

## Science-Project Interaction in the Low-Cost Mission

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### Abstract

Large, complex, and highly optimized missions have performed most of the preliminary reconnaissance of the solar system. As a result we have now mapped significant fractions of its total surface (or surface-equivalent) area. Now, however, scientific exploration of the solar system is undergoing a major change in scale, and existing missions find it necessary to limit costs while fulfilling existing goals. In the future, NASA's Discovery program will continue the reconnaissance, exploration and diagnostic phases of planetary research using lower cost missions, which must include lower **cost mission operations systems (MOS)** .

Historically, one of the more expensive functions of MOS has been its interaction with the science community. Traditional MOS elements that this interaction have embraced include mission planning, science (and engineering) event conflict resolution, sequence optimization and integration, data production (e. g., assembly, enhancement, quality assurance, documentation, archive), and other science support services. In the past, the payoff from these efforts has been that use of mission resources has been highly optimized, constraining resources have generally been completely consumed, and data products have been accurate and well documented. But because these functions are expensive we are now challenged to reduce their cost while preserving the benefits.

In this paper we will consider ways of revising the traditional MOS approach that might save project resources while retaining a high degree of service to the Projects' customers. **Pre-launch**, science interaction can be made simpler by limiting numbers of instruments and by providing greater redundancy in mission plans. Post launch, possibilities include prioritizing data collection into a few categories, easing requirements on real-time or quick-look data delivery, and closer integration of scientists into the mission operation.

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