# NASA's Mars Science Laboratory Lifts Off, Protected By Lockheed Martin-Built Aeroshell

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CAPE CANAVERAL, Fla., Nov. 26, 2011 /PRNewswire/ -- NASA's Mars Science Laboratory spacecraft launched this morning from Cape Canaveral Air Force Station, Fla. at 10:02 a.m. ET aboard an Atlas V-541 rocket provided by United Launch Alliance. The mission's large Curiosity rover is encapsulated and protected in an aeroshell that was designed and built by Lockheed Martin (NYSE: LMT).

Launch photo: http://www.lockheedmartin.com/news/press_releases/2011/1126_ss_msl.html

MSL aeroshell video: http://www.youtube.com/user/LockheedMartinVideos?feature=mhee#p/u/6/OYsezwD_AIs

With its Curiosity rover – built by the Jet Propulsion Laboratory – the Mars Science Laboratory mission will seek to determine whether the Red Planet was, or still is, habitable for microbial life. In addition, the mission will characterize the climate and geology of Mars near its landing site at the foot of a mountain inside Gale crater.

The aeroshell is a blunt-nosed cone that encapsulates and protects Curiosity during its deep space cruise to Mars, and from the intense heat and friction that will be generated as the system descends through the Martian atmosphere. Lockheed Martin has designed and built every aeroshell flown by NASA to Mars dating back to the Viking landers.

"This is the biggest most challenging aeroshell we've ever built," saidRich Hund, MSL aeroshell program manager at Lockheed Martin Space Systems Company. "Even though the basic design draws from the many previous entry systems we've built for NASA, this mission had many unique requirements, mostly centered around delivering the one-ton rover to a specific landing site in the Gale crater."

The aeroshell measures 14.8 feet (4.5 meters) in diameter. For comparison, the heatshields of the Spirit and Opportunity Mars Exploration Rovers measured 8.7 feet and Apollo capsule heatshields measured just less than 13 feet. Because of its large size, the weight of the overall spacecraft, and the unique entry trajectory through the Martian atmosphere, the heat shield was designed with a different thermal protection system than previous Mars missions. First used for the Stardust Sample Return Capsule, the MSL heat shield is covered with tiles of phenolic impregnated carbon ablator (PICA). This material will be instrumental in protecting the Curiosity rover from the expected 3,500 degrees Fahrenheit temperature as the spacecraft descends through the Martian atmosphere on Aug. 5, 2012.

In addition to the aeroshell, Lockheed Martin's Information Systems & Global Solutions (IS&GS) also provided information technology (IT) support services to the Jet Propulsion Laboratory's (JPL's) scientists, researchers and engineers at Kennedy Space Center. Through the JPL Desktop and Institutional Computing Environment (DICE) subcontract, Lockheed Martin onsite service technicians and service desk employees worked around the clock during the launch window to provide highly responsive technology support.

Headquartered in Bethesda, Md., Lockheed Martin is a global security company that employs about 126,000 people worldwide and is principally engaged in the research, design, development, manufacture, integration and sustainment of advanced technology systems, products and services. The Corporation's 2010 sales from continuing operations were $45.8 billion.

More information on the MSL mission and the aeroshell can be found at:

- About the MSL aeroshell: http://www.lockheedmartin.com/products/MarsScienceLaboratoryAeroshell
- NASA MSL fact sheet: http://marsprogram.jpl.nasa.gov/msl/news/pdfs/MSL_Fact_Sheet.pdf
- MSL Web site: http://marsprogram.jpl.nasa.gov/msl/

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