

# Science Café April 2021: Fetching Samples from Mars

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NASA Glenn Research Center

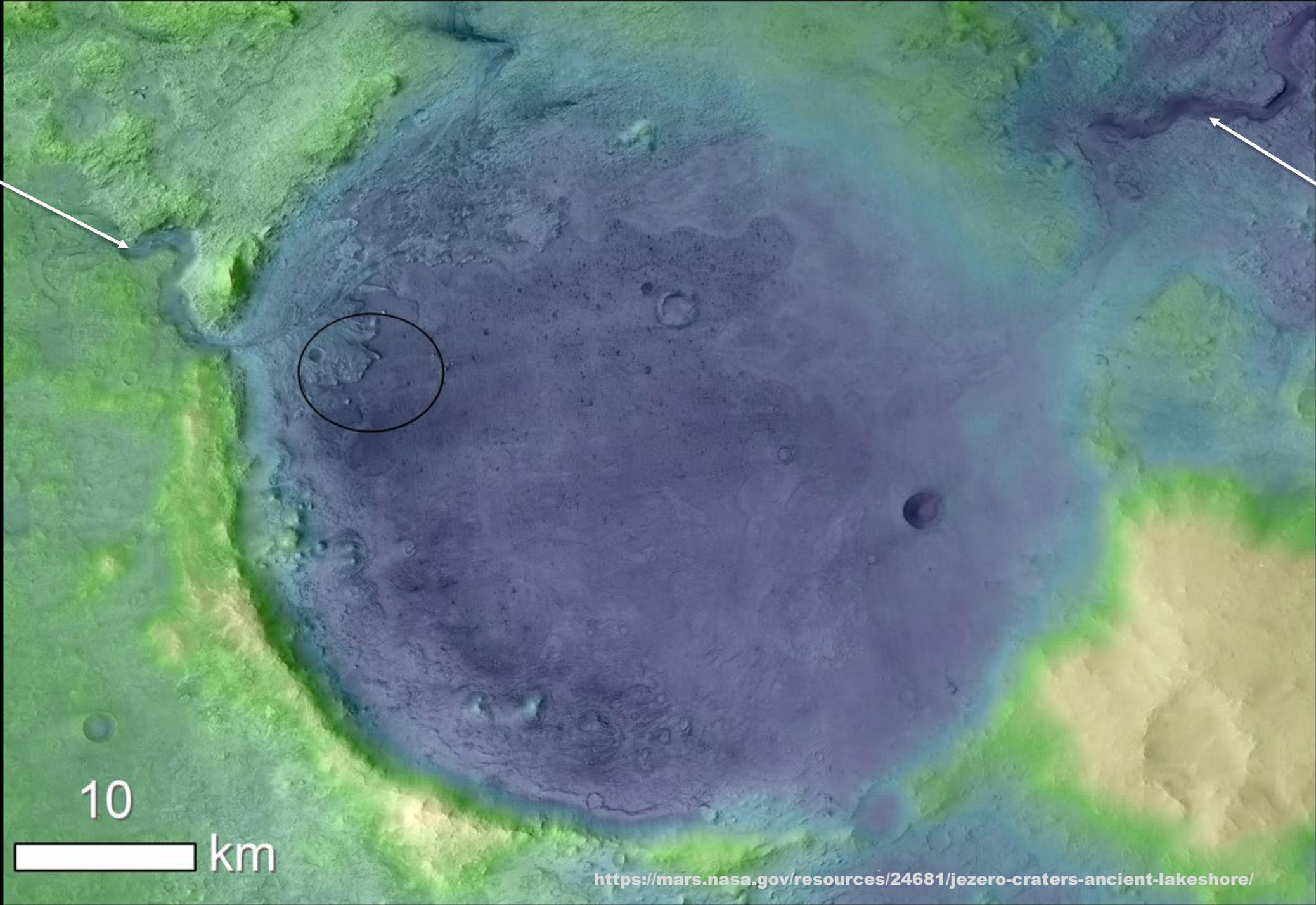
Lake inflow

