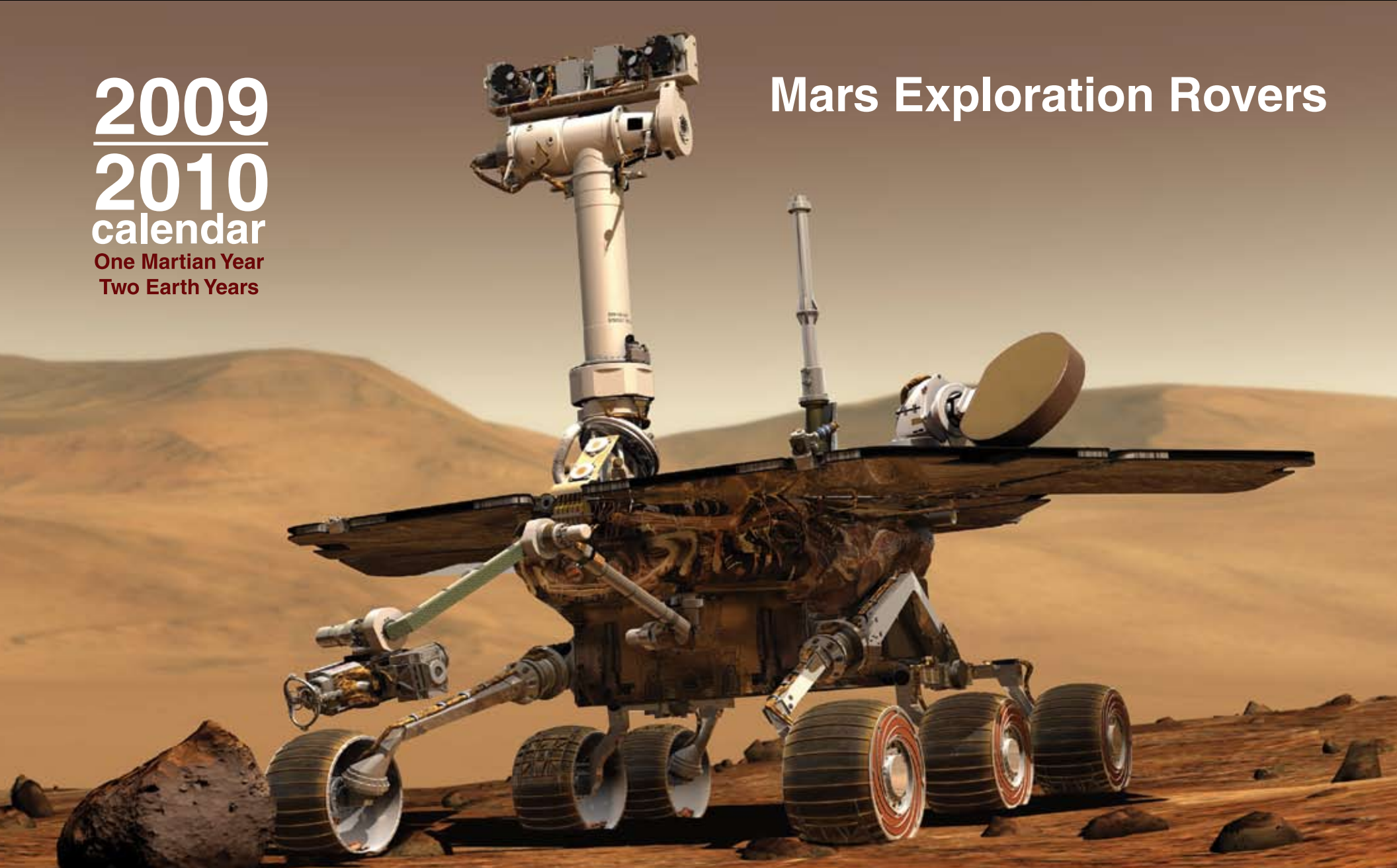


2009
2010
calendar
One Martian Year
Two Earth Years

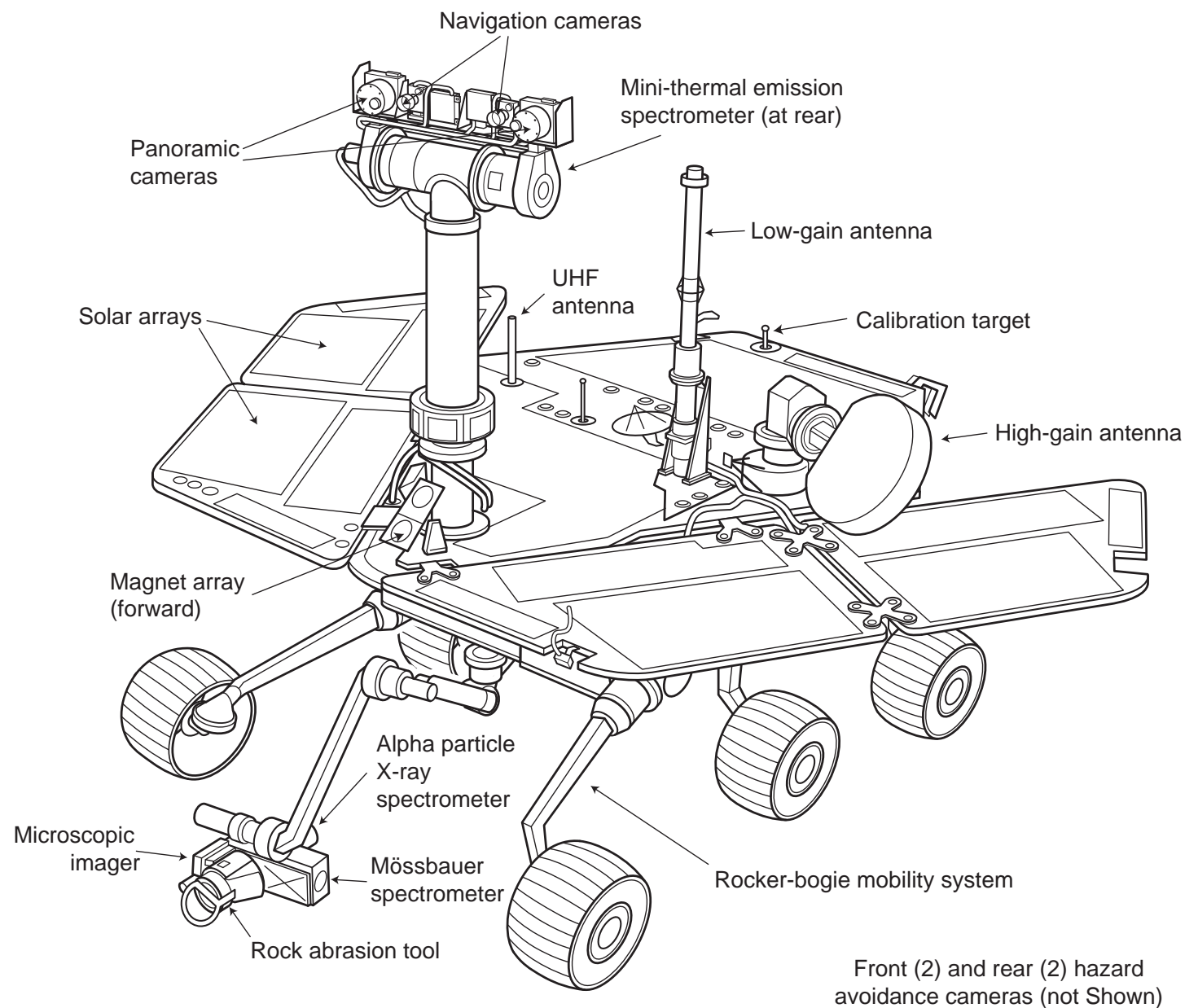
Mars Exploration Rovers



The image on the cover is an artist's concept of one of the two NASA Mars Exploration Rovers, Spirit and Opportunity. Spirit landed on Mars at Gusev Crater January 4, 2004 (UTC), and Opportunity landed on the opposite side of the planet at Eagle Crater on Meridiani Planum January 25, 2004. The rovers were originally planned to operate for 90 Martian days (called sols). They have surprised even their designers with their longevity and accomplishment, as 2009 marks the fifth anniversary of the rovers' successful exploration on the surface of Mars.

