The NASA Vision

NASA is an investment in America's future. As explorers, pioneers, and innovators, we boldly expand frontiers in air and space to inspire and serve America and to benefit the quality of life on Earth.

The NASA Strategic Enterprise Goals

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<tr>
<th>Human Exploration and Development of Space</th>
<th>Aeronautics and Space Transportation Technology</th>
<th>Space Science</th>
<th>Earth Science</th>
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<td>• Prepare to conduct human missions of exploration to planetary and other bodies in the solar system.</td>
<td>• Enable U.S. leadership in global civil aviation through safer, cleaner, quieter, and more affordable air travel.</td>
<td>• Establish a virtual presence throughout the solar system, and probe deeper into the mysteries of the Universe and life on Earth and beyond—a goal focused on the fundamental science we will pursue.</td>
<td>• Expand scientific knowledge of the Earth system using NASA's unique capabilities from the vantage points of space, aircraft, and in situ platforms.</td>
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<td>• Use the environment of space to expand scientific knowledge.</td>
<td>• Revolutionize air travel and the way in which aircraft are designed, built, and operated.</td>
<td>• Pursue space science programs that enable and are enabled by future human exploration beyond low-Earth orbit—a goal exploiting the synergy with the human exploration of space.</td>
<td>• Disseminate information about the Earth systems.</td>
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<td>• Provide safe and affordable access to space, establish a human presence in space, and share the human experience of being in space.</td>
<td>• Enable the full commercial potential of space and expansion of space and exploration.</td>
<td>• Enable and provide world-class Research and Development services including facilities and expertise, and proactively transfer technologies in support of industry and U.S. Government Research and Development.</td>
<td>• Enable productive use of Mission To Planet Earth science and technology in the public and private sectors.</td>
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<td>• Enable the commercial development of space and share HEDS knowledge, technologies, and assets that promise to enhance the quality of life on Earth.</td>
<td>• Enable and provide world-class Research and Development services including facilities and expertise, and proactively transfer technologies in support of industry and U.S. Government Research and Development.</td>
<td>• Contribute measurably to achieving the science, mathematics, and technology education goals of our Nation, and share widely the excitement and inspiration of our missions and discoveries—a goal reflecting our commitment to education and public outreach.</td>
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The Marshall Space Flight Center FY 1999 Implementation Plan defines our approach and metrics to implement the Agency and Enterprise goals and objectives. In addition, goals are included that have been specifically developed to address the direction of improvement of the Center as an institution. In response to and supporting the changing environment, directions, and processes throughout the Agency, we must not only meet the needs of the Enterprises but must forge a stronger Center through emphasis on quality and safety, directed focus on the Lead Center and Center of Excellence assignments, and improved ways of doing business through better leveraging and partnerships.

With safety as our first priority, we are committed to excellence in engineering and science, management, business, and personnel development in a safe and productive environment for our employees, our customers, our community, and our country.

FY 1999 is a critical year for both the Agency and the Marshall Space Flight Center (MSFC). The focused development of cutting edge technologies in space transportation to enable the development of space through lower cost access to orbit, the delivery of additional Shuttle capability to improve reliability and safety, the support to the Shuttle elements and launch manifest, the beginning of the assembly of the International Space Station (ISS), expanded microgravity research and development to use the orbiting ISS laboratories, and the launch and operation of the Advanced X-Ray Astrophysics Facility are all major emphasis projects for MSFC in FY 1999. In addition, many new business systems and processes will be put in place, including the Integrated Financial Management System for which MSFC is the first implementation site.

We depend on the creative and skilled team at Marshall and all our partners and contractors to meet the metrics defined. We must continue to challenge everything we do for improvement in effectiveness, efficiency, and productivity. It is essential that all employees read and understand this plan and how the work you do directly contributes to the success of the Center and the NASA vision, mission, and goals.

Carolyn S. Griner
Acting Center Director
Marshall Space Flight Center

Mission

Bringing people to space; bringing space to people.
We are world leaders in access to space and the use of space for research and development to benefit humanity.

Goals

- Establish MSFC as number one in safety within NASA.
- Develop and maintain the NASA preeminence in space propulsion to enable the exploration and development of space.
- Lead the research and development of space transportation technologies and systems that support our customers’ needs.
- Lead the NASA Microgravity Research Program and develop and maintain capabilities required to meet National research objectives.
- Lead the research and development of space optics fabrication, metrology, and testing that supports and enhances the NASA advanced propulsion and science programs.
- Enhance and sustain a highly skilled, diverse, and motivated workforce committed to safety while working in a creative and productive environment in support of cutting-edge systems and technology development.

Center of Excellence

- Space Propulsion

Mission Areas

- Space Transportation Systems Development
- Microgravity Research
- Space Optics Fabrication, Metrology, and Testing
Commitment to Safety and Mission Success

Our goal: Establish MSFC as number one in safety within NASA.

