ISS*.	Test flight of DART vehicle to demonstrate autonomous rendezvous technology between a chase vehicle and an on-orbit satellite.	OSP (UP01)
R	SLI	An OSP that provides safe, affordable, and reliable access to and from the *ISS*.	Drop test of X–37 vehicle from carrier aircraft to demonstrate autonomous landing capability as a precursor to a planned orbital demonstration.	OSP (UP01)

Implementing Strategies continued

Implementing Strategy	Strategic Objective	NASA Mission	NASA Goal	NASA Objective
IS–3. Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost.	Apply methods and technologies to ensure that designs are safe and have a high likelihood for success.	Space Flight Capabilities	Ensure the provision of space access and improve it by increasing safety, reliability, and affordability.	Assure safe, affordable, and reliable U.S.-based crew access and return from the *ISS*.
IS–4. Ensure that all NASA work environments, on Earth and in space, are safe, healthy, environmentally sound, and secure.	Improve the accessibility of space to better meet research, Space Station assembly, and operation requirements.	Space Flight Capabilities		
IS–4. Ensure that all NASA work environments, on Earth and in space, are safe, healthy, environmentally sound, and secure.	Improve the accessibility of space to better meet research, Space Station assembly, and operation requirements.	Space Flight Capabilities		
IS–4. Ensure that all NASA work environments, on Earth and in space, are safe, healthy, environmentally sound, and secure.	Prevent injuries from occurring during the course of NASA activities on NASA facilities or in the use of NASA equipment.	Space Flight Capabilities		
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IS–4. Ensure that all NASA work environments, on Earth and in space, are safe, healthy, environmentally sound, and secure.	Eliminate environmental incidents, toxic chemical use, hazardous waste, and environmental liability at all NASA sites.	Space Flight Capabilities		
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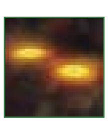

Enterprise Code	Primary and Supporting Theme	Annual Performance Goal	MSFC Metric	MSFC Implementation
R	SLI	An OSP that provides safe, affordable, and reliable access to and from the *ISS*.	Conceptual design review of OSP with sufficient cost, schedule, technical, and risk definition to enable a full-scale development decision.	OSP (UP01)
M			SSPO will maintain a 90 percent customer satisfaction rate and document continuous improvement using input and feedback from the SSPO Web page.	Space Shuttle Propulsion Office (MP01)
M			SSPO will support the *Columbia* Accident Investigation Board and Return to Flight Activities.	Space Shuttle Propulsion Office (MP01)
M			Conduct monthly area walkthroughs and project safety meetings in order to sustain workplace safety excellence.	Space Shuttle Propulsion Office (MP01)
M			Provide a multifaceted security education and awareness program to the entire Center workforce to raise awareness of critical asset protection issues and concerns.	Center Operations (AD01)
M			Make physical examinations, special screening, immunizations, first aid, and emergency assistance available to all employees.	Center Operations (AD01)
M			Reduce noncompliance incidents and releases by five percent from the FY 2002 level by 2003.	Center Operations (AD01)
M			Establish environmental liability baseline, and then reduce liability dollar for dollar by amount spent.	Center Operations (AD01)
M			Assure that 80 percent of Systems Management Office personnel participate in one safety walkthrough per year and participate in the organization's safety meetings.	Systems Management Office (VS01)
M			Provide support for ensuring the Center's safety standards are reached.	Office of Chief Financial Officer (RS01)

Implementing Strategies continued

Implementing Strategy	Strategic Objective	NASA Mission	NASA Goal	NASA Objective
IS–4. Ensure that all NASA work environments, on Earth and in space are safe, healthy, environmentally sound, and secure.	Prevent injuries from occurring during the course of NASA activities on NASA facilities or in the use of NASA equipment.	Space Flight Capabilities	Ensure the provision of space access and improve it by increasing safety, reliability, and affordability.	Assure safe, affordable, and reliable U.S.-based crew access and return from the *ISS*.
IS–4. Ensure that all NASA work environments, on Earth and in space are safe, healthy, environmentally sound, and secure.	Prevent injuries from occurring during the course of NASA activities on NASA facilities or in the use of NASA equipment.	Space Flight Capabilities	Ensure the provision of space access and improve it by increasing safety, reliability, and affordability.	Provide services for space communications and rocket propulsion testing and launch in support of NASA, other Government agencies, and industry.
IS–4. Ensure that all NASA work environments, on Earth and in space, are safe, healthy, environmentally sound and secure.	Prevent injuries from occurring during the course of NASA activities on NASA facilities or in the use of NASA equipment.	Space Flight Capabilities	Ensure the provision of space access and improve it by increasing safety, reliability, and affordability.	Create concepts, technologies, and capabilities for transportation beyond Low Earth Orbit, and define plans to enable affordable future infrastructure.
IS–5. Manage risk and cost to ensure success and provide the greatest value to the American public.	NASA will improve its processes for cost estimation and the management of major NASA projects and programs.	Space Flight Capabilities		
IS–5. Manage risk and cost to ensure success and provide the greatest value to the American public.	NASA will provide tools, techniques, and expertise that will enable all elements of the Agency to make well-informed decisions on matters of critical importance.	Space Flight Capabilities	Enable revolutionary capabilities through new technology.	Improve the capability to assess and manage risk in the synthesis of complex systems.
IS–5. Manage risk and cost to ensure success and provide the greatest value to the American public.	NASA will provide tools, techniques, and expertise that will enable all elements of the Agency to make well-informed decisions on matters of critical importance.	Space Flight Capabilities	Ensure the provision of space access and improve it by increasing safety, reliability, and affordability.	Create new system concepts and demonstrate technologies that enable new scientific measurements.