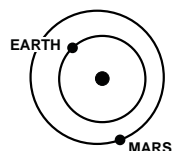
Learn more about the mission and its findings at marsrovers.jpl.nasa.gov.

Credit: NASA/JPL-Caltech



Notes on calendar format and symbols

A Martian Year: Earth is the third planet from the Sun and Mars is the fourth. Mars travels farther around the Sun in its orbit than Earth does. For this reason, a Mars year is longer than an Earth year. A Mars year is 687 Earth days long, almost two Earth years. And for this reason, this one-Martian-year calendar covers two Earth years. Each page of this calendar has a diagram showing the relative positions of Earth and Mars at that time in their journeys around the Sun.



February 1, 2009

A Martian Day: Mars rotates on its axis similarly to Earth, but a little more slowly, so a Mars day is a little longer than an Earth day. The Mars day, which we call a "sol," takes 24 hours, 39-1/2 minutes. The red and blue numbers in the calendar squares indicate how many sols have passed since Spirit (designated "A" and shown in red type) and Opportunity ("B" in blue type) landed on Mars. Those dates were January 4, 2004, for Spirit and January 25, 2004, for Opportunity. For example, on January 1, 2009, the numbers **A1777** and **B1757** mean that this date marks the 1777th sol that MER-A (technical name for Spirit) has spent on Mars and the 1757th sol for MER-B (Opportunity). You will notice that because a sol is slightly longer than a day, about every 36 days, the calendar skips an Earth day in counting the sols for each of the rovers. This way, the days and sols can stay synchronized on the calendar.

Day of Year: The number in the top right corner of each calendar square is the consecutive day of year (DOY) number, commonly used in space mission operations as a shorthand way of giving the date.

Martian seasons: The L_S number on the first day of each month is the Mars solar longitude. Imagine looking down on the solar system from a position "above" the Sun's north pole. If you draw a line from the Sun to Mars, the position of Mars at its northern vernal equinox is assigned 0° solar longitude. As Mars travels around the Sun through 360° , it experiences seasons just as Earth does.

- Northern Spring/Southern Autumn start at 0°
- Northern Summer/Southern Winter start at 90°
- Northern Autumn/Southern Spring start at 180°
- Northern Winter/Southern Summer begin at 270°

Mission Objective: The objective of the Mars Exploration Rover Mission is to determine the water, climatic, and geologic history of two sites on Mars where evidence has been preserved of past and persistent water activity that may have supported life.

Science Instruments: Spirit and Opportunity have "eyes" (powerful stereoscopic imagers) and an "arm" with powerful instruments attached that can be maneuvered like hands.

The **Panoramic cameras (Pancam)** are the most capable cameras ever sent to the surface of another planet. They sit atop a mast that allows the cameras to rotate in a complete circle. The cameras can also tilt vertically from straight up to straight down. Each of the Pancams has a filter wheel that allows it to make images in only certain wavelengths of light—a capability that allows certain details of the scene to be more easily discerned.

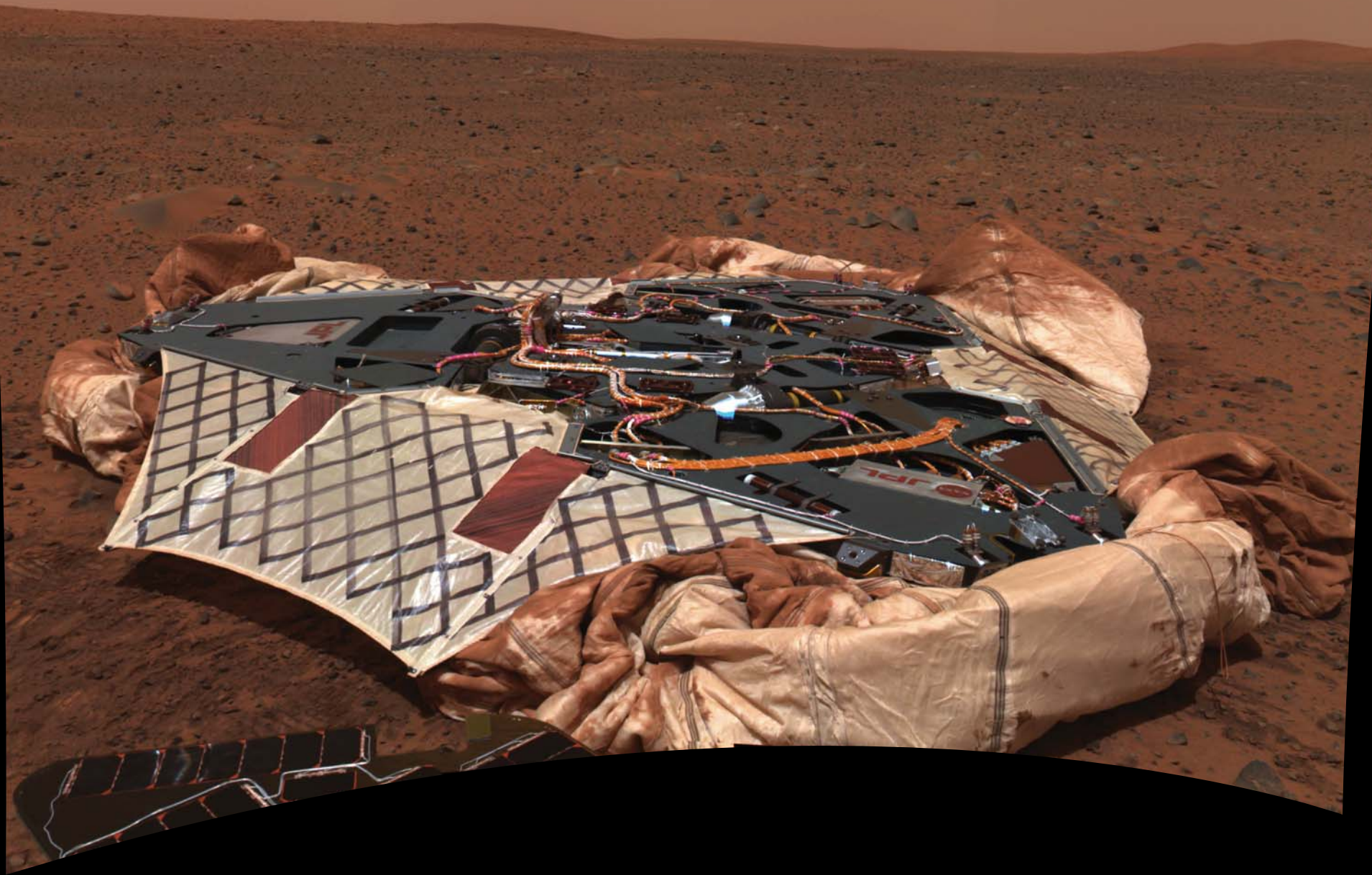
The **Miniature Thermal Emission Spectrometer (Mini-TES)** analyzes infrared light, which is a part of the spectrum that humans cannot see, but we feel as heat. The Mini-TES identifies rock-forming minerals, even some that are coated with dust. It collects data on the heat-holding properties of rocks and soils. It can also point upward and measure the varying temperatures of the Martian atmosphere from the surface up to 10 kilometers (6.2 miles).

The **Rock Abrasion Tool (RAT)**, about the size of a 12-ounce soda can, brushes and grinds rocks to clean away dust and other surface deposits. Once the undersurface is exposed, the rover's spectrometers can find out their composition and search for ancient evidence of water on Mars.

