Jet Propulsion Laboratory
California Institute of Technology

Mars Exploration Program Strategic Planning

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MEPAG 12 VM

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Credit: NASA/JPL

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Reminder of long-standing MEP objectives

Objectives

- Understand the potential for life elsewhere in the Universe
- Characterize the present and past climate and the processes of climate change
- Understand the geological processes affecting planetary interiors, crust, and surface
- Develop knowledge necessary for eventual Human Exploration

Mars Exploration Program Goals

Life

Climate

Geology & Geophysics

Prepare for Human Exploration

Key Mars Discoveries: A Springboard to the Future

- Complex geological and climate history
- Diversity of ancient water-rich environments
- Environments that have potential to preserve bio-signatures
- Cold, dry planet today still changing
- Widespread subsurface ice provides resources for exploration and potential special environments for life

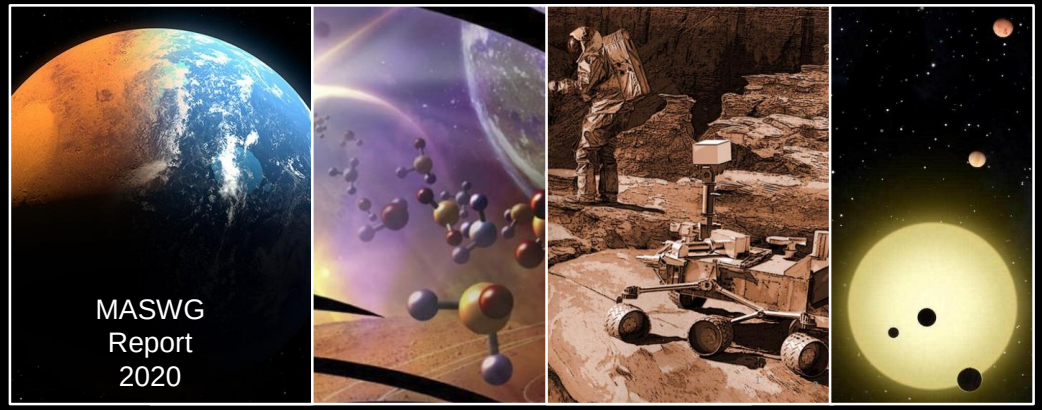
Guiding Mars Exploration Program Themes

Past:	*"Follow the Water"*	Found evidence of water, past & present
Current:	"*Explore Habitability*"	Found evidence of habitable environment from past
Future:	*"Seek Signs of Life"*	Search for biosignatures and return samples

- The goals of the Mars Exploration Program have been stable for two decades
- MEP guiding themes have evolved over that time, based on capabilities and discoveries
- Question today:
  How should we construct the next decade(s) of MEP?

Key inputs to MEP strategic planning

- NASA strategic objectives
- SMD programmatic and budget priorities
- Guidance & priorities from Planetary Science Decadal Survey
- Findings from the Mars Architecture Strategy Working Group (MASWG)
- Community inputs (MEPAG)



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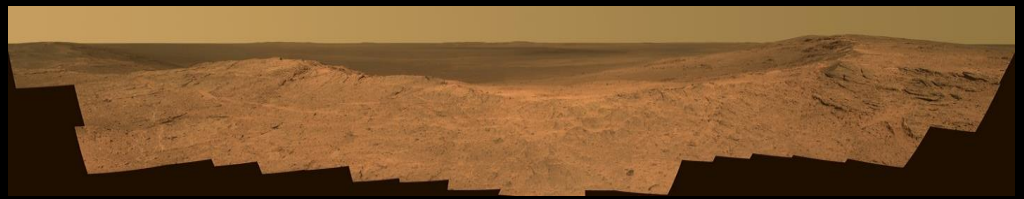


Credit: NASA/JPL

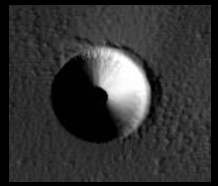
MASWG Mission Arcs are great exemplars of potential directions for MEP mission/investigation strategy

#1: Diverse Ancient Environments & Habitability

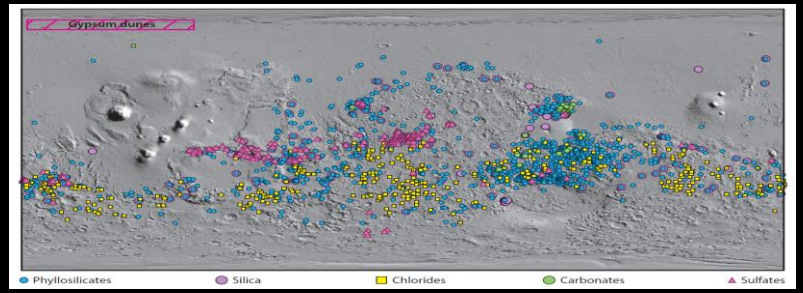
#2: Subsurface Structure, Composition & Possible Life

#3: Ice—Geologically Recent Climate Change

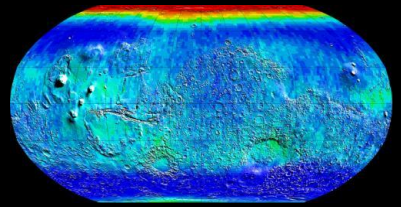
#4: Atmospheric Processes and Climate Variability



