

Figure 2. Footprint plot of MGS/MOC and THEMIS/VIS images of the Spirit rover landing site. Image identification was constrained to incidence angles between 60 and 70 degrees. THEMIS/VIS images are the larger, lighter colored footprints.

Many additional common geometric parameters can be included to further constrain the data selection. These common parameters are consistent across all imaged planets and bodies within the UPC, and can be readily retrieved from PDS image labels.

Processing Data with ISIS: ISIS 3 and older software versions are public domain ‘freeware’ developed at USGS via NASA funding for cartographic and scientific data processing and analysis of planetary data (see <http://isis.astrogeology.usgs.gov>). A UPC query can be used to identify and download images with geometric data from the PDS archives and processed in ISIS. For example, Figure 3 shows an ISIS image mosaic in Mercator projection of MGS/MOC and THEMIS/VIS data for the area shown in Figure 2.

Database Maintenance: The UPC is designed to allow for continual updating as new SPICE ephemeris data become available. Several events (collectively called ‘triggers’) will cause the UPC parameters to be recomputed. Sample triggers are the availability of new SPICE data either from NAIF or resulting from cartographic processing (such as development of a refined USGS control network), a re-release of PDS products, changes to the ISIS system (such as a bug fix or other in geometric computations and/or addition of new functionality to the UPC). Updating of the UPC is handled through a series of automated maintenance procedures in ISIS 3.

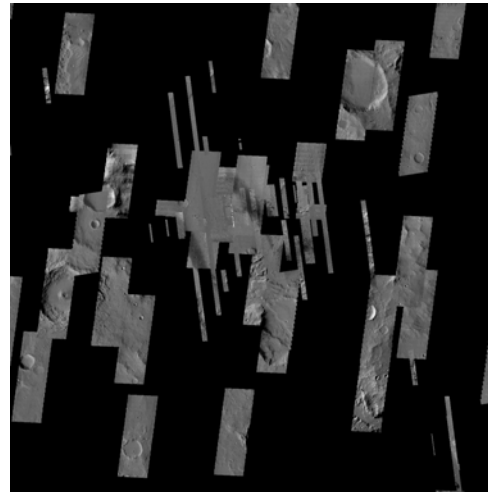


Figure 3. Merged Mercator projected mosaic processed by ISIS of the MGS/MOC and THEMIS/VIS images from the UPC query for the region of the Spirit Rover landing site.

Conclusion: The UPC will be a very powerful tool for the scientific and engineering community to access and work with planetary data archived by the PDS. All image coordinates will be consistent for all mission data and each planet/body stored, and data identification and retrieval will be simple and straightforward. Dynamic aspects of the UPC will allow for continual improvements in both SPICE ephemeris and in ISIS tools for populating the geometric and instrument specific parameters. The inclusion of GIS and web technologies in the UPC make identification, integration and use of planetary data simple and easy. The UPC will be continually expanded to add images as they are released through the PDS and to support new missions and planets/bodies as needed. The UPC is expected to become the backbone of planetary image processing into the future.

References: [1] Becker, K. et al, Unified Planetary Coordinates System: A Searchable Database of Geodetic Information (2005), *LPSC XXXVI*, Abstract #1369. [2] Anderson, J.A. et al., Modernization of the Integrated Software for Imagers and Spectrometers (2004), *LPSC XXXV*, Abstract #2039. [3] Acton C.H., (1999) SPICE Products Available to the Planetary Science Community, *LPSC XXX*, Abstract #1233. [4] Archinal, B.A. et al, (2002) A MOLA-controlled RAND-USGS Control Network for Mars, *LPSC XXXIII*, Abstract #1632. [5] Hughes, J.S., Lavoie, S., Wilf, J., Joyner, R., Crichton, D., 2003, PDS-D—The planetary data system distribution system, *LPSC XXXIV*, 1496.