INITIAL OBSERVATIONS BY THE MRO MARS COLOR IMAGER AND CONTEXT CAMERA. M. C. Malin[1], J. F. Bell III[2], W. M. Calvin[3], B. A. Cantor[1], R. T. Clancy[4], K. S.Edgett[1], L. Edwards[5], R. M. Haberle[5], P. B. James[5],S. W. Lee[6], P. C. Thomas[2], M. J. Wolff[4], [1]Malin Space Science Systems, P. O. Box 91048, San Diego, CA 92191-0148, [2]Cornell University, Ithaca NY, [3]University of Nevada, Reno, NV, [4] Space Science Institute, Boulder, CO, [5] NASA Ames Research Center, Moffett Field, CA, [6] Denver Museum of Nature & Science, Denver, CO.

Introduction: The Mars Color Imager (MARCI) on MRO is a copy of the wide angle instrument flown on the unsuccessful Mars Climate Orbiter [1]. It consists of two optical systems (visible and ultraviolet) projecting images onto a single CCD detector. The camera operates in a "pushbroom" mode such that filters are adjacent to each other on the focal plane. The field of view of the optics is 180 degrees cross-track, sufficient to image limb-to-limb for global weather and atmospheric monitoring. MARCI has two ultraviolet and five visible channels (Table 1). The visible channels have a nadir scale of about 900 m and the UV channels are summed to 7-8 km nadir scale. A primary goal of the MARCI UV images is to map the global distribution of Mars ozone (O_3) as a function of Martian season (Ls).

The Context Camera (CTX) acquires 30 km wide, 6 m/pixel images, and is new camera derived from the MCO medium angle MARCI [1]. Its primary purpose is to provide spatial context for MRO instruments with more limited fields of view. The spatial resolution is nearly equivalent to the Mars Observer Camera (MOC) on board MGS allowing additional moderate resolution coverage of the planet.

MARCI and CTX scientific studies are broadly categorized under atmospheric processes, polar processes, surface-atmosphere interactions, and surface geology and mineralogy. Some examples of our initial observations are briefly summarized.

Atmospheric Science: Clancy et al. [2] presented initial maps of Martian UV albedo and ozone concentration, noting enhanced ozone in the southern winter hemisphere and over Hellas. Dark regions in the north polar erg undergo contrast reversal in the UV, being bright in UV channels and dark in MARCI blue and red bands. Cyclonic storm patterns have been observed in the north, near the edge of the perennial cap. These storms are consistent with those observed at similar seasons by Cantor et al. [3]. Regional dust storms arising out of Ausonia have been observed tracking east and correlate with increased opacities at the Mars Exploration Rover Gusev landing site.

Polar Processes: The beginning of MRO mapping orbit corresponded to Ls ~125, allowing detailed observations of the north residual cap with CTX and monitoring of seasonal changes through the summer with MARCI (Figure 1). The coverage and resolution of CTX allow mapping of attributes of the Polar Layered Deposits such as kinds and distribution of layering, unconformities, and residual cap morphology- Phase angle studies are planned of regions that show anomalously bright albedos sustained throughout the summer [4].

VIS Bands					
Band:	1	2	3	4	5
Filter Name:	420 nm	550 nm	600 nm	650 nm	720 nm
λ_{eff}(nm):	437.2	546.3	604.2	653.1	717.7
FWHM (nm):	32.2	39.5	30.7	41.6	50.0
UV Bands					
Band	1	2			
Filter Name:	260 nm	320 nm			
λ_{eff}(nm):	258.1	319.9			
FWHM (nm):	29.7	24.4			
CTX					
λ_{eff}(nm):	611.1				
FWHM (nm):	189				

Table 1: MARCI/CTX Band passes.

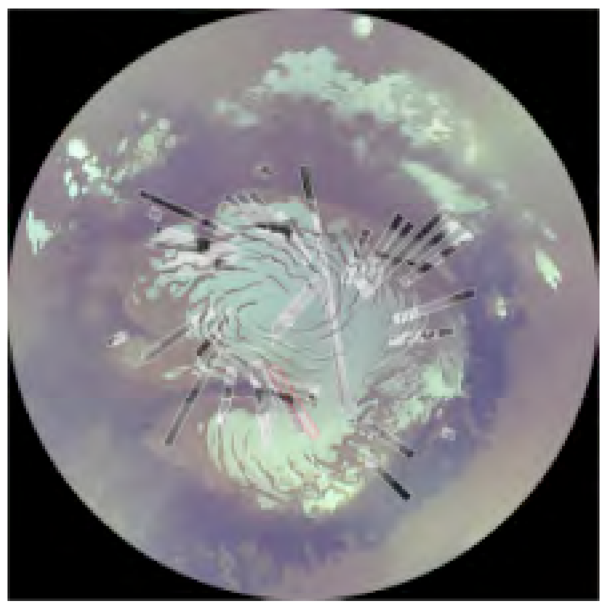

Figure 1: Example of CTX coverage of the north polar region during transition orbits.

Surface geology and mineralogy: We are still validating pipeline processing for MARCI visible spectral data, but results are consistent with previous telescopic and orbital data sets showing a strong red slope and ferric absorptions [e.g. 5].

References: [1] Malin, M.C. et al. (2001) *JGR*, *106*, p. 17651. [2] Clancy, R.T. et al. (2006) AGU Fall Meeting. [3] Cantor, B. (2002) *JGR*, *107*, doi:10.1029/2001JE001588. [4] Calvin, W.M. and T. N. Titus, (2006) *PSS*, in press. [5] Bell, III, J.F. et al. (1997) *JGR*, *102*, p. 9109.