

# ADVANCED CLOTHING SYSTEM

## Advanced Exploration Systems Logistics Reduction Project

### PROJECT MANAGEMENT

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### NASA TECHNOLOGY AREA ROADMAP

TA6 Human Health, Life Support, and Habitation Systems

6.1 Environmental Control and Life Support Systems and Habitation Systems

6.1.4 Habitation

6.1.4.5 Long Wear Clothing

### TECHNICAL READINESS LEVEL = 5

### PROJECT OVERVIEW



The goal of the Advanced Clothing System (ACS) is to use advanced commercial off-the-shelf fibers and antimicrobial treatments with the goal of directly reducing the mass and volume of a logistics item. The current clothing state-of-the-art on the International

Space Station (ISS) is disposable, mostly cotton-based, clothing with no laundry provisions. Each clothing article has varying use periods and will become trash. The goal is to increase the length of wear of the clothing to reduce the logistical mass and volume. The initial focus has been exercise clothing since the use period is lower. Various ground studies and an ISS technology demonstration have been conducted to evaluate clothing preference and length of wear. The analysis indicates that use

of ACS selected garments (e.g. wool, modacrylic, polyester) can increase the breakeven point for laundry to 300 days.

### SIGNIFICANT ACTIVITIES

80-person Exercise Wear Ground Study: June-August 2013

ISS Technology Demonstration: July-October 2014

### INFUSION POTENTIAL

This technology may be used on any crew-occupied vehicles including ISS, Orion, and future deep space vehicles to reduce mass and volume with a minimal investment.



### INNOVATION PERSPECTIVE

The textile industry has made significant progress with new fiber blends and garment finishing. The goal is to leverage existing state-of-the-art technology from the private industry to make advancements in the crew wardrobe.

### PARTNERSHIPS/HIGHLIGHTS

The ACS team has worked with the Hawaii Space Exploration Analog and Simulation (HI-SEAS) project funded via the Human Research Program (HRP) during their first and second mission to conduct preference testing of exercise clothing and sleep shirts.