LOOKING FORWARD TO CRISM. S. Murchie[1], R. Arvidson[2], P. Bedini[1], J.-P. Bibring[3], J. Bishop[4], P. Cavender[1], T. Choo[1], R.T. Clancy[5], D. Des Marais[4], R. Espiritu[6], R. Green[7], E. Guinness[2], J. Hayes[1], C. Hash[6], K. Heffernan[1], D. Humm[1], J. Hutcheson[1], N. Izenberg[1], E. Malaret[6], T. Martin[7], J.A. McGovern[1], P. McGuire[2], R. Morris[8], J. Mustard[9], S. Pelkey[9], M. Robinson[10], T. Roush[4], F. Seelos[1], S. Slavney[2], M. Smith[11], W.-J. Shyong[1], K. Strohbehn[1], H. Taylor[1], M. Wirzburger[1], and M. Wolff[5], [1]Applied Physics Laboratory, Laurel, MD, 20723, scot.murchie@jhuapl.edu; [2]Washington University, St. Louis, MO; [3]Institut d'Astrophysique Spatiale, Orsay, France; [4]NASA/ARC, Moffett Field, CA; [5]Space Science Institute, Boulder, CO; [6]Applied Coherent Technology, Herndon, VA; [8]NASA/JSC, Houston, TX; [9]Brown University, Providence, RI; [10]Northwestern University, Evanston, IL; [11]NASA/GSFC, Greenbelt, MD; [7]NASA/JPL, Pasadena, CA.

Instrument: The Compact Reconnaissance Imaging Spectrometer for Mars (CRISM) [1] is a hyperspectral imager on the MRO spacecraft. CRISM consists of three subassemblies, a gimbaled Optical Sensor Unit (OSU), a Data Processing Unit (DPU), and the Gimbal Motor Electronics (GME). Spectral coverage is 362-3920 nm with sampling at 6.55 nm/channel. Spatial sampling is 15-19 m/pixel .

Measurements: CRISM's objectives are (1) to map the entire surface using a subset of bands to characterize crustal mineralogy, (2) to map the mineralogy of key areas at high spectral and spatial resolution, and (3) to measure spatial and seasonal variations in the atmosphere. These objectives are addressed using three major types of observations. In multispectral survey mode, with the OSU pointed at planet nadir, data are collected at a subset of 73 channels covering key mineralogic absorptions, and binned to pixel footprints of 100 or 200 m/pixel. Nearly the entire planet can be mapped in this fashion. In targeted mode, the OSU is scanned to remove most along-track motion, and a region of interest is mapped at full spatial and spectral resolution (545 channels). Ten additional abbreviated, spatially-binned images are taken before and after the main image, providing an emission phase function (EPF) of the site for atmospheric study and correction of surface spectra for atmospheric effects (Figure 1). In atmospheric mode, only the EPF is acquired. Global grids of the resulting lower data volume observations are taken repeatedly throughout the Martian year to measure seasonal variations in atmospheric properties.

Hydrated Minerals: Detection of sulfates and phyllosilicates by OMEGA [2] drove both the selection of wavelengths in the multispectral survey and the selection of preliminary sites for targeted observations. Pelkey et al. [3] used OMEGA data to refine the initial selection of multispectral wavelengths to adequately sample these minerals' diagnostic absorptions (Figure 2), and formulated a set of standard parameters to represent occurrences of these minerals in map form. From those maps, thousands of targets have been identified for targeted observation at CRISM's full spatial resolution. In the 99% of the planet not targeted, occurrence of sulfates and phyllosilicates will be mapped at 2-20 times the resolution of OMEGA. These data will provide improved understanding of distributions and spatial relations of Martian aqueous minerals.

References: [1] Murchie S. et al. (2006) *JGR,* in press. [2] Bibring J.-P. et al. (2005) *Science*, *307*, 1576-1581. [3] Pelkey S. et al. (2006) *JGR,* in press.

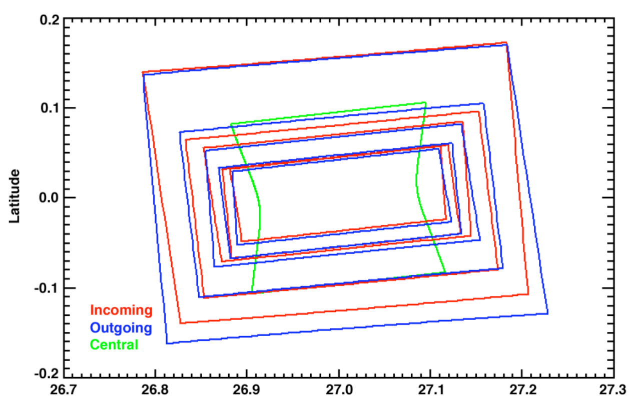

Figure 1. During overflight of a target, five short incoming (red) and outgoing (blue) scans across the target are performed during which data are taken spatially binned. At the time of target closest approach, a slow scan is performed at full spatial resolution (green).

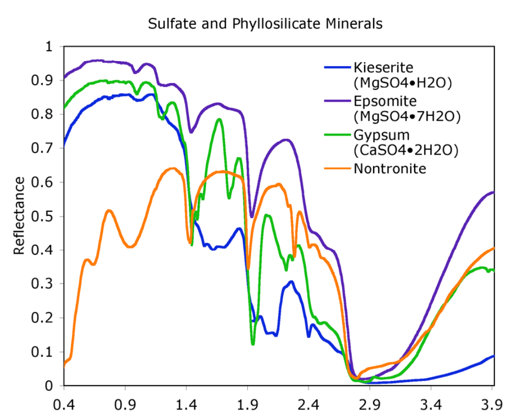

Figure 2. Reflectance spectra of sulfate and phyllosilicate minerals over CRISM's spectral range.