MSFC’s Safety Philosophy

Senior management commitment to flight crew, employees, facilities, and program hardware safety

- Safety is an integral part of the life cycle of all MSFC programs and operations.
- Safety success requires commitment and involvement of the total workforce at and away from the workplace.
- A comprehensive safety and risk management program enhances the probability of mission success.

Safety Management Programs and Techniques

MSFC has implemented unique and innovative management techniques to improve safety performance.

Current Safety Processes

- Collocation of key Safety and Mission Assurance personnel in the major project offices and at contractor plants.
- Maintaining safety of flight while transitioning from oversight to insight and reducing Government Mandatory Inspection Points on Shuttle projects.
- Senior management safety review of all MSFC payloads.
- Internet web pages with payload assurance information.
- Center employee Safety Concern Reporting System.
- Use of state-of-the-art system safety tools for hazard identification and control.
- Risk assessments to prioritize management decisions on corrective actions.
- MSFC Safety Day Stand Down.

FY 1999 Safety Initiatives

- Augment training to implement safety focus which ensures line management and employee responsibility and accountability.
- Obtain certification in the Occupational Safety and Health Administration Voluntary Protection Program.
- Integrate quality and safety into the MSFC ISO 9000 Management System.
- Use world-class Probabilistic Risk Assessment capability to model and quantify Shuttle enhancements for risk management decisions.
- Emphasize safety improvement criteria in all Performance Evaluation Board deliberations with our contractors.
- Include Safety Program performance briefings in MSFC senior management meetings.
- Communicate safety program performance.
- Add safety performance to all manager and supervisor performance plans.

Safety and Mission Success Metrics

- Achieve a 60 percent increase in predicted reliability of the Space Shuttle over the 1995 baseline.
- Reduce lost time mishap rate 20 percent per year over a 5-year period.
- Implement safety into the MSFC ISO 9000 Management System by the beginning of FY 2000.
- Complete certification in the Occupational Safety and Health Administration Voluntary Protection Program by the beginning of FY 2000.
Center of Excellence: 
Space Propulsion

Our goal: Develop and maintain the NASA preeminence in space propulsion to enable the exploration and development of space.

We support—

- Human Exploration and Development of Space Enterprise
- Aeronautics and Space Transportation Technology Enterprise
- Space Science Enterprise
- Industry and Commercial Needs
- Other Federal Agencies

As the NASA Center of Excellence for Space Propulsion, Marshall is leading the development of advanced earth-to-orbit and in-space propulsion systems and technologies.

NASA engineers are working to enable significantly lower cost propulsion systems with higher performance and aircraft-like operability. Technologies will be developed and demonstrated at several levels including component, subsystem, and system in both ground and flight test, where appropriate.

Marshall provides space propulsion services to all Enterprises and provides critical leadership for efforts among NASA field centers, industry, academia, and other Government agencies.

The world-class capability of skilled personnel, processes, and facilities will be maintained and enhanced to develop new and innovative space propulsion technologies.

Earth-to-Orbit Propulsion

A critical element to lowering the cost of space access is lowering the operations, development, and manufacturing costs while increasing the performance of earth-to-orbit propulsion systems.

Near term activities are focused on enabling a rocket-based reusable launch vehicle around the end of the decade. These technologies include advanced nozzle concepts (aerospike, expansion-deflection), lightweight composite thrusters, composite lines and ducts, ceramic turbines, composite housings, and other low cost components.

Building on near term developments, mid term technology activities are centered around enabling an air-augmented rocket engine. Building on synergy between space and aeronautics activities, Marshall has initiated flowpath demonstrations of these bold, new concepts.

Long term technologies include revolutionary off-board energy sources, such as magnetic levitation catapults and ground-based laser propelled systems.
In-Space Propulsion

Over 70 percent of all payloads need transportation beyond low-earth orbit. A primary driver to enabling these systems is increasing the efficiency while decreasing the mass of the propulsion system.

Marshall is pursuing technologies to enable Earth-orbital and planetary transportation that include advanced chemical engines, solar thermal and solar electric propulsion systems, and electrodynamic tethers.

Interstellar missions will require several orders-of-magnitude reduction in trip times. Technologies being researched include fusion and breakthrough propulsion physics including matter/antimatter and gravity field manipulation.

Space Propulsion Metrics

- Deliver Fastrac engine to X–34 in 1999.
- Complete Rocket Based Combined Cycle flowpath testing in 1999.
- Demonstrate the viability of a ceramic matrix composite blisk and nozzle in 1999.
- Fly NSTAR ion engine on Deep Space–1 in 1999.
- Demonstrate capability to store cryogens for long-term missions (30 days) in 1999.
- Demonstrate the viability of large-scale metal matrix composite housings and polymer matrix composite lines and ducts in 2000.
- Flight demonstrate an air-augmented system by 2002.
Mission: Space Transportation Systems Development

Our goal: Lead the research and development of space transportation technologies and systems that support our customers’ needs.

