

Mars Exploration Program Analysis Group (MEPAG)

chartered by NASA HQ to assist in planning the scientific exploration of Mars



MEPAG Report to PSS

November 21, 2014

Lisa Pratt, MEPAG Chair

Slopes of Mt. Sharp

Pahrump Hills

Murray Formation



Curiosity: NASA / JPL-Caltech / MSSS



***Examples of bedding
diversity at
Pahrump Hills***



NASA
/ JPL-Caltech /
MSSS



Mars Exploration

Operational

2001 - 2014

2016

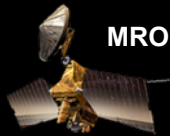
2018

2020

2022



Odyssey



MRO

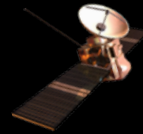
Mars Express
Collaboration



MAVEN



ISRO - MOM
Mangalyaan



ESA Trace Gas
Orbiter
(Electra)



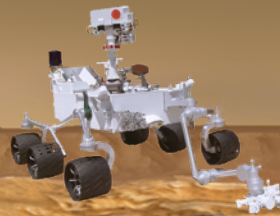
ESA ExoMars
Rover (MOMA)



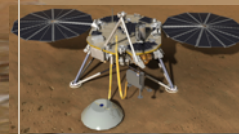
2020
Science Rover



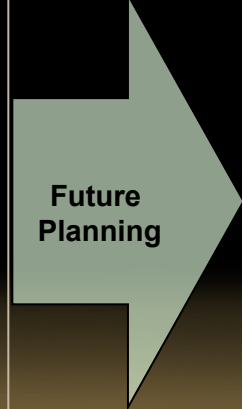
Opportunity



Curiosity -
Mars Science
Laboratory



InSIGHT
(Discovery Program)

