

# **The High Resolution Imaging Science Experiment (HiRISE) on Mars Reconnaissance Orbiter (MRO)**

A. McEwen (1)

(1) University of Arizona, USA

MRO launched in August 2005 and HiRISE acquired images of the Moon and stars on the way to Mars orbit insertion (10 March 2006), to be followed by 6 months of aerobraking and 2 months of transitional orbits and solar conjunction. The camera features a 0.5 m diameter primary mirror, 12 m effective focal length, and a focal plane system that can acquire images containing up to 28 Gb of data in as little as 6 seconds. HiRISE will provide detailed images (0.25 to 1.3 m/pixel) covering ~1% of the Martian surface during the 2-year Primary Science Phase beginning November 2006. The images may include color data (green, red, near-IR) over 20% of the field of view. A top priority is to acquire ~1000 stereo pairs and apply precision geometric corrections to enable topographic measurements to better than 25 cm vertical precision. We expect to return ~18 Tb of HiRISE data during the 2-year PSP, and use pixel binning, conversion from 14 to 8 bit values, and a lossless compression system to increase coverage of the surface. HiRISE images are acquired via 14 CCD detectors, each with 2 output channels, and with multiple choices for pixel binning (none, 2x2, 3x3, 4x4, 8x8, 16x16) and number of Time Delay Integration lines (8, 32, 64, or 128). We will calibrate, map-project, and mosaic the 28 channels into Reduced Data Records (RDRs) and also produce Digital Elevation Models and special products for release via the Planetary Data System (PDS). The HiRISE Operations Center at the University of Arizona is a PDS subnode, and we plan to release RDRs (along with the raw data) as soon as processing has been completed. HiRISE will support future Mars exploration by locating and characterizing past, present, and future landing sites, crash sites, and rover traverses. We will investigate cratering, volcanism, tectonism, hydrology, sedimentation, stratigraphy, aeolian processes, mass wasting, landscape evolution, seasonal processes, climate change, spectrophotometry, glacial/periglacial processes, polar geology, and other science themes. An Internet web site (HiWeb) will enable anyone in the world to suggest HiRISE targets on Mars and to easily locate, view, and download HiRISE data products. We expect to acquire nine images of Mars a few days after Mars orbit insertion, and will present some initial interpretations at the conference. For further information, see: <http://hirise.lpl.arizona.edu/>