

**A Capable and Temporary Test Facility on a  
Shoestring Budget:  
The MSL Touchdown Test Facility**

**2008 Aerospace Testing Seminar**

April 8, 2008

Christopher V. White, John K. Frankovich  
Philip Yates, George Wells, Jr., Robert Losey

Jet Propulsion Laboratory  
California Institute of Technology  
Pasadena, CA 91109





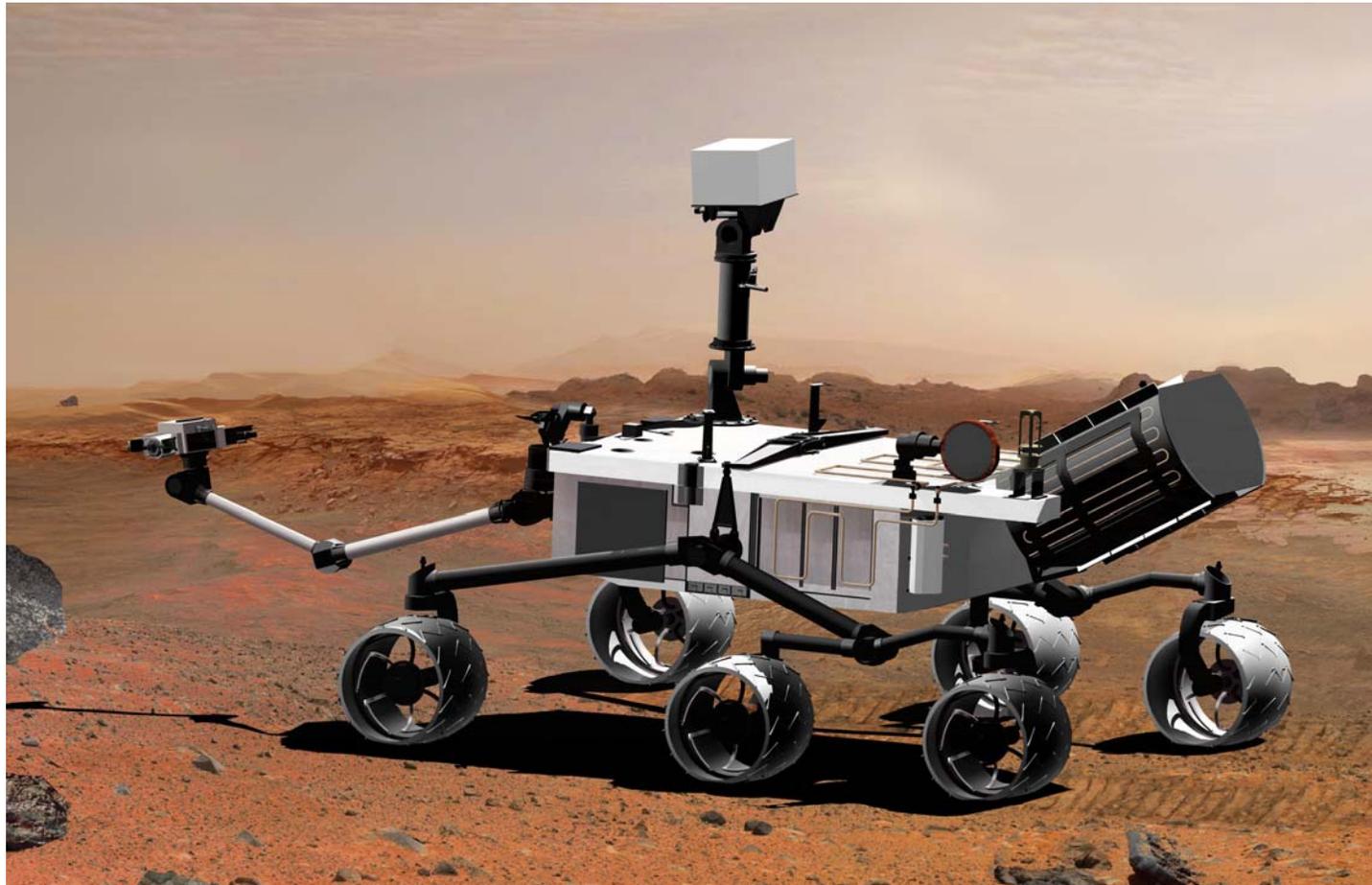
# Mars Science Laboratory (MSL), Sept 2009