Lake outflow

10

km

<https://mars.nasa.gov/resources/24681/jezero-craters-ancient-lakeshore/>

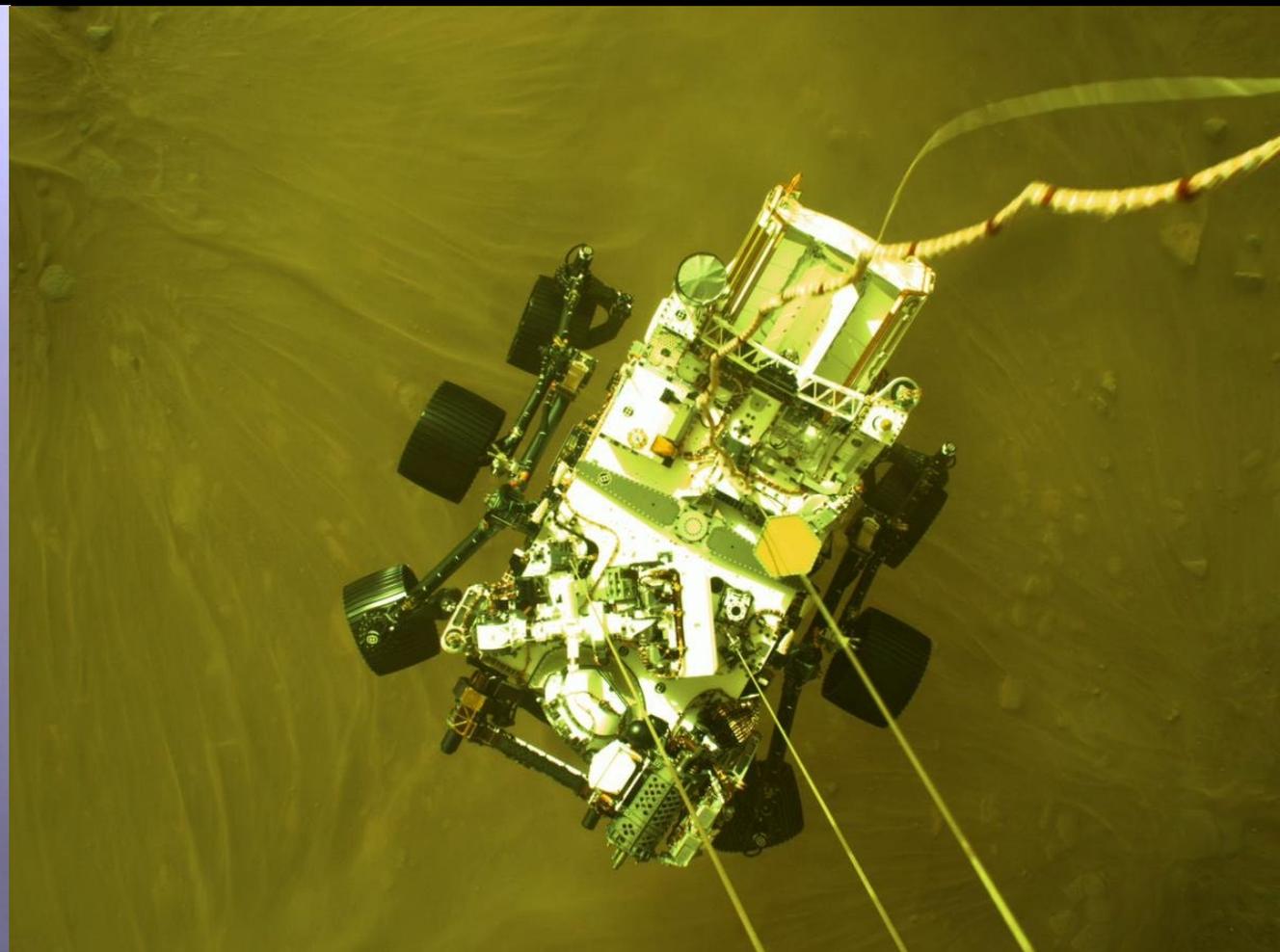
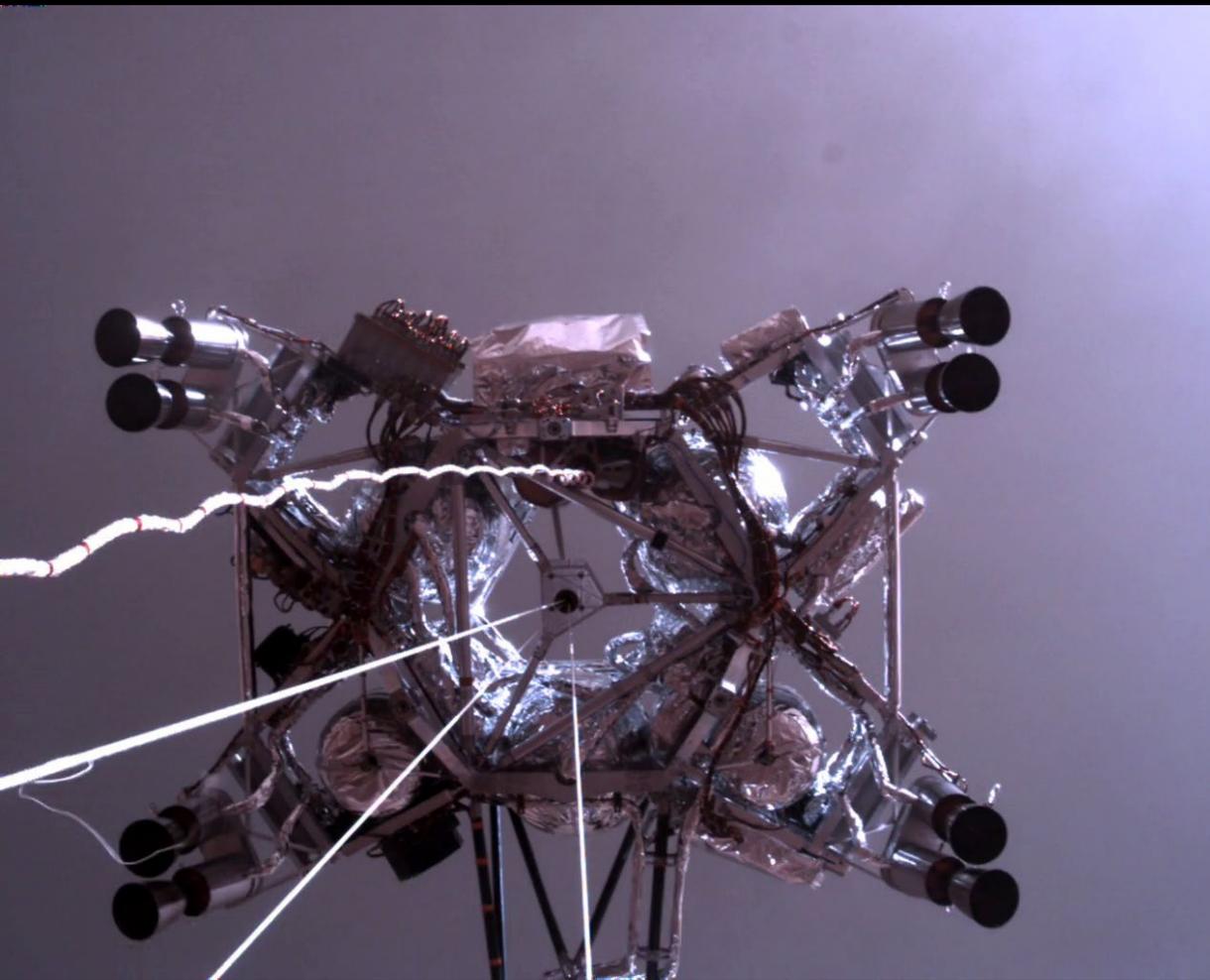


