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Washington U. physicist will help analyze comet dust from mission

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A Washington University researcher will be among the first scientists to sift through Stardust.

Later today, scientists at NASA's Johnson Space Center in Houston will unlock a canister containing debris from the comet Wild 2. The Stardust space capsule collected the comet dust in 2004 as it swooped past the comet.

After a seven-year mission, the capsule parachuted onto the Utah salt flats early Sunday. It bounced three times in soft mud before coming to rest on its side. The landing chipped off a piece of the capsule's heat shield, meant to protect it as it re-entered Earth. But the capsule and its canister were in good shape otherwise, said Joe Vellinga of Lockheed Martin, which built the capsule.

"Everything is very clean. It looks very pristine," Vellinga said Monday.

Stardust's homecoming with the first comet particles ever captured in space was a relief for NASA, whose Genesis space probe carrying solar wind particles crashed and split open in 2004 after its parachutes failed to open. Despite the accident, scientists were able to salvage some of the fragile solar samples for analysis. Some of those samples are under investigation at Washington University.

Physicist Frank J. Stadermann at the university's Laboratory for Space Sciences will be one of the team members on hand for the Stardust opening in Houston today. Stadermann and his colleagues in St. Louis study interstellar dust particles collected from the upper atmosphere.

As much as 8 tons of space dust falls on Earth every day, Stadermann said. The dust is presumed to be mostly comet debris, but no one knows for sure because Stardust is the first mission to bring comet samples back to Earth.

Stadermann expects to find a honeycombed collection device about the size of a tennis racket studded with dust particles inside Stardust's canister.

The comet debris he expects to find embedded in the collector probably hit Stardust traveling at 150,000 miles per hour, Stadermann said. The dust would have burrowed about a half inch into a hard, clear collection material called "aerogel." The substance - about an inch thick, transparent and light as a feather - can withstand extreme heat but is also fragile, he said.

The dust from Wild 2 and other comets probably contains building blocks of the early solar system and may yield clues to how the solar system was formed, Stadermann said.

"Comets are basically like cosmic refrigerators that are preserving material

for a long time," he said.

The researchers will use a minivan-size machine, called NanoSIMS, to analyze some of the dust particles. The Washington University group is one of about 50 groups around the world that will perform preliminary analysis on Stardust's catch.

The scientists plan to publish results from their investigation in about six months, Stadermann said.

The \$212 million Stardust mission is managed by NASA's Jet Propulsion Laboratory in Pasadena, Calif.

The Associated Press contributed to this report.

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