Jet Propulsion Laboratory

Mars Science Laboratory Project



**“Explore and quantitatively assess a local region on Mars’ surface as a potential habitat for life, past or present”**



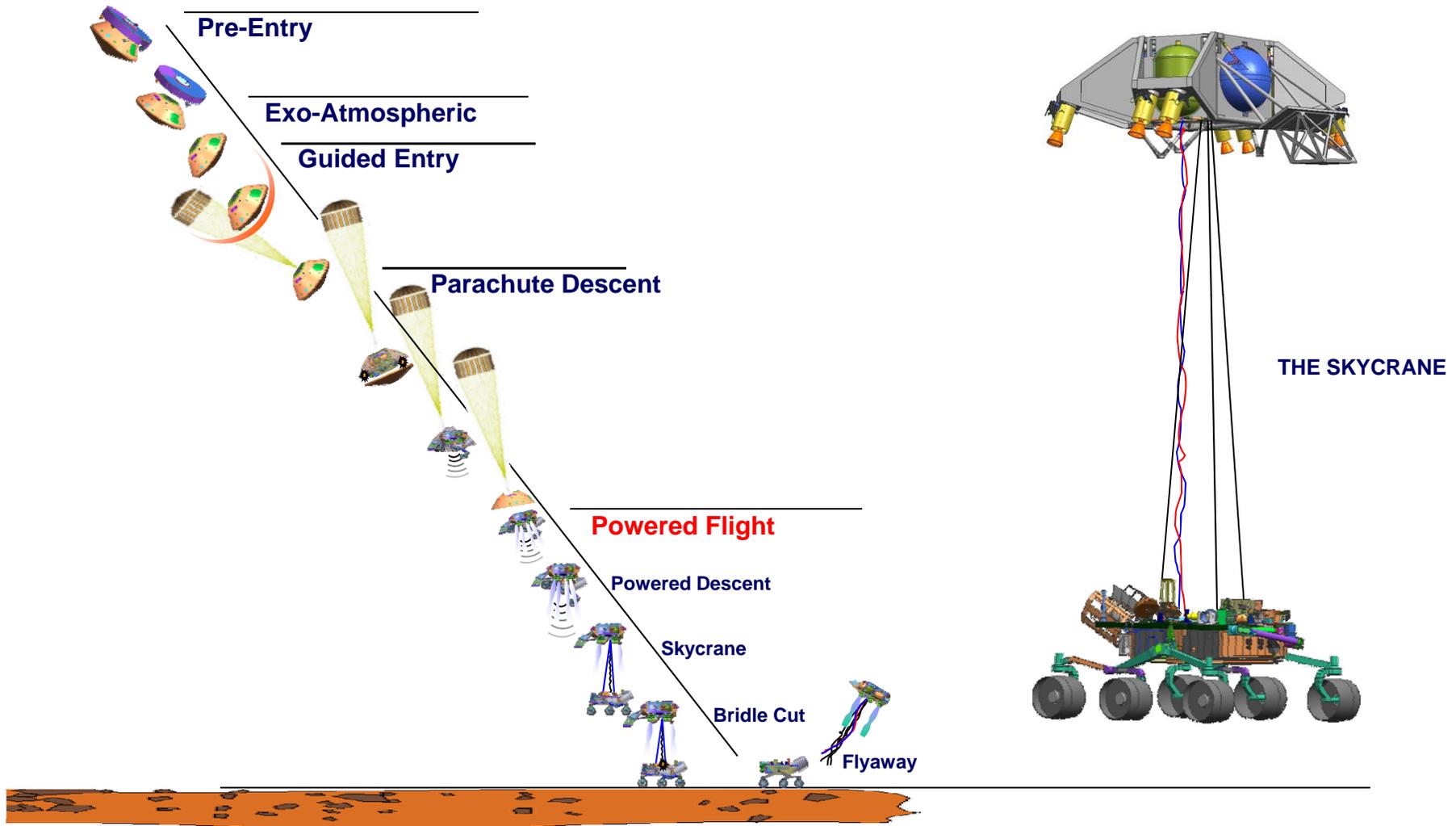
April 8, 2008

THE MSL TOUCHDOWN TEST FACILITY

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# EDL Overview

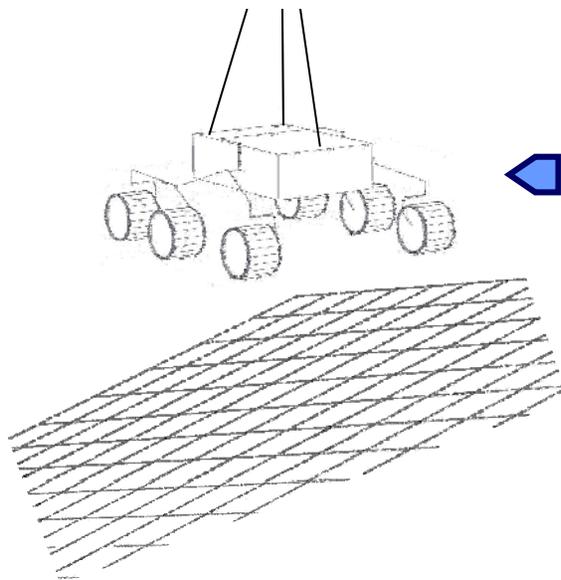
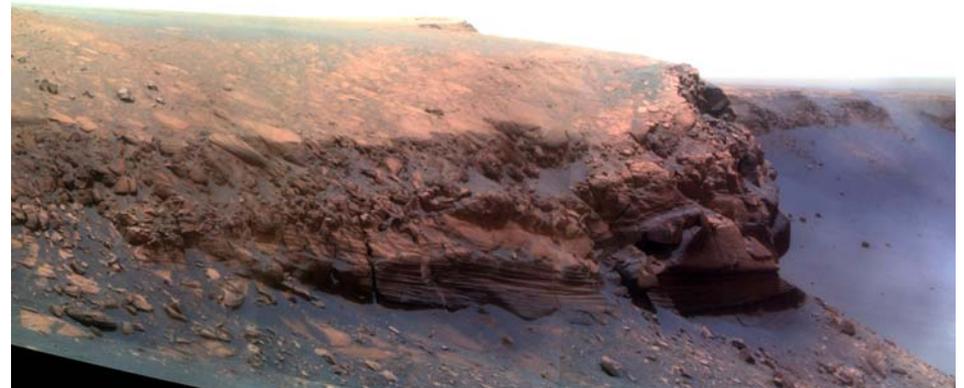