The **Alpha Particle X-ray Spectrometer** measures the chemical composition of Martian rocks and soil. It works by bombarding the material in question with energetic alpha particles and X-rays from the synthetic radioactive element curium-244. The emitted X-ray energy has a particular spectrum, or fingerprint, which the spectrometer measures to identify the element.

The **Mössbauer Spectrometer** also measures the chemical composition of materials, specializing in different kinds of iron-bearing rocks and soils. Placed directly up against the target material, the spectrometer illuminates it with gamma particles emitted by the radioactive element cobalt-57. The particles interact with the targeted material, and characteristics of the radiation reflected back into the spectrometer reveal the presence, amount and types of iron-bearing minerals.

The **Microscopic Imager**, like the RAT and the spectrometers, is located on the turret or "fist" of the rover arm. It is a combination of microscope optics and a camera that provides detailed images on the small-scale features of Martian rocks and soils. The Microscopic Imager has allowed scientists to characterize the undersurface of rocks. When able to see beneath the outer, weathered coating and layers of dust, scientists can better determine how the rocks formed.



We have arrived!

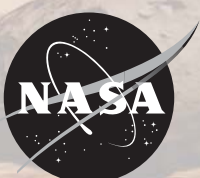
NASA/JPL/Cornell

January 2009

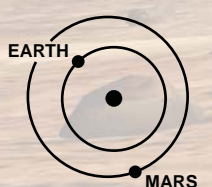
| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|---|----------------------------|----------------------------|----------------------------|---|----------------------------|----------------------------|
| | | | | 1 1 $L_s=183.4^\circ$ A1777 B1757 | 2 2 A1778 B1758 | 3 3 A1779 B1759 |
| 4 4 Spirit's 5th Earth Anniversary A1780 B1760 | 5 5 A1781 | 6 6 A1782 B1761 | 7 7 A1783 B1762 | 8 8 A1784 B1763 | 9 9 A1785 B1764 | 10 10 A1786 B1765 |
| 11 11 A1787 B1766 | 12 12 A1788 B1767 | 13 13 A1789 B1768 | 14 14 A1790 B1769 | 15 15 A1791 B1770 | 16 16 A1792 B1771 | 17 17 A1793 B1772 |
| 18 18 A1794 B1773 | 19 19 A1795 B1774 | 20 20 A1796 B1775 | 21 21 A1797 B1776 | 22 22 A1798 B1777 | 23 23 A1799 B1778 | 24 24 B1779 |
| 25 25 Opportunity's 5th Earth Anniversary A1800 B1780 | 26 26 A1801 B1781 | 27 27 A1802 B1782 | 28 28 A1803 B1783 | 29 29 A1804 B1784 | 30 30 A1805 B1785 | 31 31 A1806 B1786 |

February 2009

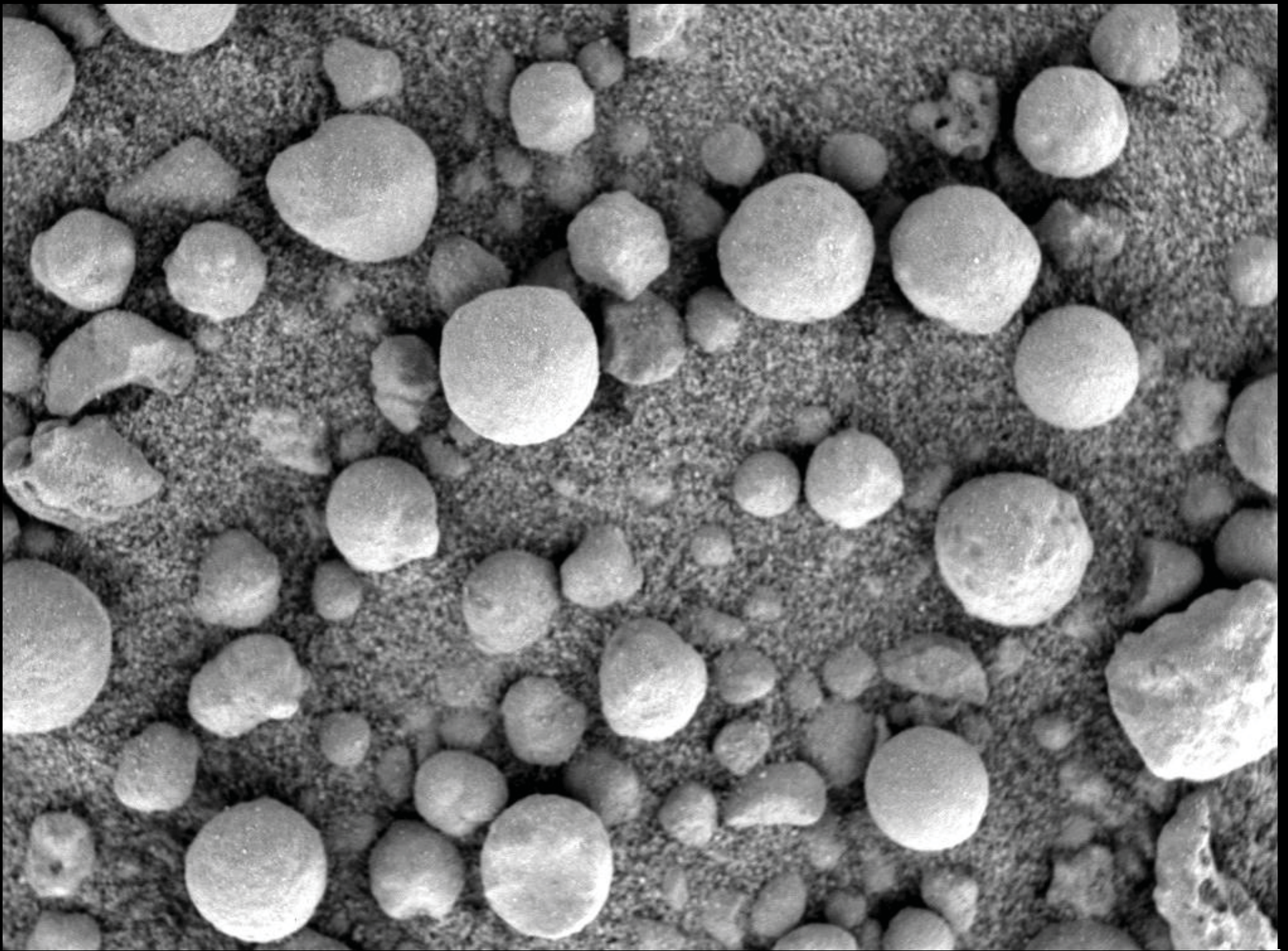
| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|--|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| 1 32 $L_s=201.5^\circ$ A1807 B1787 | 2 33 A1808 B1788 | 3 34 A1809 B1789 | 4 35 A1810 B1790 | 5 36 A1811 B1791 | 6 37 A1812 B1792 | 7 38 A1813 B1793 |
| 8 39 A1814 B1794 | 9 40 A1815 B1795 | 10 41 A1816 B1796 | 11 42 A1817 | 12 43 A1818 B1797 | 13 44 A1819 B1798 | 14 45 A1820 B1799 |
| 15 46 A1821 B1800 | 16 47 A1822 B1801 | 17 48 A1823 B1802 | 18 49 A1824 B1803 | 19 50 A1825 B1804 | 20 51 A1826 B1805 | 21 52 A1827 B1806 |
| 22 53 A1828 B1807 | 23 54 A1829 B1808 | 24 55 A1830 B1809 | 25 56 A1831 B1810 | 26 57 A1832 B1811 | 27 58 A1833 B1812 | 28 59 A1834 B1813 |



After exiting its protective landing system, the Mars rover Spirit turned to capture this spectacular view of its landing site, the floor of Gusev Crater. The lander platform was named the Columbia Memorial Station in honor of the Space Shuttle Columbia and its crew. In the background are the Columbia Hills, about 3 kilometers (2 miles) away. They were among the first destinations of Spirit's long journey. On January 4, 2009, its 5th Earth-year anniversary on Mars, Spirit had logged a total of approximately 7.5 km (4.7 miles). On Opportunity's 5th anniversary, January 25, 2009, it had logged 13.6 km (8.5 miles) on Meridiani Planum on the opposite side of the planet.