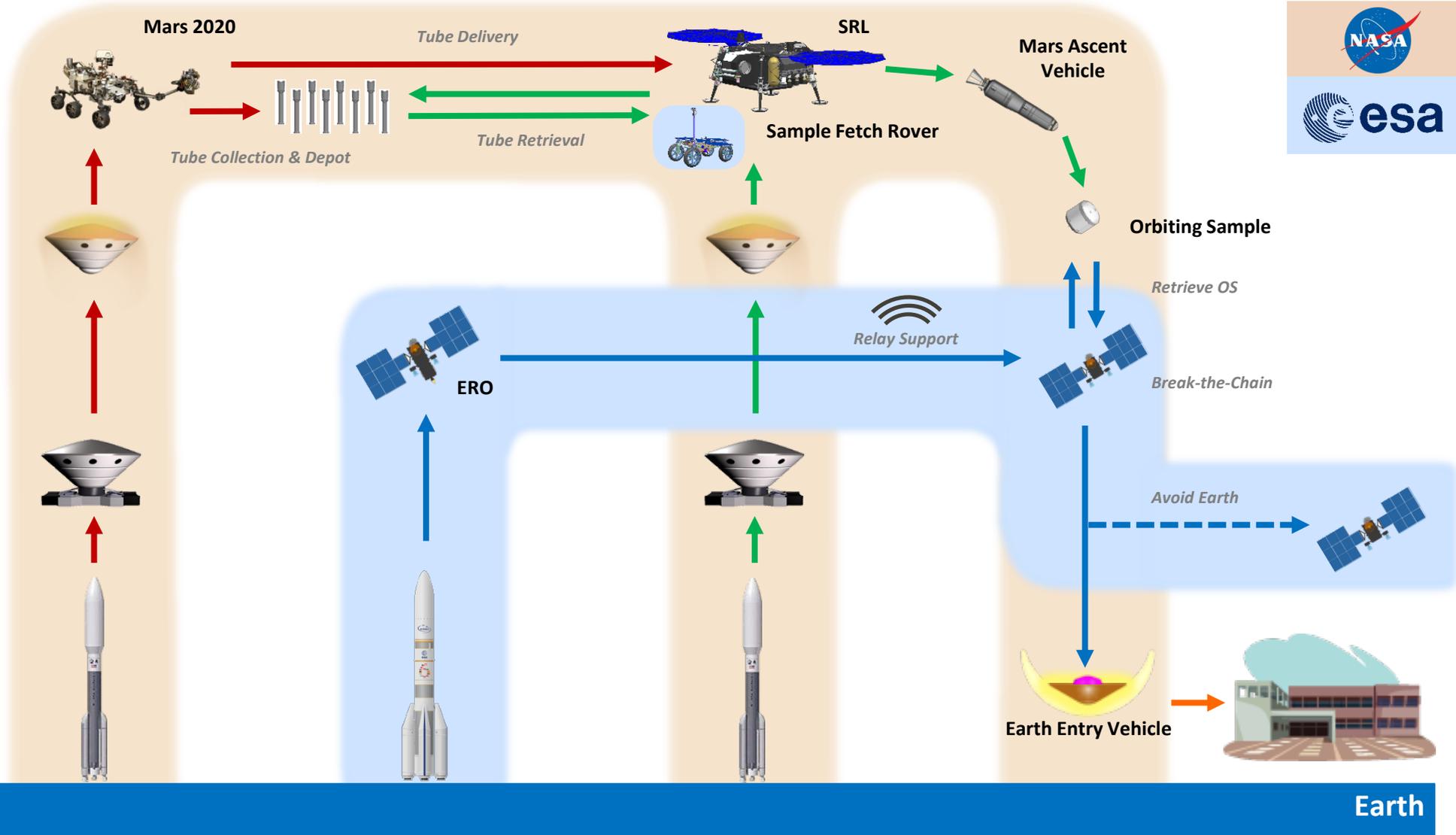


Octavia E. Butler Landing



2 months ago!





