National Aeronautics and Space Administration

# MEPAG

## October 4, 2012

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This says it all!
MARS IS HARD!
EARTH
HALF-TIME
SCORE:
MARS
24
16

...well, almost!

SCAN & TRACK ON BACK
14/50
Hot Wheels
MARS ROVER CURIOSITY
3+
2012 NEW MODELS
14/247
Hot Wheels collectSPACE

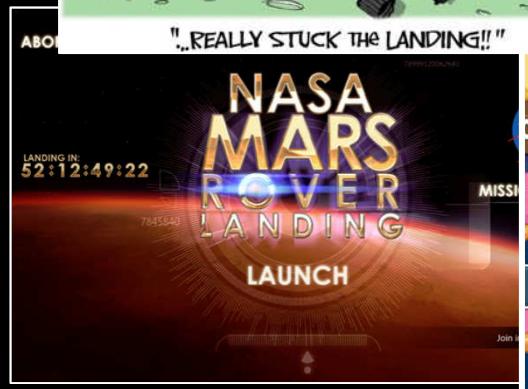
LEGO
SPACE

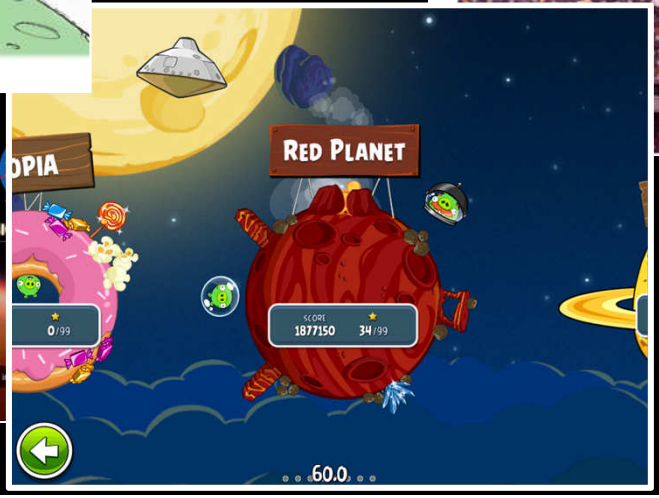
Los Angeles Times
7 shot dead at Sikh temple
'Wheels down on Mars'
BIG news

7 MINUTES OF TERROR

10 10 10
MARS OLYMPICS
"..REALLY STUCK THE LANDING!!"

