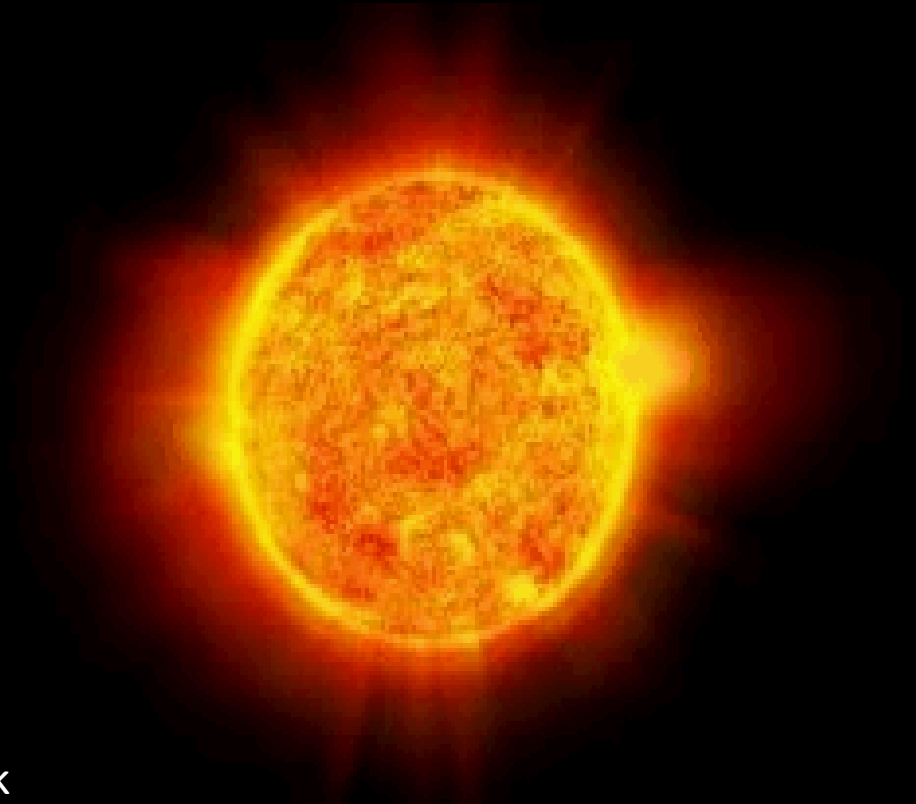
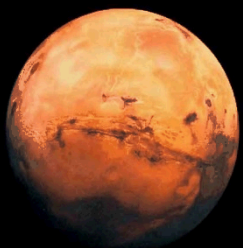