Enterprise Code	Primary and Supporting Theme	Annual Performance Goal	MSFC Metric	MSFC Implementation
R	SLI	Minimize technical, cost, and schedule risk to NASA, DOD, and commercial test customers by ensuring safe and efficient operations of NASA test facilities.	Reduce the MSFC team lost-time mishap rate by 10 percent over the FY 2003 rate, while striving toward a world-class incident rate of zero.	Safety and Mission Assurance (QS01)
M	SFS	Minimize technical, cost, and schedule risk to NASA, DOD, and commercial test customers by ensuring safe and efficient operations of NASA test facilities.	Zero type A and B hardware anomalies or escapes at launch or test sites attributed to MSFC/S&MA.	Safety and Mission Assurance (QS01)
M	SFS	4SSP20	Continuing to improve our Safety performance by lowering closure time to ED Safety Concerns Reporting System (SCRS), improving the implementation of safety principles as evidenced by fewer Safety violations discoveries during Safety walkthroughs and striving for 100 percent in performing Safety Meetings and Visits each month.	Engineering Directorate (ED01)
M			Revise NASA/Air Force Cost Model every 18 months to include the latest cost data and model enhancements, and expand the REDSTAR (Resource Data Storage and Retrieval) database by 5 percent.	Systems Management Office (VS01)
R	MSM	10.1.1 Enable new technologies to identify and reduce mission risk.	Achieve a satisfactory rating of 90 percent on assessments among mission support team members and S&MA counterparts as indicated on an annual survey.	Safety and Mission Assurance (QS01)
M	SFS	9.5.2 Develop innovative approaches and concepts to inform future decisions concerning systems, infrastructures, and missions for human and robotic explorations of space.	Explore successful S&MA organizations to identify potential benchmarks for S&MA excellence.	Safety and Mission Assurance (QS01)

Points of Contact

Center of Excellence for Space Propulsion

Assistant Director & Chief Engineer for Space Propulsion	DA01	Robert Sackheim	256–544–1938
Assistant Director for Technology & Chief Technologist	DA01	James Bilbro	256–544–3467
Space Transportation Directorate http://www.spacetransportation.com	TD01	Denny Kross	256–544–4386
In-Space Propulsion Systems Office	TD05	Les Johnson	256–544–0614
High-Powered Propulsion Systems Office	TD06	Gary Langford	256–544–4948
Next Generation Launch Technology Propulsion	TD07	Jim Owen	256–544–7213
NGLT Program Office http://www.slinews.com/index.html	NP01	Garry Lyles	256–544–9203
Propulsion Research Center	TD40	Stephen Rodgers	256–544–0818
Space Transportation Engineering	TD50	Preston Jones	256–544–5716
Subsystem and Component Development	TD60	Preston Jones	256–544–5716
Test and Evaluation Department	TD70	Mike Allen (acting)	256–544–5611
Space Transportation Integration Office	TD02	Alberto Duarte	256–544–2944
Business and Administration Office	TD10	Rosemary Finley	256–544–0194

Human Exploration and Development of Space

Space Shuttle Propulsion Office http://liftoff.msfc.nasa.gov	MP01	Sandra Coleman	256–544–6201
Advanced Planning and Concepts Office (ISTP) http://www.spacetransportation.com	TD03	Norm Brown	256–544–0505
Exploration and Development Office	TD04	Dallias Pearson	256–544–6621
International Space Station	FD01	Rex Geveden (acting)	256–544–1911
Environmental Control and Life Support Systems	FD20	Scott Croomes	256–544–2452
Payload Operations and Integration	FD30	Teresa Vanhooser	256–544–2315
Huntsville Operations Support Center	FD30	Rickey Cissom	256–544–2017
Cargo Vehicle Integration	FD20	Scott Croomes	256–544–2452

Aerospace Technology

Space Transportation Systems Development http://www.spacetransportation.com	TD01	Denny Kross	256–544–4386
NGLT Program Office http://www.slinews.com	NP01	Garry Lyles	256–544–9203
Orbital Space Plane Program Office http://www.slinews.com	UP01	Dennis Smith	256–544–9119
X–37 Project Office http://www.slinews.com	UP40	Dan Dumbacher	256–544–0171