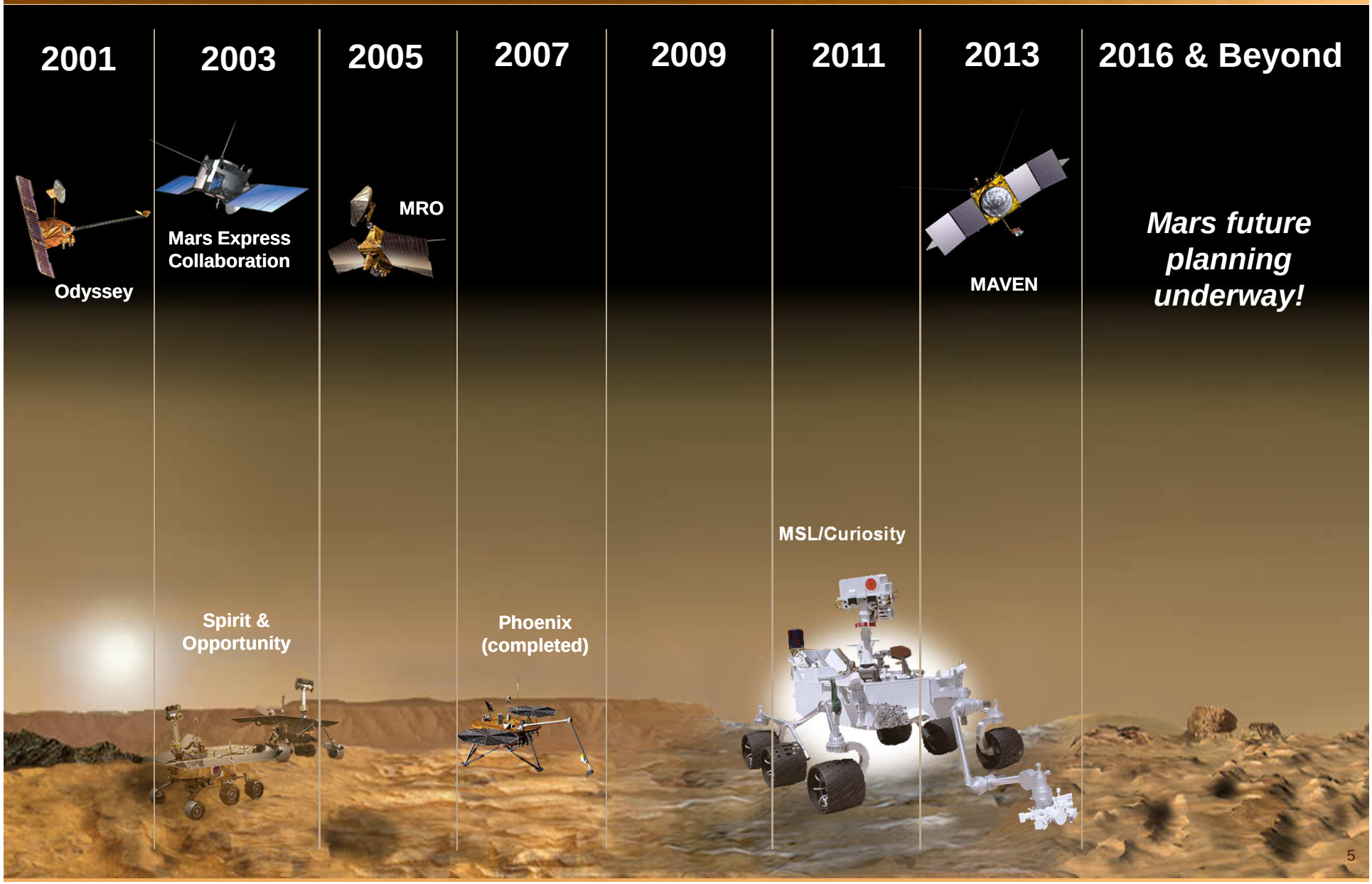
Google


NASA MARS ROVER LANDING
LANDING IN:
52:12:49:22
LAUNCH


RED PLANET
0/99
SCORE
1877150
34/99
60.0

# Mars Exploration Program

## More Than a Decade of Integrated, Strategic Program Planning



# "State of the Program" 1/2

| | TECH | COST | SCHD | PROG | COMMENTS |
|---|---|---|---|---|---|
| Odyssey (ODY) | Y | G | G | G | Returning to nominal spacecraft/instrument extended mission operations after Curiosity landing and intial ops support. Continuing MER and Curiosity ops UHF relay support. Working to develop operational solutions for reaction wheel and IMU issues. |
| Mars Exploration Rovers (MER) | G | G | G | G | Opportunity has exceeded 35 km on Mars and is in good health with ample energy production as spring and summer approach. Currently exploring Cape York at the rim of Endeavour Crater. |
| ESA/Mars Express (MEx) | G | G | G | G | Nominal extended operations; provided MSL/Curiosity landing support |
| Mars Reconnaissance Orbiter (MRO) | G | G | G | G | Returning to nominal spacecraft/instrument extended mission operations after Curiosity landing and intial ops support. Continuing MER and Curiosity ops UHF relay support |
| Mars Science Laboratory (MSL)/Curosity | G | G | G | G | Arrived August 5, 2012 PDT! All systems are healthy and rover is proceeding to first science destination - Glenelg |
| Mars Atmosphere and Volatile Evolution Mission (MAVEN) | G | G | G | G | MAVEN passed KDP-D and started ATLO early - August 2012 |

Progress according to plan
All commitments can be met

Area of concern; Problem can be resolved within reporting organization; Needs attention

