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## International Space Station Technology Demonstration

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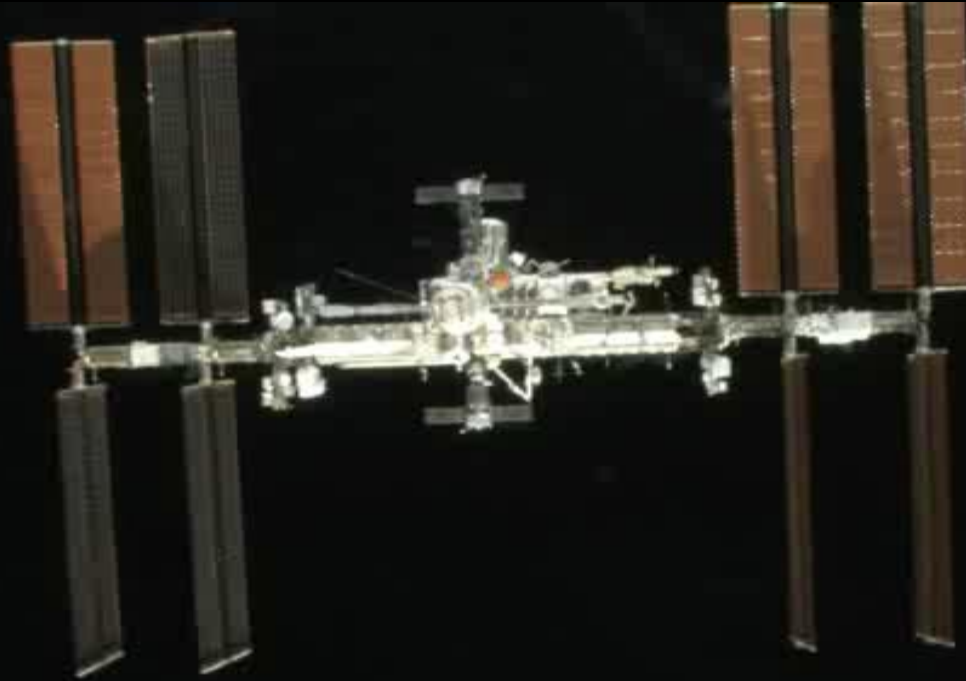
# International Space Station Technology Demonstration



Opportunity to demonstrate technologies in an operating long-duration spacecraft, reducing future mission risks and proving new capabilities for exploration and commercial implementation



# International Space Station – Technology Demonstration





# Technology Demonstration on ISS – Unique Benefits







# Technology Demonstration Focus - Technical Areas



Life Support and Habitation Systems

Fire Safety

Long Duration Health & Performance

Operational Processes and  
Procedures

Radiation (monitoring & protection)

Exploration Destination Systems

Communications and Navigation

Space Power and Energy

Thermal Management Systems

Science Instruments

In-Space Propulsion

Materials, Structures, and Manufacturing

Robotics, Tele-Robotics,  
and Autonomous Systems

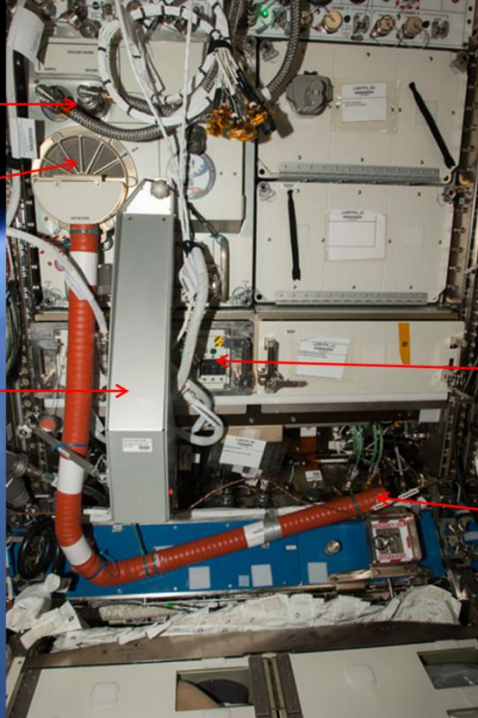
Entry, Descent, and Landing Systems







# Example Technology Demonstrations Life Support and Habitation Systems



MTL Cooling  
Supply/Return

Air inlet

VES interface,  
protected by cover

Amine Swingbed  
CO2 removal system



ISIS Drawer  
containing power and  
control functions and  
data collection

Microbial Monitoring System

Silica Analyzer

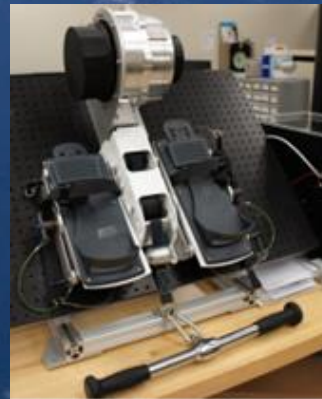
Air Return



Organic Water Monitor



Water Monitoring Suite  
In-situ Water Monitoring



Mini Exercise Device  
Crew Health



Air Quality Monitor  
In-situ Air Monitoring



# Example Technology Demonstrations Entry, Descent, and Landing Systems; & Autonomous Systems and Navigation



*Reentry Breakup Recorder (REBR)*  
Entry Environment Measurements



*SPHERES Vertigo*  
Vision based navigation and  
mapping algorithms



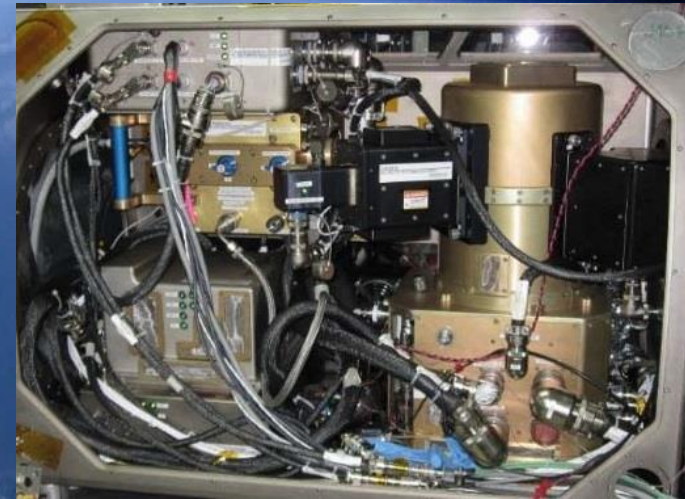
*Robonaut*  
Atmosphere Measurements



# Example Technology Demonstrations Thermal Management Systems



Phase Change Heat Exchanger  
Orion Thermal Management



Zero Boil-Off Tank (ZBOT)  
Cryo Fluid Management





# Technology Demonstration on ISS – Unique Benefits



Systems demonstration without risk to the crew, spacecraft, or mission

Training (flight and ground crew)

Demonstrating actual system logistics/reliability.

Operations planning (nominal and off nominal)

Demonstrate system performance in an operationally relevant environment (including flight safety and system interoperability)

New capabilities can be realized with efficiency of cost and schedule