# How do you ensure a successful landing?



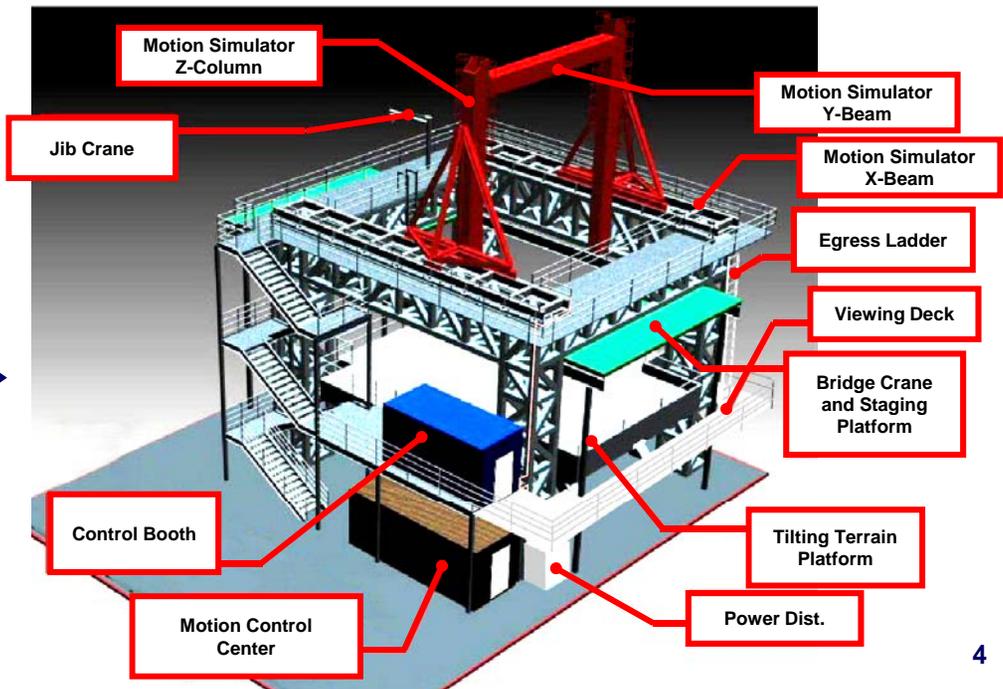
And Everything In-Between



COMPUTER SIMULATION (ADAMS)