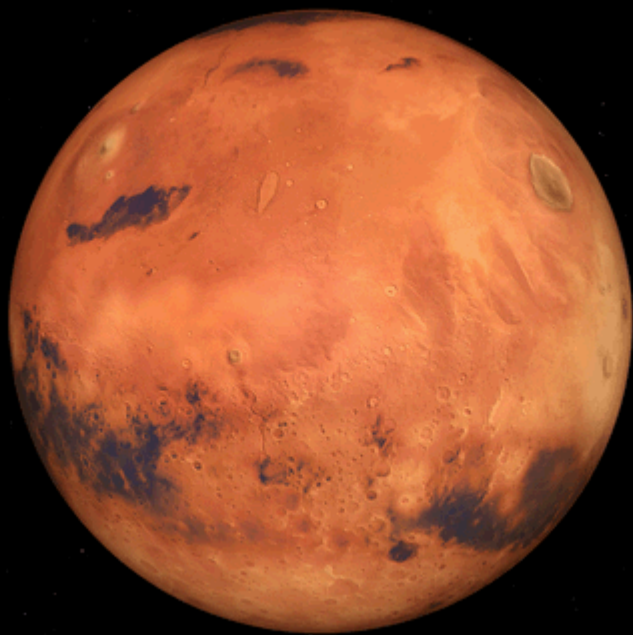


I NEED MY SPACE

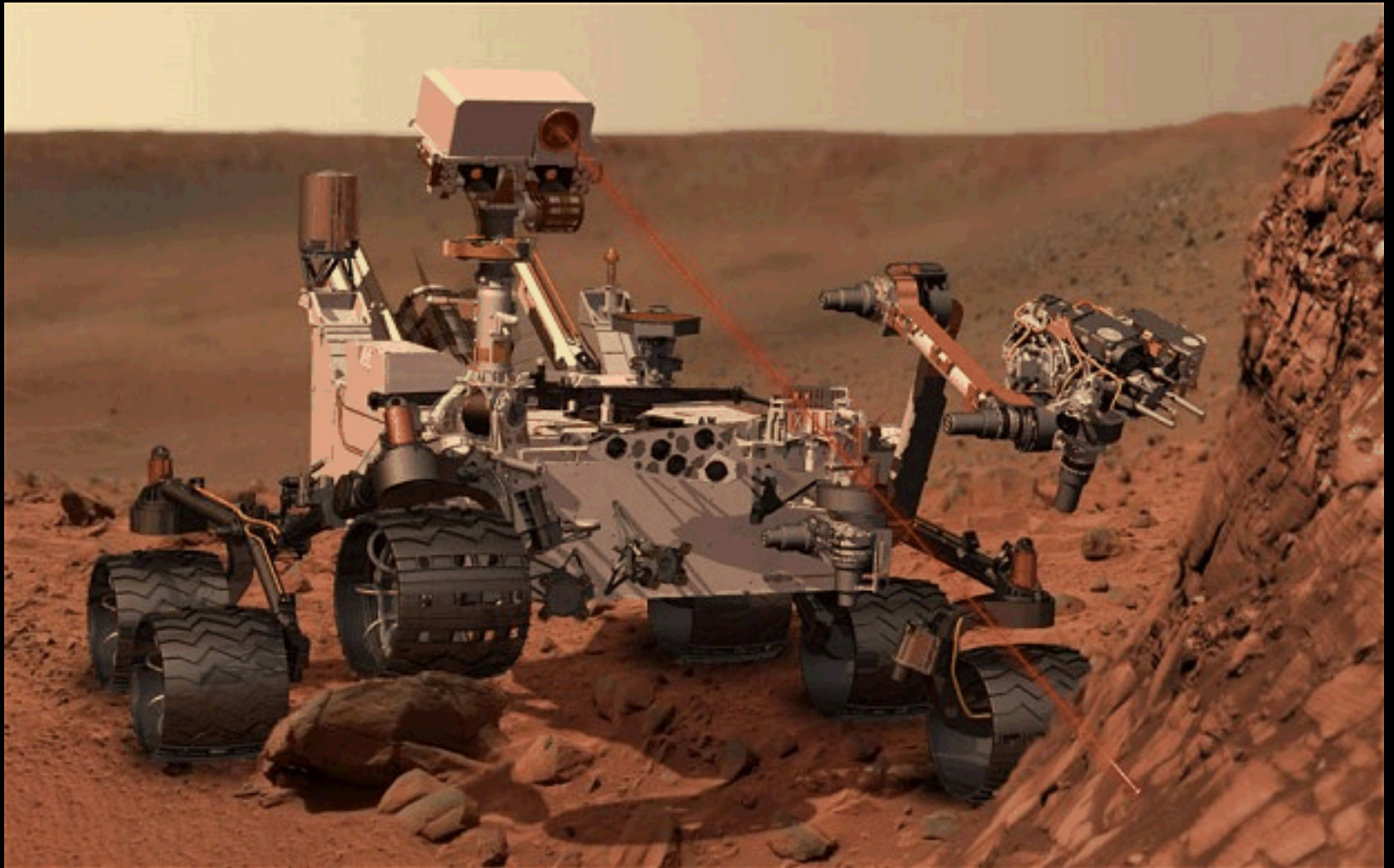
*Mission to Mars and Exploring
Wind Tunnels*