Mars 2020

Earth Return Orbiter

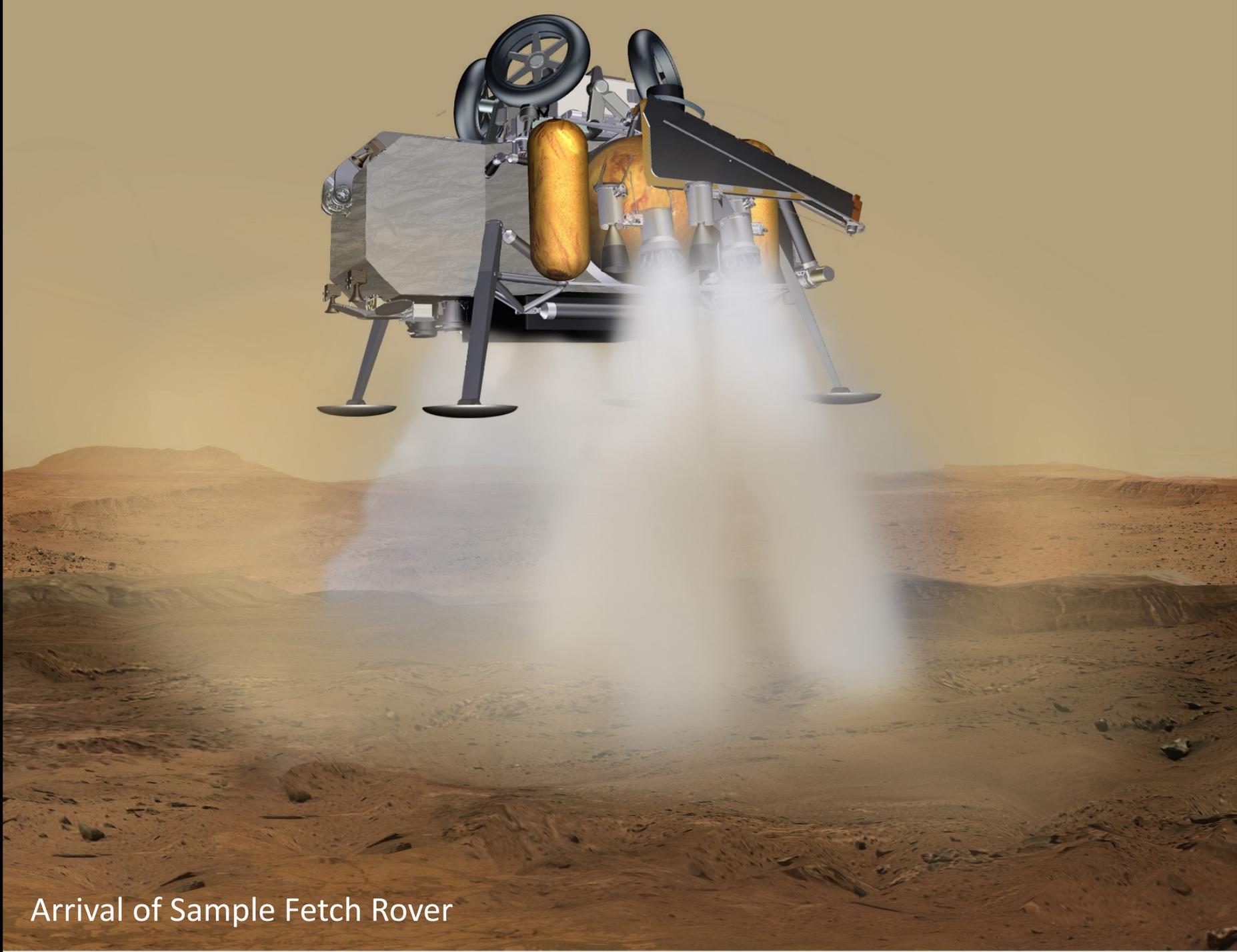
Sample Retrieval Lander

Sample Return and Science



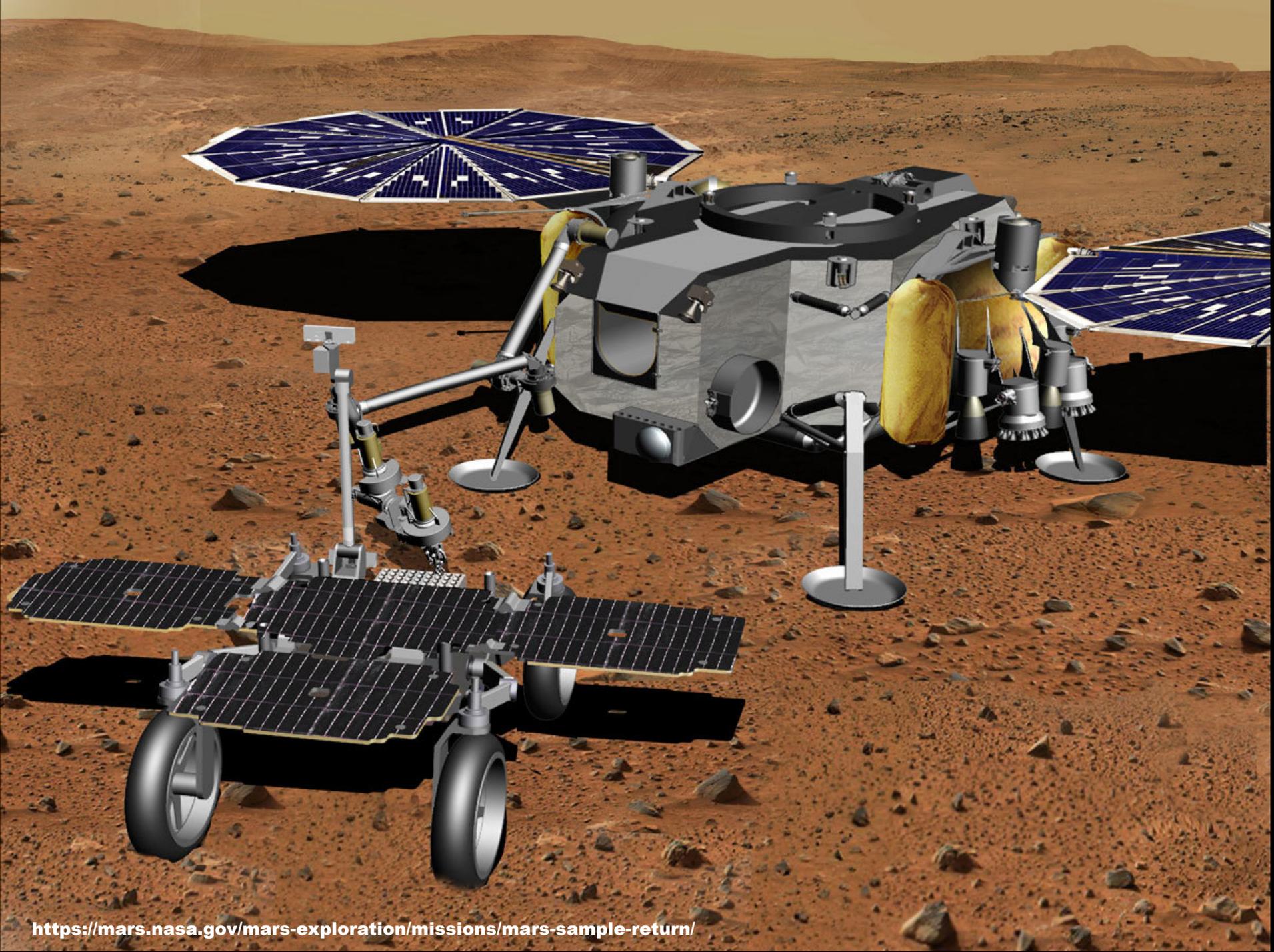