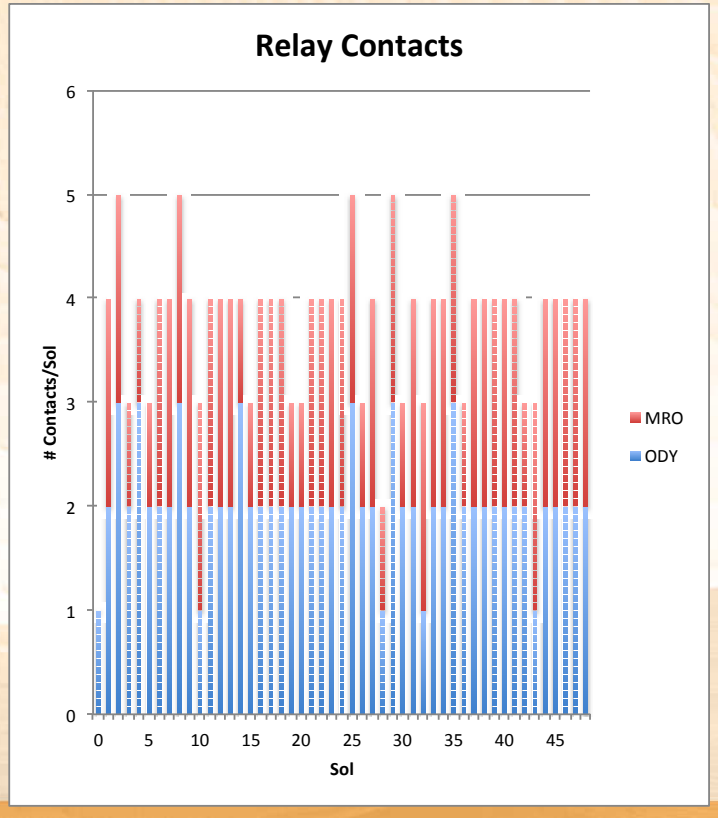
Significant problem; Solution not identified
Needs action/help beyond reporting org.

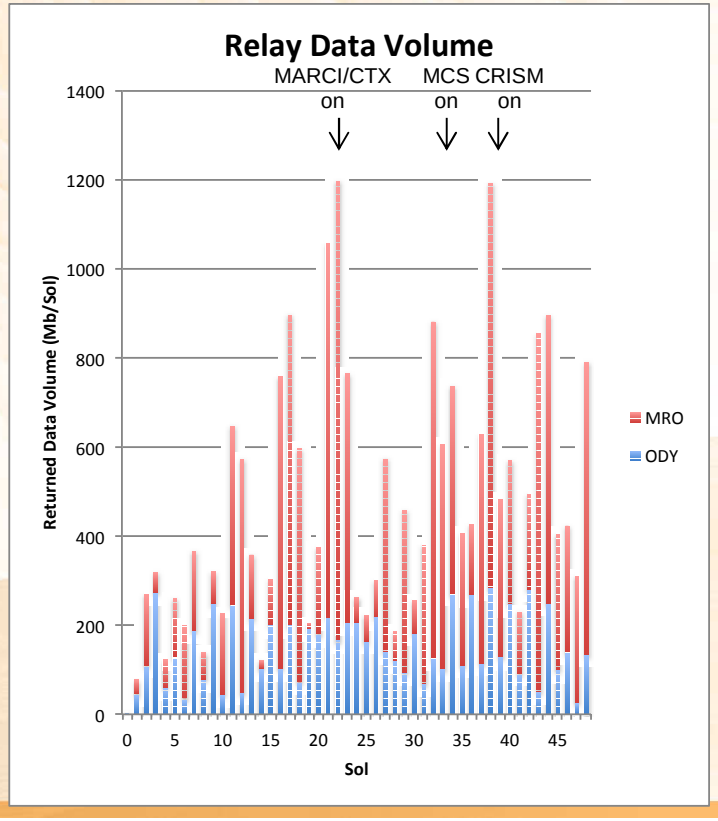
# “State of the Program” 2/2

- MSL/Curiosity remains the highest priority of MEP.
  - Entry, Descent and Landing (EDL) Reconstruction initiated
- MAVEN remains the highest-priority mission in development.
- Operating missions, Odyssey, MRO, and Opportunity are fully funded, including through the notional run-out.
  - Senior Review did not take programmatic infrastructure requirements into account (telecom, site certification, etc.)
- 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