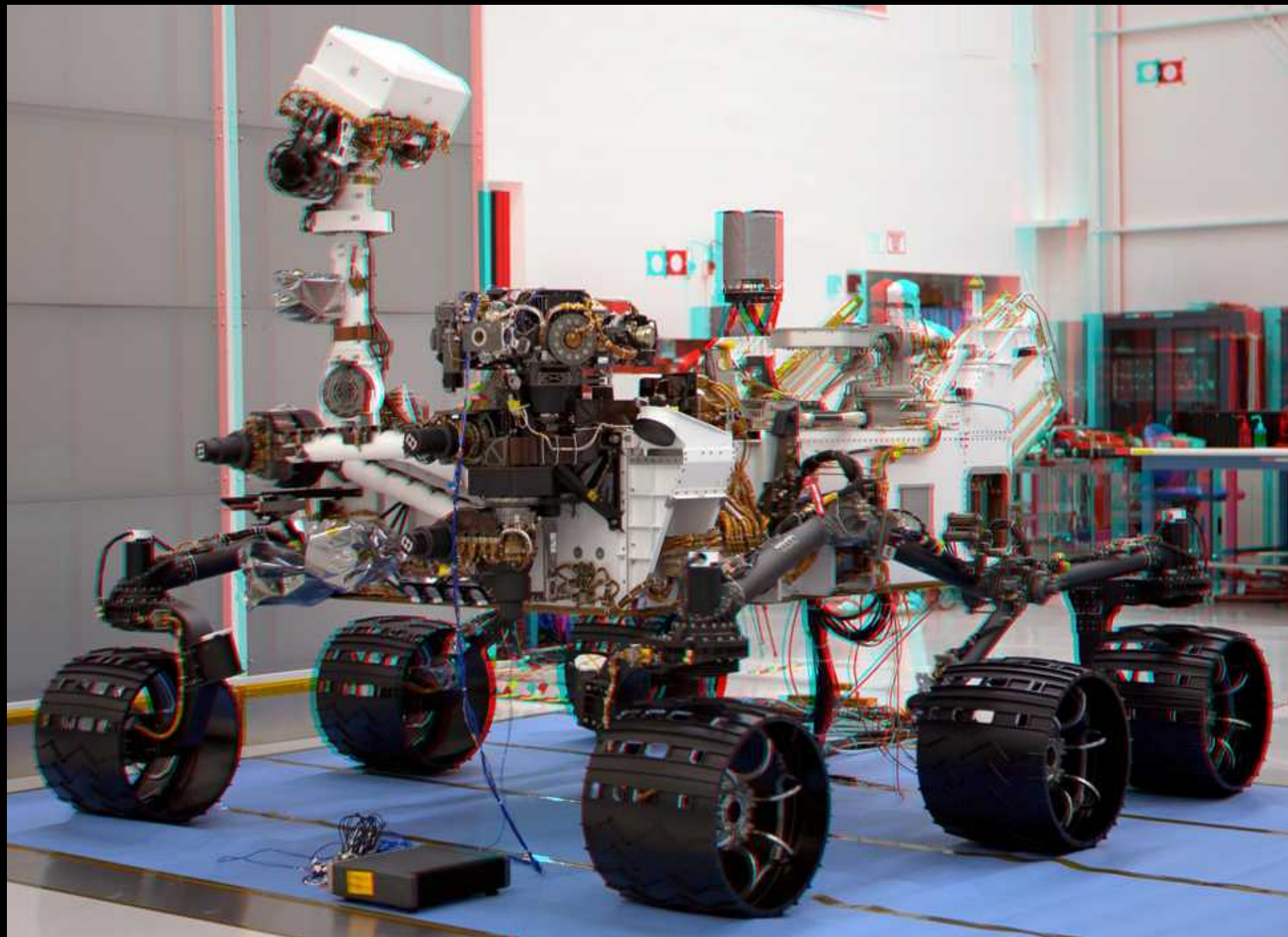


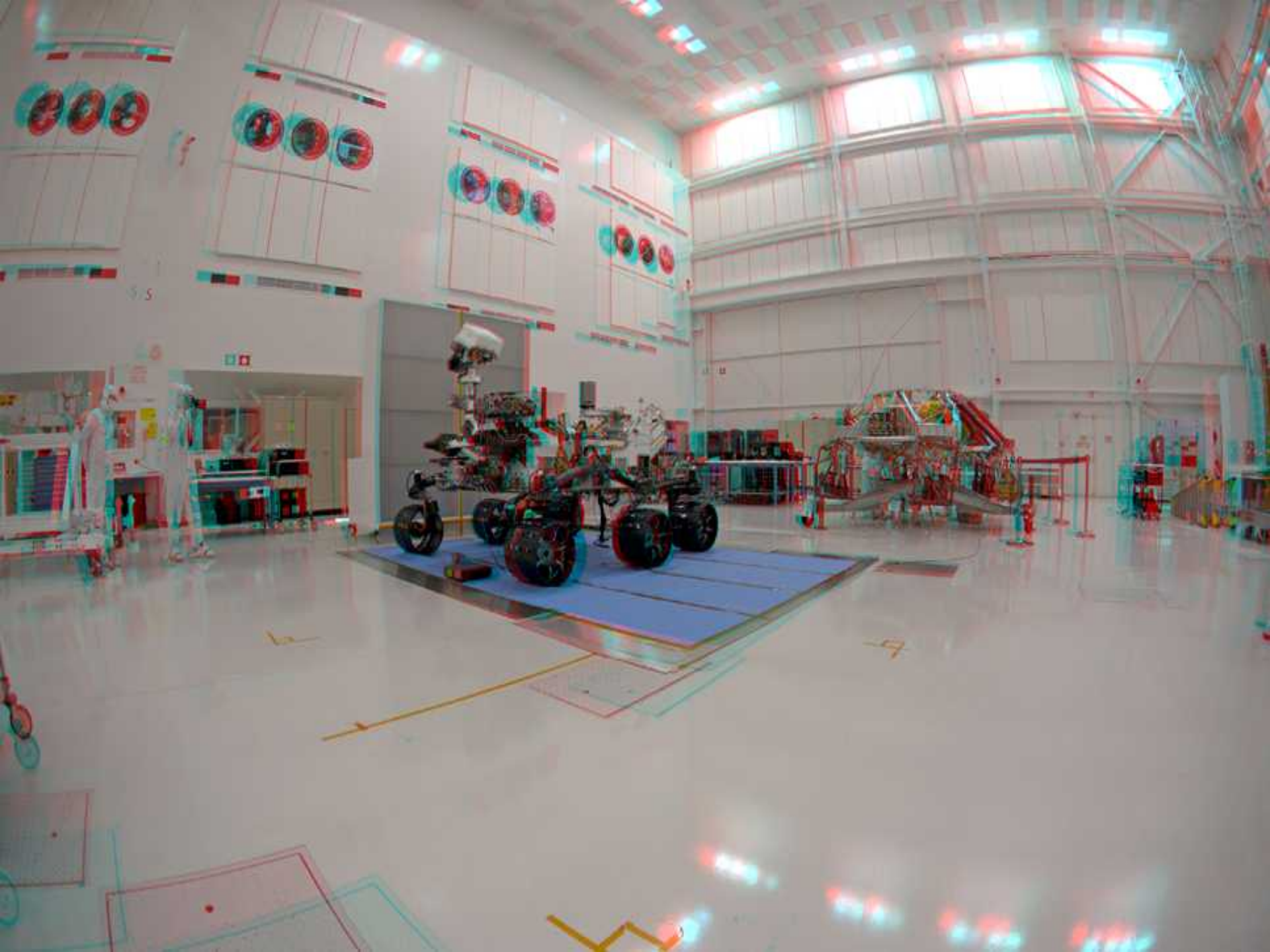
Jenna Eppink and Christie Funk
NASA Langley Research Center

