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BRIDGING THE EARTH SCIENCE AND SPACE EXPLORATION COMMUNITIES

Abstract

Synergies between space exploration and Earth science do exist that have not been fully recognized and exploited, to date. Protection and understanding of life on Earth, search for extraterrestrial life, and expansion of human presence in outer space all require applications of fundamental knowledge and information about life science. Instrumentation and data systems of Earth observing satellites are based on similar technologies that are used for planetary missions. While planetary surface operations are conducted under different conditions, the investigation of surface and subsurface of all planetary objects, including Earth, uses similar tools, such as radar, seismometers, and drilling devices etc. An interdisciplinary approach is also needed in both fields of Earth science and space exploration to exploit data on Earth observations, space weather and biodiversity. The Earth observation community has developed some exemplary tools and has featured a successful international cooperation in handling and sharing of data that could equally be applied to robotic space exploration. Both communities suffer from the lack of long-term strategy, adequate funding, and public awareness and support, in addition to being faced with similar challenges in private sector participation, international cooperation, and other policy issues. Sharing of information, knowledge, and experience as well as coordination and collaboration among different communities can help provide answers to some of the challenging questions. To maximize potential synergies different groups and communities (e.g. national/international, private/public, provider/user, space/non-space, data/service provider) should be brought together to address the common issues faced by space exploration and Earth science. The establishment of a network among Earth- and space-centric communities is thus proposed, which would enable an exchange of scientific insights and the development of new policies and management strategies. Such a network could provide a vital forum that assists the management of our planet and builds a bridge between the Earth science and space exploration communities.