

IAA Study Group Status Report

Responsible Commission: 6.16 - Multi-Commissions

Study Number and Title: 6.16 - "STEM/STEAM for Space. Grand Challenges."

Short Study Description (repeat from Study Group Proposal):

The launch of Sputnik in 1957 marks the beginning of a global surge in interest in science, technology, engineering and mathematics (STEM) education. The world was excited by each development in space exploration. Not only were there vast improvements in STEM education, but also an increase in participation in these disciplines by our youth. Many of them eventually joined this exciting endeavor, while others utilized their education to benefit mankind in a myriad of other ways. In the 50+ years of the space age, developments have continued apace in the physical sciences. Recent years have also seen impressive advances in the life sciences stemming from space research. These advances are steadily moving toward the enablement of humanity to go beyond near-earth orbit on into the cosmos.

As space research has stimulated STEM education, improvements in technical education have benefitted space research and, indeed, all aspects of society. Less recognized is the interaction between the creative arts, space research and STEM education. Space research has stimulated the imagination of the art community in music, architecture, literature, and the graphic arts. Technical developments have made possible new methods of creating works of art. And conversely, the arts have stimulated creativity in science, technology, engineering, mathematics – and space research. It is this complex interaction we have dubbed STEAM. We propose to study this interaction with the objective of increasing the benefits to all.

The first step will be to gain a clearer picture of where we are today on the interaction between STEAM education and space research. Then we will address questions such as the following. How can we improve STEAM education for the benefit of space research and *vice versa*? How can we develop a coordinated initiative to support development of high quality STEAM education? Should we encourage the sort of competitions that have proved so successful in other fields, such as robotics, in our universities, high schools and, yes, even with younger students? If so, how can we persuade governmental space agencies, foundations and private industry to help?

While learning from the past, we need to look to the future to fully benefit from the complex interaction between space research and education in science, technology, engineering, art, and mathematics. We need a bright, enthusiastic generation for future space activities and they need us now.

Progress in past six months:

The Multi-Commission Study group was officially formed at the June.

Participants were recruited from different IAA Commissions, national academies and space agencies. Everyone is eager to contribute to this vital effort. Thus far, communications have been via the internet.

We are organizing our first workshop on STEM/STEAM in Space.

Topics for discussion have been selected, and recommended presenters will be invited by the IAA office and by the Chairs of the Study Group.

Several possible venues are under consideration for working meetings:

1. Canada (Château Vaudreuil, near Montreal with assistance of Clarkson University students, faculty, administration volunteered).
2. USA (Cambridge, near Boston, with the assistance of MIT students, faculty and administration volunteered).
3. France (Paris during the IAA Spring meeting), and more possible venues for the next two years.

Suggestions have been made and more details will be provided before December 1, 2014 to the IAA office, all of members SG.

Website Study Information up to date? (Study Group Membership, Study Plan and Schedule):
Details are not yet ready for web disclosure

Issues requiring resolution? (recommend approach): none

Product Deliveries on Schedule? (If modified explain rationale): none

Study Team Member Changes? (List any Study Team Members that you wish to discontinue, and provide names plus contact coordinates of any Members you wish to add on the second page of this Study Update form.) Note: Complete contact information including email, tel. and fax must be provided for all additions. Only Members with complete contact information will be listed and receive formal appointment letters from the IAA Secretariat.) None

Name of person providing Study Group Status (Study Group Chair or Co-Chair):
Prof. Dr. Liya Regel, Chair

Status Report Date: September 8, 2014

Study Team Membership Changes - no changes