MEPAG Goals Committee Update

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• Goal IV: Human Exploration
  • Abhi Tripathi (JSC; abhishek.b.tripathi@nasa.gov)
  • Darlene Lim (NASA Ames; Darlene.Lim@nasa.gov)
History of the Goals Document

- 2001 – Original MEPAG Goals Document created
  - Drafted by the MEPAG Executive Committee with inputs from the community
  - Included sessions at MEPAG meetings dedicated to establishing consensus
- 2004 – First Major revisions
- 2005 – Minor Maintenance
- 2006 – Minor Maintenance
- 2008 – Major revision of Goals II & III
- 2009-2010 – Update in progress for Goals I & IV
Science Goals for Mars Exploration

I. Determine if life ever arose on Mars
II. Understand the processes and history of climate on Mars
III. Determine the evolution of the surface and interior of Mars
IV. Prepare for human exploration
I. GOAL: DETERMINE IF LIFE EVER AROSE ON MARS

A. Objective: Assess the past and present habitability of Mars

B. Objective: Characterize Carbon Cycling in its Geochemical Context

C. Objective: Assess whether life is or was present on Mars

High-resolution scanning electron microscope image showing an unusual tube-like structural form that is less than 1/100th the width of a human hair in size found in meteorite ALH84001. NASA image.
II. GOAL: UNDERSTANDING THE PROCESSES AND HISTORY OF CLIMATE

A. Objective: Characterize Mars’ Atmosphere, Present Climate, and Climate Processes Under Current Orbital Configuration

B. Objective: Characterize Mars’ Recent Climate History and Climate Processes Under Different Orbital Configurations

C. Objective: Characterize Mars’ Ancient Climate and Climate Processes


MEPAG Meeting  March 18, 2010
III. GOAL: DETERMINE THE EVOLUTION OF THE SURFACE AND INTERIOR

A. Objective: Determine the nature and evolution of the geologic processes that have created and modified the Martian crust

B. Objective: Characterize the structure, composition, dynamics, and evolution of Mars’ interior

C. Objective: Understand the origin, evolution, composition and structure of Phobos and Deimos
IV. GOAL: PREPARE FOR HUMAN EXPLORATION

A. Objective. Obtain knowledge of Mars sufficient to design and implement a human mission with acceptable cost, risk and performance

B. Objective. Conduct risk and/or cost reduction technology and infrastructure demonstrations in transit to, at, or on the surface of Mars

C. Objective. Characterize the state and processes of the martian atmosphere of critical importance for the safe operation of both robotic and human spacecraft
Revision of the Goals Document

Goal 1:

• Desire to re-address objectives and investigations with respect to water

• Westall and Hoehler organizing revision
  – Expected to have new draft on MEPAG website in September, with follow-on inputs from community
  – Decided to get inputs from:
    • Goals Committee members
    • NASA Astrobiology Institute (NAI) Mars focus group (D. DesMarais et al.) organized independent review
      – 15 reviewers (including 6 from European Mars community)
      – Successive rounds of reviews
      – Final received review 12/24/09
    • Revised document incorporating all reviews done on 3/10/10
    • Current document available for comment until March 31 on http://mepag.jpl.nasa.gov/reports/index.html
Revision of the Goals Document

Goal IV:

- Design Reference Architecture (DRA) released last fall
  - [http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20090012109_2009010520.pdf](http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20090012109_2009010520.pdf)

- MEPAG and Tripathi/Lim organized a small Science Analysis Group (SAG) to prepare revised Goal IV
  - Convened Nov. 1, 2009
  - Discussed via telecons through February, 2010
  - Reorganization of Objectives, Investigations, Measurements

- Comments on both Goal I and IV updates invited by March 31