

IAF HUMAN SPACEFLIGHT SYMPOSIUM (B3)  
Utilization & Exploitation of Human Spaceflight Systems (3)

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RESULTS FROM THE OPEN INNOVATION CROWDSOURCE CHALLENGE: RECYCLING IN  
SPACE: WASTE HANDLING IN A MICROGRAVITY ENVIRONMENT

**Abstract**

Repurposing food packaging, plastic, paper, fabric and other types of waste in space for applications of reduced gravity is a great design challenge. The public was engaged to develop methods of collecting trash from astronauts and feed the trash into a receptacle for transport through a high-temperature trash-to-gas reactor system. This innovation crowdsourcing challenge was developed to provide solutions for consideration in NASA's Advanced Exploration Systems and space technology programs to develop trash-to-gas technology that can recycle waste into useful gases. The "Recycling in Space: Waste Handling in a Microgravity Environment" Innovation Contest was conducted in collaboration with NASA through the company NineSigma, a NASA Tournament Lab Platform. From 43 high fidelity proposals, three winners were selected and announced. The methodology and results of the challenge winners, including the "Waste Pre-Processing Unit", "Microgravity Waste Management System", and "Trash-Gun" are discussed here.