We support—

- Human Exploration and Development of Space Enterprise
- Aeronautics and Space Transportation Technology Enterprise
- Industry and Commercial Needs
- Other Federal Agencies

M SFC has responsibility for research, technology maturation, design, development, and integration of space transportation and propulsion systems. This includes both reusable space transportation systems for Earth-to-orbit applications, as well as vehicles for orbital transfer and deep space transportation.

Space Shuttle Elements

MSFC’s Space Shuttle projects manage safe, continuous, robust, and cost-effective operations for the Space Shuttle propulsion elements: external tank, solid rocket booster, reusable solid rocket motor, and Space Shuttle main engine. MSFC will continue to streamline operations and aggressively develop and implement significant upgrades to improve safety, supportability, and reliability, and to reduce costs to efficiently sustain the Space Shuttle for its lifetime.

Space Shuttle Metrics

- Maintain less than one in-flight anomaly (IFA) per mission.
- Streamline operations.
  a. Transition routine operations from a government role of oversight to insight.
  b. Transition Shuttle prime contracts to the Space Flight Operations Contract, based on project maturity and stability:
    - Solid rocket booster: July 1998
    - External tank, Space Shuttle main engine, and reusable solid rocket motor under assessment.
- Achieve a 60 percent increase in predicted reliability of the Space Shuttle over the 1995 baseline.
  - Projections based on the Quantitative Risk Assessment indicate a 95 percent improvement (48 percent risk reduction) for ascent upon incorporation of Space Shuttle main engine upgrades:
    - Block I: July 1995
    - Block IIA: January 1998
    - Block II: May 1999.
Advanced Space Transportation Technology

MSFC’s Advanced Space Transportation Technology Programs Office will significantly reduce the cost of future space transportation systems while improving reliability, operability, responsiveness, and safety. MSFC, in partnership with the space launch industry and other NASA centers, is dedicated to developing advanced technologies and systems to enable new civil, commercial, and military mission capabilities; and encourage commercial investment in, and operation of, space transportation systems.

MSFC leads the Nation in space transportation by combining the development of ground-based state-of-the-art technologies with the validation of key technology products in a series of flight demonstrations (X–33 advanced technology demonstrator, X–34 small demonstrator, and Future-X demonstrations). MSFC efforts are focused on substantially reducing the risk associated with developing a full-scale operational Reusable Launch Vehicle (RLV) early in the next decade while setting the stage for hundredfold reductions in the cost of future space transportation systems.

The Advanced Space Transportation Program (ASTP) will pursue the development of revolutionary advancements in space access with the potential to reduce costs to hundreds of dollars per pound of payload versus the thousands of dollars measured today. ASTP will provide the basic building blocks of propulsion and airframe systems technologies to support flight demonstration projects, while focusing on future break-through technologies beyond the next generation.

Space Transportation Metrics

- Begin flight tests of the X–33 and demonstrate key technologies in 1999.
- Initiate flight tests of the X–34 and demonstrate key technologies in 1999.
- Realize tenfold reduction in the cost of space transportation within 10 years.
- Realize another tenfold reduction within 25 years.
- Reduce the cost of in-space transportation systems by an order of magnitude within 15 years.
- Realize 2–3 times reduction in mass and trip times.
Mission:
Microgravity Research

Our goal: Lead the NASA Microgravity Research Program and develop and maintain capabilities required to meet National research objectives.

We support—

- Human Exploration and Development of Space Enterprise
- NASA Approved Principal Investigators
- National Scientific Community
  - Academia
  - Industry
  - Government
- Commercial Space Centers and Industry Partners
- American Companies/Industry

SFC’s Microgravity Research Program Office is responsible for implementing the Agency's microgravity initiatives. MSFC’s efforts enable scientific and commercial researchers the unique opportunity to use the low-gravity environment of space as a catalyst to generate new knowledge, products, and services that improve the quality of life on Earth.

Microgravity Research Program

The purpose of the Microgravity Research Program is to use the low-gravity environment of space as a tool to advance knowledge. Microgravity researchers are provided the unique opportunity to study physical, chemical, and biological processes and phenomena in the near absence of gravity. Comparison between ground- and space-based research data allows scientists to accurately understand the role gravity plays in everyday life. Low-gravity research also allows scientists the opportunity to explore phenomena normally obscured by the effects of gravity. Scientists selected into the program perform peer-reviewed investigations in the research areas of biotechnology, combustion science, fluid physics, fundamental physics, and materials science. MSFC manages the implementation of the program, including the development of major facilities to be permanently housed on the International Space Station (ISS) and available to the science community for unique low-gravity research opportunities. In addition to its programmatic assignment, MSFC serves as a world leader in the areas of biotechnology and materials science research, working with selected scientists to transfer knowledge about the microgravity environment and provid-
ing science and engineering expertise necessary to aid the scientist in the successful execution of his investigation.