February 1, 2009



Blueberry surprise

NASA/JPL/USGS

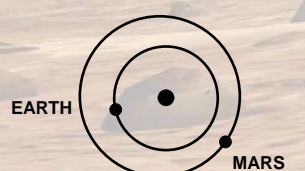
March 2009

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|---|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| 1 ⁶⁰ L _s =218.6° A1835 B1814 | 2 ⁶¹ B1815 | 3 ⁶² A1836 B1816 | 4 ⁶³ A1837 B1817 | 5 ⁶⁴ A1838 B1818 | 6 ⁶⁵ A1839 B1819 | 7 ⁶⁶ A1840 B1820 |
| 8 ⁶⁷ A1841 B1821 | 9 ⁶⁸ A1842 B1822 | 10 ⁶⁹ A1843 B1823 | 11 ⁷⁰ A1844 B1824 | 12 ⁷¹ A1845 B1825 | 13 ⁷² A1846 B1826 | 14 ⁷³ A1847 B1827 |
| 15 ⁷⁴ A1848 B1828 | 16 ⁷⁵ A1849 B1829 | 17 ⁷⁶ A1850 B1830 | 18 ⁷⁷ A1851 B1831 | 19 ⁷⁸ A1852 B1832 | 20 ⁷⁹ A1853 B1833 | 21 ⁸⁰ A1854 |
| 22 ⁸¹ A1855 B1834 | 23 ⁸² A1856 B1835 | 24 ⁸³ A1857 B1836 | 25 ⁸⁴ A1858 B1837 | 26 ⁸⁵ A1859 B1838 | 27 ⁸⁶ A1860 B1839 | 28 ⁸⁷ A1861 B1840 |
| 29 ⁸⁸ A1862 B1841 | 30 ⁸⁹ A1863 B1842 | 31 ⁹⁰ A1864 B1843 | | | | |

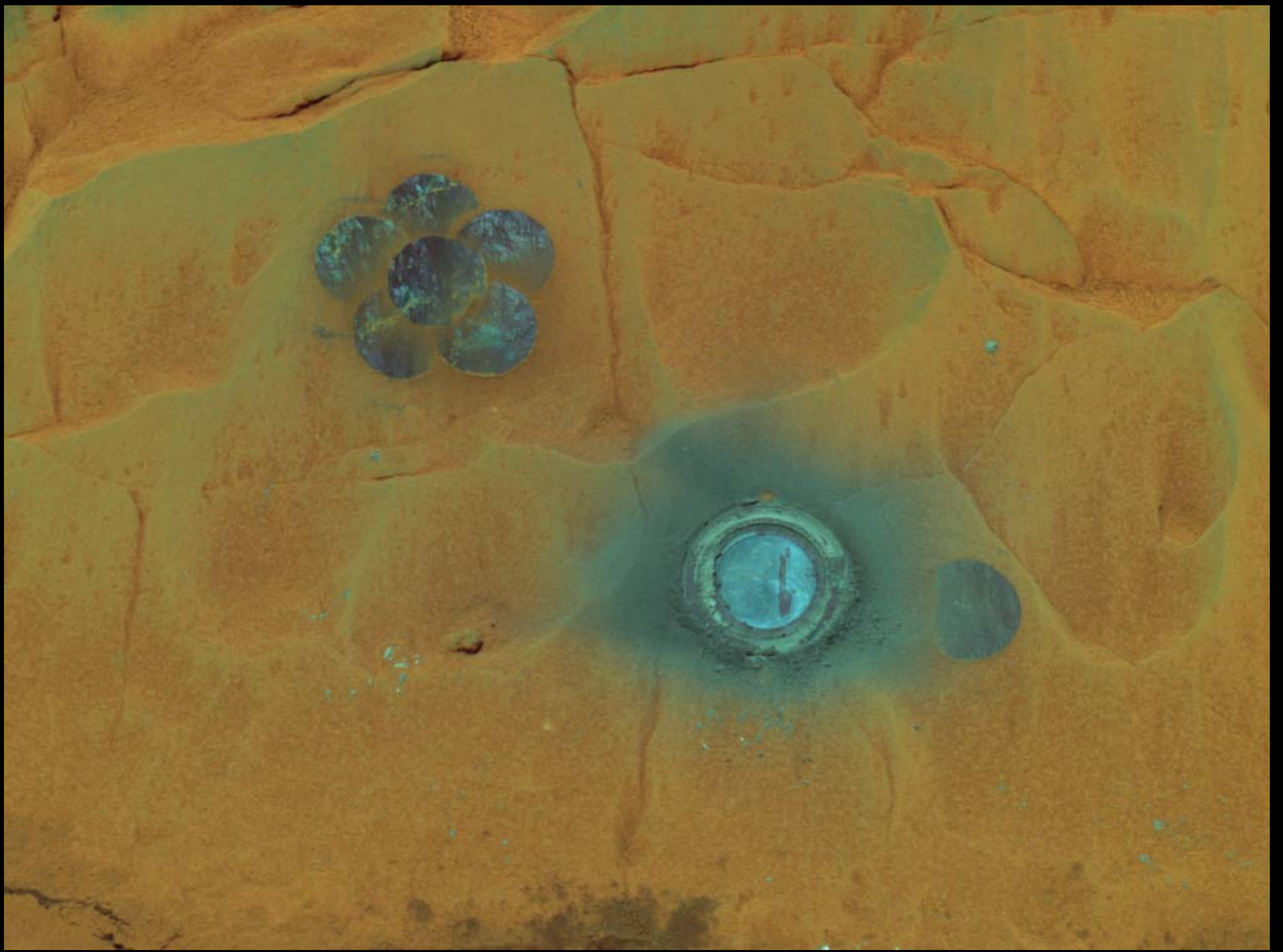
April 2009

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|-------------------------------------|-------------------------------------|-------------------------------------|---|-------------------------------------|-------------------------------------|-------------------------------------|
| | | | 1 ⁹¹ L _s =238.0° A1865 B1844 | 2 ⁹² A1866 B1845 | 3 ⁹³ A1867 B1846 | 4 ⁹⁴ A1868 B1847 |
| 5 ⁹⁵ A1869 B1848 | 6 ⁹⁶ A1870 B1849 | 7 ⁹⁷ A1871 B1850 | 8 ⁹⁸ B1851 | 9 ⁹⁹ A1872 B1852 | 10 ¹⁰⁰ A1873 B1853 | 11 ¹⁰¹ A1874 B1854 |
| 12 ¹⁰² A1875 B1855 | 13 ¹⁰³ A1876 B1856 | 14 ¹⁰⁴ A1877 B1857 | 15 ¹⁰⁵ A1878 B1858 | 16 ¹⁰⁶ A1879 B1859 | 17 ¹⁰⁷ A1880 B1860 | 18 ¹⁰⁸ A1881 B1861 |
| 19 ¹⁰⁹ A1882 B1862 | 20 ¹¹⁰ A1883 B1863 | 21 ¹¹¹ A1884 B1864 | 22 ¹¹² A1885 B1865 | 23 ¹¹³ A1886 B1866 | 24 ¹¹⁴ A1887 B1867 | 25 ¹¹⁵ A1888 B1868 |
| 26 ¹¹⁶ A1889 B1869 | 27 ¹¹⁷ A1890 | 28 ¹¹⁸ A1891 B1870 | 29 ¹¹⁹ A1892 B1871 | 30 ¹²⁰ A1893 B1872 | | |

This image from Opportunity's Microscopic Imager on sol 13 shows round, blueberry-shaped formations in the Martian soil near a part of the rock outcrop at Meridiani Planum called Stone Mountain. The "blueberries" averaged 5 millimeters (about .2 inch) in diameter. Measurements by the spectrometers onboard Opportunity indicated that the berries were composed largely of gray hematite. The presence of this particular mineral form of iron oxide strongly hints that water played a significant role in Mars' past.



