

Lockheed Martin-Built Stardust Spacecraft Ready To Return Comet Samples To Earth

PRNewswire-FirstCall
DENVER

A capsule containing comet particles and interstellar dust samples collected in space by NASA's Stardust spacecraft -- designed and built by Lockheed Martin -- is heading to Earth for a parachute landing early on the morning of January 15, 2006, in northwest Utah.

The Stardust mission, managed by the NASA Jet Propulsion Laboratory (JPL), will provide scientists with the first comet samples and interstellar dust grains ever returned to Earth. In addition to building the Stardust spacecraft, Lockheed Martin Space Systems Company built the sample return capsule (SRC) under contract to NASA, provided joint spacecraft operations working in concert with JPL, and has designed and will implement the capsule's recovery.

"We are thrilled by how well Stardust has performed during its nearly seven years in space, and look forward next Sunday to bringing those precious samples safely back to Earth," said Joe Vellinga, Stardust program manager, at Lockheed Martin Space Systems Company. "We're very proud to have played a role in another of NASA's exciting voyages of exploration and look forward to learning what Stardust will tell us about the origins of our solar system."

Stardust was launched from the Cape Canaveral Air Force Station, Fla., Feb. 7, 1999. Between February and May of 2000, the first interstellar dust collection was performed successfully. Nearly two years after launch, on Jan. 15, 2001, Stardust flew by Earth, receiving a gravity assist that would speed it on its way to intercept Comet Wild 2.

Between August and December of 2002, Stardust completed successfully its second collection of interstellar dust. During this period, on Nov. 2, Stardust flew within 3100 kilometers (1927 miles) of asteroid Annefrank. The encounter was used to test ground and spacecraft operations that would later be put into practice during its upcoming comet encounter.

The encounter and cometary dust sample collection at comet Wild 2 was performed January 2, 2004. During its closest approach, Stardust came within approximately 240 kilometers (149 miles) of the comet nucleus and acquired detailed images of surface features. While flying through the comet's coma, the spacecraft captured particles and stored them in the SRC.

As Stardust flies back past Earth on Jan. 15, the SRC will be released from the main body of the spacecraft. The capsule will reenter the Earth's atmosphere and, with the assistance of a parachute system, land gently at the Utah Test and Training Range in the Utah desert. The samples will be delivered to the curatorial facility at the Johnson Space Center in Houston, TX, for analysis by the science team. The samples will then be distributed to the international science community for detailed analyses.

The Stardust comet samples from Wild 2 are expected to provide unique chemical and physical information that could yield insight into the formation of the solar system and the materials that made up its family of planets. Comets are believed to be composed of material accreted in the solar nebula prior to the formation of the planets. Thus they represent the oldest and most basic material available for study and could help scientists better understand the creation of the Universe.

Additionally, the interstellar dust to be brought back by Stardust is believed to consist of ancient pre-solar interstellar grains and nebular material that include remnants from the formation of the solar system. Analysis of these precious specks might offer important insights into the evolution of the Sun and its planets, and possibly even the origin of life itself.

Lockheed Martin Space Systems Company is one of the major operating units of Lockheed Martin Corporation. Space Systems designs, develops, tests, manufactures and operates a variety of advanced technology systems for military, civil and commercial customers. Chief products include a full range of space launch systems, including heavy-lift capability, ground systems, remote sensing and communications satellites for commercial and government customers, advanced space observatories and interplanetary spacecraft, fleet ballistic missiles and missile defense systems.

Headquartered in Bethesda, Md., Lockheed Martin Corporation employs about 135,000 people worldwide and is principally engaged in the research, design, development, manufacture and integration of advanced technology

systems, products and services. The corporation reported 2004 sales of \$35.5 billion.

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