# Fantastic Comm Support to Curiosity

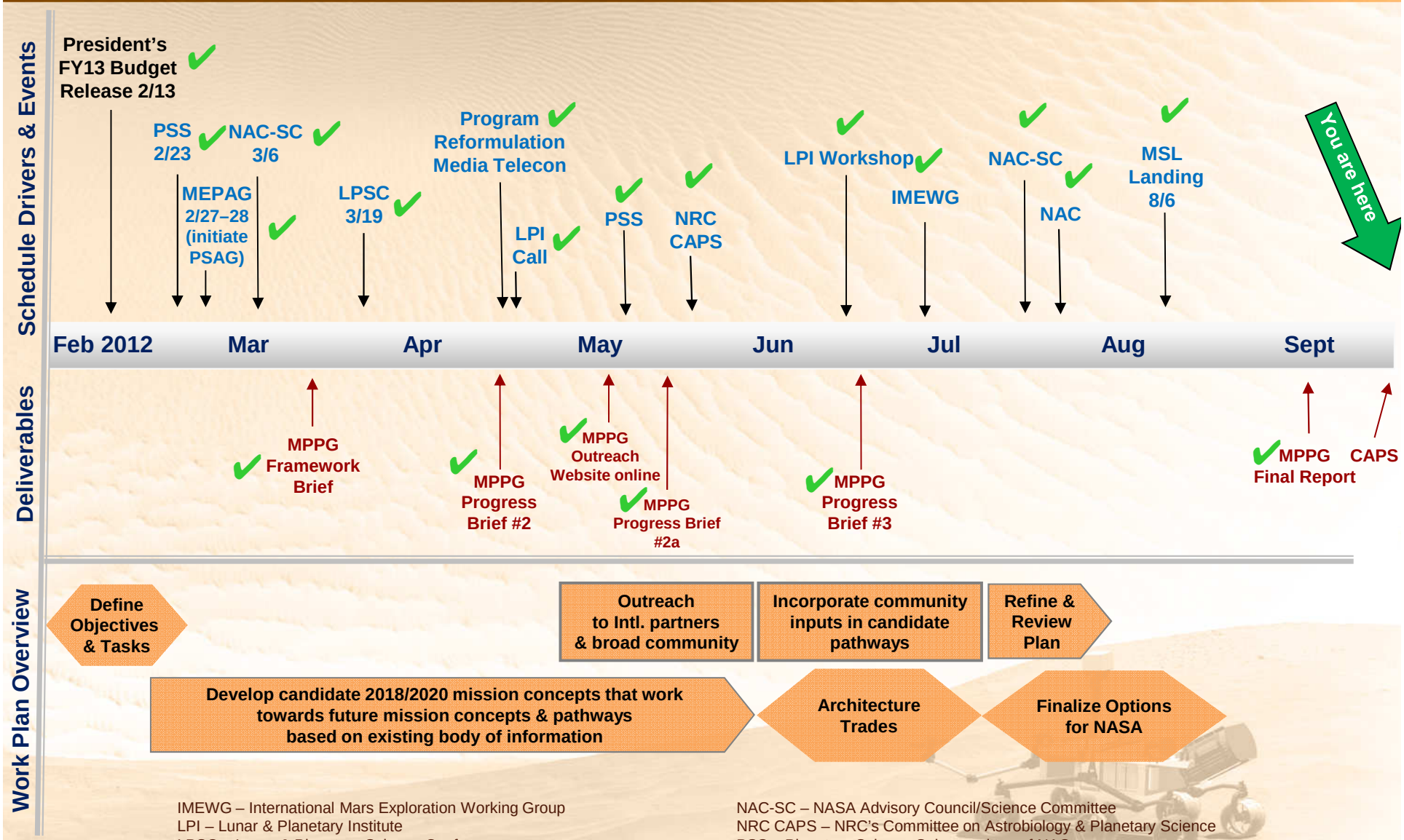
- Through Sol 48, over 23 Gb of Curiosity data have been returned via ODY and MRO
  - Average data return per sol exceeds 480 Mb/sol
  - Some days <1Gb!
- Electra's Adapative Data Rate (ADR) is now being used routinely for MRO passes



