

Marshall Space Flight Center (MSFC)

Highlights*:

- Heavy Lift and Propulsion Research and Development Program: New Program Office to manage \$559 million in FY 2011 and \$3.1 billion over five years to develop next-generation engines and propulsion technologies.
- Exploration Precursor Robotic Program: New Program Office to manage approximately \$105 million in FY 2011 and \$2.6 billion over five years allocated to scout locations for eventual human visits.
- Space Technology Demonstrations: New Program Office to manage \$75 million in FY 2011 and \$1.4 billion over five years to oversee flight testing of crosscutting aerospace technologies.
- Centennial Challenges Program: New Program Office to manage \$10 million in FY 2011 and \$50 million over five years for this innovative prize program.

* Proposals regarding Program Office assignments will be implemented following Congressional approval of the FY 2011 budget; and funding amounts include the cost of civil service labor.

Center Assets: Located on the Redstone Arsenal in Huntsville, AL, MSFC employs over 2,500 civil servants, consisting mainly of professional engineers and scientists with expertise in rocket propulsion technology, and building launch vehicles, spacecraft, and scientific instruments. Center capabilities that will be tapped in the President's new program include systems engineering, propulsion and transportation systems, and management of robotic missions. Specific new activities include the following.

Heavy Lift and Propulsion Research and Development Program (HLPRD) Program Office: This new program will investigate a broad scope of R&D activities to support next-generation space launch propulsion technologies to both reduce costs and shorten development timeframes for future heavy-lift and in-space systems. Target R&D activities include new approaches to first-stage launch propulsion; in-space advanced engine technology development and demonstrations; and foundational propulsion research. Projects may also include intra-governmental, commercial, academic and international partnerships. As the Program Office, MSFC will coordinate programmatic activities with the Exploration Systems Mission Directorate and provide management oversight and integration across the technology project elements. Most of these technology development projects involve collaborations between Centers, with industry, and/or with academia. MSFC's many capabilities in engine and propulsion development will be utilized in leading this program.

Exploration Robotic Precursor Program (xPRP) Program Office: This new program will send robotic precursor missions to the Moon, Mars and its moons, Lagrange points, and nearby asteroids to scout targets for future human activities, and identify the hazards and resources that will determine the future course of the expansion of human civilization into space. Program goals include gaining critical knowledge, proving technologies, and testing operational concepts that will benefit future human explorers at these destinations. As the Program Office, MSFC will coordinate programmatic activities and provide management oversight and integration across mission elements. MSFC's existing lunar robotic management capabilities will serve as the foundation for this new program.

Technology Demonstrations Missions Program Office: The new Technology Demonstration Missions Program will support crosscutting technologies with potential to benefit to multiple NASA mission directorates, other government agencies or the space industry. Performing flight demonstrations will advance the technology readiness of the selected systems, provide tangible products from the NASA innovation and technology program and capture significant public interest and awareness. Executing these engaging and technically challenging space flight demonstrations, including designing the flight test program, building the flight hardware and performing/operating the mission is also an outstanding means for preparing the current NASA and industry workforce to handle more challenging space missions in the future. As the Program Office, MSFC will coordinate and manage these activities across the nation in collaboration with NASA's Office of the Chief Technologist.

Centennial Challenges Program Office: The Centennial Challenges Program seeks innovative solutions to technical problems that can drive progress in aerospace technology, and be of value to NASA's missions in space operations, science, exploration and aeronautics. The program encourages the participation of independent teams, individual inventors, student groups and private companies of all sizes, and from diverse backgrounds (from non-traditional sources to established aerospace research and development organizations), to seek the most innovative solutions to technical challenges through competition and cooperation. NASA's original seven prize challenges have been successful in encouraging broad participation by innovators across our nation and across generations. Many of these technical challenges also have direct relevance to national and global needs such as energy and transportation. As the Program Office, MSFC will manage this program in collaboration with NASA's Office of the Chief Technologist to benefit all of NASA and the private sector.