

# Mercury's Messenger Survives Solar Radiation Thanks to NASA Glenn Engineers

August 1 2004

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Engineers at NASA's Glenn Research Center, Cleveland, are excited about the role they played in preparing MESSENGER for its mission to Mercury, the planet closest to the Sun. Members of the Thermal Energy Conversion Branch supported 19 tests for [MESSENGER](#) (short for MErcury, Surface, Space ENvironment, GEochemistry, and Ranging) in Glenn's **unique solar simulation vacuum facility**.

Glenn's support of the project began in 1999, before MESSENGER was selected as a flight mission, when testing was conducted for the Johns Hopkins University Applied Physics Laboratory (APL), Laurel, Md., to verify that solar arrays and thermal shields could survive the intense solar radiation at Mercury.

APL was selected to manage MESSENGER for NASA's Office of Space Science and entered into a Space Act Agreement with Glenn in 2001 to provide additional solar simulation testing in Glenn's Solar Thermal Vacuum Facility.

"During MESSENGER's journey, the spacecraft is expected to experience solar radiation intensities 11 times higher than that at Earth," said Wayne Wong, Glenn project engineer. "Our unique Thermal Vacuum Facility allows us to simulate these harsh conditions in order to verify that materials and components will survive in that extreme environment. Testing at Glenn has provided critical data to the spacecraft designers and engineers."

Glenn conducted a variety of tests to evaluate prototype solar array modules, thermal shielding materials, communication devices, and a variety of other sensors and components. Testing to support APL in the Vacuum Facility included thermal cycling of candidate photovoltaic arrays between the extreme cold and hot temperatures that will be experienced by the spacecraft as well as a 100 hour thermal shade life test.

In February 2003, Glenn engineers successfully completed a Flight Antenna Qualification Test, their 19th and final solar thermal vacuum test for MESSENGER. The primary test component was the flight assembly of the phased array and fan beam antennas. In addition to the antennas, a variety of other components were also tested in parallel including components that underwent redesign as a result of previous testing.

The MESSENGER project is the seventh in NASA's Discovery Program of lower-cost, scientifically focused missions. It is scheduled for launch at 2:16 a.m. EDT on Aug. 2, the first day of a 13-day launch period. Messenger will enter Mercury orbit in March 2011 and carry out comprehensive measurements for one Earth year.

For additional information about MESSENGER on the Internet, visit: [www.nasa.gov/messenger](http://www.nasa.gov/messenger) or [messenger.jhuapl.edu](http://messenger.jhuapl.edu)

Source: [NASA](http://NASA)

Citation: Mercury's Messenger Survives Solar Radiation Thanks to NASA Glenn Engineers (2004, August 1) retrieved 25 April 2024 from <https://phys.org/news/2004-08-mercury-messenger-survives-solar-nasa.html>

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