

SPACE EXPLORATION SYMPOSIUM (A3)

Mars Exploration – Part 1 (3A)

Author: Dr. Ramon P. De Paula

National Aeronautics and Space Administration (NASA), United States

Prof. Nilton Renno

University of Michigan, United States

Dr. Richard Zurek

Jet Propulsion Laboratory - California Institute of Technology, United States

Dr. Michael Meyer

National Aeronautics and Space Administration (NASA), United States

OVERVIEW OF THE DISCOVERIES OF MRO AND PHOENIX AND THE IMPACT ON FUTURE MARS EXPLORATION

Abstract

This presentation discusses the mission aspects, highlights and latest scientific results from Mars Reconnaissance Orbiter (MRO) and the Phoenix missions, as well as their impact on future exploration of Mars.

These two missions are part of NASA's Mars Exploration Program (MEP), a science-driven effort that addresses NASA's Strategic Plan goal of exploring the solar system and the universe beyond, understand the origin and evolution of life, and search for evidence of life elsewhere. The MEP, seeks to understand the current state and evolution of the atmosphere, surface, and interior of Mars, and to take the first steps to return of samples from Mars for analysis on Earth; determine if life exists or has ever existed on Mars; and to develop an understanding of Mars in support of possible future human exploration.

The MRO spacecraft, with a comprehensive suite of remote sensing instruments, has been orbiting Mars for more than four years and has returned an astonishing amount scientific data (greater than 100 Tbs). MRO has shown that Mars is geologically active with a dynamic process. It has discovered sulfates and hydrothermal deposits. MRO's high-resolution images were critical in the selection of the landing site for Phoenix in 2008 and now for MSL in 2011. The Phoenix spacecraft landed on icy soil, and was the first mission to touch and prove that water ice exists at the surface of Mars.

This presentation will examine how MRO and Phoenix discoveries have been influencing NASA's Mars Exploration program and our scientific understanding of this Earth-like planet. In particular, the presentation will discuss our current knowledge of the history of water on Mars, and its importance for past or present life on this planet. Future Mars missions under study include joint missions between ESA and NASA starting in 2016.