**Microgravity Research Metrics**
- Increase the number of microgravity researchers to 400 in FY 1999.
- Conduct research on 16 parabolic aircraft flights and three suborbital rocket flights in FY 1999.
- Build four Glovebox experiments in FY 1999.
- Achieve the steady-state goal of 425 microgravity researchers starting in FY 2000.

**Space Product Development Program**

In fulfilling NASA’s responsibility to encourage the fullest commercial use of space, the Space Product Development (SPD) Program is managing an organization of Commercial Space Centers (CSC’s) that has successfully employed methods for encouraging private industry to exploit the benefits of space-based research. Unique research opportunities of the space environment are being made available to private industry in an effort to develop new competitive products, create jobs, and enhance the quality of life. The success of the CSC’s research is evidenced by the increasing amount of industrial participation in commercial microgravity research and the potential products nearing marketability.

**Space Product Development Metrics**
- Conduct 30 commercial investigations on STS–95 in 1998.
- Increase CSC industrial affiliates by 10 percent in 1999.
- Establish two new CSC’s in 1999 – Food Technology – Environmental Systems
- Establish a virtual center for metal casting processes in 1999.

Near-perfect crystals grown in space aid pharmaceutical research on Earth.

Aerogel insulation protection properties are capable of shielding a delicate flower from intense heat.
**Human Exploration and Development of Space Enterprise**

- Explode the realm of space in physical, chemical, and biological processes.
- Develop the research community to use gravity as an experimental variable.
- Publish at least 60 percent of HESS sponsored research; make it accessible on the Internet.
- Prepare the next generation of number of sponsored investigators to 780.
- Analyze data from 60 to achieve:
  - Three-year, "jump-start" for cell culture and protein crystal growth research.
  - Improve our prediction capabilities of such cell lines.
- Use the NGL results to alternate and divide the mission by one-half.
- Evaluate the data obtained by fluid physics research to contribute to fundamental topics in condensed matter physics.
- Continue to expand and develop the space technology:
  - Develop and assemble the ISS in the science and commercial sectors.
  - Share HEDS knowledge, technologies, and assets that promise to enhance the quality of life on Earth.
- Develop innovative technologies for Enterprise operations and technologies.
- Improve Space Shuttle program operations by safely flying the manned and automated systems for a period of 1 year.
- In partnership with the Space Science Enterprise carry out an integrated program of research and development on the solar system to characterize the potential for human exploration and development.
- Reduce cost of Space Shuttle operations through privatization, commercial, and financial partnerships.
- Promote development in commercial areas out potential for commercial and financial partnerships.
- Foster the science of industry, academia, and government.
- Involve our nation's citizens in the adventure of exploring space and transfer knowledge and technologies to enhance the quality of life on Earth.
- Improve X-33 for flight testing.
- Complete the X-33 in preparation for flight testing.
- Begin flight tests of the X-33 and demonstrate the technolgy for reducing the cost of space transportation.
- Transfer at least 10 new technologies to industry and commercial enterprises.
- Expand the technology research program with the Space Station Freedom.
Mission:
Space Optics Fabrication, Metrology, and Testing

Our goal: Lead the research and development of space optics fabrication, metrology, and testing that supports and enhances the NASA advanced propulsion and science programs.

We support—

- Aeronautics and Space Transportation Technology Enterprise
- Space Science Enterprise
- Industry and Commercial Needs
- Other Federal Agencies

As a world leader in Space Optics Manufacturing Technology, MSFC will foster research and development to advance the state of the art in optical manufacturing and testing; and serve as a repository of technical knowledge and as a focal point for technology transfer among government, industry, and academia. New technologies for the coating and fabrication of large, lightweight, inflatable reflectors and Fresnel lenses are being pursued in support of the Aeronautics and Space Transportation Enterprise for future applications in solar thermal propulsion. New technologies for large, low-cost, lightweight optics in space are being pursued for the Next Generation Space Telescope and other future programs. Low-energy x-ray telescope mirrors are needed to support future Space Science Enterprise missions such as the Constellation X-Ray Mission planned for the period of 2003–2009. MSFC optical testing will be enhanced with the unique capability to test large optical systems at cryogenic temperatures.

