



Robots for Human Exploration

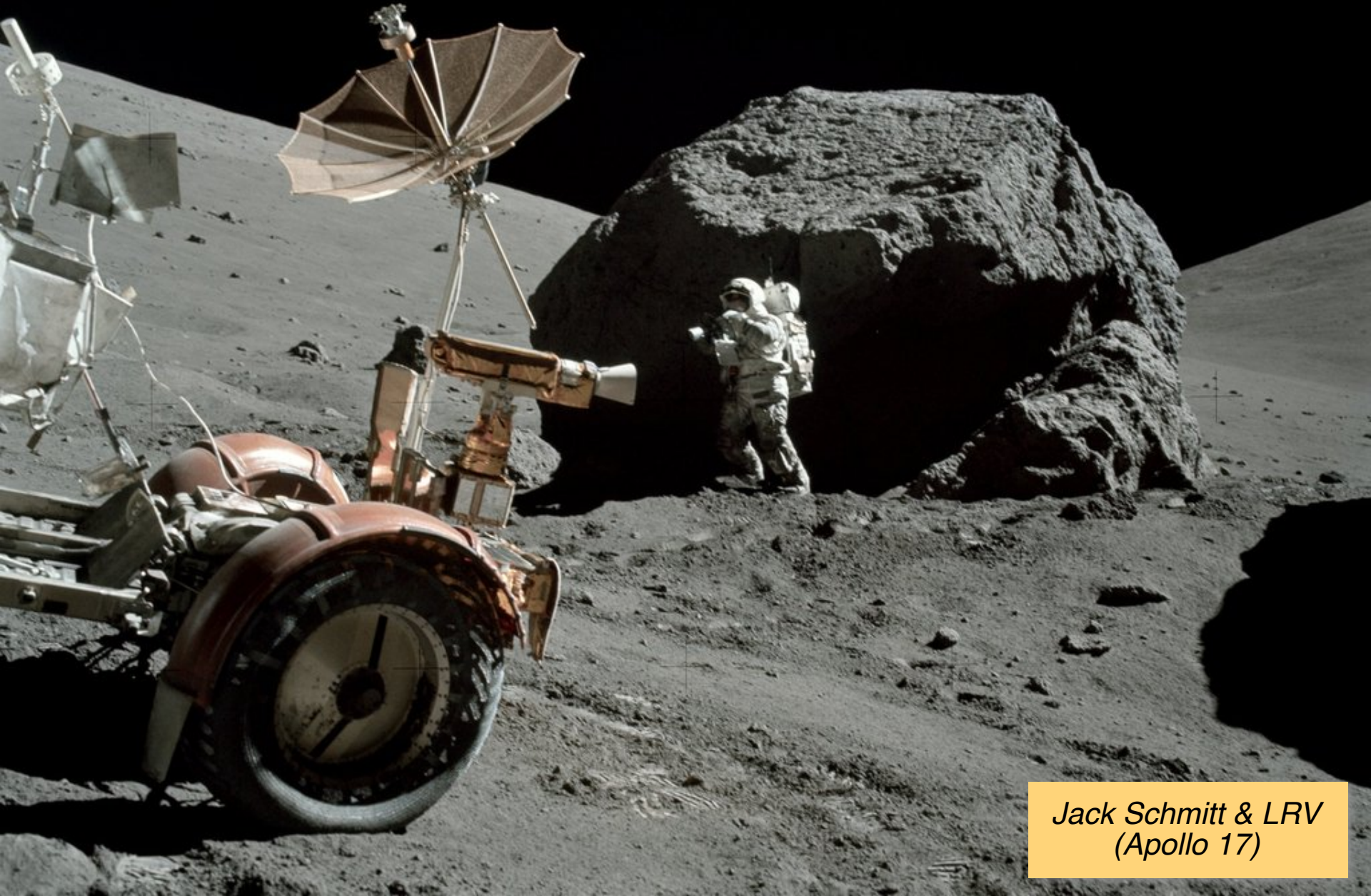
New ways of exploring the Moon, Mars & beyond