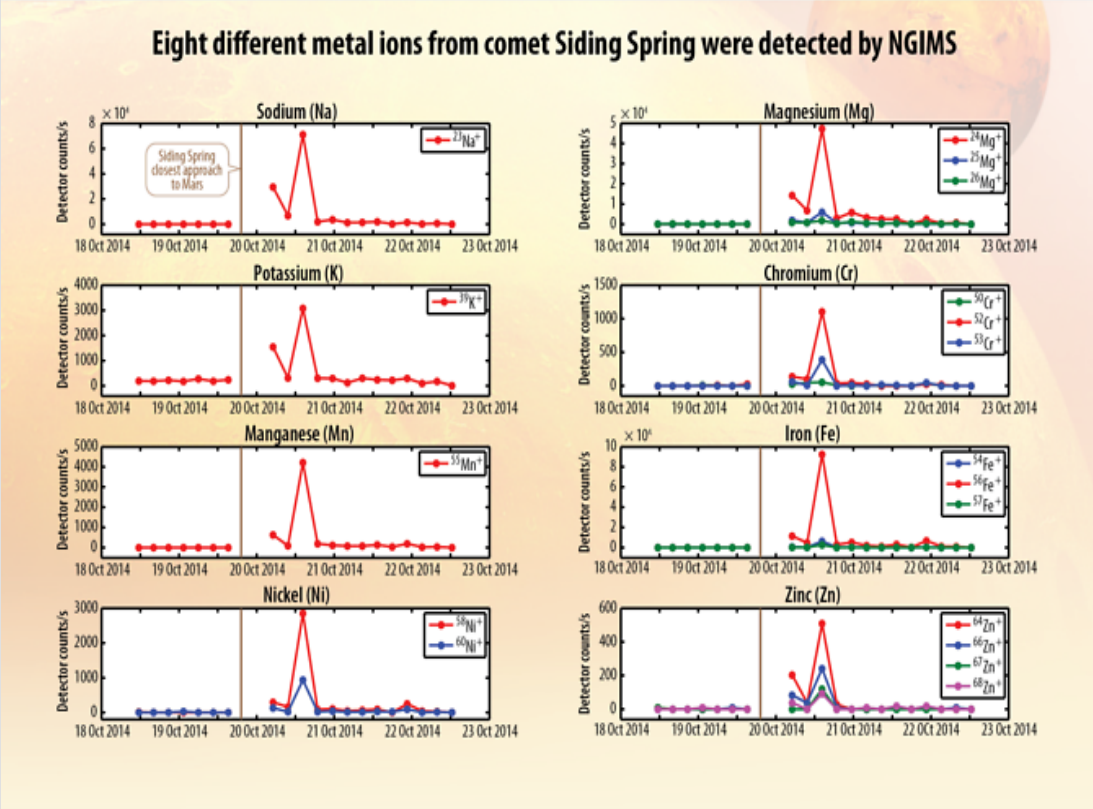


Future
Planning

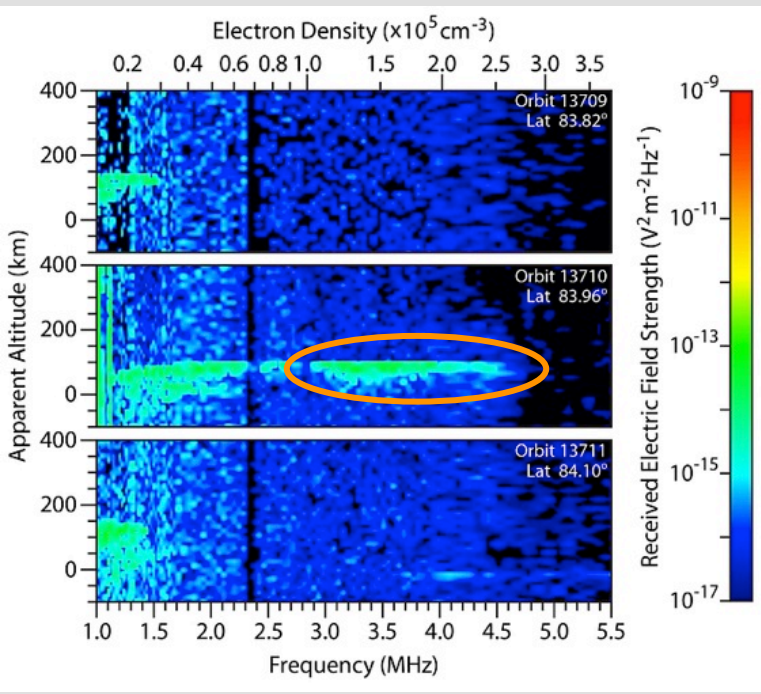
Comet /2013 A1 Siding Spring: Comet Dust in the Mars Atmosphere

MAVEN IUVS & NGIMS:
Metallic signatures of Comet Dust in the Mars Atmosphere

MEX MARSIS & MRO SHARAD:
Comet-induced Ionization in the Mars Atmosphere

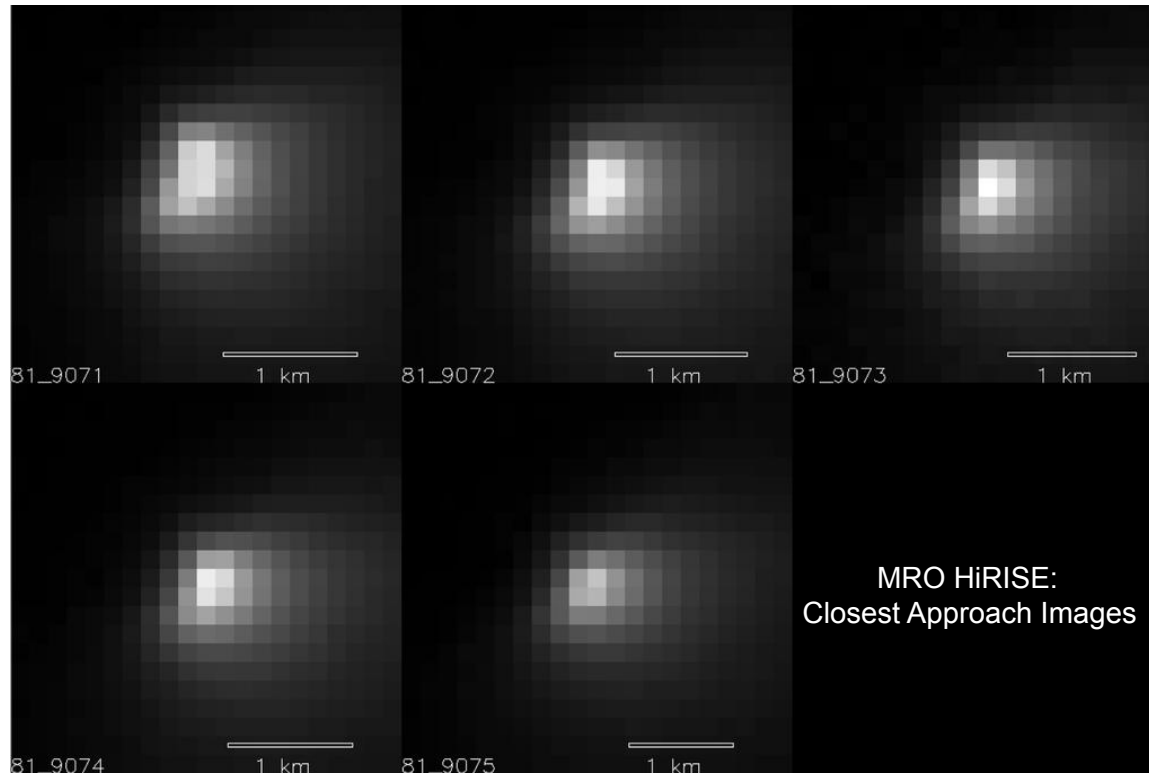


MAVEN NGIMS: *In situ* metal detection (~175 km)