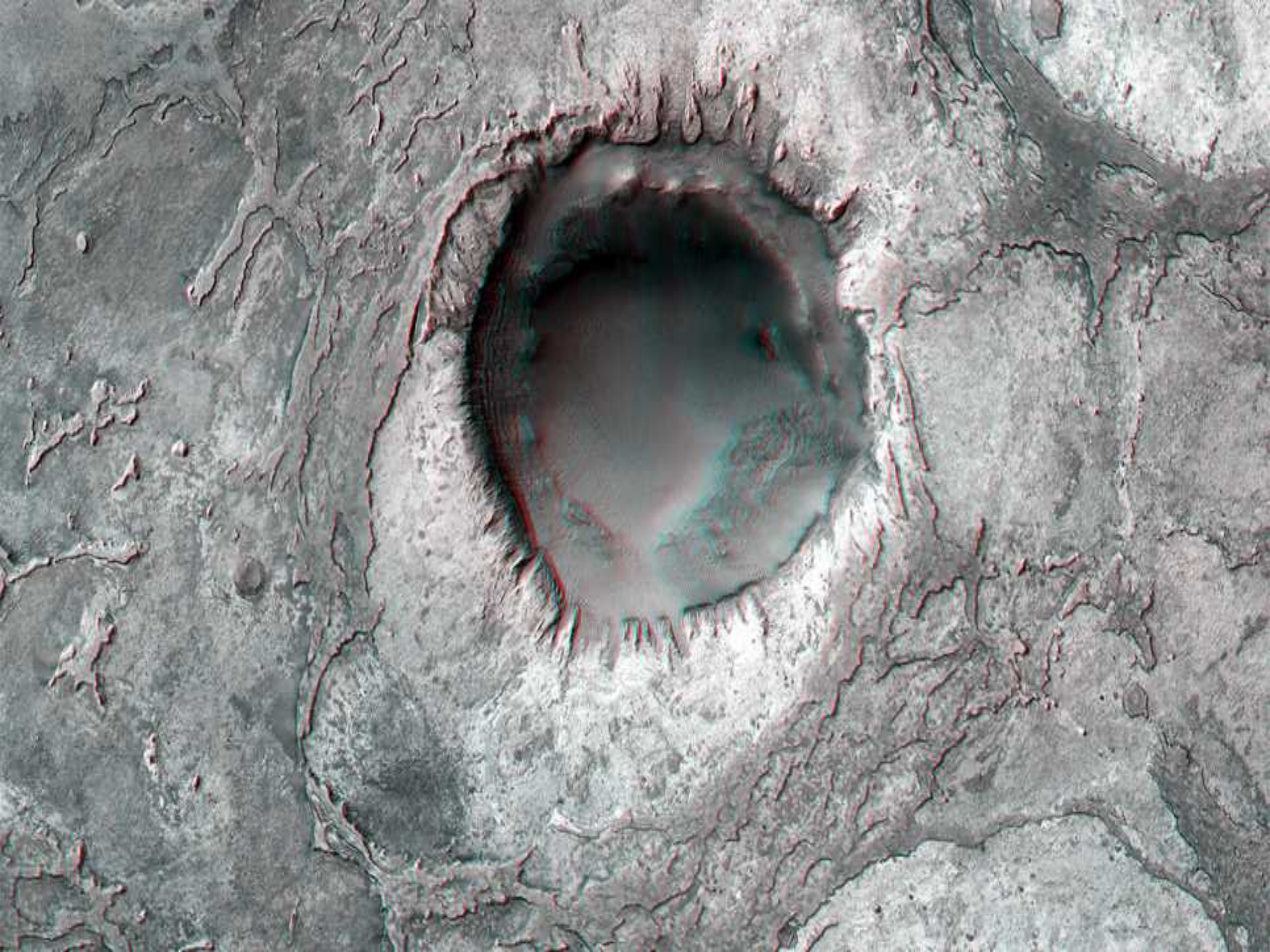


CURIOSITY









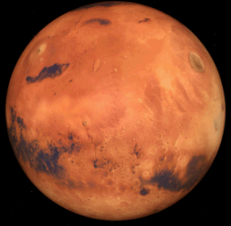


MISSION TO MARS

- **WHAT ARE SOME CHALLENGES ASSOCIATED WITH A MISSION TO MARS?**

Trip Time

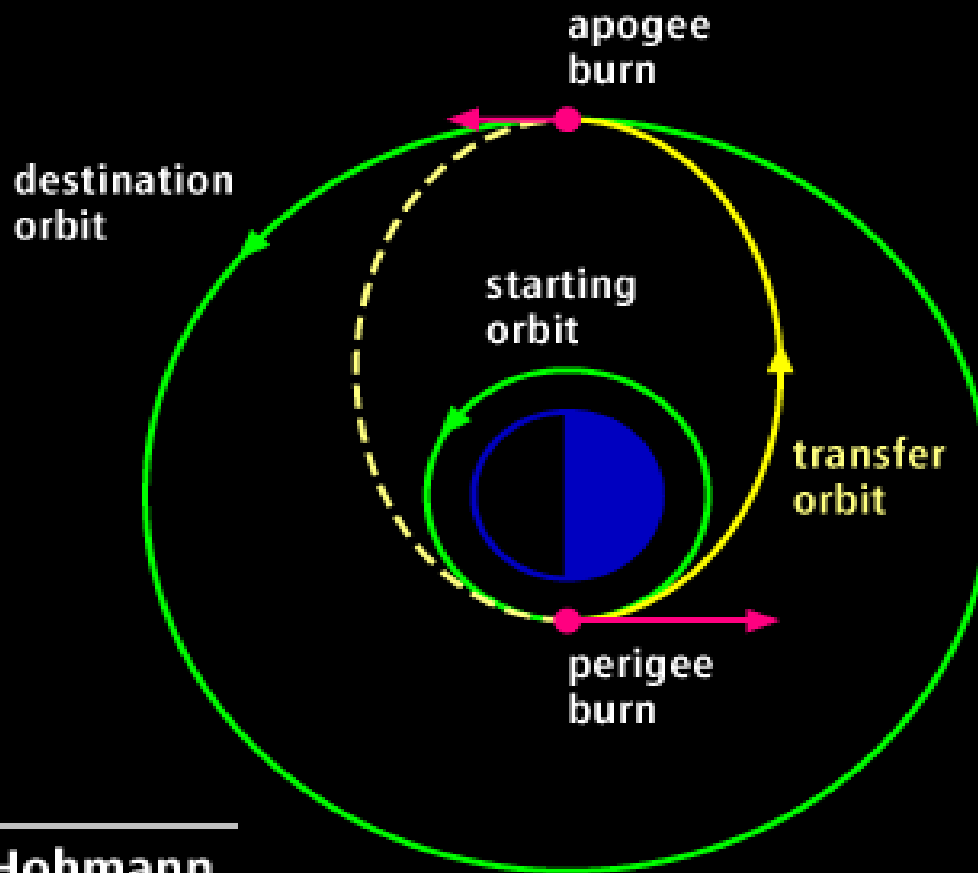
- Round trip human expedition to Mars: 2-3 years (incl. time spent on the Red Planet)
 - » Astronauts lose muscle and bone mass due to microgravity
 - » Radiation exposure
 - » How to provide enough supplies
 - » How to store enough fuel