April 1, 2009



Getting under the surface

NASA/JPL-Caltech/Cornell

May 2009

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|---|---|-----------------------------|
| | | | | | 1 121 <i>L_s=257.0°</i> A1894 B1873 | 2 122 A1895 B1874 |
| 3 123 A1896 B1875 | 4 124 A1897 B1876 | 5 125 A1898 B1877 | 6 126 A1899 B1878 | 7 127 A1900 B1879 | 8 128 A1901 B1880 | 9 129 A1902 B1881 |
| 10 130 A1903 B1882 | 11 131 A1904 B1883 | 12 132 A1905 B1884 | 13 133 A1906 B1885 | 14 134 A1907 B1886 | 15 135 A1908 B1887 | 16 136 B1888 |
| 17 137 A1909 B1889 | 18 138 A1910 B1890 | 19 139 A1911 B1891 | 20 140 A1912 B1892 | 21 141 Southern Mars Summer Solstice A1913 B1893 | 22 142 A1914 B1894 | 23 143 A1915 B1895 |
| 24 144 A1916 B1896 | 25 145 A1917 B1897 | 26 146 A1918 B1898 | 27 147 A1919 B1899 | 28 148 A1920 B1900 | 29 149 A1921 B1901 | 30 150 A1922 B1902 |
| 31 151 A1923 B1903 | | | | | | |

June 2009

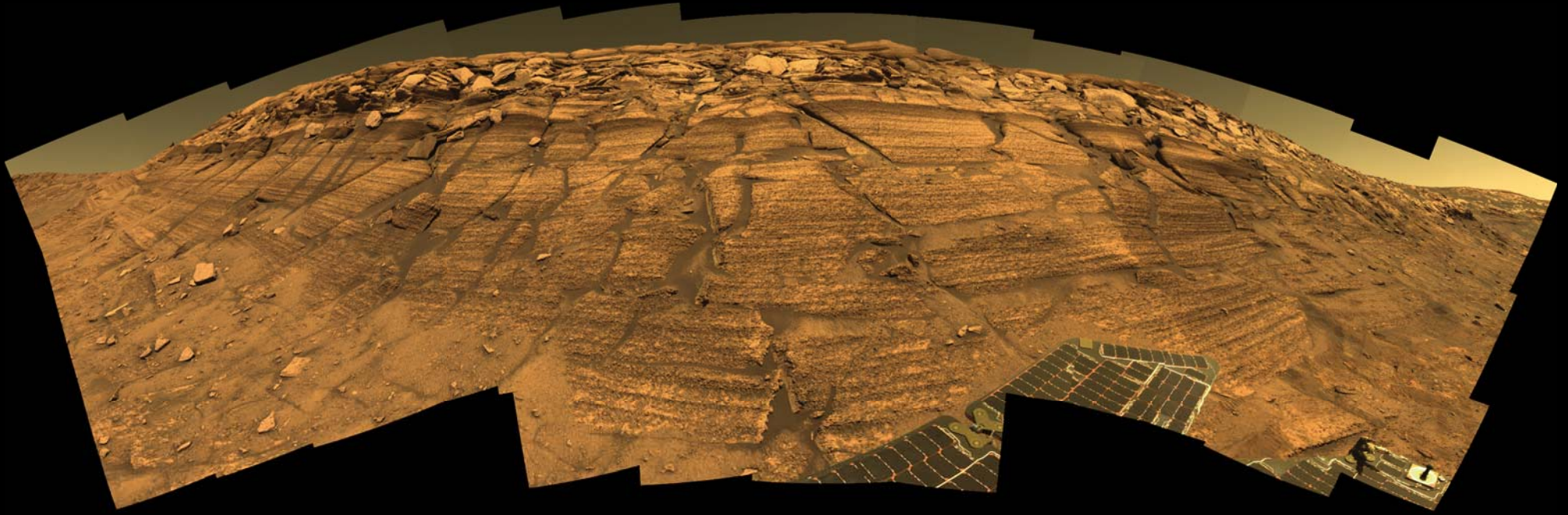
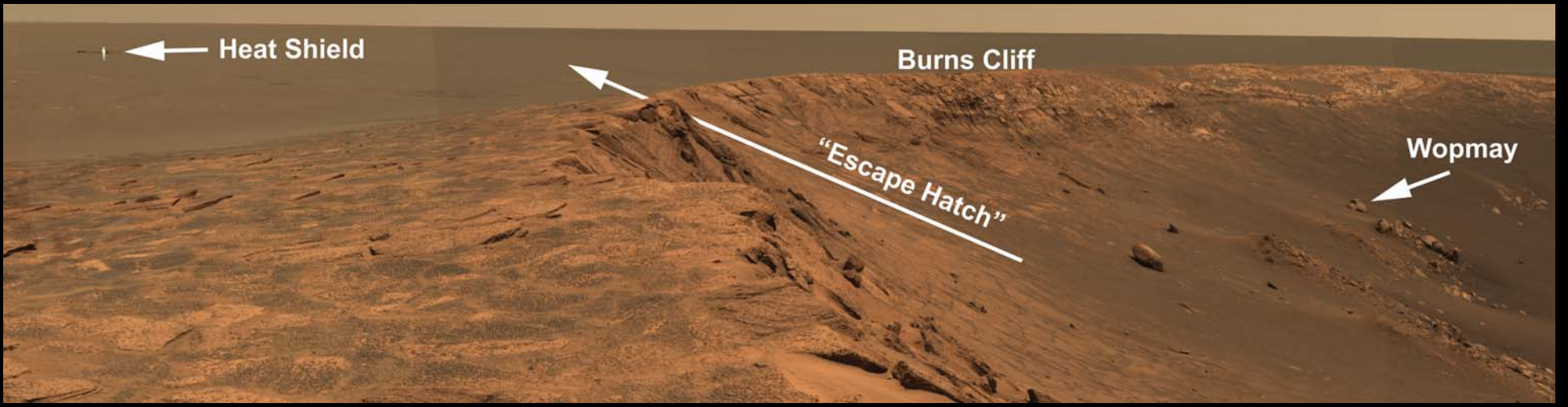
| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|-----------------------------|---|-----------------------------|--|-----------------------------|-----------------------------|-----------------------------|
| | 1 152 <i>L_s=276.6°</i> A1924 B1904 | 2 153 A1925 B1905 | 3 154 A1926 | 4 155 A1927 B1906 | 5 156 A1928 B1907 | 6 157 A1929 B1908 |
| 7 158 A1930 B1909 | 8 159 A1931 B1910 | 9 160 A1932 B1911 | 10 161 Spirit launched in 2003 A1933 B1912 | 11 162 A1934 B1913 | 12 163 A1935 B1914 | 13 164 A1936 B1915 |
| 14 165 A1937 B1916 | 15 166 A1938 B1917 | 16 167 A1939 B1918 | 17 168 A1940 B1919 | 18 169 A1941 B1920 | 19 170 A1942 B1921 | 20 171 A1943 B1922 |
| 21 172 A1944 B1923 | 22 173 B1924 | 23 174 A1945 B1925 | 24 175 A1946 B1926 | 25 176 A1947 B1927 | 26 177 A1948 B1928 | 27 178 A1949 B1929 |
| 28 179 A1950 B1930 | 29 180 A1951 B1931 | 30 181 A1952 B1932 | | | | |



Captured on Sol 86 of Spirit's mission on Mars, this false-color Pancam image of the rock Mazatzal demonstrates the range of operations the Rock Abrasion Tool (RAT) can perform. On the right, a RAT brushing operation removed overlying surface material for the spectrometers and, on the left, a mosaic of brushing operations cleaned a larger area for analysis with the Mini-Thermal Emission Spectrometer. The bright spot in the center highlights the area where the RAT abraded away the rock exterior so that contact spectrometers could analyze the un-weathered interior.