Space Optics Fabrication, Metrology, and Testing Metrics

- In a three-phase process, beginning in 1998 and completing in 2002, increase mirror diameter four times while decreasing the mass by a factor of six and improving the resolution by 33 percent.
- Capability to optically test large optical systems at cryogenic temperatures.
Other Programmatic Assignments

The following is a brief summary of program related assignments being implemented by MSFC for the NASA Enterprises and other Lead Centers.

International Space Station

We support—

- Human Exploration and Development of Space Enterprise

The International Space Station (ISS) is a U.S.-led, international partnership program to build and operate a unique, world-class orbiting laboratory, free from the effects of gravity. Long-term scientific and technology development will be conducted for the benefit of life on Earth. MSFC is responsible for: development of the regenerative life support systems for ISS’s crew and research animals; management oversight of two node elements and the Multipurpose Logistics Module being built by the Italian Space Agency; and the Interim Control Module being built by the Naval Research Laboratory; development of research facilities including the EXPRESS rack; integration support of Spacelab pallets and support equipment for ISS assembly; environmental qualification testing of major ISS elements and systems; and management of the payload operations and utilization activities for research onboard the ISS.

International Space Station Metrics

- One Minipressurized Logistics Flight Module delivered to Kennedy Space Center (KSC) — August 1998.
- Flight 6A Spacelab pallet flight support equipment delivered to KSC — December 1998.
- Complete integration for the first EXPRESS rack with five payloads ready for launch at the beginning of FY 2000.
- Complete preparations for the launch of the first rack of the Human Research Facility and the Window Observational Research Facility on the first utilization flight.
- The Payload Operations and Integration Center will be ready to support payload operations for Flight 7A.1, March 2000.

International Space Station Participation—

United States • Canada • Japan • Russia • Brazil
Italy • France • Belgium • Netherlands • Denmark • Norway
Spain • Germany • United Kingdom • Sweden • Switzerland
Advanced X-Ray Astrophysics Facility

We support—

Space Science Enterprise

MSFC is responsible for managing the overall design, development, integration, and testing of the Advanced X-Ray Astrophysics Facility (AXAF). The program’s goals are to determine the nature of celestial objects from normal stars to quasars, understand the nature of physical processes that take place in and between astronomical objects, and understand the history and evolution of the Universe. These goals will be accomplished by extending the range of astrophysical observations significantly beyond that of previous x-ray observatories through increases in sensitivity and resolution. Images taken will be 10 times sharper than those from previously flown x-ray telescopes.

Advanced X-Ray Astrophysics Facility Metrics
- Five-year life.
- System level imaging resolution: subarcsecond.
- Time on orbit above 60,000 km: $\geq$ 68 percent.

Scientific Payloads and Research

We support—

Space Science Enterprise

MSFC manages the Gravity Probe-B, Solar X-Ray Imager, and Solar-B scientific payloads and instruments, and conducts research in high-energy astrophysics, solar magnetic fields, and low-energy space plasma physics.

Scientific Payloads and Research Metrics
- Gravity Probe-B
  - Launch readiness by October 2000.
  - Mission lifetime of 16 months.
  - Measurement accuracy for relativistic drift of 0.5 milliarcsecond/year.
- Solar-B
  - Mission lifetime of 3 years.
  - Engineering models by October 2000.
  - Focal plane instrument delivery to ISAS by June 2002.
  - 0.5-Meter Optical Telescope resolution of 0.25 arcseconds.
- Solar X-Ray Imager
  - Launch on GOES-M August 1999.
  - Mission lifetime of 3 years.
  - Full-disk soft x-ray imaging of the Sun, including solar flares and coronal holes.

Global Hydrology and Climate Center

We support—

Earth Science Enterprise

National Oceanic and Atmospheric Administration (NOAA)

Through the Global Hydrology and Climate Center (GHCC), a joint venture with academia, MSFC engages in research, education, and the development of Earth-science applications. The GHCC focuses on using advanced technology to observe and understand the global climate system, and applies this knowledge to agriculture, urban planning, water resource management, and operational meteorology. Areas of emphasis include observations of lightning, winds, and the use of other measurements for the study of Earth’s global hydrologic and energy cycles. MSFC manages the development of the Lightning Mapper Sensor (LMS) and the Shuttle-based Lidar Wind Measurement Demonstration (SPARCLE).

Global Hydrology and Climate Center Metrics
- Develop and publish a global lightning data base on a seasonal and annual basis.
- Deliver LMS by the end of FY 2001 for flight on Geostationary Operational Environmental Satellite (GOES) mission.
- In 1999, complete the SPARCLE design.
- Develop the technique to assimilate lidar wind data into regional climate models.
- Be selected as Southeast Regional Earth Science Application Centers and initiate two application projects.
Agency Support Activities

A broad range of personnel, facility, and operational support services is required to support NASA’s mission. NASA Headquarters has assigned the following Agency support activities to MSFC.