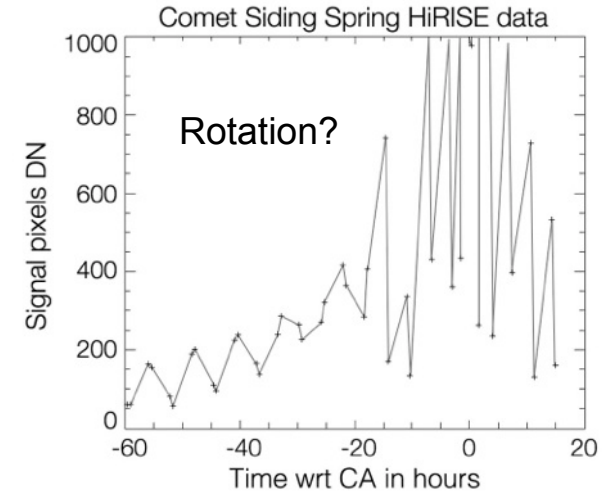


MEX MARSIS: Transient Ionospheric Layer at ~100 km

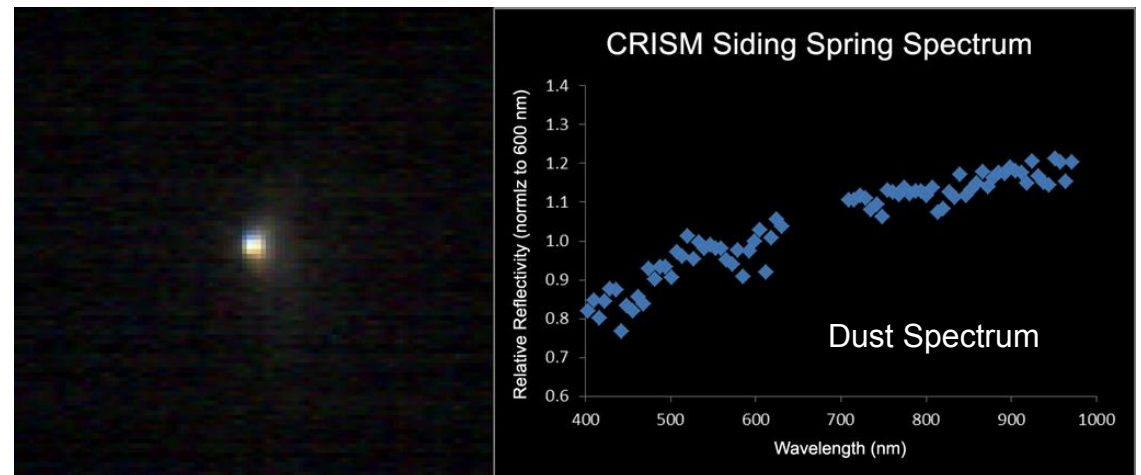
Comet /2013 A1 Siding Spring: Nucleus & Inner Coma



MRO HiRISE:
Brightness variation during CSS Encounter



MRO CRISM:
Left: Comet Siding Spring Color Composite From Closest Approach (CA) Images
Right: Composite Spectrum of CSS Reflecting Dust of the Inner Coma



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Status / Progress

- **Comet Siding Spring Encounter Observations:**
 - MRO: First-ever imaging of the nucleus of a long-period comet
 - MAVEN: First-ever determination of metals in dust from an Oort Cloud comet
 - MAVEN, MEX, MRO: Meteors definitely entered Mars atmosphere!
- **Landing Sites: MRO has completed >50% of all current requests for 2016 InSight, 2018 ExoMars and 2020 Mars rover landing site characterization**
 - Pace has slowed as expected during Comet encounter & November “no roll” period
 - New requests expected to extend coverage as sites are down-selected.
- **Curiosity on slopes of Mt. Sharp investigating Murray formation**
- **Opportunity finished up investigation of a variety of rocks excavated by Ulysses Crater impact on Endeavour Crater rim**
- **Special Regions (SAG2) Report accepted and posted by MEPAG; to appear in *Astrobiology***
- **Organic Contamination Panel Report submitted to NASA Sept. 24 and to appear in *Astrobiology* in December issue.**

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New Activity: MEPAG Goals Revision

- **Objective:** *To update the MEPAG Goals document to reflect discoveries and progress in Mars Exploration since the last major updates of the document in 2008 and 2010.*
 - This will serve as a basis for future MEP and PSD planning.
- **Approach:**
 - Build on presentations at the Eight International Conference on Mars (July, 2014), including a synthesis activity that was conducted at the meeting, as well as other relevant meetings.
 - Task the MEPAG Goals Committee to put together a draft for the community to consider at the February MEPAG face-to-face meeting.
- **Status/Schedule:**
 - Draft to be released to Mars community in January and discussed at Feb. 24-25 MEPAG meeting.
 - Follow-up and finalization by April 2015.

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MEPAG Face-2-Face Meeting February 24-25, 2015 in Pasadena area

Five Major Segments:

- **Report from NASA Headquarters**
 - *New Mars Exploration Program Director*
 - *Science Highlights*
 - *HEOMD Plans for Mars Exploration*
- **Status of Mars Exploration by NASA and Other Space Agencies**
 - *NASA, ESA, JAXA, ISRO*
 - *Emerging Technologies/Mission Capabilities*
 - *Status of Missions in Development: 2020 Mars rover, InSight. ExoMars*
- **Discussion: Proposed Revision of MEPAG Goals Document**
 - *Next steps in Mars Exploration Program Planning*
- **NASA and ESA Landing Site Progress**
- **New Science Results: MAVEN & MOM**