



# 3<sup>RD</sup> SPACE EXPLORATION CONFERENCE & EXHIBIT

## Human and Robotics Collaboration to Further Space Exploration

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# Human-Robotic Collaboration - Current



Recent history of robotics in human spaceflight revolves around the use of the Shuttle and International Space Station robotic manipulators

- Shuttle
  - Shuttle Remote Manipulator System (RMS) is fixed in payload bay
  - controlled by crewmembers in the aft flight deck
  - Direct and TV viewing of operations
- Station
  - Station RMS can move between power-data grapple fixtures
  - Station RMS can be moved on the Mobile Base System along the Truss
  - All viewing via cameras
  - Controlled either by crewmembers in US lab or telerobotically on the ground
- Future human robotic activity will expand upon this base to assist humans in Lunar exploration and outpost establishment

# Human-Robotic Interaction in Space



Video

# Human-Robotic Collaboration - Panelists



- **Dan Andrews**
  - **Low Cost, Innovative Missions in the Context of LCROSS**
  
- **Rob Ambrose**
  - **Lessons in Remote Operations and Human Robotic Interactions**
  
- **Mike Gernhardt and Carl Walz**
  - **EVA: Challenges in Planetary Exploration**
  
- **Phil Spampinato**
  - **Inflatable Habitats: Preparations in Analog Environments to Test Lunar Concepts**