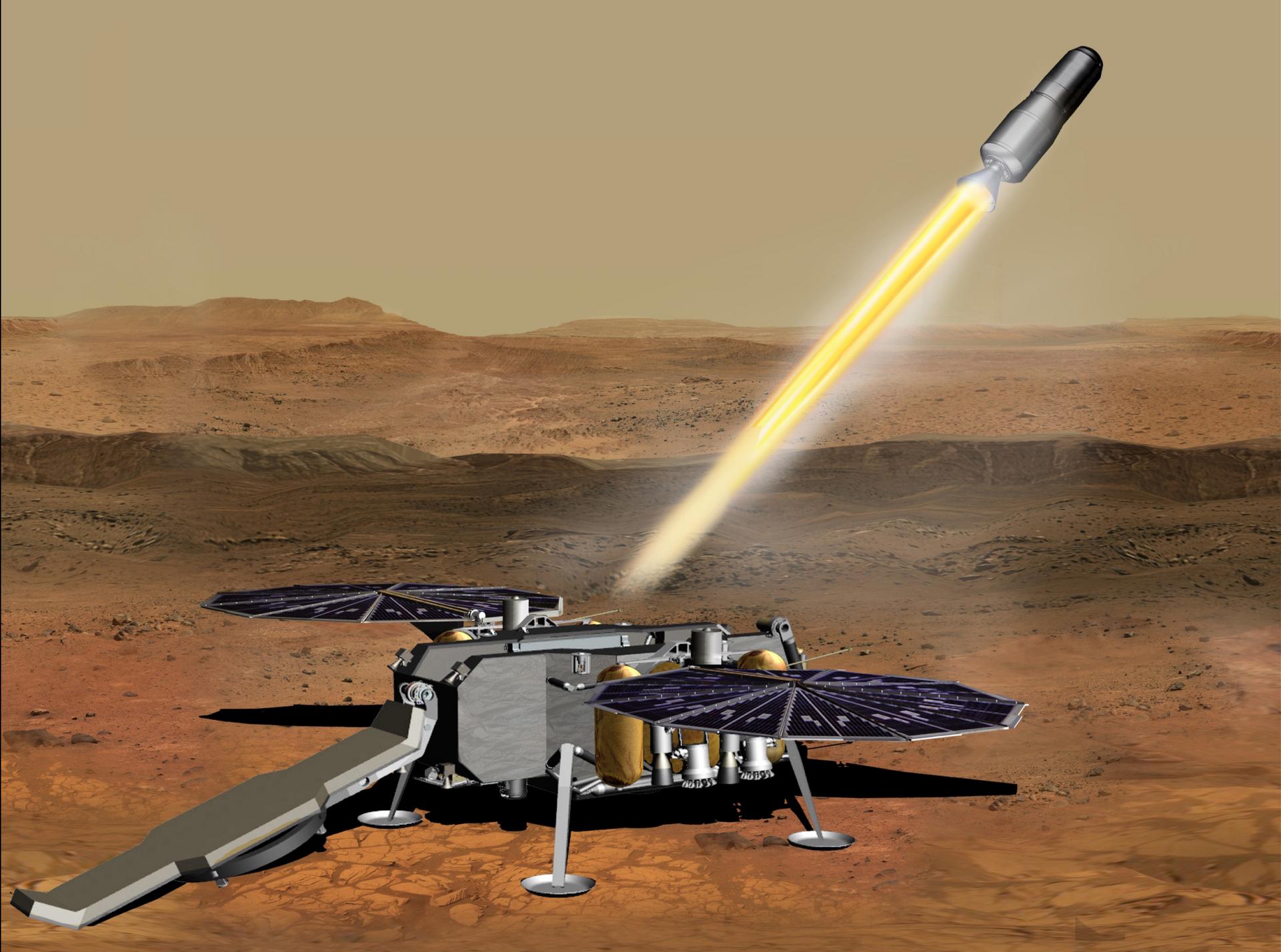
Sample tubes awaiting retrieval!



Arrival of Sample Fetch Rover



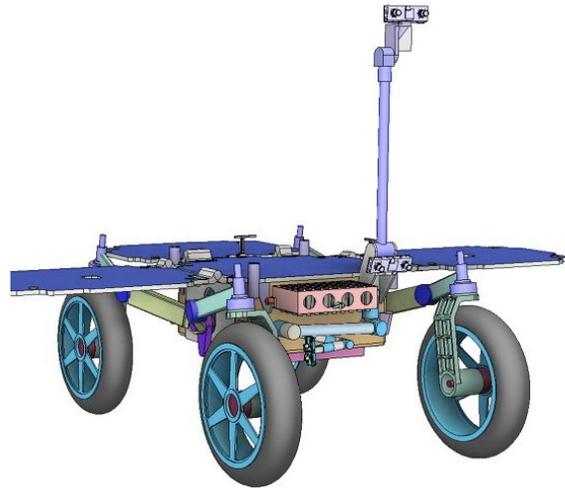




*Form follows function*



<https://mars.nasa.gov/mars2020/spacecraft/rover/>



<https://www.airbus.com/newsroom/press-releases/en/2020/06/airbus-wins-next-study-contract-for-martian-sample-fetch-rover.html>