Lead Center Support Activities

- **Communications Architecture and Providing Agencywide Area Network (WAN) Services**
  Develop an Agencywide communications architecture to support NASA’s Enterprises that incorporates flexibility of technologies, efficiency in sustaining costs, and standards insuring full interoperability. The WAN shall incorporate these principles while successfully transitioning the WAN to the CSOC with no loss of availability.

- **Consolidated Mainframe and Administrative Server Operations**
  Provide cost effective mainframe computing support for the Agency’s Strategic Enterprises.

- **NASA Digital Television Transition**
  Provide policy dissemination, planning, and implementation guidelines to efficiently transition from NASA’s current analog television and video systems architecture to the U.S. digital standard.

- **Earned-Value Management (EVM)**
  Establish an effective, value-added NASA EVM program and provide the oversight and guidance for the implementation of EVM policy throughout the Agency.

- **NASA Metric Transition**
  Transition the Agency’s activities to the SI/metric systems of units in lieu of the inch-bound system.

- **NASA Operational Environment Team**
  Provide a central environmental technology resource to ensure that all NASA programs and projects comply with environmental standards as provided by the Environmental Protection Agency.

- **Preferred NASA Engineering Standards**
  Provide an integrated system of NASA-wide preferred engineering standards, guidelines, specifications, and handbooks.

- **Space Environments and Effects**
  Serve as NASA’s lead for identifying, developing, and maintaining the technologies required to mitigate effects of hazardous space environments on spacecraft required for future missions.

Other Support Activities

- **AdminSTAR**
  Provide leadership in implementing and sustaining a training administration business system across the Agency.

- **Electronic Meeting System**
  Provide leadership in implementing and sustaining a collaborative performance improvement tool across the Agency.

- **Human Resource and Payroll Information Systems**
  Increase the operational efficiency and effectiveness of the program functional manager activities associated with the Agency Human Resource and Payroll Information Systems.

- **Integrated Financial Management Program (IFMP)**
  Integrate the Agency’s administrative processes and procure and implement commercial off-the-shelf software applications to facilitate those re-engineered processes. Provide Agencywide training for IFMP.

- **Logistics Business Systems Operations and Maintenance**
  Provide responsive and cost effective logistics business systems to all NASA Strategic Enterprises, business partners, and logistics business process customers.
# Institutional Functions and Capabilities

Our goal: Enhance and sustain a highly skilled, diverse, and motivated workforce committed to safety while working in a creative and productive environment in support of cutting-edge systems and technology development.

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<td>Safety and Mission Assurance</td>
<td>Enhance MSFC’s effectiveness in roles supporting NASA’s Strategic Enterprises by ensuring that safety, reliability, maintainability, and quality assurance are integrated early into and throughout the life cycle of all programs and projects.</td>
<td>• Initiate Center-wide safety initiative to enable NASA to be #1 in safety</td>
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| Center Operations             | Enhance customer satisfaction by simplifying processes and reducing costs associated with providing and delivering quality support services, protecting and preserving physical assets, providing a safe and healthy environment for the MSFC workforce, and promoting harmonious industrial labor relations. | • Ninety percent customer satisfaction by FY 2000.  
• Ninety percent services provided at competitive rates by FY 2000.  
• Eighty percent of processes simplified through integrated support services by FY 2000.  
• Ninety percent availability rate for primary mission-related facilities, systems, and equipment by FY 1999.  
• 100 percent of MSFC Mission Critical Systems complete; “Year 2000 Implementation” by March 1999.                                                                 |
| Customer and Employee Relations| Facilitate and coordinate the MSFC strategic and implementation planning process and communicate, internally and externally, clear, consistent messages that are traceable to the MSFC Implementation Plan. Ensure an effective workforce that enables MSFC to succeed in a dynamic external environment, and provide quality products and services to our customers. | • Reduce the MSFC civil servants FTE while maintaining a diverse workforce.  
• Provide frequent updates to the public for all missions.  
• Expand the scope of NASA teacher programs to include workshops that serve state-level urban and rural systems and science centers/museums.  
• Increase the number of NASA Educator Resource Centers in our six-state geographical service region from four to six.  
• Increase the employee and organizational development opportunities.  
• Increase the number and value of partnerships established, patents obtained, licenses issued, and releasable success stories.                                                                 |
| Equal Opportunity             | Promote and strive for equal opportunity; equity and diversity in all occupational groups, grade levels, organizational units; MSFC programs and activities; and fully-accessible facilities. Conduct educational programs with historically black and other minority universities. | • Strive for representation in all grade and organizational levels and occupational skill groups.  
• Provide fully-accessible facilities.  
• Increase research opportunities with historically black and other minority universities.                                                                                       |
| Financial Management          | As stewards of Government resources, we will develop and maintain processes and systems that ensure accurate financial control across the Center.                                                                 | • Obligate 95 percent of authorized funding for the current Program Year.  
• Ensure that the IFMP Phase 1 systems and processes are successfully implemented by June 1, 1999.                                                                                         |
**Procurement**

Improve effectiveness and efficiency of Center acquisitions through increased use of techniques and management tools that enhance contractor innovations and performance.

