

**NASA's Space Launch System:
Positioning Assets for Tele-Robotic Operations**

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Abstract

The National Aeronautics and Space Administration (NASA) is designing and developing America's most capable launch vehicle to support high-priority human and scientific exploration beyond Earth's orbit. The Space Launch System (SLS) will initially lift 70 metric tons (t) on its first flights, slated to begin in 2017, and will be evolved after 2021 to a full 130-t capability — larger than the Saturn V Moon rocket. This superior lift and associated volume capacity will support game-changing exploration in regions that were previously unattainable, being too costly and risky to reach. On the International Space Station, astronauts are training for long-duration missions to asteroids and cis-martian regions, but have not had transportation out of Earth's orbit — until now. Simultaneously, productive rovers are sending scientists — and space fans — unprecedented information about the composition and history of Mars, the planet thought to be most like Earth. This combination of experience and information is laying the foundation for future missions, such as those outlined in NASA's "Mars Next Decade" report, that will rely on tele-robotic operations to take exploration to the next level. Within this paradigm, NASA's Space Launch System stands ready to manifest the unique payloads that will be required for mission success. Ultimately, the ability to position assets — ranging from orbiters, to landers, to communication satellites and surface systems — is a critical step in broadening the reach of technological innovation that will benefit all Earth's people as the Space Age unfolds. This briefing will provide an overview of how the Space Launch System will support delivery of elements for tele-robotic operations at destinations such as the Moon and Mars, which will synchronize the human-machine interface to deliver hybrid on-orbit capabilities. Ultimately, tele-robotic operations will open entirely new vistas and the doors of discovery. NASA's Space Launch System will be a safe, affordable, and sustainable platform for these purposes and more.