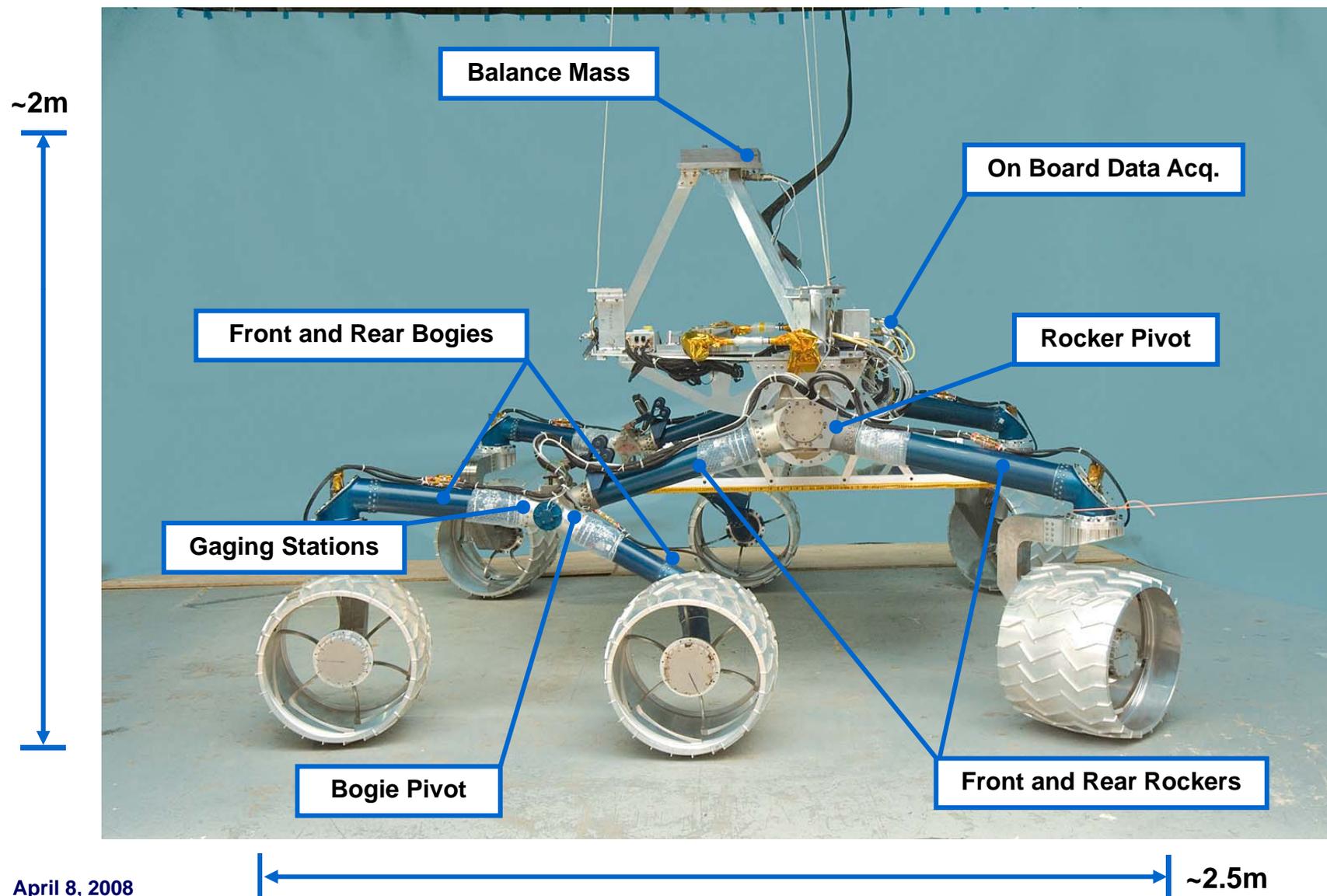


TESTING PROGRAM



