Mars Exploration Program

F. Li

March 17, 2010
Highlights of Mars Operating Missions

Odyssey
- Sept. 2003
  Local true solar time = 4:32 p.m.
- May 2009
  Local true solar time = 3:21 p.m.

2 MER rovers still operational after 6 years on Mars surface
- Opportunity matching towards Endeavor crater
- Spirit embedded in ‘Troy’
- Spirit winter survival

MER
- Opportunity to Endeavor
- Spirit Front and Rear Rover Embedded
- Completed Orbit change to local solar time of ~3:45 pm: allows significant improvements in the SNR for THEMIS IR mapping

MRO has completed mission scientific Level I requirements
- Continues to acquire science data with all its instruments
- Project acquired over 100 Tbits
  - Has acquired more data than all deep space missions beyond the moon combined
- Continues to map a wide variety of Martian terrain suitable for future landing missions
MSL Spacecraft Major Elements

- **Cruise Stage**
- **Backshell (EDL)**
- **Descent Stage**
- **Rover**
- **Heatshield with MEDLI (EDL)**
- **Backshell Interface Plate (BIP)**
- **Parachute Support Structure (PSS)**
- **Parachute (EDL)**
- **Bridle & Umbilical Device**
- **Separations & Pyros**

May 9-10, 2007
MSL ATLO Image
Actuator Status

• ALL flight and flight spare actuators have been delivered to JPL
• WATER (A337) life test is now 100% through the 2x life test
  – Unit is 100% through 3rd life at -90C (final brake cycles on-going)
• LPHTA is through 100% through the 2x life test
  – Still plan to complete 3rd life at -90C
MSL Payload Progress

All major payload elements delivered, except REMS, ChemCAM and SAM
Flight RA Shoulder Assembly

Flight TDS ready for TVAC prior to TRM rework
MSL ATLO starts
MSL Progressing to 2011 Launch

- Landing site workshop in Sept ‘10 will assess the priority of adding/ MODIFYING candidate sites

- Remaining significant development issues:
  - SAM Wide Range Pump
  - Radar Transmit Receive Module
  - MMRTG beginning of mission power shortfall
  - Mid-wheel restraint

- Agency PMC January 2010:
  - Approved to proceed, consistent with independent review committee recommendation
  - 2011 LRD achievable, & cost and risk remain well within predictions and external commitment

- ATLO formally started in Feb’10
  - Moving to system level environment tests later 2010/early 2011
Mars Exploration Program

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Mars Exploration Program

- 2001: Mars Odyssey
- 2003: ESA Mars Express
- 2005: Mars Reconnaissance Orbiter
- 2007: Phoenix
- 2011: Mars Science Laboratory
- 2013: MAVEN
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