June 1, 2009



Plunging into a crater

NASA/JPL/Cornell

July 2009

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|----------------|----------------|----------------|--|----------------|----------------|----------------|
| | | | 1 182 | 2 183 | 3 184 | 4 185 |
| | | | $L_s=295.0^\circ$ A1953 B1933 | A1954 B1934 | A1955 B1935 | A1956 B1936 |
| 5 186 | 6 187 | 7 188 | 8 189 | 9 190 | 10 191 | 11 192 |
| A1957 B1937 | A1958 B1938 | A1959 B1939 | Opportunity launched in 2003 A1960 B1940 | A1961 B1941 | A1962 B1942 | A1963 |
| 12 193 | 13 194 | 14 195 | 15 196 | 16 197 | 17 198 | 18 199 |
| A1964 B1943 | A1965 B1944 | A1966 B1945 | A1967 B1946 | A1968 B1947 | A1969 B1948 | A1970 B1949 |
| 19 200 | 20 201 | 21 202 | 22 203 | 23 204 | 24 205 | 25 206 |
| A1971 B1950 | A1972 B1951 | A1973 B1952 | A1974 B1953 | A1975 B1954 | A1976 B1955 | A1977 B1956 |
| 26 207 | 27 208 | 28 209 | 29 210 | 30 211 | 31 212 | |
| A1978 B1957 | A1979 B1958 | A1980 B1959 | A1981 B1960 | B1961 | A1982 B1962 | |

August 2009

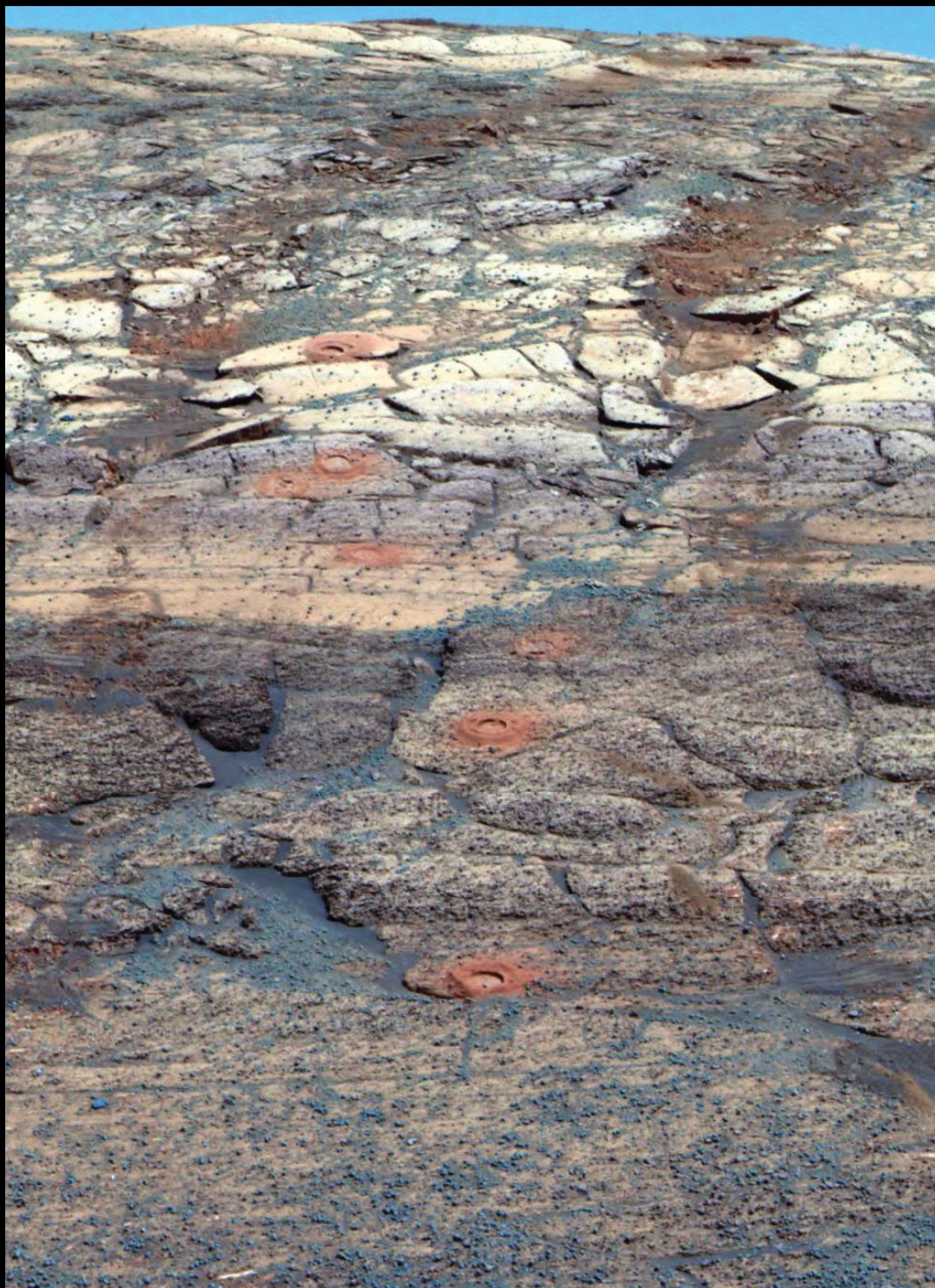
| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|----------------|----------------|----------------|--|----------------|----------------|-------------------------------------|
| | | | | | | 1 213 |
| | | | | | | $L_s=313.3^\circ$ A1983 B1963 |
| 2 214 | 3 215 | 4 216 | 5 217 | 6 218 | 7 219 | 8 220 |
| A1984 B1964 | A1985 B1965 | A1986 B1966 | A1987 B1967 | A1988 B1968 | A1989 B1969 | A1990 B1970 |
| 9 221 | 10 222 | 11 223 | 12 224 | 13 225 | 14 226 | 15 227 |
| A1991 B1971 | A1992 B1972 | A1993 B1973 | A1994 B1974 | A1995 B1975 | A1996 B1976 | A1997 B1977 |
| 16 228 | 17 229 | 18 230 | 19 231 | 20 232 | 21 233 | 22 234 |
| A1998 B1978 | A1999 | A2000 B1979 | A2001 B1980 | A2002 B1981 | A2003 B1982 | A2004 B1983 |
| 23 235 | 24 236 | 25 237 | 26 238 | 27 239 | 28 240 | 29 241 |
| A2005 B1984 | A2006 B1985 | | Spirit's 3rd Martian Anniversary | | | |
| A2012 B1991 | A2013 B1992 | A2007 B1986 | A2008 B1987 | A2009 B1988 | A2010 B1989 | A2011 B1990 |
| 30 242 | 31 243 | | | | | |



In the top panorama (taken sols 117-123), Opportunity overlooks Endurance Crater. Before the rover plunged in, mission planners wanted to make sure it would be able to get out again. The second image shows the planned "escape hatch." The intrepid rover ventured into the crater and began to explore. By the time it rolled up to the base of Burns Cliff at the southeastern portion of the crater and began taking the images in the bottom wide-angle panorama, it was sol 287. Opportunity entered the crater on sol 133 and exited on sol 315.



