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IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Enabling the Future - Developing the Space Workforce (5)

Author: Ms. Carol Galica
NASA Headquarters, United States

Mr. John Guidi
NASA, United States
Mr. Patrick Troutman
National Aeronautics and Space Administration (NASA)/Langley Research Center, United States
Ms. Shelley Spears
National Institute of Aerospace (NIA), United States
Ms. Stacy Dees
National Institute of Aerospace (NIA), United States

REVOLUTIONARY AEROSPACE SYSTEMS CONCEPTS ACADEMIC LINKAGE (RASC-AL) CHALLENGE

Abstract

Future exploration missions in the space between the Earth and the moon or beyond will require complex operational activities to ensure that crew, cargo, and exploration systems safely and successfully reach their destination. Through the Revolutionary Aerospace Systems Concepts - Academic Linkage (RASC-AL) competition, NASA partners with the National Institute of Aerospace to bring together university teams to design human scale deep space architecture concepts. Engaging academia allows NASA to obtain innovative approaches and harnesses the ingenuity of university students to bring forth revolutionary new ideas that have influenced current and future human space exploration planning.

RASC-AL is an annual university-level (undergraduate and graduate) student design competition that seeks innovative approaches to NASA's future engineering and technology advancement needs related to extending humanity's reach beyond low Earth orbit. Over the course of an academic year, university teams design human scale architecture concepts that have supporting engineering analysis and realistic assessment of costs for technology maturation, system development and operations. Through a rigorous 2 gate down-select process, twelve to 16 teams are chosen to advance to present their concepts to a panel of NASA and industry judges at the annual RASC-AL Forum in Cocoa Beach, Florida. The forum provides students a once-in-a-lifetime opportunity to engage in conversations with NASA and industry experts, and many students have received job/internship offers based on their participation. The RASC-AL themes encourage students to develop concepts for space pioneering and prospecting toward Earth independence, which are critical to achieve NASA's goal of extending humanity's reach into space.

Since 2009, NASA has received 290 RASC-AL student concepts from 132 universities that address topics such as orbital debris mitigation approaches, tele-operated robotics, artificial gravity deep space transports, reusable hybrid propulsion, and in-situ drilling operations. These concepts provide NASA with novel and robust applications to support expanding humanity's ability to thrive beyond Earth.