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MEPAG VM#10
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Mars Science - Activities

- Perseverance launched, capable of exploring the region of Jezero Crater and selecting and caching 43 samples and blanks from which a large scientifically-invaluable subset will be brought to Earth. A community Caching Strategy Workshop is being planned for January 2021.
- NASA/ESA Mars Sample Return Sample Planning Group – Phase 2 (MSPG2) will address science and curation planning questions for analyzing samples brought from Mars.
  - Jointly, NASA and ESA openly-competed membership on the MSPG2 , selecting 29 members across a wide-range of disciplines, experience, and countries with four tasks:
    - Develop a Science Management Plan;
    - Address technical issues related to the science and how the implementation impacts the potential scientific usefulness of the samples;
    - Propose a working list of high-level requirements for the Sample Return Facility that can be used in cost estimation and budgeting; and
    - Develop a timeline of key decision points with inputs from science, curation, and planetary protection experts.
  - The Team has been meeting every week since June 2020, split between either working in Focus Groups or as a whole team.
  - Reports expected in Spring 2021
- The Mars Architecture Strategy Working Group is finishing up, briefing to HQ at the end of October, report posted soon thereafter.
- COSPAR's Sample Safety Assessment Protocol Working Group (SSAP) is developing a recommendation for determining when extraterrestrial samples are safe for distribution outside of containment, aiming to report out at the 43rd COSPAR Assembly in Jan/Feb 2021.

Mars Sample Return Science Planning Group 2

Coordination Team


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Tomo Usui


Michael Velbel


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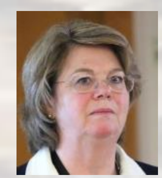
Frances Westall

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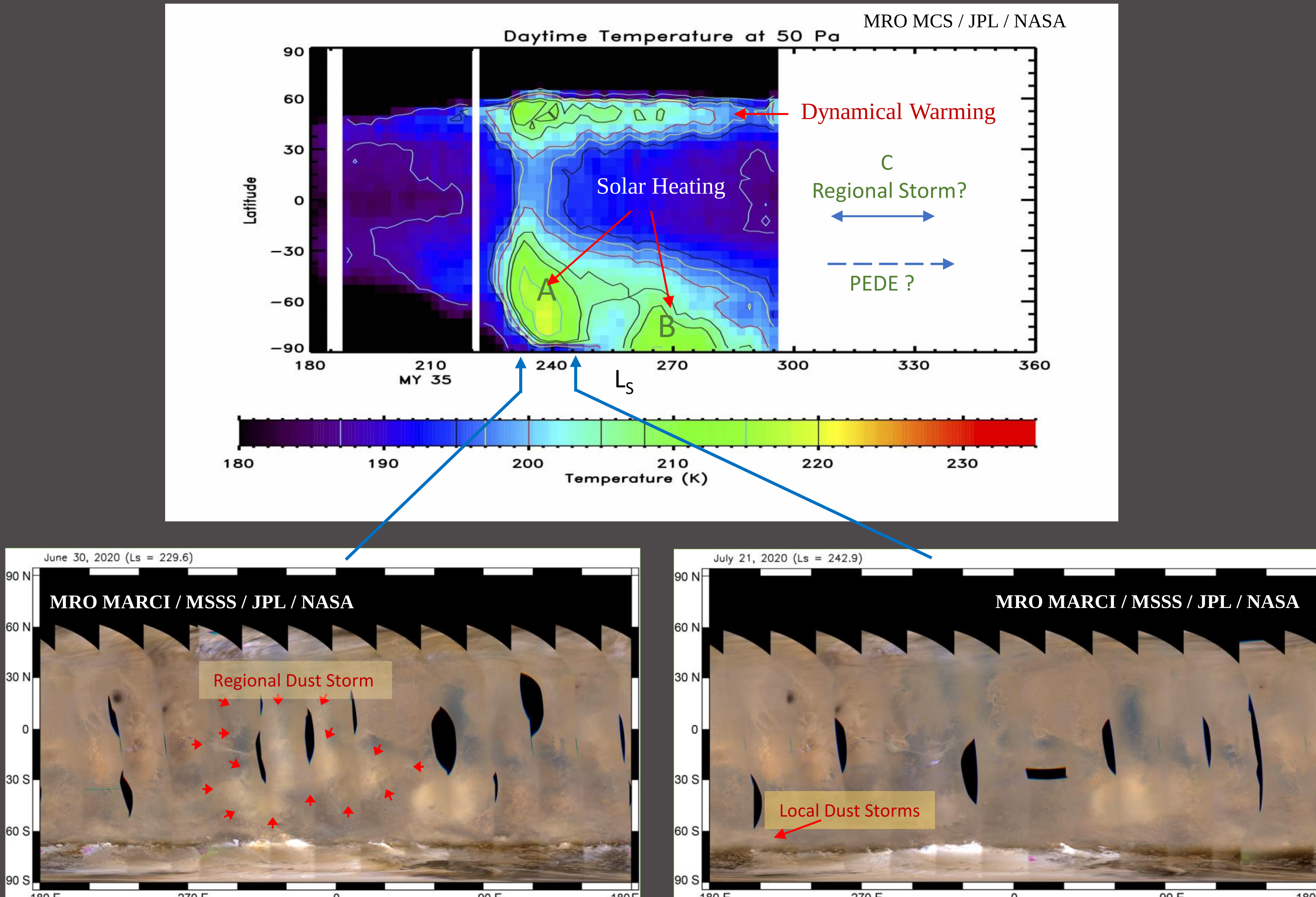
Recent Highlights from the Mars Science Laboratory