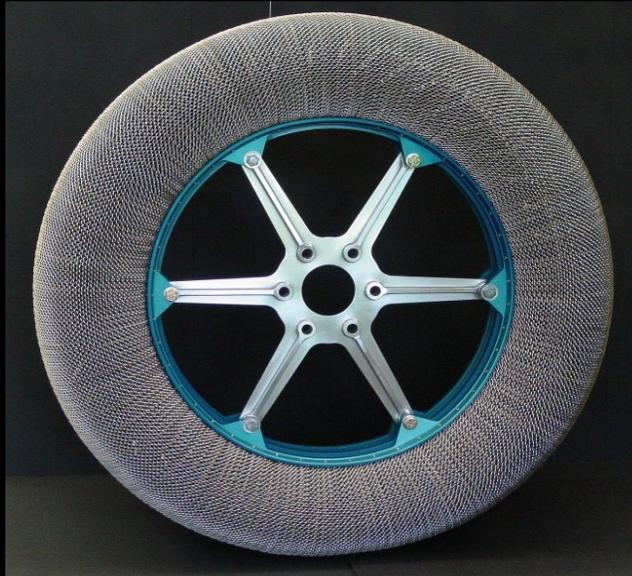
Apollo/ mesh tire



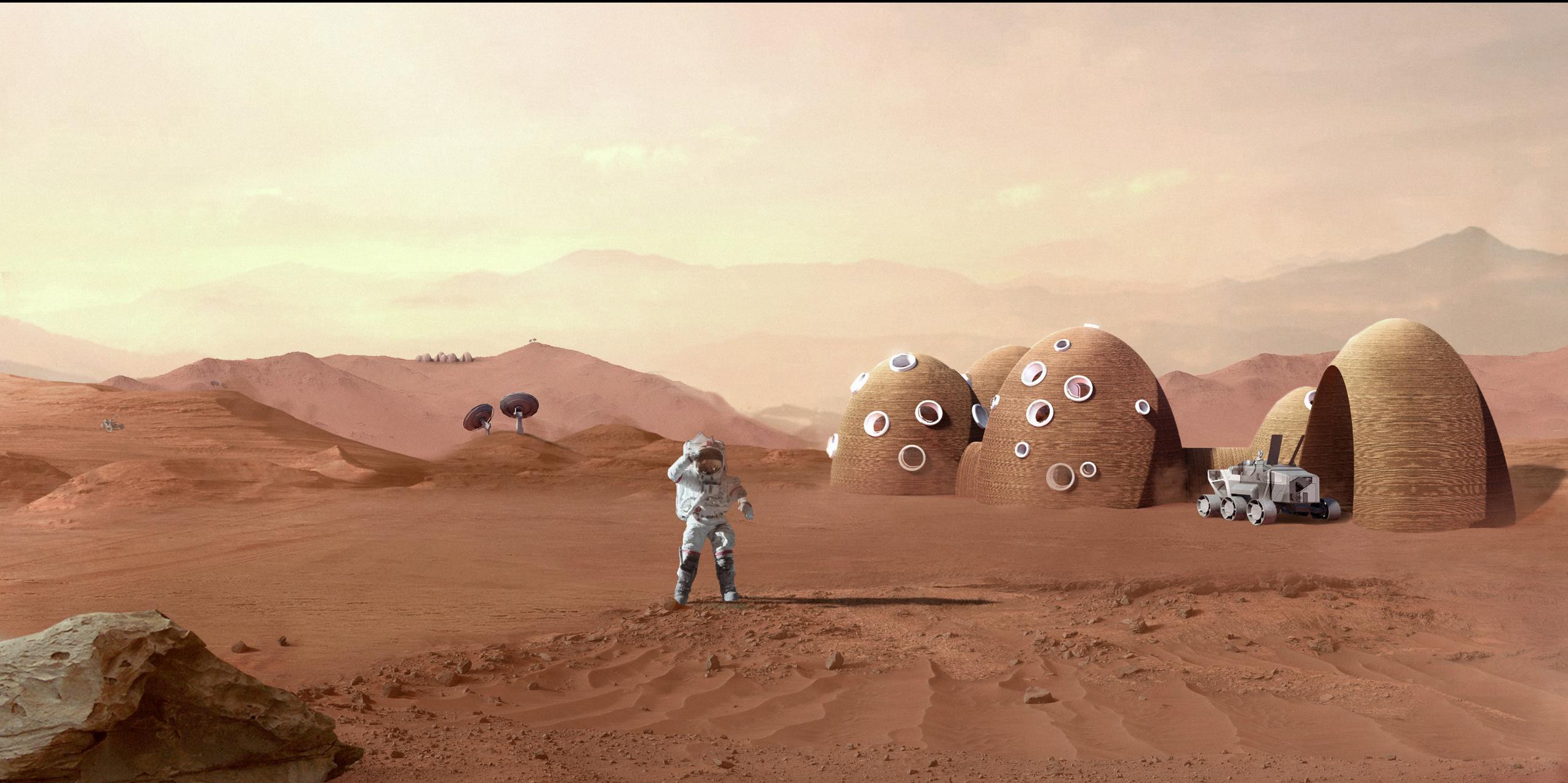
Constellation/ spring tire



Mars Sample Return/ Superelastic Spring Tire





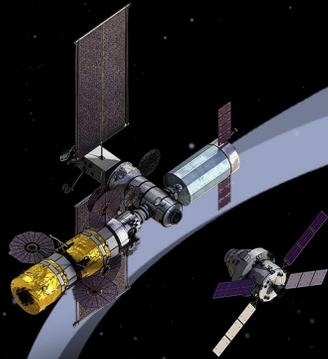


Credits: Logan Architecture

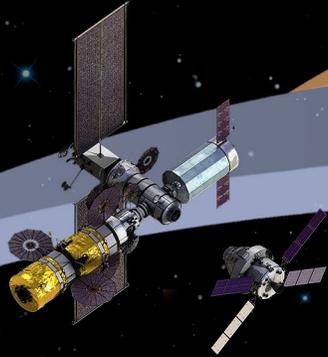




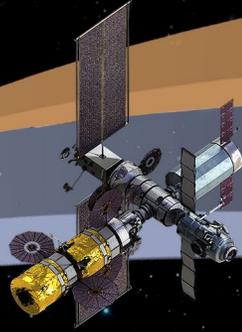
# ARTEMIS PREPARES FOR MARS



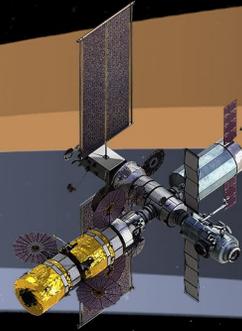
Testing landing and ascent capabilities



Expanding the range of surface exploration and ISRU demonstrations



Gateway augmented with international habitat for increased capabilities



Foundation Surface Habitat and Habitable Mobility Platform delivered to complete Artemis Base Camp