Office of Biological and Physical Research

Science Directorate http://science.nasa.gov	SD01	Ann Whitaker	256–544–2481
Microgravity Science and Applications Dept.	SD40	Corky Clinton	256–544–2682
Ground Systems Dept.	FD40	Ann McNair	256–544–2025
Space Product Development Program Office	SD10	Mark Nall	256–544–9152

Office of Space Science

Science Directorate	SD01	Ann Whitaker	256–544–2481
http://science.nasa.gov			
Space Science Department	SD50	Frank Six	256–961–7701
Space Optics Manufacturing Technology	SD70	Scott Smith	256–544–5175
Gravity Probe-B	SD30	Tony Lyons (acting)	256–544–2281
Chandra Program Office	FD03	Keith Hefner	256–544–0675

Earth Science Enterprise

Science Directorate	SD01	Ann Whitaker	256–544–2481
http://science.nasa.gov			
Global Hydrology and Climate Center (GHCC)			
http://www.ghcc.msfc.nasa.gov/ghcc_home.html	SD60	Jim Arnold	256–961–7722

Principal Center and Agency Support Activities

AdminSTAR	CD02	Lisa Martin	256–544–4374
Center for Review of Clean Air Act Regulations	ED36	Marceia Clark-Ingram	256–544–6229
Administrative Systems	AD33	Marisa Wofford	256–544–7482
DCAS Financial Management Service	RS21	Kenny King	256–544–7328
Environmental Assessments Impact Statements	AD01	Sheila Cloud	256–544–0120
Logistics Business Systems Operations and Maintenance	AD40	Nikita Zurkin	256–544–6326
NASA ADP Consolidation Center	AD33	Sittra Battle	256–544–6953
NASA Acquisition Internet Service (NAIS)	AD33	Marisa Wofford	256–544–7482
NASA Earned Value Performance Management	RS40	Tommy Watts	256–544–8242
NASA Human Resources Systems	CD02	Lou Nosenzo	256–544–7401
NASA Integrated Service Network	AD30	Beth Paschall	256–544–2930
NASA Materials Replacement Team	ED36	Marceia Clark-Ingram	256–544–6229
NASA Payroll	RS10	Mike Clemons	256–544–7345
NASA Preferred Technical Standards Program	ED41	Paul Gill	256–544–2557
NASA Space Environments and Effects Program	ED03	Billy Kaufmann	256–544–1418
NASA Spacelink	CD60	Jeff Ehmen	256–544–6531
http://spacelink.nasa.gov			
National Center for Advanced Manufacturing	ED34	John Vickers	256–544–3581
National Space Science and Technology Center	SD03	Robin Henderson	256–961–7002
http://www.nsstc.org			
Sustaining Engineering Support for Agencywide Administrative Systems	AD33	Marisa Wofford	256–544–7482
WAN Services	AD33	Beth Paschall	256–544–2980
Integrated Financial Management Program			
Administrative Systems Implementation Project	RS02	Pam Cucarola	256–544–7281
Core Financial Projects	RS02	Pam Cucarola	256–544–7281
Integration Project	AD04	Jonathan Pettus	256–544–9271
Budget Formulation Module	RS60	Rose Caudle	256–544–3246

MSFC Institutional Functions and Capabilities

Chief Counsel	LS01	Bill Hicks	256–544–0010
Chief Information Officer	AD30	Jim Ellis	256–544–0721
NASA Computing and Communication System	AD30	Rick Helmick	256–544–3460
Engineering Directorate	ED01	Bill Kilpatrick	256-544-1000

Environmental Engineering	AD01	Sheila Cloud	256–544–0120
Equal Opportunity Office	OS01	Charles Scales	256–544–4927
Facilities Engineering	AD20	Edwin Jones	256–544–7927
Financial Management	RS01	Frank Mayhall (acting)	256–544–7266
Information Services	AD30	Jim Ellis	256–544–0721
Logistics Services	AD40	Ron Burns	256–544–4124
Occupational Medicine and Environmental Health	AD60	Joyce Eagan	256–544–3996
Industrial Safety	QS50	David Spacek	256–544–2686
Procurement	PS01	Steve Beale	256–544–0257
Protective Services	AD50	Owen Johnson	256–544–4539
Safety & Mission Assurance	QS01	Jan Davis	256–544–0254
Small Business Industry Assistance	PS01	Stan McCall	256–544–0154
Systems Management Office	VS01	Dale Thomas	256–544–1180
Customer & Employee Relations			
Customer and Employee Relations Directorate	CD01	Tereasa Washington	256–544–7491
Human Resources	CD10	Danny Hightower	256–544–7496
Employee and Organizational Development	CD20	Susan Cloud (acting)	256–544–5377
Technology Transfer	CD30	Vernotto McMillan	256–544–2615
Internal Relations & Communications	CD40	Steve Durham	256–544–0390
Government & Community Relations	CD50	Shar Hendrick	256–544–5549
Educational Programs http://education.msfc.nasa.gov	CD60	Jim Pruitt	256–544–8800
Media Relations	CD70	Dom Amatore	256–544–0031

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