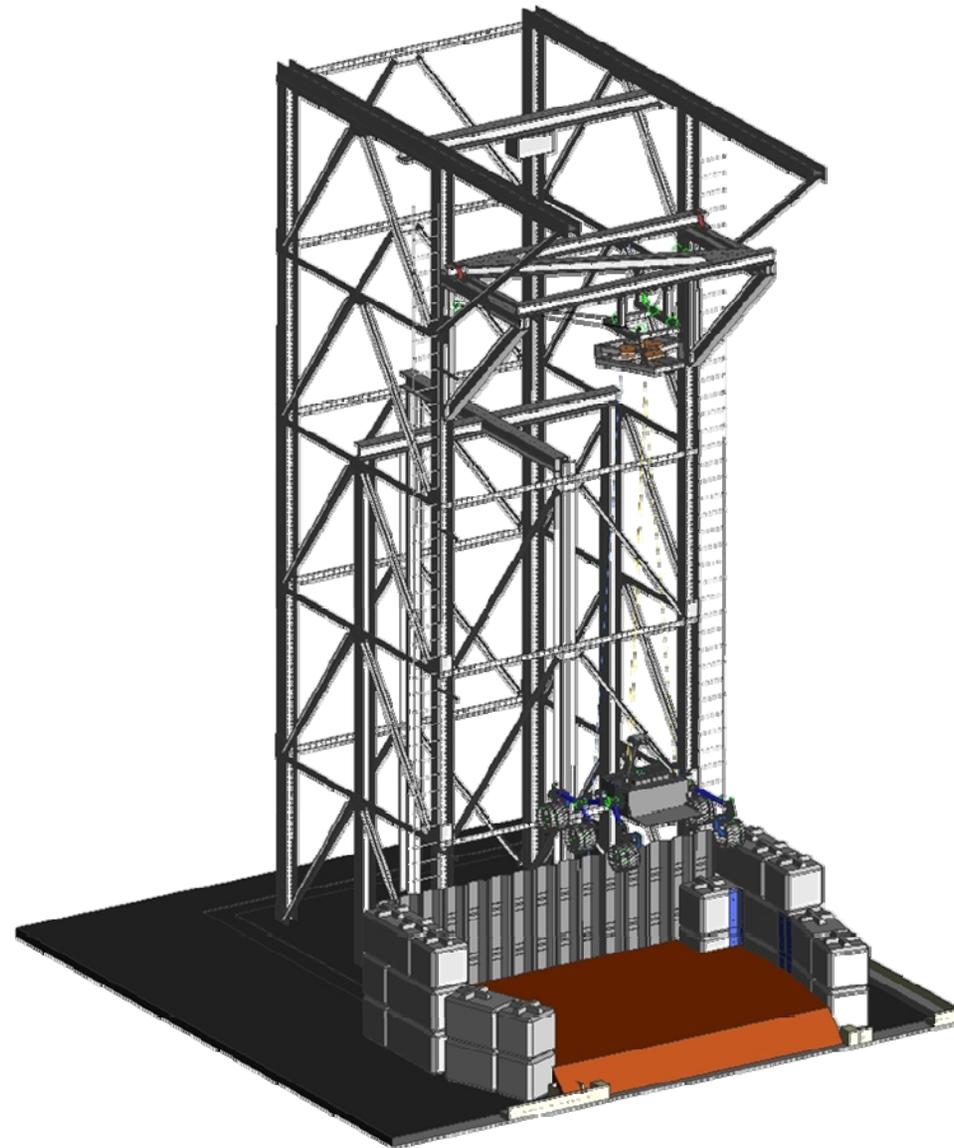
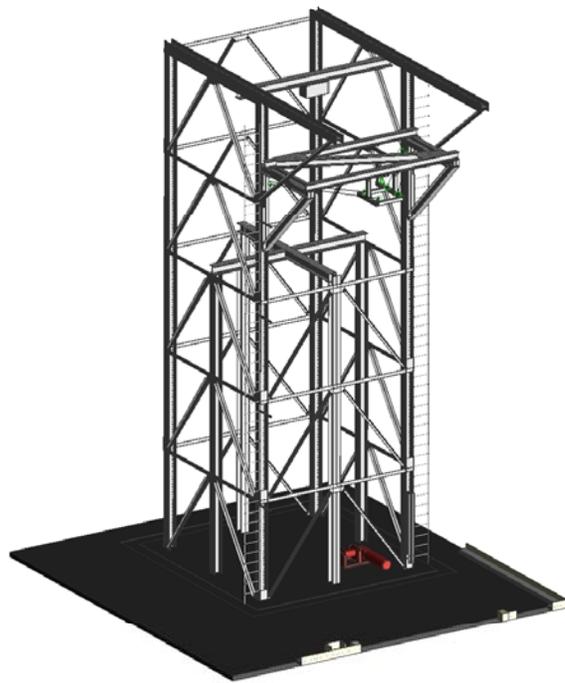