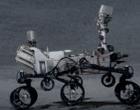
Expanded habitation capability added to Gateway to enable Mars mission dress rehearsal at the Moon



Mars mission dress rehearsal with longer in-space and surface durations



Lunar Terrain Vehicle



Habitable Mobility Platform



Foundation Surface Habitat



## SUSTAINABLE LUNAR ORBIT STAGING CAPABILITY AND SURFACE EXPLORATION

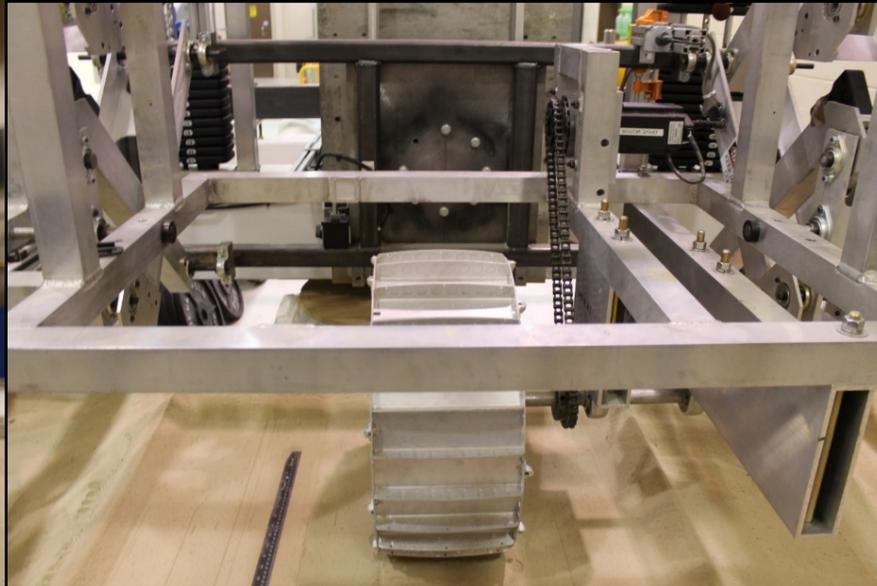
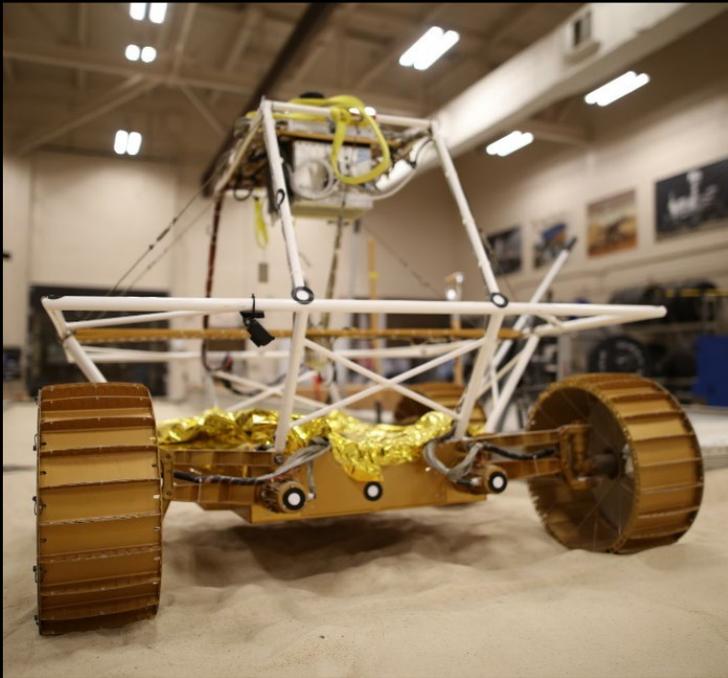
MULTIPLE SCIENCE AND CARGO PAYLOADS | INTERNATIONAL PARTNERSHIP OPPORTUNITIES | TECHNOLOGY AND OPERATIONS DEMONSTRATIONS FOR MARS





## Our role at NASA Glenn...

Support the mobility testing needs of Artemis rover industry. Develop spring tire technologies for future Mars, lunar, and planetary rover missions



# Earth Applications of Shape Memory Alloys

## Research and Technology for the Benefit of All

### Startup founded by 'Survivor' champ debuts airless bike tires based on NASA rover tech

Darrell Etherington @etherington / 10:46 AM EDT • March 16, 2021



Image Credits: SMART Tire Company

### Other Applications

- Medical
- Aerospace
- Automotive
- Civil Structures
- Textiles

