IAF MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)
Microgravity Sciences on board ISS and beyond (6)

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GRAVITYGAMES 2.0

Abstract

Expeditions to Mars will present many challenges that will need to be overcome. Students for the Exploration and Development of Space (SEDS) - the largest student-led STEM organization globally - partnered with Made In Space, Inc. (MIS) believe that additive manufacturing provides a solution to some of the challenges that astronauts will face: the additive manufacturing of tools, utensils, spare parts, a "swiss army knife", and other innovative objects that explorers may need to help them adapt to the extreme conditions of Mars or in potentially hazardous circumstances that could threaten their welfare and the mission. SEDS and MIS see the Additive Manufacturing Facility (AMF) aboard the ISS as an essential proof point that can help teach and train future Mars explorers about the possibilities and vast use cases of additive manufacturing. A STEM education challenge will help the next generation of space leaders and innovators imagine the challenges and learn the technologies to successfully explore space. University and high school students of 30+ countries are challenged to design a product that will be selected for print on the ISS Made In Space AMF that can be demonstrated by the astronauts. The Mars Challenge, using the MIS printer, is offered to inspire students' imagination, innovation, and experimentation. The original (pilot) challenge project, called GravityGames, was created to provide a unique educational experience also to encourage STEM students (high-school to college) to develop authentic, hypothesis-based research. GravityGames used the 0G-3D space-based technology on the ISS to make a product for astronauts to play while on a long-duration space flight and was on ISS Mission 50/51. Mars Challenge, or GravityGames 2.0, takes this idea a step further: to challenge more students to design a 0G-3D product needed on a future spaceflight to Mars, perhaps a mission students will be working on one day as professionals in aerospace or as astronauts.