# Test Vehicle (SCARECROW)



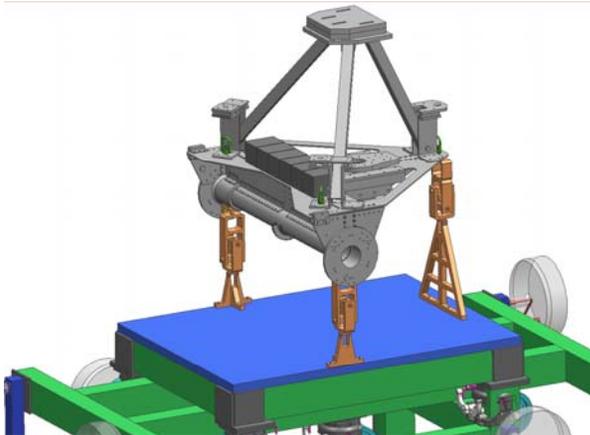


# Facility Development (Modifying 280)

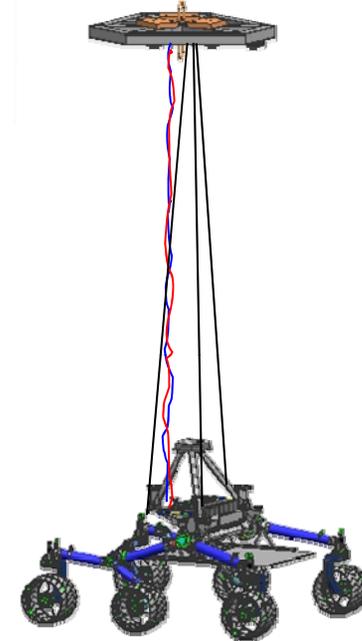




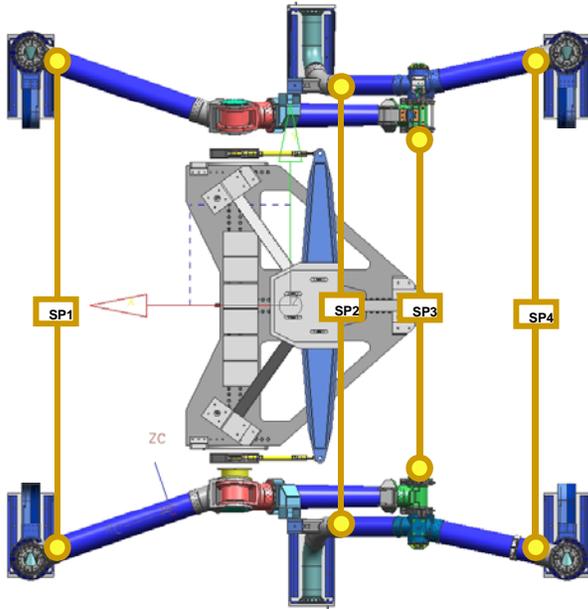
