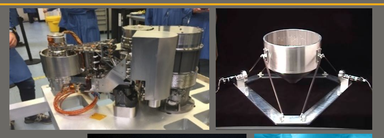
Low-Cost Robotics for Lunar Science and Exploration

Lunar Surface Innovation Consortium, Fall Meeting, 3-4 November 2021

Atif M. Qureshi, *Principal Robotics Engineer*, **Maxar**

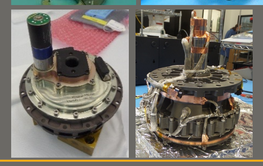
World Leader in Space Robotics for 20+ Years



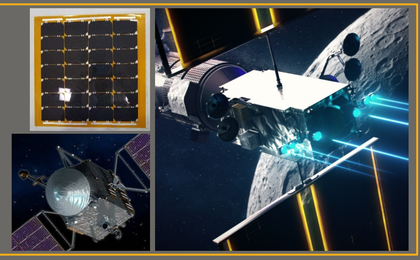
Broad Experience with Automated Systems

Company Overview

A Versatile Line of Actuator Options

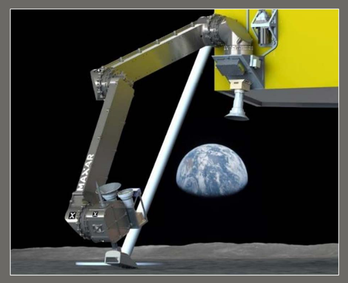


60+ Years of Reliable Space Systems, Power and Communications

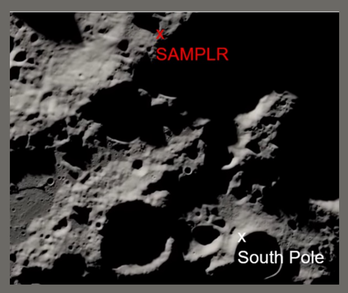


SAMPLR

- Overview
  - Productized Commercial Robotic Manipulator, Enables:
    - Affordable, rapid development
    - Planetary exploration/science
  - Fully integrated (bolt-on) system
  - Commercially operated
- Modular Capabilities:
  - 0.5 to 2+ meter reach
  - 25+ kg payload
  - 4-7 Degrees of Freedom
  - Force/torque sensing
  - 1mm precision



- Mission Capabilities
  - 4 Degrees of Freedom
  - 14 kg arm, 1.5 m reach
  - Avg 28 W, Peak 45 W
  - Landing in 2023



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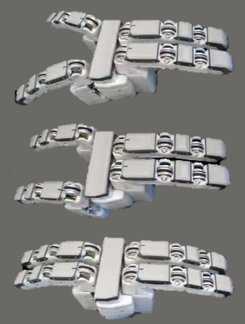
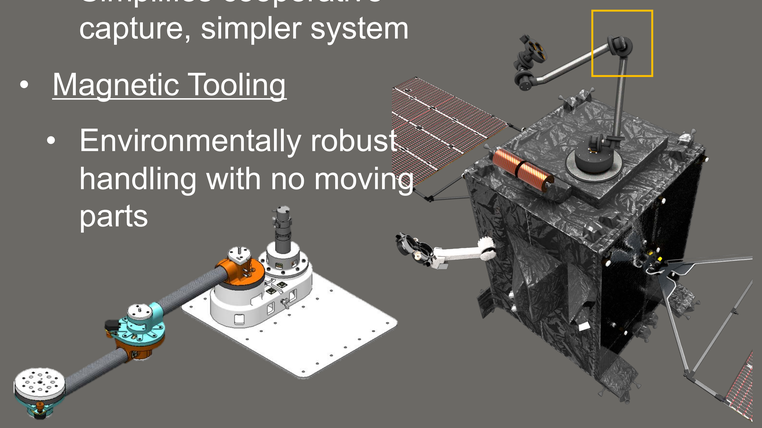
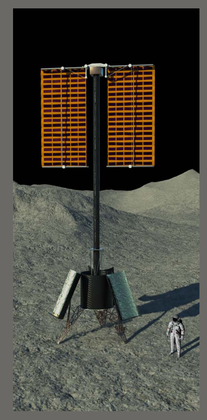


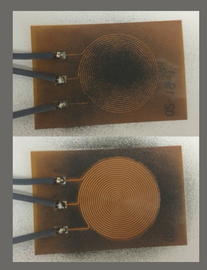
- Overview
  - New technology to reduces system cost and mass
  - Better environmental protection
  - TRL6 by 2023
- Under-Actuated Architecture
  - One motor drives many joints
- Electro-Adhesive Brakes
  - Light and powerful, to minimize system mass
- Electro-Adhesive Capture
  - Simplifies cooperative capture, simpler system
- Magnetic Tooling
  - Environmentally robust handling with no moving parts



LVSAT

- Overview
  - An autonomously deployable and relocatable 10 kW solar array for lunar surface operations.
  - Leveraging our Mars surface experience, high-reliability commercial satellite components, and advanced technology from NASA and industry partners.
- Deployable Composite Boom
  - Forms the main vertical mast
  - Superior packing factor, high stiffness, best in class mass, excellent thermal stability.
- Electrodynamic Dust Shield
  - Uses electrical fields to protect moving parts from lunar dust intrusion.
- 5J IMM-α Solar Cells
  - Highest efficiency space solar cell in production, 32% minimum average.





Please feel free to contact me at atif.qureshi@maxar.com if you have any questions or comments.

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