Mars Exploration Program
An Integrated, Strategic Program

- Odyssey (2001)
- MRO (2005)
- Phoenix (2007, completed)
- Spirit & Opportunity (2001)
- MSL/Curiosity (2009)
- MAVEN (2013)
- Mars future planning underway!

2003
2005
2007
2009
2011
2013
2016 & Beyond

PSS - October 2, 2012
General Program Update

- **MPPG is complete**
  - Next steps are in NASA’s hands under PPBE14 process

- **InSight**
  - Managed by the Discovery Program Office
  - MEP Program Exec (Ramon DePaula) and Program Scientist (Mitch Schulte) will oversee the Project for HQ/PSD
    - Dr. DePaula was the Phoenix Program Exec

- **MSL Entry, Descent and Landing (EDL) Reconstruction initiated**

- **Senior Review**
  - Did not take into account the Programmatic infrastructure requirements at Mars (telecom, site certification, etc.)
  - Final funding levels will be set by MEP/PSD incorporating Sr. Review results and programmtics
## Mars Exploration Program Mission Status

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<tr>
<th>TECH</th>
<th>COST</th>
<th>SCHD</th>
<th>PROG</th>
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<tr>
<td>Odyssey (ODY)</td>
<td>Y</td>
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<td>Mars Exploration Rovers (MER)</td>
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<td>ESA/Mars Express (MEx)</td>
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<td>Mars Reconnaissance Orbiter (MRO)</td>
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<td>Mars Science Laboratory (MSL)/Curiosity</td>
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<td>Mars Atmosphere and Volatile Evolution Mission (MAVEN)</td>
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- **Progress according to plan**: All commitments can be met
- **Area of concern**: Problem can be resolved within reporting organization; Needs attention
- **Significant problem**: Solution not identified; Needs action/help beyond reporting org.
Opportunity at Cape York
Curiosity’s Parachute

Orbiter Support

Curiosity tracks on Mars!
Orbiter Comm Support to Curiosity

- Through Sol 48, over 23 Gb of Curiosity data have been returned via ODY and MRO
  - Average data return per sol exceeds 480 Mb/sol
- Adapative Data Rate (ADR) is now being used routinely for all MRO passes
- Since Sol 39, with HiRISE, CTX, MARCI, MCS, and CRISM all powered on, we are averaging ~400 Mb/sol on the MSL-MRO link
Mars Exploration Program – Plan Forward 1/2

• Mars Program Planning Group (MPPG) results briefed to SMD at the end of August.
  – Established by the SMD as one component of planning the next step in Mars Exploration
  – MEP/PSD now develops a recommended architecture integrating MPPG study with other drivers

• MPPG stakeholder briefings completed in September, and rolled-out publicly
  – CAPS briefing 9/25
  – Press telecon and release of MPPG summary report also on 9/25
    • Downloadable at: www.nasa.gov/marsplanning

• A Mars Exploration Program architecture will be recommended to NASA and OMB during the FY14 PPBE process
  – Focus on 2018/2020/2022
  – If possible, establish SDTs, draft AO’s, etc. in Oct/Nov to enable a 2018
    • 2018 mission is funding and program architecture dependent
Mars Exploration Program Budget History ($M)

(*) actual based on last Op Plan of each Fiscal Year

PSS - October 2, 2012
Next Steps:
– Sept/Oct: NASA integrates MPPG results with other drivers and generates architecture for the reformulated Mars Exploration Program
– Mid-Oct: Brief OMB on reformulated Mars Exploration Program
– Late Nov: OMB Passback
– Oct/Nov: If possible, establish SDTs, draft AO’s, etc., to enable 2018
– NLT Feb 2013: Roll-out revised Mars Exploration program in FY14 President’s Budget Request
– Feb/Mar: Engage Community on reformulated MEP (PSS, NRC, MEPAG, etc.)

Note that NASA’s plan for reformulating Mars exploration is embargoed under the PPBE-14 budget process
– Release prior to President’s FY14 Budget Request (Feb ‘13) is TBD
Launch date: Nov. 26, 2011
Cape Canaveral, Florida
Landing Accuracy

2012 Curiosity
12 x 4 mi

2008 Phoenix
62 x 12 mi

2004 Opportunity & Spirit
93 x 12 mi

1997 Pathfinder
125 x 44 mi

1976 Viking
174 x 62 mi

Surface Elevation (mi)

-3  -2  -1  0
Sol 10
Windy

Summer solstice
Aug 16, 2012 on Earth

Temperature
(min / max)
-11 °C
-71 °C

Average Pressure
8.2 hPa
Higher than nominal

Average Abs. Humidity
8 %

Dominant Winds
Blowing from the NW at 25 m/s

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http://cab.inta-csic.es/rems/marsweather.html
Where Water Flowed Down Slope
SMMWG Approved Green Route
18 Sept. 2012
(modified for drive up to Sol 50)
Drive Progress (as the crow flies)

Arrive Glenelg Target on Sol 70

"SSS/ LTP Current Plan"

Cumulative Drive

Drive to scooping target; model as 25 m/sol

Drive to Glenelg; model as 10 m/sol

FTAs @ Scooping

FTAs @ Jake_M

Cumulative Eff

Sol

PSS - October 2, 2012
I’m Curiosity...

...and I know it!