# The Testing Plan



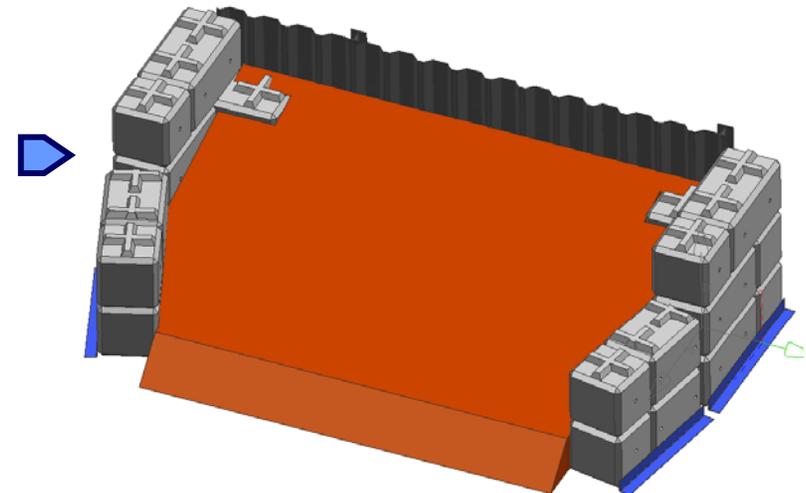
CG Measurement



Stiffness Testing



Touchdown Simulations





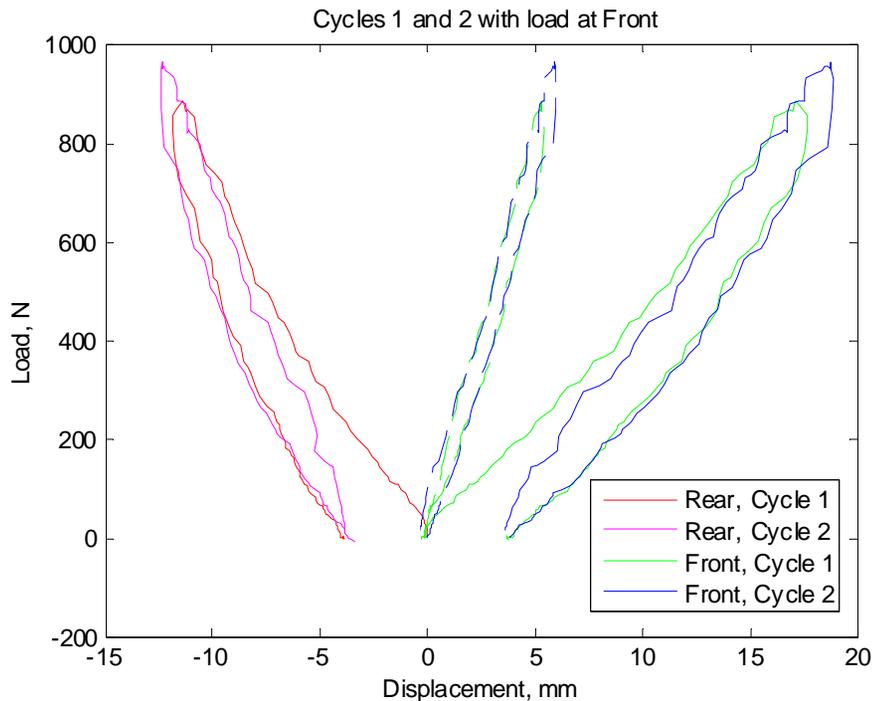
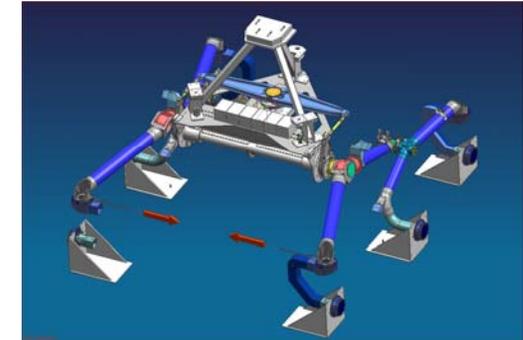
# Strain Gage Calibration and Stiffness Testing