- Increase obligated funds available for Performance-Based Contracts to 80 percent.
- MSFC will award 20 percent of its budget to Small Business concerns in FY99.
- MSFC will award 8 percent of its budget to SDB concerns in FY99.

**Program Development**

Program Development (PD) implements and manages a wide range of technical and programmatic planning efforts to provide project plans, advanced systems conceptual definitions, technical feasibility analyses, and preliminary designs in support of space systems definition activities and proposed new initiatives to achieve the goals and objectives of MSFC and NASA. The mission of PD is to provide its customers with innovative concepts, plans, designs, and advanced mission studies, including high-quality technical, programmatic, and economic analyses. PD supports diverse technical disciplines and projects including advanced space transportation systems, advanced launch vehicles, propulsion systems, upper stages, scientific experiments and payloads, space exploration, and related mission planning.

**Science and Engineering**

MSFC’s highly skilled engineers and scientists of the Science and Engineering (S&E) Directorate use state-of-the-art equipment and world-class facilities to accomplish research and development (R&D) for MSFC, other NASA Centers and government agencies, industry, and academia. Our prime responsibility to the Agency is for R&D of Space Transportation Technologies and Systems, Space Propulsion, Microgravity R&D, Payloads, and Space Optics Manufacturing. MSFC’s space systems architecture and engineering expertise design, develop, test and deliver crosscutting projects and services to a variety of customers. These motivated and highly-trained professionals make up two thirds of MSFC employees and reside in seven unique laboratories described below.

**Astrionics:** Plans, performs, and directs R&D in engineering and analysis of electrical systems, guidance and control systems, optical and radio frequency systems, computer and communication systems, software, and avionics simulation systems related to space vehicles, payloads, and support equipment.

**Materials and Processes:** Provides science, technology, and engineering design, development, and test of materials, processes, and products to be used in space vehicle applications, including related ground facilities, test articles, and support equipment.

**Mission Operations:** Performs mission operations by analyzing and developing mission operations requirements on flight and ground systems, implementing mission support systems, and conducting preflight planning and on-orbit flight operations from the Huntsville Operations Support Center.

**Propulsion:** Plans, establishes, directs, and conducts engineering R&D relative to propulsion and mechanical design systems, and evaluates the launch and operation of space vehicles, payloads, and support equipment.

**Space Sciences:** Plans, coordinates, directs, and conducts original and supporting theoretical, experimental, and observational research in space science, microgravity science, and Earth system science.

**Structures and Dynamics:** Plans, conducts, and directs R&D in structures and dynamics for the analysis, design, and/or qualification testing of space and launch vehicles, payloads, and systems.

**Systems Analysis and Integration:** Performs systems engineering, analysis, integration, and test functions for MSFC, other NASA Centers, industry, academia, and state and federal agencies.
The NASA Strategic Plan defines the Agency’s vision, mission, and fundamental questions of science and research that provide the foundation for our goals. The four Strategic Enterprises identify their objectives to meet the Agency’s goals in their individual Strategic Plans.

The MSFC FY 1999 Implementation Plan provides the link for the Center Program Plans, Project Plans, Institutional Implementation Plans, Center Procedures, and Employee Performance Plans to the Agency and Enterprise Strategic Plans. Our implementation is supported by industry, other Centers, other federal agencies, and academia. The Implementation Plan reflects MSFC’s dedication to NASA’s goals and communicates to the Strategic Enterprises, our employees, and our partners and customers the implementation of our roles and missions through metrics tied to the Agency budget.

**MSFC’s Link to the Future**
Points of Contact

For further information regarding the Marshall Space Flight Center FY 1999 Implementation Plan, please contact the following individuals.

