Science Steering Group reports

At the meeting on June 30-July 2, 2004, MEPAG heard reports on three SSGs, two of which have completed and submitted their reports and one of which is in process. MEPAG was singularly impressed with the quality and depth of the analysis carried out by each of the SSGs, the more so in that many of the questions addressed by them were originally ill-posed or ill-defined. One important conclusion that we would like to highlight is that these SSGs are an outstanding way to involve the science community in providing scientific input that feeds into the programmatic decisions that are to be made; there is no effective substitute or alternative.

- Organic Contaminants SSG. This is an important report, because it represents some first steps by MEPAG to specify how the science community would like to see contamination requirements framed, as well as initial findings regarding quantitative limits on different classes of contaminants. In addition, this report contains an important discussion of the protocols necessary to distinguish contaminants from natural signal in life-related experiments—having effective strategies in this area will be important in designing both in situ and sample return missions in the future.
- Astrobiological Field Laboratory SSG. MEPAG's 2002 Pathways SSG recommended that a major in-situ astrobiology mission, which was given the tentative name AFL, be considered for the next decade. The AFL SSG was asked to follow this up by analyzing what AFL could be. The study began with a valuable program-level analysis of the strategic planning issues associated with achieving MEPAG Goal I (life detection), and with an analysis of the projected state of the astrobiological exploration of Mars 10 years from now. This analysis will set the context for all Mars missions of the next 10-20 years. From there, the AFL SSG presented an analysis of some possible in situ missions that could make a meaningful contribution to this overall exploration theme. Those descriptions elicited substantial discussion by the MEPAG audience, and further discussion in the future is anticipated. Finally, because there has been much recent confusion over terminology, the Mars Program has requested that the AFL SSG recommend to MEPAG a set of definitions related to Goal I. Definitions of "habitability", "habitat", "biosignature", and "life detection" were prepared, and have been accepted by MEPAG.
- Moon-Mars SSG. The objective of this SSG was to define the scientific linkages between the Moon and Mars, and in particular, the activities that could be carried out at the Moon that would be of benefit to MEPAG's martian scientific objectives. The SSG has defined 20 primary linkages, which are organized into three categories: Scientific investigations, Resource-related issues, and Capability demonstrations. These linkages have been prioritized in a relative sense, and those priorities stirred up considerable discussion by the MEPAG audience. The SSG plans to take the feedback from those discussions, and to incorporate in a revised report.