Jet Propulsion Laboratory

Mars Science Laboratory Project



- **Achieved Two Goals with Simple Testing Suite**
  - **Budget conscious**
    - **Sailing Tackle for Squeeze Loads**
    - **Overhead Crane for Downward Pull**

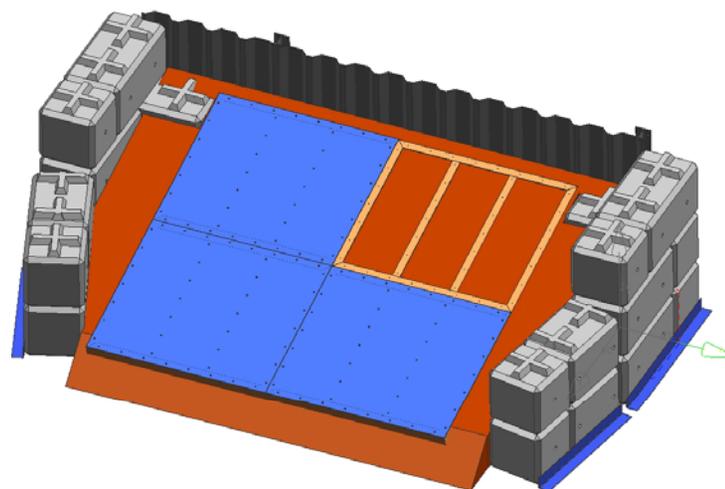
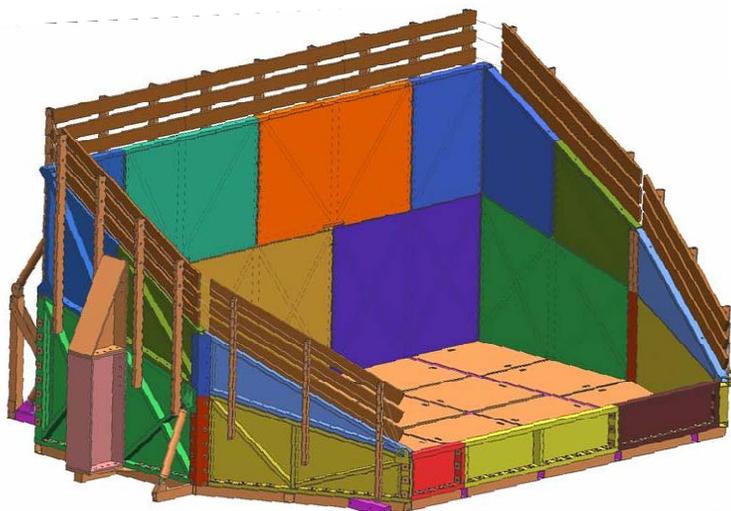




# Facility Development (Sandbox)



- Develop and fabricate sandbox
  - Capable of holding 41 Cubic yards of sand
  - Accommodating to varying surface inclines
  - Fit inside the small building footprint
  - Quickly assembly/disassembly
  - Cheap!













# Touchdown Testing Team

*And Many Others...*