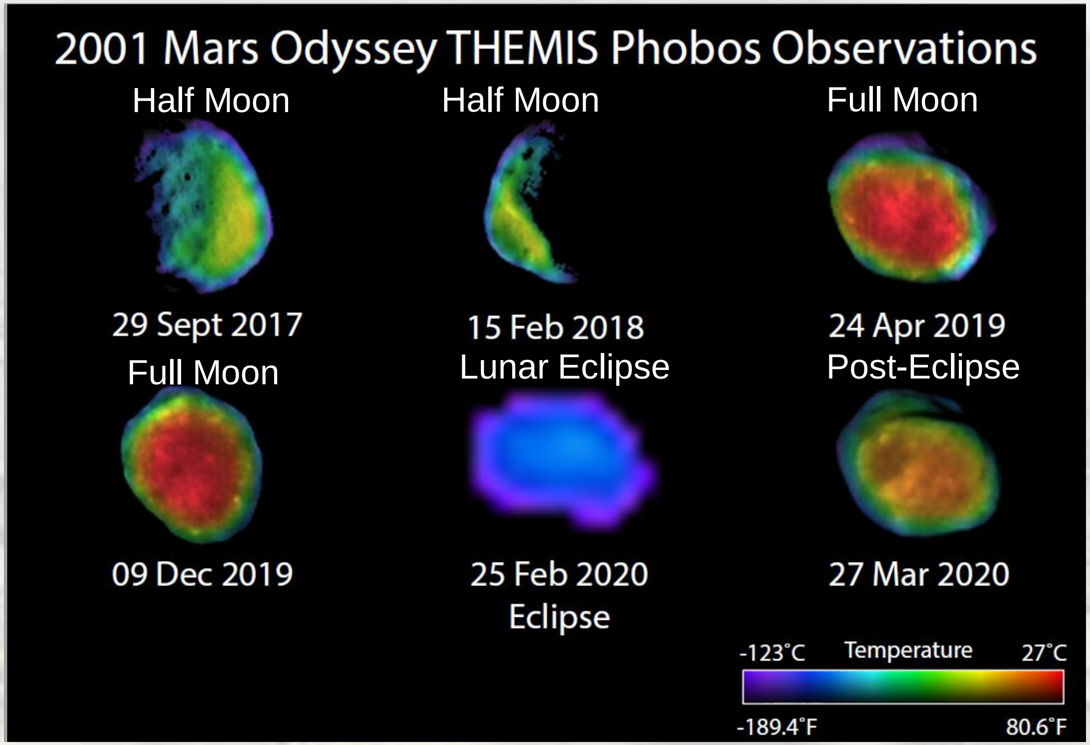
- The Curiosity rover and all ten science instruments are healthy and in full use. The rover has traversed 23 km, climbed nearly 400 m, and just acquired a sample from its 29th drill hole.
- Curiosity is completing its investigation of a clay-bearing interval of Mount Sharp that is overlain by the sandstone-capped Greenheugh pediment. The rover will reach the transition from clay to sulfate-bearing layers of Mount Sharp within several months.
- Curiosity followed its initial detection of diverse organic molecules in the clay-bearing unit with two additional wet chemistry experiments, including the first use of thermochemolysis to extract carboxylic acids. The experiments were successful and the data analysis is ongoing.

Mars Year 35 Great Dust Storm Season in Progress



Odyssey Captures the Many Faces of Phobos

- Odyssey captured two additional images of Phobos in different phases: first, when the shadow of Mars fell across the face of Phobos, and second, just after Phobos emerged from an eclipse.
- These two configurations are especially interesting for determining thermal inertia with a rapid change in surface temperature as Phobos transits in and out of shadow.



Images of Phobos captured so far by the THEMIS instrument on Mars Odyssey. To study the thermal inertia of a surface, we measure the temperature of a surface as a function of incoming insolation (solar radiation). Surfaces with high thermal inertia (for example, rocks) change slowly in response to changing insolation, whereas surfaces with low thermal inertia (for example, sand and dust) change quickly.