

Lecture Abstract:

What Can the Curiosity Rover Tell Us About the Climate of Mars?

Assessing the habitability of Gale Crater is the goal of the Curiosity Rover, which has been gathering data since landing on the Red Planet last August. To meet that goal, Curiosity brought with it a suite of instruments to measure the biological potential of the landing site, the geology and chemistry of its surface, and local environmental conditions. Some of these instruments illuminate the nature of the planet's atmosphere and climate system, both for present day conditions as well as for conditions that existed billions of years ago. For present day conditions, Curiosity has a standard meteorology package that measures pressure, temperature, winds and humidity, plus a sensor that measures the UV flux. These data confirm what we learned from previous missions namely that today Mars is a cold, dry, and barren desert-like planet. For past conditions, however, wetter and probably warmer conditions are indicated. Curiosity's cameras reveal gravel beds that must have formed by flowing rivers, and sedimentary deposits of layered sand and mudstones possibly associated with lakes. An ancient aqueous environment is further supported by the presence of sulfate veins coursing through some of the rocks in Yellowknife Bay where Curiosity is planning its first drilling activity. I will discuss these results and their implications in this lecture.

Lecturer's Bio:

Bob Haberle is a Space Scientist at NASA's Ames Research Center. He holds a Ph.D. in atmospheric science from the University of Washington and has been a NASA scientist since 1983. He has been active in the study of planetary atmospheres for his entire career and has participated in many of NASA's Mars missions. He is currently a Co-Investigator on the Rover Environmental Monitoring Station on the Curiosity Rover.