

Offered Title: Spirit and Opportunity

It happened January 3 and 24, 2004. After parachuting, then bouncing around like a ball, two six-wheeled geology labs on solar panels began their "sojourns" (pun intended) on Mars. Spirit landed in Gusev Crater on January 4th, while Opportunity landed over 5000 miles away in Meridiani Planum (now named Eagle Crater) on January 24th.

It was supposed to be a 90-day mission for each but that changed radically after Opportunity quickly found evidence for past presence of liquid water. While Spirit spent seven months just searching for suitable outcrops of rock to study, Opportunity literally landed on one. Sometimes ya just get lucky.

As I mentioned, these rovers were geology labs on solar panels. Here's the stuff they had and how it was used.

Panoramic Camera – Great shots! Plus 14 special filters for analyzing minerals and the atmosphere.

Miniature Thermal Emission Spectrometer – Used infrared light to spot minerals that formed with water.

Mossbauer Spectrometer – Used to identify iron bearing minerals, again to show the role water played.

Alpha Particle X-Ray Spectrometer – Measured the concentration of elements in rocks and soils.

Microscopic Imager – For extreme closeups of rocks and soils, looking at grain structure and shape.

Rock Abrasion Tool – Yep, grind off rock surface to expose deeper material for study.

Each rover also had engineering instruments such as a navigation camera, and hazard avoidance cameras set up in pairs that produced 3-D information about the rover's surroundings. The front pair of hazard avoidance cameras were used to help position tools mounted on the rover's arm. Even the rover's wheels were used as tools. They could be spun in place to dig through top layers of soils for evaluation.

Officially Mars Exploration Rovers, MER-A and MER-B, they were named Spirit and Opportunity as the result of a nationwide essay contest with over 10,000 entries.

Spirit landed first and provided engineers with a heads-up early on. Soon after it landed and started collecting data its computer began having hiccups and losing data or transmitting nonsense. Turned out its flash memory was getting overloaded due to incorrect memory manager code. Their solution was to fix the errant code and reformat the flash memory module. The engineers did the same for Opportunity once it landed and became operational.

Spirit found evidence of long-ago liquid water from its analysis of rock and soil samples. On May 1, 2009 Spirit got stuck in a sand trap and could not get out. Its mission was completed on March 22, 2010 after communication with Spirit stopped.

Opportunity went on to also find plenty of evidence for liquid water on a young Mars, then a massive planet-wide dust storm in 2018 promoted its demise. Opportunities' mission was completed on February 13, 2019 after months of no communication.

What's in the Sky?

June 28; after sunset; west-northwest: See if you can spot Mercury, Mars, Pollux, and Castor near the horizon.