Center of Excellence for Space Propulsion

http://photo3.msfc.nasa.gov/propulsion.html

RA01 Garry Lyles 256–544–9203

Human Exploration and Development of Space

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MG01 Joel Kearns 256–544–5506


JA01 Dick Marmann 256–544–1883

Space Shuttle—http://liftoff.msfc.nasa.gov/

SA01 Alex McCool 256–544–0718

Aeronautics and Space Transportation Technology

Space Transportation Systems Development—http://stp.msfc.nasa.gov/

XX01 Rick Bachtel 256–544–7210

Advanced Space Transportation Program—http://astp.msfc.nasa.gov/

RA01 Garry Lyles 256–544–9203

X–33 Program—http://rlv.msfc.nasa.gov/

RA20 Robert Austin 805–572–2134

X–34 Program—http://rlv.msfc.nasa.gov/

RA30 John London 256–544–0454

Space Science Enterprise

Space Optics Fabrication, Metrology, and Testing

EB51 Robert Jayroe 256–544–1968

Space Science—http://wwwssl.msfc.nasa.gov/

ES01 Greg Wilson 256–544–1628

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Global Hydrology and Climate Center (GHCC)—

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HR01 Ray Arnold 256–922–5861

Agency Support Activities

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Integrated Financial Management Program

BF01 Jonathon Pettus 256–544–9271

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WAN Services

AI51 Terry Luttrell 256–544–0130

Lead Center for Consolidated Mainframe and Administrative Server Operations

AI11 Portia Dischinger 256–544–8650

Lead Center for Earned Value Performance Management

BJ01 Jeff Saxon 256–544–0109

Lead Center for NASA Operational Environment Team

DA01 Bob Schwinghamer 256–544–1001

Lead Center for Preferred NASA Engineering Standards

EL01 Gabe Wallace 256–544–4359

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<tr>
<th>Agency Lead for Space Environments and Effects</th>
<th>DA01</th>
<th>Bob Schwinghamer</th>
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<td>NASA Digital Television Transition</td>
<td>AI41</td>
<td>Rodney Grubbs</td>
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<td>Sustaining Engineering Support for Agencywide Administrative Systems</td>
<td>AI51</td>
<td>Marcellus Graham</td>
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<td>Logistics Business Systems Operations and Maintenance</td>
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<td>NASA Metric Transition</td>
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<td>Darlene Springer</td>
<td>256–544–1312</td>
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<tr>
<td>AdminSTAR and Electronic Meeting System</td>
<td>CO20</td>
<td>Greg Walker</td>
<td>256–544–7558</td>
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**MSFC Institutional Functions and Capabilities**—http://www.msfc.nasa.gov/

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<th>Science and Engineering</th>
<th>EA01</th>
<th>William Taylor</th>
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<td>Program Development</td>
<td>PA01</td>
<td>Axel Roth</td>
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<td>Chief Counsel</td>
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<td>Bill Hicks</td>
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<td>Educational Programs</td>
<td>CO60</td>
<td>Jim Pruitt</td>
<td>256–544–0213</td>
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<td>Equal Opportunity</td>
<td>CE01</td>
<td>Charles Scales</td>
<td>256–544–4927</td>
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<td>Financial Management</td>
<td>BC01</td>
<td>David Bates</td>
<td>256–544–0092</td>
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<td>Human Resources</td>
<td>CO10</td>
<td>Danny Hightower</td>
<td>256–544–7496</td>
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<td>Internal Relations &amp; Communications</td>
<td>CO40</td>
<td>Norm Brown</td>
<td>256–544–0505</td>
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<td>Media Relations</td>
<td>CO70</td>
<td>John Taylor</td>
<td>256–544–0031</td>
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<td>Government &amp; Community Relations</td>
<td>CO50</td>
<td>Lynne Lowery</td>
<td>256–544–5549</td>
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<td>Employee and Organizational Development</td>
<td>CO20</td>
<td>Greg Walker</td>
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<td>Information Systems</td>
<td>AI01</td>
<td>Charles Houston</td>
<td>256–544–5772</td>
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<td>Facilities Services</td>
<td>AB01</td>
<td>Peter Allen</td>
<td>256–544–7909</td>
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<td>Environmental Engineering</td>
<td>AE01</td>
<td>Rebecca McCaleb</td>
<td>256–544–4367</td>
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<td>Logistics Services</td>
<td>AC01</td>
<td>Roy Malone</td>
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<td>Procurement</td>
<td>GP01</td>
<td>Steve Beale</td>
<td>256–544–0257</td>
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<td>Safety &amp; Mission Assurance</td>
<td>CR01</td>
<td>Amanda Harris</td>
<td>256–544–0043</td>
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<tr>
<td>Technology Transfer</td>
<td>CO30</td>
<td>Sally Little</td>
<td>256–544–4266</td>
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The Marshall Commitment

We are committed to—

- **Safety**—human life, both in space and on Earth, is our first priority.
- **Excellence**—responsive and accountable to our customers in supplying high-quality products and services.
- **Our Employees**—our most valuable asset. We will build and maintain a unified, interdependent Marshall team.
- **Partnerships**—building with other Centers, academia, industry, and other Government agencies.
- **Change**—innovative thinking and flexibility in adapting to change.
- **Communication**—open and effective communications with each other, our customers, and the public.
- **Community and Environment**—maintain a valuable and active role in our community and environment.
- **Continual Learning**—increase core capabilities by enhancing core competencies.