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IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Lift Off - Secondary Space Education (2)

Author: Mr. Alexander Bowen-Rotsaert
Space Design Competitions Australian Inc. (SDCA), Australia,
alexander.bowenrotsaert@uqconnect.edu.au

Ms. Bronte Ford
Space Design Competitions Australian Inc. (SDCA), Australia, bronte@ausspacedesign.org.au
Dr. Chuong Nyugen
Space Design Competitions Australian Inc. (SDCA), Australia, chuong@ausspacedesign.org.au
Mr. Adrian O'Keeffe
Space Design Competitions Australian Inc. (SDCA), Australia, adrian@ausspacedesign.org.au

AUSTRALIAN SPACE DESIGN COMPETITION: DESIGNING A HABITAT TO COLLECT AND PROCESS SPACE DEBRIS

Abstract

The Australian Space Design Competition (ASDC), hosted by Space Design Competitions Australia Inc. (SDCA), is an industry simulation experience set in the future and targeted at teams of up to twelve high school students. The ASDC emulates, as closely as possible, the experience of working as a member of an aerospace industry proposal team. The first Space Settlement Design Competition was held in the United States in 1984, and now has a network of competitions around the world. The first Australian team competed at the International Space Settlement Design Competition in 2003, and plans for the first non-US-based competition hatched led to the first ASDC in 2006. Participants are formed into five companies, each consisting of three to four teams, and must work together with a common goal to produce a technical proposal in response to a Request For Tender (RFT). The RFT scenarios change every year, but have included designing habitats within lunar lava tubes, transportation settlements between Earth and Mars, and settlements under the frozen surface of Europa. They must design an overall structure, define sources of construction materials, specify vehicles used for transportation, and determine sources of electrical power and water, design computer and robotics systems, specify allocation of interior space, and show examples of pleasant community design. Importantly they must also provide estimated costs and schedules for completion of the project. The experience of participating at ASDC teaches young people optimism for the future, technical competence, management skills, knowledge of space environments and resources, appreciation for relationships between technical products and human use, teamwork, and techniques for preparing effective documentation. Students are supported by industry advisors who help them work in the teams of 30+ people. Technical training is also provided for the different departments so students understand the basic constructs of the teams they are working in, as well as some of the technologies that are available to them. As the students only have 24 hours to work on the proposal, the presentation is limited to 20 minutes with 5 minutes of questions from a judging panel. Each year the ASDC is refined through changes and improvements to help create the most engaging experience possible. This paper will provide an overview of the specific scenario and evaluate education aspects of the RFT. To conclude, evaluations from participants and volunteers will be summarised, as well as the lessons learnt and potential improvements for future competitions.