

SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)  
New Worlds - Innovative Space Education and Outreach (7)

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IMPORTANCE OF COLLABORATIVE EFFORTS FOR A BALANCED DESIGN AND LEARNING  
PROCESS**Abstract**

This paper will discuss importance of a strategic planning and design process when developing long-term space exploration missions both robotic and manned. The discussion begins with reviewing current and/or traditional international perspectives on space development at the American, Russian and European space agencies. Some analogies and comparisons will be drawn upon analysis of several international student collaborative programs: Summer International workshops at the Bauman Moscow State Technical University, Lund University's STAR program at NASA's Johnson Space Center, and a new initiative between Chalmers University of Technology, Rice University and the University of Houston. The paper will focus on discussion about optimization of design and planning processes for successful space exploration missions and will highlight importance of the following:

- understanding connectivity between different levels of human being and machinery;
- simultaneous mission planning approach;
- reflections and correlations between disciplines involved in planning and executing space exploration missions;
- knowledge gained from different disciplines and through cross-applying and re-applying design approaches between variable space related fields of study and research.

The conclusions will summarize benefits and complications of applying balanced design approach at all levels of the design process. Analysis of successes and failures of organizational efforts in space endeavors is used as a methodological approach to identify key questions to be researched as they often cause many planning and design processing problems.