

AIAA Space 2011 Conference

NASA's Space Launch System Progress Report

Joan (Jody) A. Singer, Deputy Program Manager
Jerry R. Cook, Associate Program Manager
Garry M. Lyles, Chief Engineer
David E. Beaman, Spacecraft and Payload Integration Manager

Space Launch System Program
NASA Marshall Space Flight Center

Exploration beyond Earth will be an enduring legacy for future generations, confirming America's commitment to explore, learn, and progress. NASA's Space Launch System (SLS) Program, managed at the Marshall Space Flight Center, is responsible for designing and developing the first exploration-class rocket since the Apollo Program's Saturn V that sent Americans to the Moon. The SLS offers a flexible design that may be configured for the Multi-Purpose Crew Vehicle and associated equipment, or may be outfitted with a payload fairing that will accommodate flagship science instruments and a variety of high-priority experiments. Both options support a national capability that will pay dividends for future generations. Building on legacy systems, facilities, and expertise, the SLS will have an initial lift capability of 70 metric tons (mT) and will be evolvable to 130 mT. While commercial launch vehicle providers service the International Space Station market, this capability will surpass all vehicles, past and present, providing the means to do entirely new missions, such as human exploration of asteroids and Mars. With its superior lift capability, the SLS can expand the interplanetary highway to many possible destinations, conducting revolutionary missions that will change the way we view ourselves, our planet and its place in the cosmos. To perform missions such as these, the SLS will be the largest launch vehicle ever built. It is being designed for safety and affordability — to sustain our journey into the space age. Current plans include launching the first flight, without crew, later this decade, with crewed flights beginning early next decade. Development work now in progress is based on heritage space systems and working knowledge, allowing for a relatively quick start and for maturing the SLS rocket as future technologies become available. Together, NASA and the U.S. aerospace industry are partnering to develop this one-of-a-kind asset. Many of NASA's space centers across the country will provide their unique expertise to the Space Launch System endeavor. Unique infrastructure to be used includes the Michoud Assembly Facility for tank manufacturing, Stennis Space Center for engine testing, and Kennedy Space Center for processing and launch. As this panel will discuss, the SLS team is dedicated to doing things differently—from applying lean oversight/insight models to smartly using legacy hardware and existing facilities. Building on the foundation laid by over 50 years of human and scientific space flight—and on the lessons learned from the Apollo, Space Shuttle, and Constellation Programs—the SLS team has delivered both technical trade studies and business case analyses to ensure that the SLS architecture will be safe, affordable, reliable, and sustainable.