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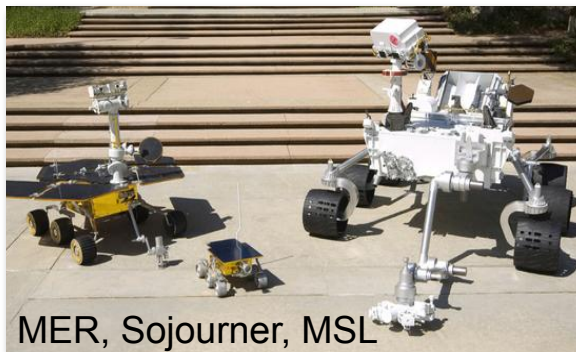
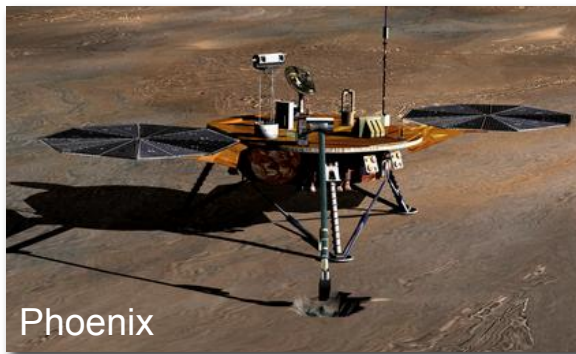
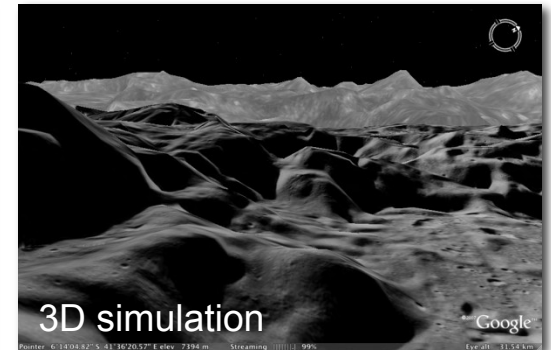
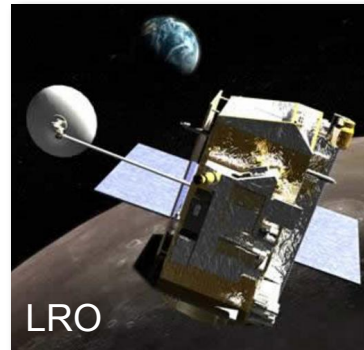
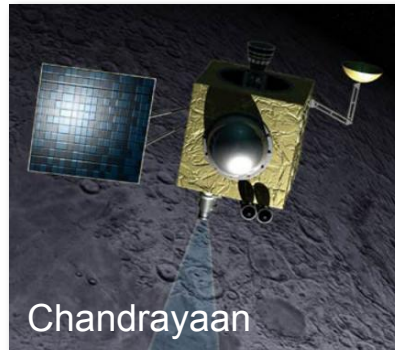
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Apollo Surface Operations



*Jack Schmitt & LRV
(Apollo 17)*

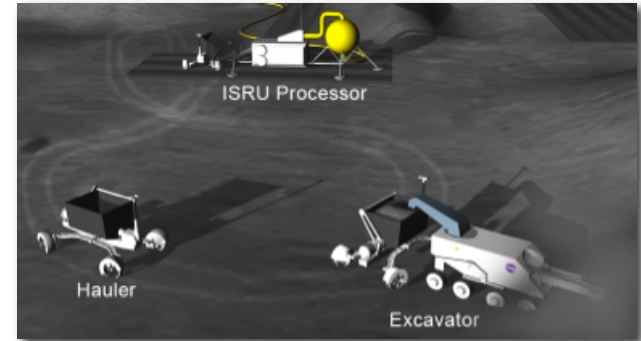
What's changed since Apollo?



Robots for human exploration

Before Crew

- Robots do work before humans arrive
- Scouting, prospecting, etc.
- Site prep., equipment deploy, etc.



Supporting Crew

- Robots work in parallel with humans
- Inspection, mobile camera, etc.
- Heavy transport & mobility



After Crew

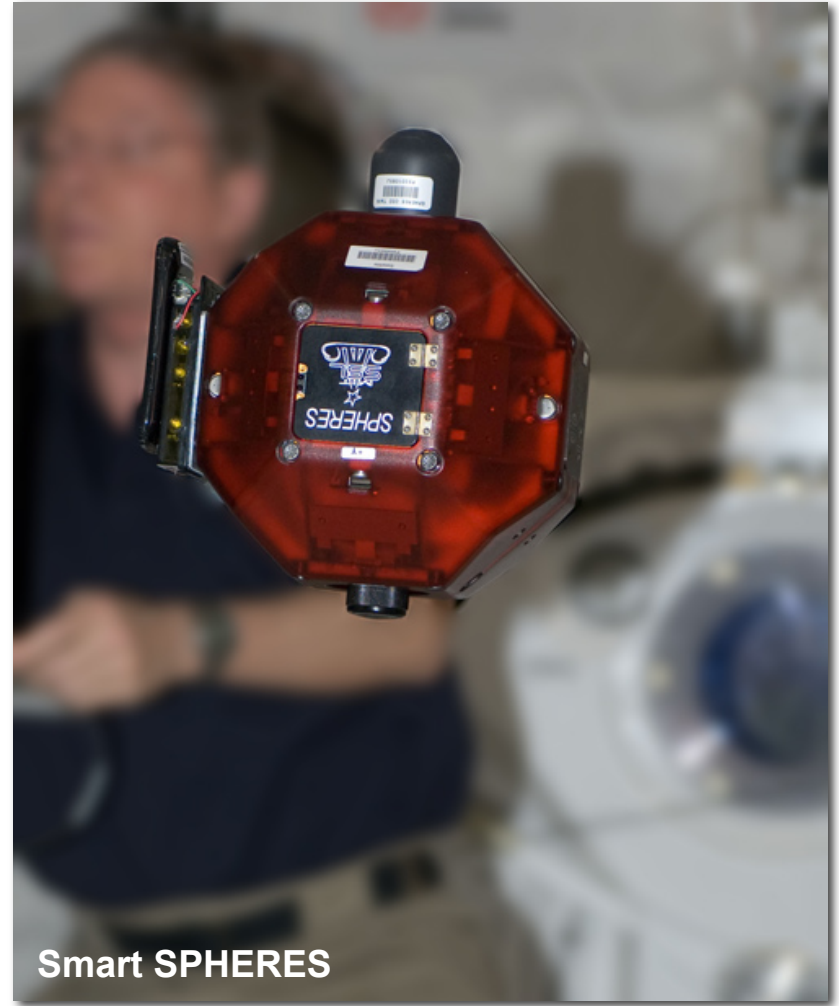
- Robots do work after humans leave
- Follow-up & close-out work
- Site survey, supplementary tasks, etc.



