James Webb Space Telescope Mirror Backplane Prototype Passes Critical NASA Space Readiness Tests

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REDONDO BEACH, Calif., Jan. 17, 2007 (PRIME NEWSWIRE) -- A prototype structure that holds the primary mirrors for the optical element of the James Webb Space Telescope (JWST) passed a key readiness milestone after undergoing a series of rigorous cryogenic tests at NASA's Marshall Space Flight Center in Huntsville, Ala. Northrop Grumman Corporation (NYSE:NOC) is the prime contractor for JWST, leading a team in the design and development under contract to NASA Goddard Space Flight Center.

Test results verified that the Backplane Stability Test Article (BSTA) has met the criteria necessary to demonstrate Technology Readiness Level (TRL) 6. TRL is a measure used by NASA and other government agencies to assess the maturity of evolving technologies before they are incorporated into operational systems. Achieving TRL 6 means that a representative model or prototype item has been successfully tested in a relevant environment (simulating space) and is ready to move into the final design phase.

"These results represent a tremendous achievement for the JWST team," noted Martin Mohan, Northrop Grumman's JWST program manager. "This section of the backplane was measured to an unprecedented level of accuracy. The BSTA performed even better than expected and demonstrates the telescope's ability to stay accurately focused. This milestone exemplifies the outstanding work of our teammate ATK and of the Space Telescope Science Institute (STScI), and our close partnership with NASA."

The BSTA is a full-scale sub-section of the mirror's backplane, a structure that holds and supports the observatory's sensitive lightweight mirrors and mirror controls. The test article holds up to three of JWST's 18 primary mirror segments and was designed and fabricated by Alliant Techsystems (NYSE:ATK).

The BSTA is the largest structure ever tested cryogenically. It performed to tolerances measured in nanometers (one nanometer is about the length of 4 atoms). Tests were designed to measure stability at cryogenic temperatures as low as 30 Kelvin (minus 405 F) and as high as 60 Kelvin over periods lasting two to three days. Conducted from late June through mid-September, the tests took place in a specially modified vacuum chamber at Marshall Space Flight Center's X-Ray Calibration Facility.

The James Webb Space Telescope, the next-generation premier space observatory, will explore a wide variety of phenomena in astronomy -- from distant galaxies to nearby planets and stars. From the first light after the Big Bang to the formation of star systems capable of supporting life on planets like Earth, JWST will give scientists clues about the formation of the universe and the evolution of our own solar system.

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