August 1, 2009



A trail of holes

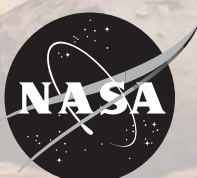
NASA/JPL-Caltech/Cornell

September 2009

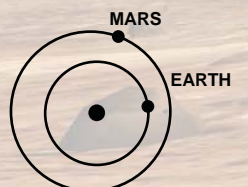
| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|--------------------------|--------------------------|---|---|--------------------------|--------------------------|--------------------------|
| | | 1 244 L _s =330.8° A2014 B1993 | 2 245 A2015 B1994 | 3 246 A2016 B1995 | 4 247 A2017 B1996 | 5 248 B1997 |
| 6 249 A2018 B1998 | 7 250 A2019 B1999 | 8 251 A2020 B2000 | 9 252 A2021 B2001 | 10 253 A2022 B2002 | 11 254 A2023 B2003 | 12 255 A2024 B2004 |
| 13 256 A2025 B2005 | 14 257 A2026 B2006 | 15 258 A2027 B2007 | 16 259 Opportunity's 3rd Martian Anniversary A2028 B2008 | 17 260 A2029 B2009 | 18 261 A2030 B2010 | 19 262 A2031 B2011 |
| 20 263 A2032 B2012 | 21 264 A2033 B2013 | 22 265 A2034 B2014 | 23 266 A2035 B2015 | 24 267 A2036 | 25 268 A2037 B2016 | 26 269 A2038 B2017 |
| 27 270 A2039 B2018 | 28 271 A2040 B2019 | 29 272 A2041 B2020 | 30 273 A2042 B2021 | | | |

October 2009

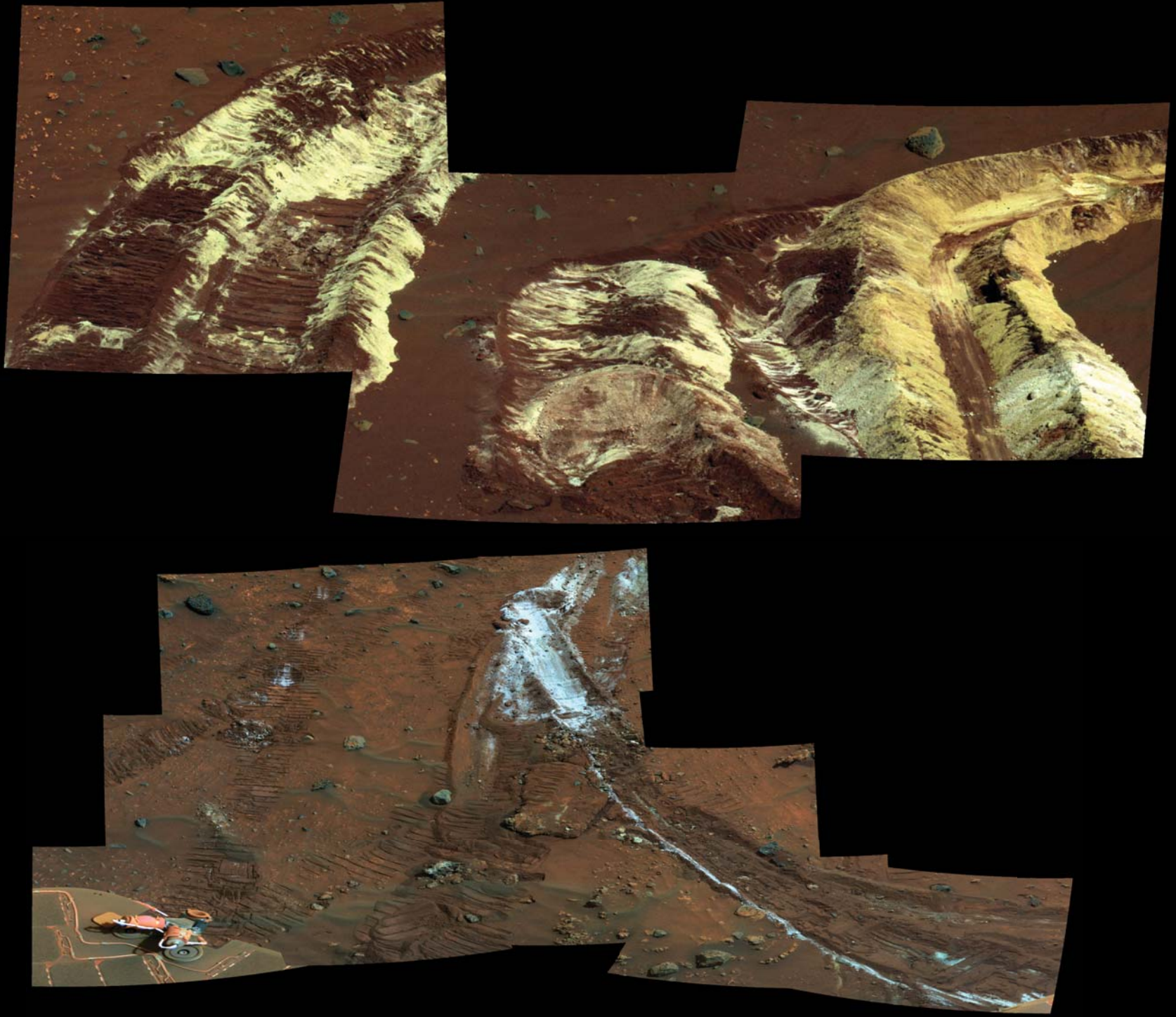
| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|--------------------------|---|--------------------------|--------------------------|---|--------------------------|--------------------------|
| | | | | 1 274 L _s =346.8° A2043 B2022 | 2 275 A2044 B2023 | 3 276 A2045 B2024 |
| 4 277 A2046 B2025 | 5 278 A2047 B2026 | 6 279 A2048 B2027 | 7 280 A2049 B2028 | 8 281 A2050 B2029 | 9 282 A2051 B2030 | 10 283 A2052 B2031 |
| 11 284 A2053 B2032 | 12 285 B2033 | 13 286 A2054 B2034 | 14 287 A2055 B2035 | 15 288 A2056 B2036 | 16 289 A2057 B2037 | 17 290 A2058 B2038 |
| 18 291 A2059 B2039 | 19 292 A2060 B2040 | 20 293 A2061 B2041 | 21 294 A2062 B2042 | 22 295 A2063 B2043 | 23 296 A2064 B2044 | 24 297 A2065 B2045 |
| 25 298 A2066 B2046 | 26 299 Southern Mars Autumnal Equinox A2067 B2047 | 27 300 A2068 B2048 | 28 301 A2069 B2049 | 29 302 A2070 B2050 | 30 303 A2071 B2051 | 31 304 A2072 |



This false-color view from Opportunity's Pancam (taken on sol 173) shows the first seven holes that the rover's Rock Abrasion Tool (RAT) dug on the inner slope of Endurance Crater. The false color allows the holes to be much more visible than they would be in a natural-color image. Note that the sky on Mars is not really blue, as it appears in this image. The rover was about 12 meters (about 39 feet) down into the crater, with the Pancam looking back toward the rover's tracks. The tailings around the holes show evidence of fine-grained red hematite similar to what was observed months earlier in Eagle Crater outcrop holes.