# Mars Exploration Program Reformulation

## FY12 Timeline & Milestones (dates are approximate)



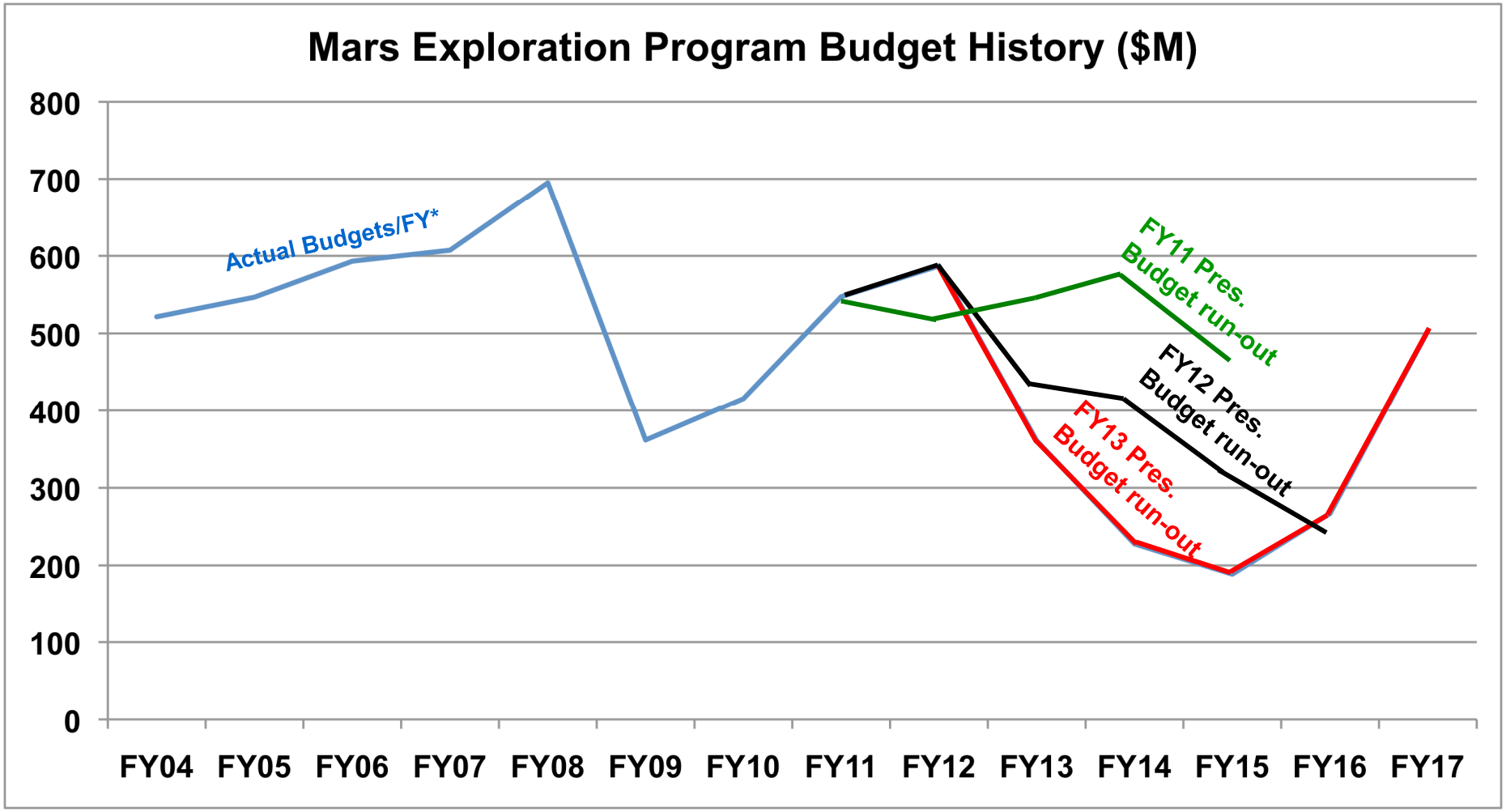

IMEWG – International Mars Exploration Working Group
LPI – Lunar & Planetary Institute
LPSC – Lunar & Planetary Science Conference
MEPAG – Mars Exploration Program Analysis Group

NAC-SC – NASA Advisory Council/Science Committee
NRC CAPS – NRC's Committee on Astrobiology & Planetary Science
PSS – Planetary Science Subcommittee of NAC
NRC – National Research Council

# 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

# MEP Budget History




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

# Mars Exploration Program – Plan Forward 2/2

- 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.)

