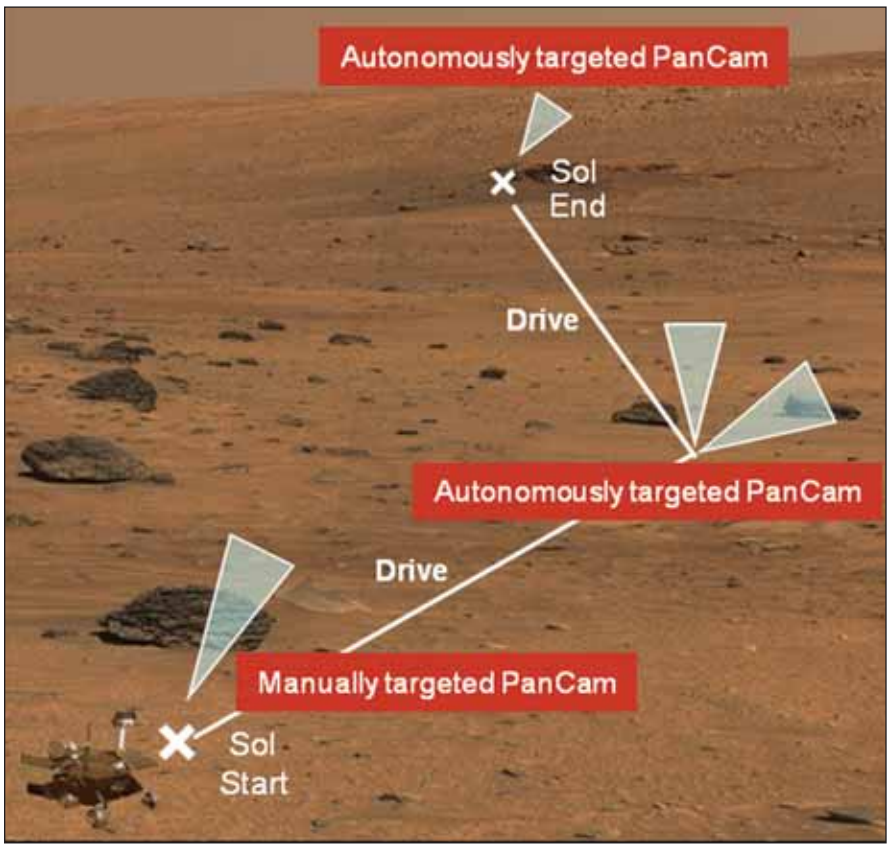
# Autonomous Exploration for Gathering Increased Science

*NASA's Jet Propulsion Laboratory, Pasadena, California*

The Autonomous Exploration for Gathering Increased Science System (AEGIS) provides automated targeting for remote sensing instruments on the Mars Exploration Rover (MER) mission, which at the time of this reporting has had two rovers exploring the surface of Mars (see figure). Currently, targets for rover remote-sensing instruments must be selected manually based on imagery already on the ground with the operations team. AEGIS enables the rover flight software to analyze imagery onboard in order to autonomously select and sequence targeted remote-sensing observations in an opportunistic fashion. In particular, this technology will be used to automatically acquire sub-framed, high-resolution, targeted images taken with the MER panoramic cameras.

This software provides:

- Automatic detection of terrain features in rover camera images,
- Feature extraction for detected terrain targets,
- Prioritization of terrain targets based on a scientist target feature set, and
- Automated re-targeting of rover remote-sensing instruments at the highest priority target.




**New MER Capability** is shown for automated targeting.

*This work was done by Benjamin J. Bornstein, Rebecca Castano, Tara A. Estlin, Daniel M. Gaines, Robert C. Anderson, David R. Thompson, Charles K. De Granville, Steve A. Chien, Benyang Tang, Michael C. Burl, and Michele A. Judd of Caltech for NASA's Jet Propulsion Laboratory. For more information, contact iaoffice@jpl.nasa.gov.*

*This software is available for commercial licensing. Please contact Daniel Broderick of the California Institute of Technology at danielb@caltech.edu. Refer to NPO-46876.*

# World Wide Web Metaphors for Search Mission Data

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A software program that searches and browses mission data emulates a Web browser, containing standard metaphors for Web browsing. By taking advantage of back-end URLs, users may save and share search states. Also, since a Web interface is familiar to users, training time is reduced. Familiar back and forward buttons move through a local search history. A refresh/reload button regenerates a query, and loads in any new data. URLs can be constructed to save search results.

Adding context to the current search is also handled through a familiar Web metaphor. The query is constructed by clicking on hyperlinks that represent new components to the search query. The selection of a link appears to the user as a page change; the choice of links changes to represent the updated search and the results are filtered by the new criteria. Selecting a navigation link changes the current query and also the URL that is associated with it. The back button can be used to return to the previous search state. This software is part of the MSLICE release, which was written in Java. It will run on any current Windows, Macintosh, or Linux system.

*This work was done by Jeffrey S. Norris, Michael N. Wallick, Joseph C. Joswig, Mark W. Powell, Recaredo J. Torres, David S. Mittman, Lucy Abramyan, Thomas M. Crockett, Khawaja S. Shams, and Jason M. Fox of Caltech and Melissa Ludowise of Ames Research Center for NASA's Jet Propulsion Laboratory. For more information, contact iaoffice@jpl.nasa.gov.*

*This software is available for commercial licensing. Please contact Daniel Broderick of the California Institute of Technology at danielb@caltech.edu. Refer to NPO-46832.*