

# Particles and fields package integrated on upcoming Mars-bound spacecraft

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NASA's MAVEN spacecraft undergoes acoustics testing on Feb. 13, 2013 at Lockheed Martin Space Systems' Reverberant Acoustic Laboratory. The environmental test simulates the maximum sound and vibration levels the spacecraft will experience during launch. MAVEN is the next mission to Mars and will be the first mission devoted to understanding the Martian upper atmosphere. Credit: Lockheed Martin

The six science instruments that comprise the Particles and Fields Package that will characterize the solar wind and ionosphere of Mars have been integrated aboard NASA's Mars Atmosphere and Volatile Evolution (MAVEN) spacecraft. The spacecraft is on track for launch later this year.

The Solar Wind Electron Analyzer (SWEA) was the last of the six instruments to be delivered, and was integrated late last week at Lockheed Martin in Littleton, Colo. SWEA measures the properties of electrons at Mars, one electron at a time, and can process up to one million events per second.

The other instruments in the package had been delivered earlier. In addition to the SWEA instrument, the package includes the Solar Wind Ion Analyzer (SWIA), Suprathermal and Thermal [Ion Composition](#) (STATIC), Solar Energetic Particle (SEP), Langmuir Probe and Waves (LPW), Magnetometer (MAG), and a data-processing unit.

"The Particles and Fields Package is designed to study the solar wind interaction with Mars and the structure and dynamics of Mars' ionosphere, including the influence of Mars' strongly magnetized crust," said David L. Mitchell, SWEA instrument lead and coordinator for the full package, from the University of California, Berkeley/Space Sciences Laboratory (SSL). "The package measures solar ultraviolet flux, [solar wind](#) properties, and [energetic particles](#) produced in [solar storms](#) to help us understand how the Sun influences the upper atmosphere and drives atmospheric escape."

The package was built by the University of California, Berkeley/Space Sciences Laboratory (SSL) with support from the University of Colorado Boulder/Laboratory for Atmospheric and Space Physics (CU/LASP) and NASA's Goddard Space Flight Center.

"The final components of the science payload are coming together, so we're getting closer to being ready for launch," said Bruce Jakosky, MAVEN principal investigator from CU/LASP. "I look forward to the exciting and diverse science results that the Particles and Fields Package instruments will provide."

The MAVEN spacecraft will carry two other instrument suites. The Remote Sensing Package, built by CU/LASP, will determine global characteristics of the upper atmosphere and ionosphere. The Neutral Gas and Ion Mass Spectrometer, provided by NASA Goddard, will measure the composition and isotopes of neutral ions.

"We're in the home stretch now of completing the assembly and test of the spacecraft. With the full complement of Particles and Fields Package instruments now onboard the spacecraft, we are in a very good position for delivering the spacecraft to the launch site on schedule in August", said David F. Mitchell, MAVEN project manager from NASA's Goddard Space Flight Center in Greenbelt, Md.

MAVEN is scheduled for launch in November, 2013. It is the first spacecraft devoted to exploring and better understanding the Martian upper atmosphere. MAVEN will investigate the role that loss of Mars' atmosphere to space played in determining the history of water on the surface.

MAVEN's principal investigator is based at the University of Colorado at Boulder's Laboratory for Atmospheric and Space Physics. The university provides science instruments and leads science operations, and Education and Public Outreach. NASA's Goddard Space Flight Center manages the project and provides two of the science instruments for the mission. [Lockheed Martin](#) of Littleton, Colo., built the [spacecraft](#) and is responsible for mission operations. The University of California at Berkeley Space Sciences Laboratory provides [science instruments](#) for

the mission. NASA's Jet Propulsion Laboratory, Pasadena, Calif., provides navigation support, the Deep Space Network, and the Electra telecommunications relay hardware and operations.

Provided by NASA's Goddard Space Flight Center

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