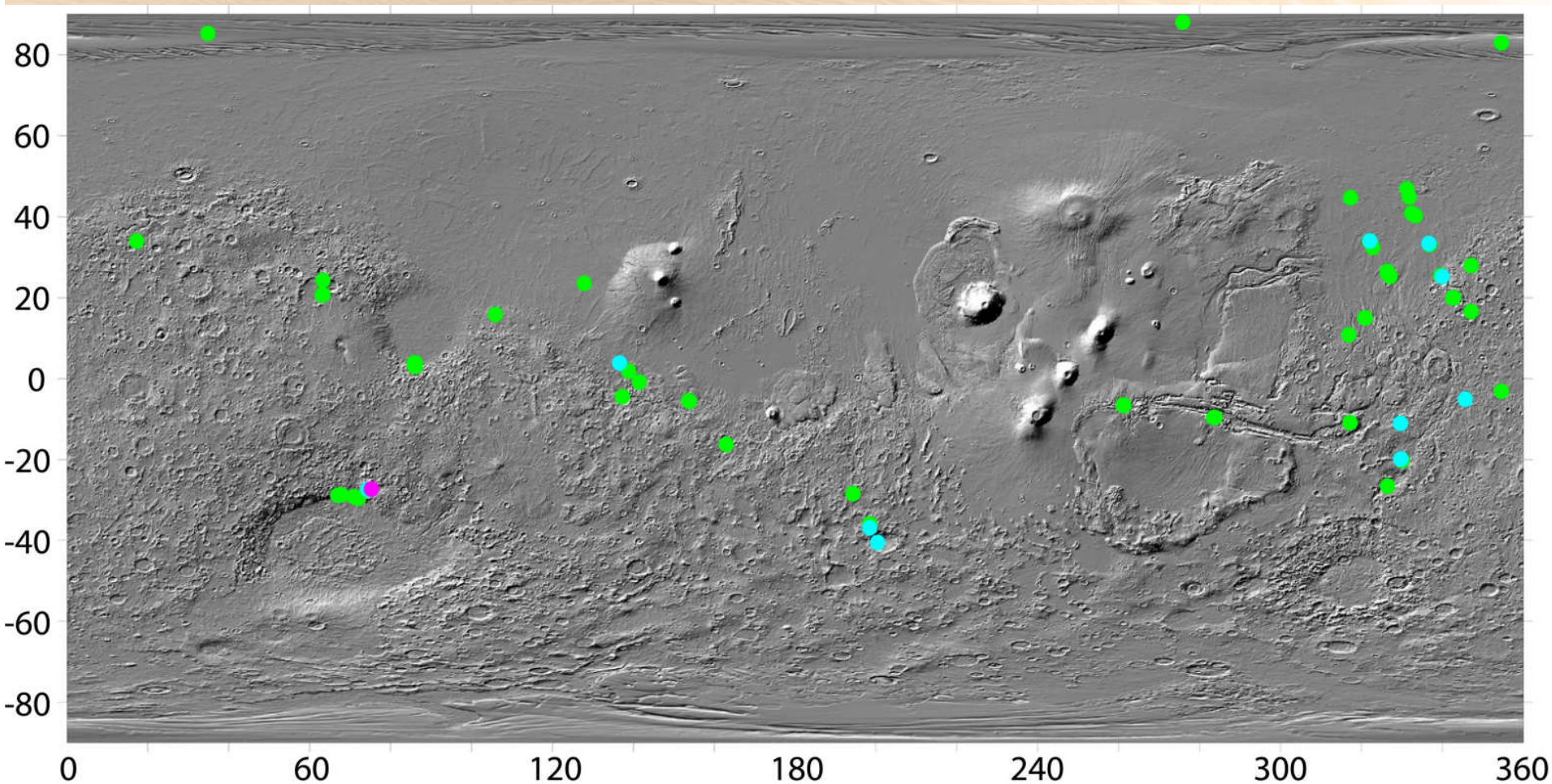
- Note that NASA's plan for reformulating Mars exploration is embargoed under the PPBE-14 budget process
  - Release prior to President's FY14 Budget Request (Feb '13) is TBD

# Candidate Future Landing Sites on Mars:

- Multiple calls for new sites have resulted in 59 candidates total
- Includes a wide range of future mission scenarios
  - Many candidate ellipses are 10 km X 15 km, but others specified by proposer
- Call for Critical Data Products V, VI, and VII (CDP V, VI, and VII) yielded additional candidates (and some funding!).
- New sites queued for imaging by MRO and other orbital assets
- Mars Steering Committee formalized represents international interest and broad scientific topics (Astrobiology to SR and others).
  - Steering Committee includes John Grant, Matt Golombek, and Nicolas Mangold (co-chairs), Steve Ruff, Dave Des Marais, Scott McLennan, Brad Jolliff, Jack Mustard, Ken Tanaka, Barb Sherwood-Lollar, Gian Ori, Ernst Hauber, John Bridges, Mark Sephton, David Fernandez Remolar, Francois Poulet

