The Mars Atmosphere and Volatile Evolution (*MAVEN*) Mars Scout Mission. Bruce M. Jakosky (Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder, CO 80309-0392; jakosky@lasp.colorado.edu) and the MAVEN science team.

The MAVEN mission was selected in September 2008 to proceed forward as the next Mars Scout mission. Details of the mission will be presented, and additional information can be found at our interim project web site, at http://lasp.colorado.edu/maven.

Science objectives. The MAVEN science goals are aimed at determining the role that loss of volatiles from the Mars atmosphere to space has played through time, allowing us to understand the histories of Mars' atmosphere and climate, liquid water, and planetary habitability. MAVEN will determine the current state of the upper atmosphere, ionosphere, and interactions with the solar wind; determine the current rates of escape of neutrals and ions to space and the processes controlling them; and determine the ratios of stable isotopes that will tell us the history of loss through time.

Institutional partners. MAVEN represents a collaboration between multiple institutions that have a long history of spacecraft investigation in the solar system. NASA/GSFC will provide project management and technical oversight. Lockheed Martin (Denver) will provide the spacecraft and will carry out mission operations. Science instruments will be provided by the University of Colorado Laboratory for Atmospheric and Space Physics, the University of California at Berkeley Space Sciences Laboratory, and GSFC. NASA/JPL will provide spacecraft navigation. CU/LASP will provide science operations and the science data center, and also will lead the education and public outreach activities for the mission.

Instruments. The science payload for MAVEN consists of eight science instruments, grouped for simplicity into three instrument packages. They are:

Particles and Fields package:

- Solar Wind Electron Analyzer (SWEA), measures solar wind and ionospheric electrons.
- Solar Wind Ion Analyzer (SWIA), measures solar wind and magnetosheath ion density and velocity.
- Suprathermal and Thermal Ion Composition (STATIC), measures thermal ions to moderate-energy escaping ions.
- Solar Energetic Particle (SEP), determines the impact of SEPs on the upper atmosphere.
- Langmuir Probe and Waves (LPW), determines ionospheric properties and wave heating of escaping ions, and solar EUV input to atmosphere.
- Magnetometer (MAG), measures interplanetary, solar wind, and ionospheric magnetic fields.

Remote Sensing package:

- Imaging Ultraviolet Spectrometer (IUVS), measures global characteristics of the upper atmosphere and ionosphere.

Mass Spectrometry package:

- Neutral Gas and Ion Mass Spectrometer (NGIMS), measures the composition and isotopes of thermal neutrals and ions.

Spacecraft. The spacecraft is a 3-axis-stabilized sun-pointing spacecraft. Instruments are either body-mounted on the spacecraft, mounted at the end of booms or the solar panels to get away from magnetic and charging effects, or mounted on an articulated payload platform that allows them to point in the ram or planet directions. The spacecraft is based on the *Mars Reconnaissance Orbiter* bus, and is compatible with either the Atlas V or the Delta IV EELV launch vehicle. The high-gain antenna is body mounted, and the spacecraft rotates to Earth for downlink twice per week.

Mission overview. The launch window opens on 18 November 2013, with arrival at Mars on 16 September 2014. The orbit is elliptical, high-inclination, and has a 4.5-hour period. Periapsis is nominally at 150km altitude, allowing measurements below the exobase on every orbit. Five "deep-dip" campaigns allow measurements near to the 120-km altitude of the homopause, providing complete coverage of the upper atmosphere and above. Precession of the orbit in both latitude and local solar time allows thorough coverage of both over the one-Earth-year primary mission. The primary mission occurs during the declining phase of the solar cycle, allowing measurements of the effects of EUV and solar-wind variability and of major SEP events.

Education and public outreach. EPO activities will include efforts aimed at middle schools, especially serving underrepresented groups, a science journalist workshop to reach out to the widest audience, and active utilization of social media (such as YouTube, Facebook, MySpace, etc.).