

Habitable Environments in Gale Crater, Mars: The Journey of the Curiosity Rover

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The Mars Science Laboratory rover Curiosity has successfully explored Gale crater for over 3 Earth years. Curiosity has discovered fine-grain sedimentary deposits that appear to have been deposited in ancient lake environments. These fine-grained sediments contain clay minerals, sulfides, amorphous materials, oxychlorine phases along with primary igneous minerals. Elements necessary for life (CHONPS) have been directly detected in these sediments. Curiosity has recently arrived at the foot of Mt. Sharp, a mound of over 5 km of sedimentary deposits near the center of the crater. Detailed analyses are currently underway on fine-grained mudstones and overlying sandstones that may represent the lowest stratigraphic layers of Mt. Sharp. The environmental conditions during the deposition of these sediments may have been favorable for life.