# Future Mars Landing Sites

## As of September 4, 2012




Acquired/Released

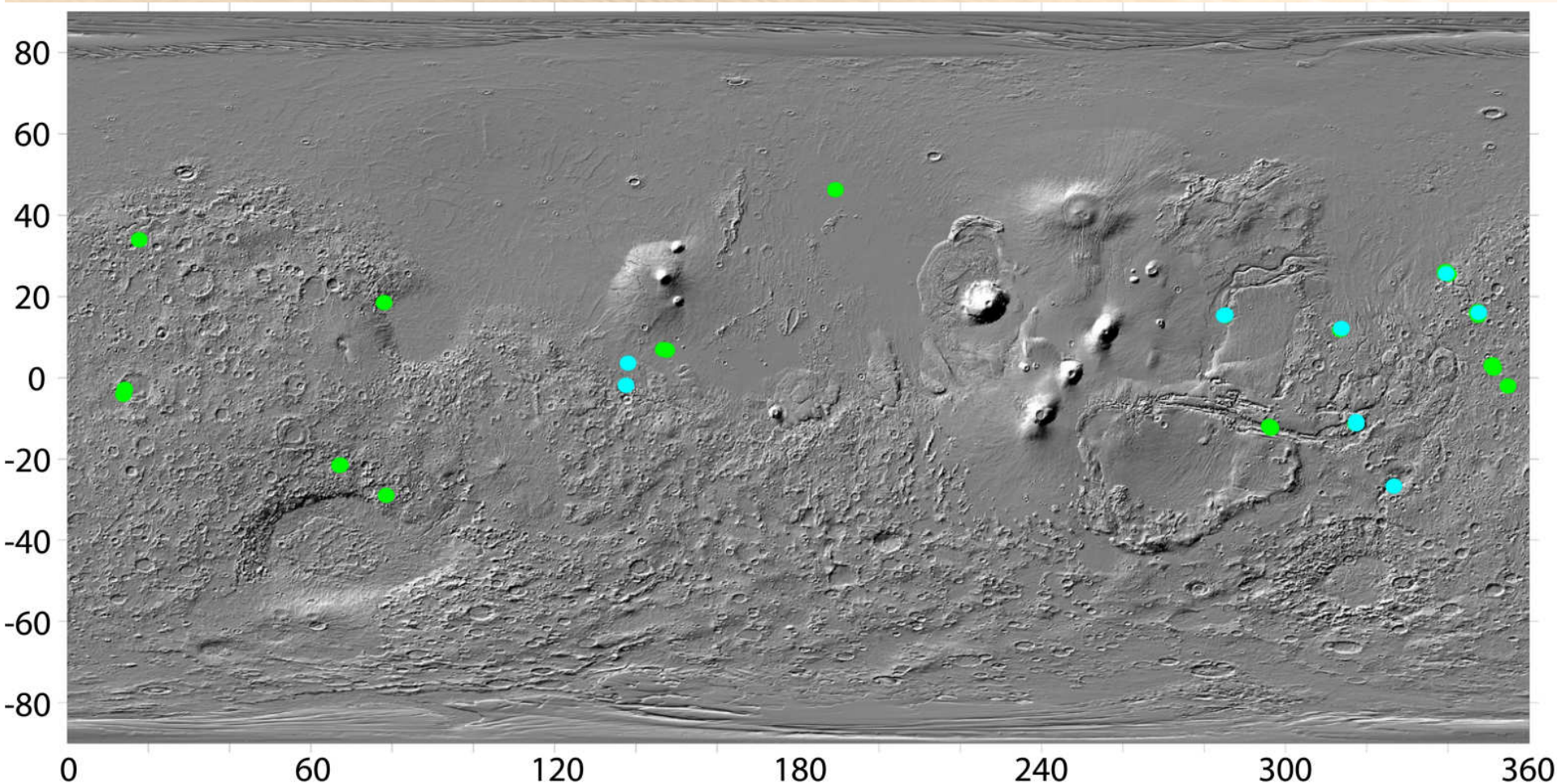
Planned

Suggested

# 2018 ("Joint Rover") Sites

**As of September 4, 2012**