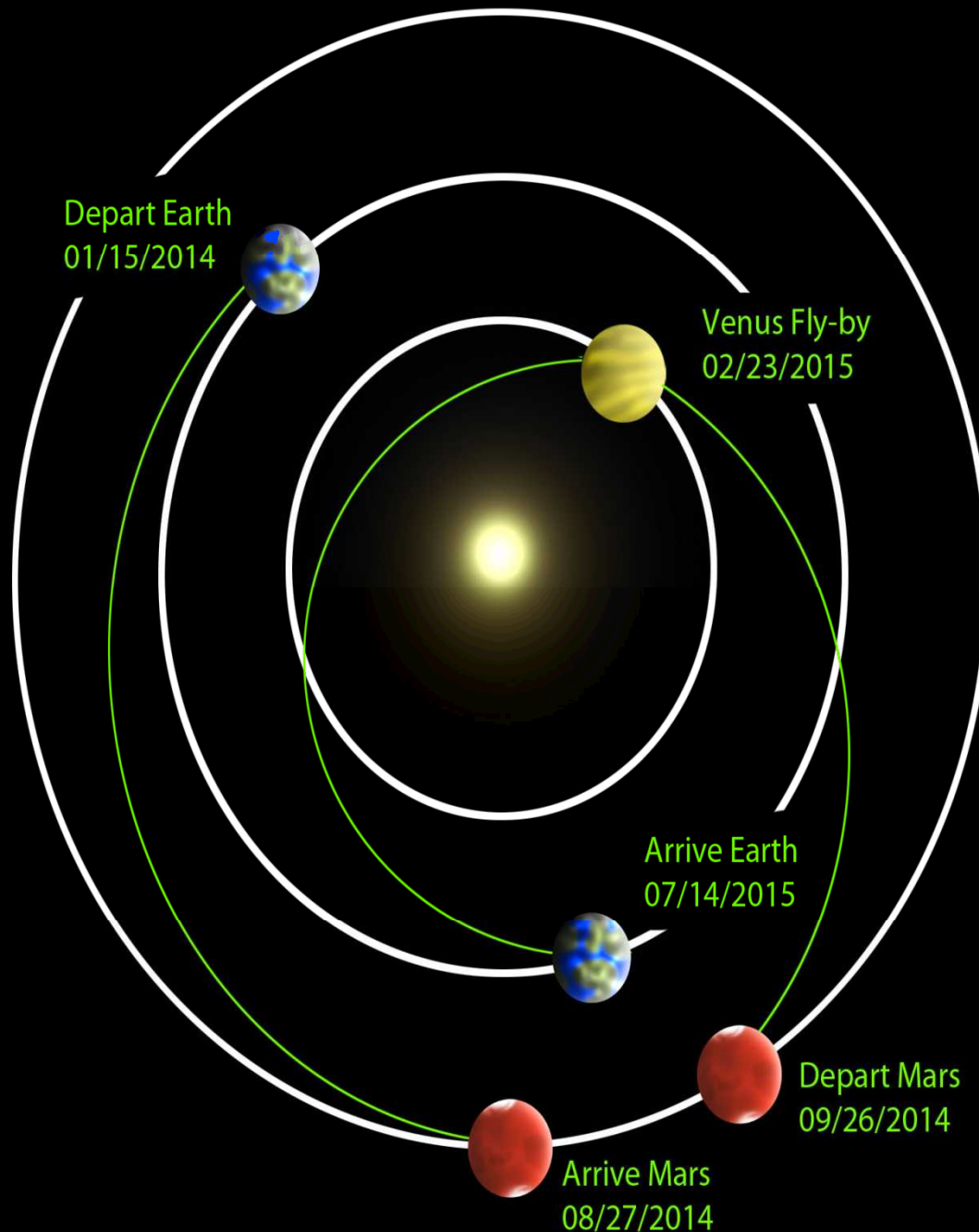
MISSION TO MARS

- HOW WOULD YOU GO FROM THE EARTH TO MARS? STRAIGHT LINE?
- HOW FAR ARE THE EARTH AND MARS FROM THE SUN?
 - The Earth is 149,600,000 km from the Sun
 - Mars is 227,940,000 km from the Sun
 - Scale for today's activity:
1 cm = 10,000,000 km

HOHMANN TRANSFER



Hohmann
Transfer
Orbit



Mission Times

Outbound 224 Days

Stay 30 Days

Return 291 Days

Total:

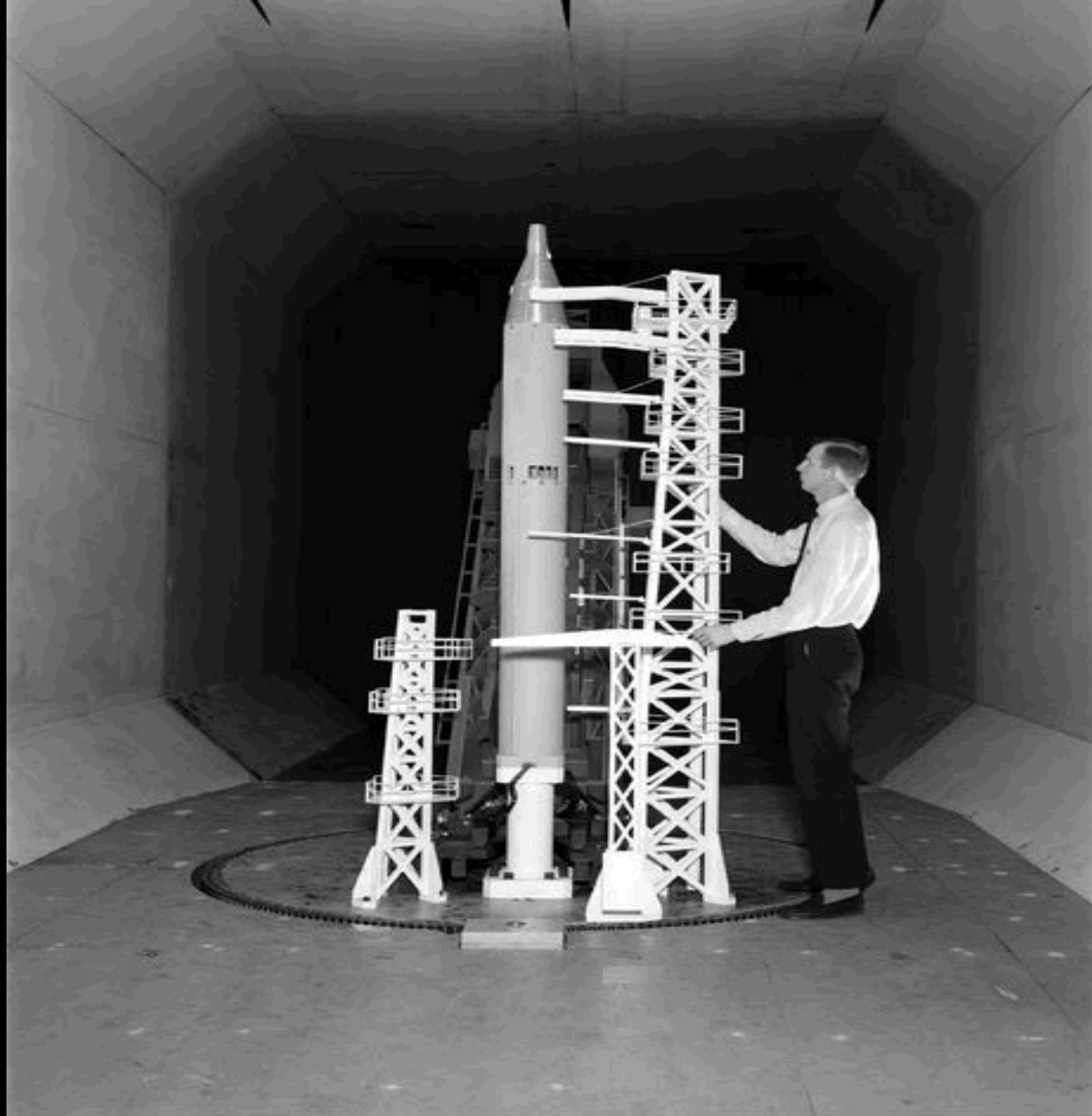
545 Days

The NASA Langley Transonic Dynamics Tunnel



Test section: 16 feet x 16 feet
Test medium: R-134a or Air
Mach number range: 0 to 1.2
Total pressure range: 0.01 to 1.0 atmosphere
Dynamic pressure (max): 550 psf (R-134a) / 320 psf (Air)







F/A-18 E/F flutter clearance model in the Langley TDT
NASA Langley Research Center

7/27/1994

Image # EL-1996-00023



Cessna GX Flutter Model
NASA Langley Research Center

1/21/1994

Image # EL-1996-00105

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At Bombardier**

**China's Hypersonic
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AVIATION WEEK

& SPACE TECHNOLOGY



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2'x3' Low Speed Boundary Layer Channel