Different robots... Different forms...



K10 Planetary Rover



Smart SPHERES

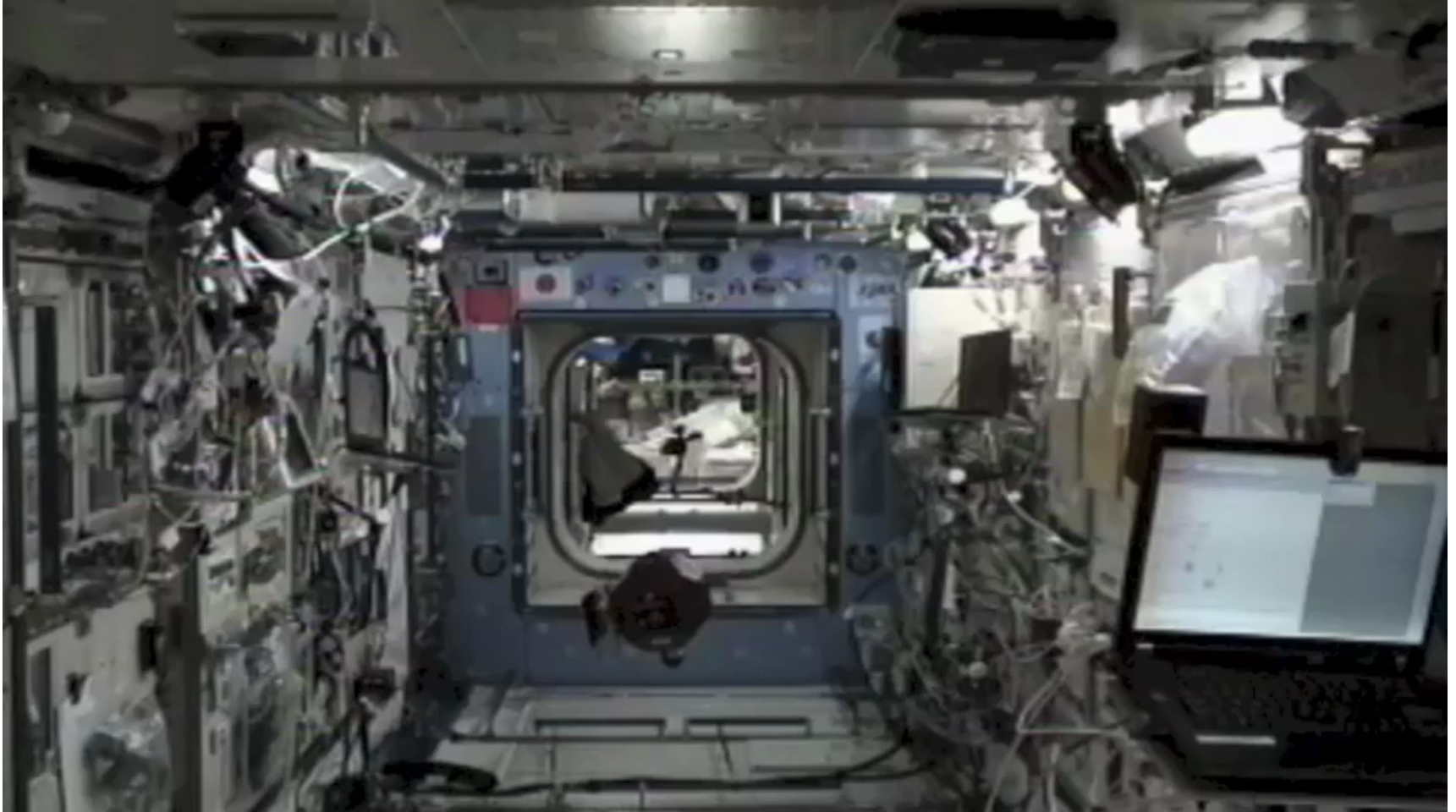
K10 Planetary Rover



July 25, 2010
Haughton Crater, Devon Island, Canada



Smart SPHERES



***December 12, 2012
Kibo Laboratory, International Space Station***

2x speed



Questions?



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