

# Mars atmosphere and volatile evolution mission (maven)

[Science](#), [Astronomy](#)



Mars Atmosphere and Volatile Evolution Mission (MAVEN) The red planet Mars has long been a cultural and scientific fascination. People have pondered for decades over the biological potential of the planet and its past. Geological features on Mars resembling dry riverbeds, and the discovery of minerals that form in the presence of water, suggest that Mars once had a thicker atmosphere and was warm enough to allow liquid water to flow on the surface.

But phenomenally, the Mars that is seen today is radically different --- barren, lifeless, and dry. Why? In hopes of uncovering the answers to these mysteries, the National Aeronautics and Space Administration (NASA) will launch its newest mission to Mars, the Mars Atmosphere and Volatile Evolution Mission (MAVEN). Set to launch in November 18, 2013, MAVEN has been given the task of exploring the Martian upper atmosphere, the planet's ionosphere and its interactions with the sun and solar wind. NASA) It will be the first mission devoted to this understanding. According to NASA, MAVEN data will be used to determine how the loss of volatile compounds (such as carbon dioxide, nitrogen dioxide, and water) from Mars's atmosphere to space has influenced the evolution of the planet's atmosphere and climate. Clearly, the mission is expected to provide insights into liquid water and habitability on the red planet. The means by which the data harvested by MAVEN will achieve its primary scientific objectives have been determined.

Scientists plan to infer how the Martian atmosphere changed over the course of time by measuring the current rate of escape to space of atmospheric gases and understanding the ways by which they do. (Wikipedia) To extract

information on Mars, the four hundred eighty-five million dollar MAVEN space probe has been equipped with the latest scientific instruments, processed into three different instrumental suite packages. (NASAScience) One of which includes the Particles and Field Package.

This specific package will be largely responsible for measuring solar wind, ionospheric electrons and magnetic fields, and magnetosheath ion density and velocity. Another package included is the Remote Sensing Package, which contains an ultraviolet spectrometer that will be used to measure the global characteristics of Mars's upper atmosphere and ionosphere. The final package, the Neutral Gas and Ion Mass Spectrometer Package, will have the work of assigning measurements to the composition and isotopes of neutral gases and ions found in the planet's atmosphere.

With these instruments, MAVEN will gather substantial atmospheric information from its orbit 3, 870 miles above the planet's surface. (Wikipedia) Currently, scientists believe that Mars may have lost most of its atmosphere due to a process known as "sputtering," by which high-energy photons from the sun transform molecules into ions that are eventually carried out of the atmosphere and away from the planet by the magnetic fields generated by solar winds. NASA) The objective of the Mars Atmosphere and Volatile Evolution Mission (MAVEN) is expected to provide evidence for the mentioned theory. While that may only be an expectation, one thing is for sure, in discovering the answers to the mysteries of Mars, we as humans will too certainly extend our senses as a whole in our quest to understand the secrets of our origins, and the destiny that lies ahead.