

## **Mars Sample Return: Protecting the Planets, Safeguarding the Science, And Preparing For Public Scrutiny**

**Margaret S. Race**; SETI Institute, Mountain View, CA

Planning for extraterrestrial sample return missions – whether from Mars or other solar system bodies with the potential for harboring living entities– must be done in a way that integrates planetary protection concerns with technical and scientific considerations. On both the outbound and return mission, strict cleaning and handling measures will be required to avoid harmful cross contamination of the planets and to ensure the integrity of scientific experiments. Upon return to Earth, strict biocontainment and quarantine will be required until a comprehensive battery of tests can determine if any living, replicating entities are included in the samples and whether the returned materials are harmful in any way to Earth's biota or ecosystems. However, because scientific uncertainty about extraterrestrial life is likely to persist throughout mission planning, it is anticipated that intense public scrutiny and even opposition to sample return may arise. Understanding and addressing legitimate societal concerns about possible environmental, health and safety risks will be a critical part of the public decision making process for sample return missions. Information from scientific, technological, and social areas will be used in preparing the environmental impact statement for public review and in fulfilling a variety of legal and procedural requirements. Returning extraterrestrial samples to Earth will be a momentous scientific and technological advance that must be accomplished carefully, responsibly and ethically. It is fitting that the public be fully informed and educated about the broad implications of these exciting endeavors.