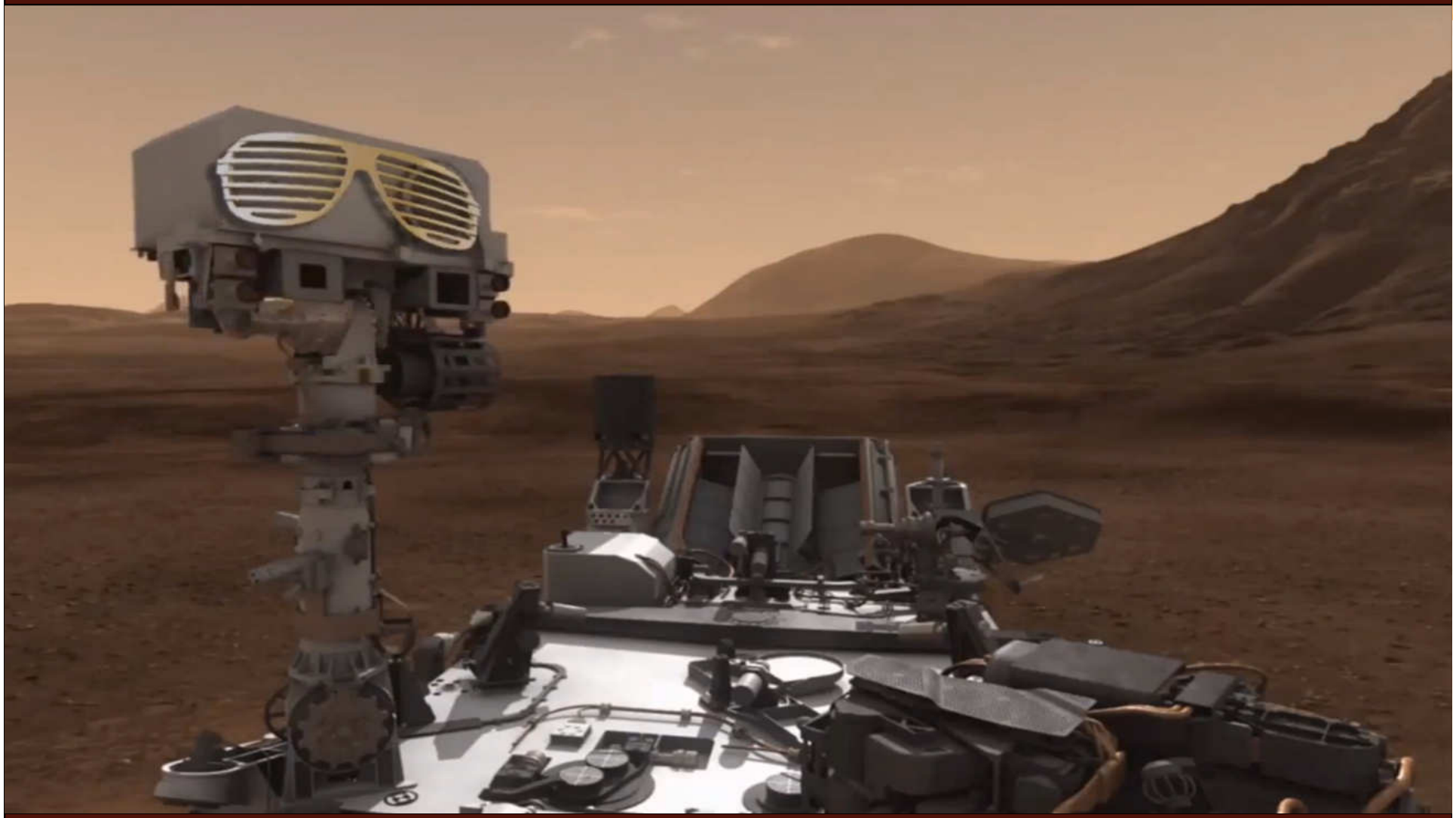
Not all of these were presented at first workshop




**Acquired/Released**

**Suggested**

# I'm Curiosity…



Credit: YouTube/Satire

**…and I know it!**