

THE MARS EXPLORATION ROVER MISSION: 2+ YEARS OF SAND, SULFUR AND SPECTRA

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The twin Martian rovers, Spirit and Opportunity, landed in January of 2004 to carry out the mission of tracing the geological and geochemical evidence of water on the surface of Mars. The landing sites, Gusev Crater and Meridiani Planum, were selected based on orbital evidence of the potential for a "watery" past. Over 2 years and more than 15 kilometers combined, these robot explorers continue to unveil the surface through optical and infrared spectroscopy, Moessbauer, APXS and magnetic studies, and a wealth of imagery from microscopic to panoramic scales. Highlights of the mission include the discovery of hematitic spherules, "blueberries", in layered sediments at Meridiani, active dust devils at Gusev, and a wealth of information on aqueous alteration of surface materials dominated by the formation of iron oxides, oxyhydroxides, and sulfates, with limited evidence for phyllosilicates. These results point to alteration in an acidic, water-limited environment, early in the planets history. A summary of the missions' accomplishments and major scientific findings to date will be presented.