NASA / JPL / U. Arizona / MRO HiRISE



Ehlmann & Edwards, 2014



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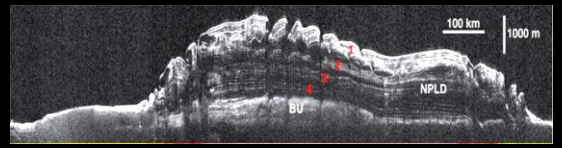


NASA-ASI / JPL / MRO SHARAD

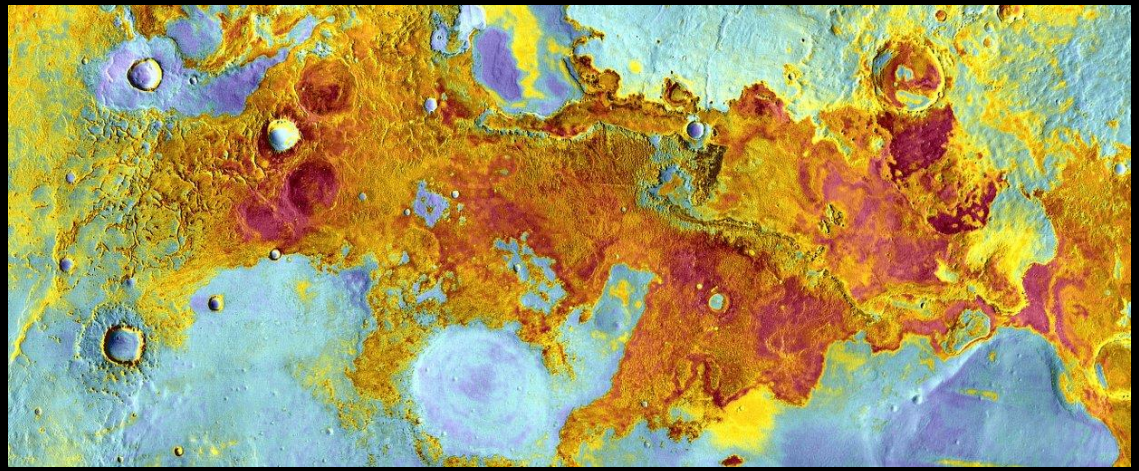
NASA / JPL / MRO CTX & HiRISE

NASA / JPL / MSSS / MRO MARCI

NASA / JPL / U. Arizona / MRO HiRISE

Lower-cost missions are one potential mechanism to address MASWG recommendations

- Smallsats and other novel spacecraft
- Innovative payload delivery approaches
- Partnerships
  - International
  - Commercial



NASA/JPL-Caltech-Arizona State University

The Mars science community is an essential part of MEP strategy development

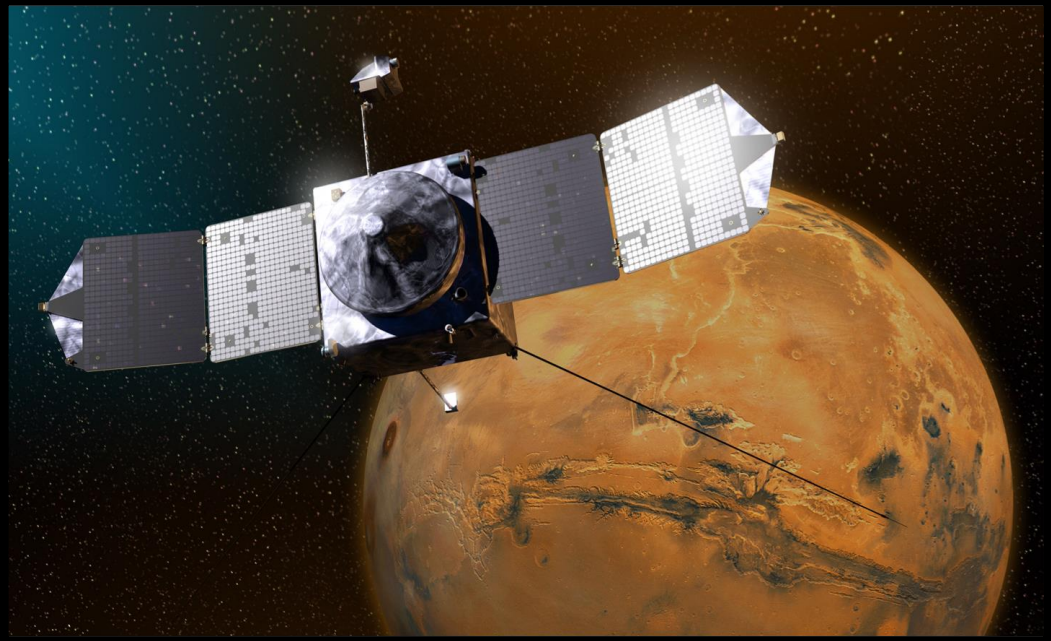
- Transformation of high-level goals into missions and investigations
- Community efforts to refine strategy and answer key questions
- Advocacy

NASA/JPL

Credit: NASA/GSFC

Seeking your inputs

- Science investigations
- Mission concepts
- Enabling and enhancing technologies
- Community efforts (e.g., MEPAG, working groups, workshops)



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