October 1, 2009



Pale hints of past water

NASA/JPL-Caltech/Cornell

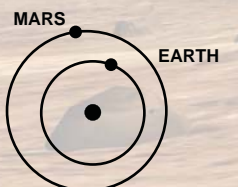
November 2009

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| 1 305 A2073 B2052 | 2 306 A2074 B2053 | 3 307 A2075 B2054 | 4 308 A2076 B2055 | 5 309 A2077 B2056 | 6 310 A2078 B2057 | 7 311 A2079 B2058 |
| 8 312 A2080 B2059 | 9 313 A2081 B2060 | 10 314 A2082 B2061 | 11 315 A2083 B2062 | 12 316 A2084 B2063 | 13 317 A2085 B2064 | 14 318 A2086 B2065 |
| 15 319 A2087 B2066 | 16 320 A2088 B2067 | 17 321 A2089 B2068 | 18 322 A2090 B2069 | 19 323 A2091 B2070 | 20 324 A2092 B2071 | 21 325 A2093 B2072 |
| 22 326 A2093 B2073 | 23 327 A2094 B2074 | 24 328 A2095 B2075 | 25 329 A2096 B2076 | 26 330 A2097 B2077 | 27 331 A2098 B2078 | 28 332 A2099 B2079 |
| 29 333 A2100 B2080 | 30 334 A2101 B2081 | | | | | |

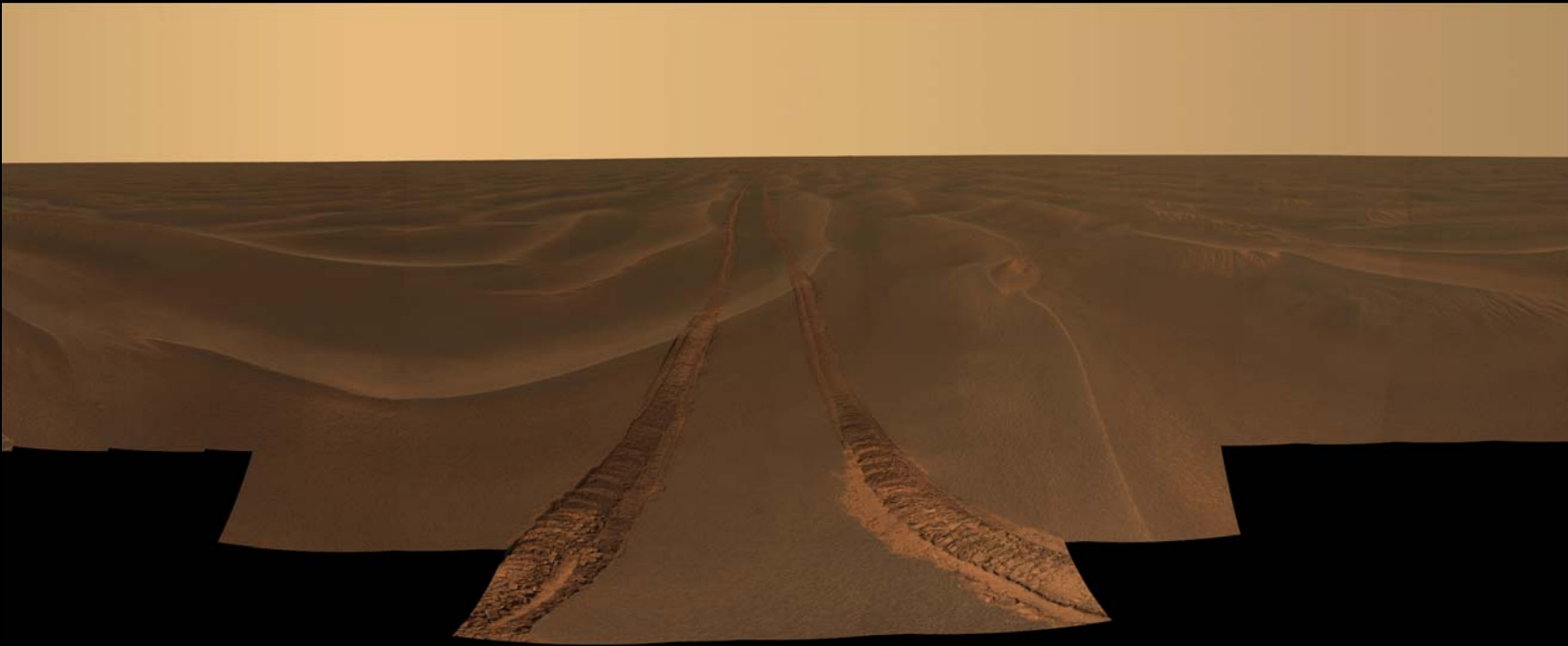
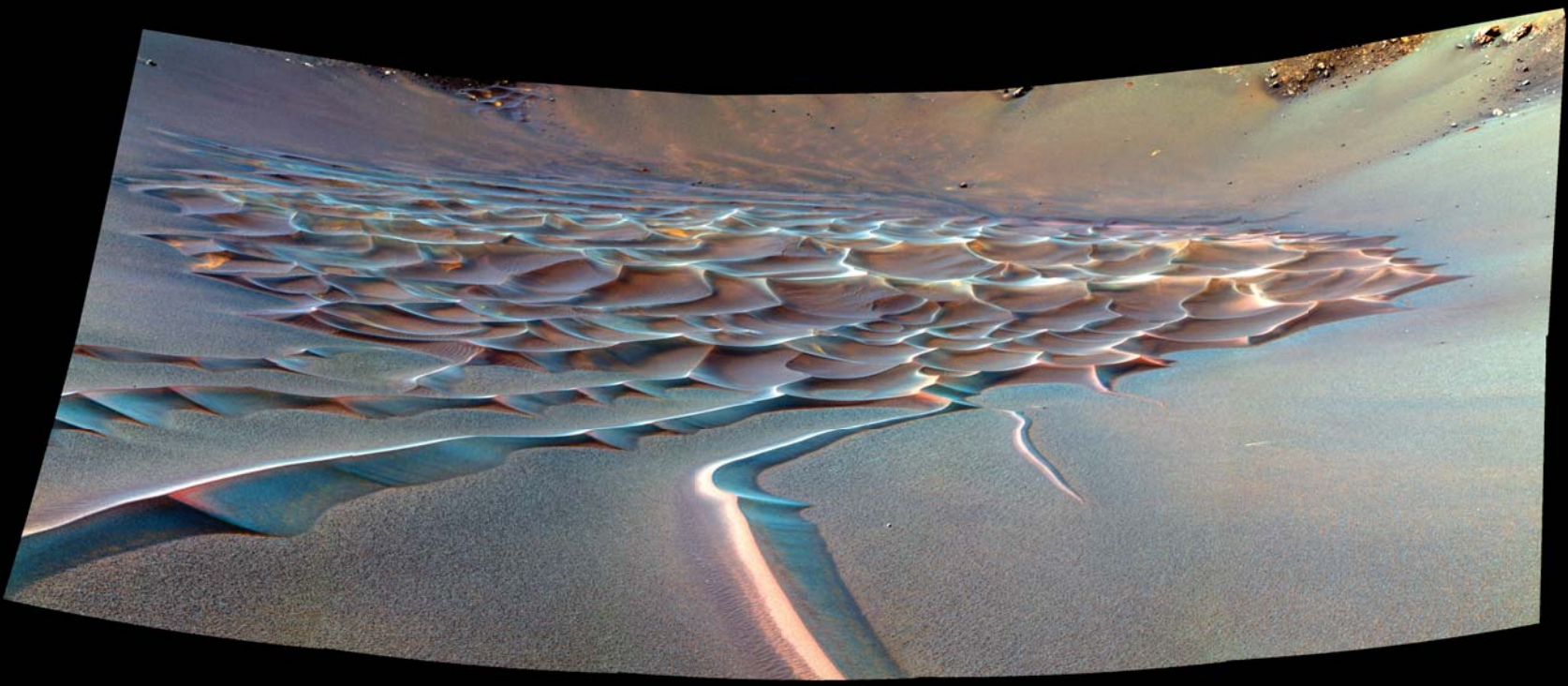
December 2009

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| | | 1 335 A2102 B2082 | 2 336 A2103 B2083 | 3 337 A2104 B2084 | 4 338 A2105 B2085 | 5 339 A2106 B2086 |
| 6 340 A2107 B2087 | 7 341 A2108 | 8 342 A2109 B2088 | 9 343 A2110 B2089 | 10 344 A2111 B2090 | 11 345 A2112 B2091 | 12 346 A2113 B2092 |
| 13 347 A2114 B2093 | 14 348 A2115 B2094 | 15 349 A2116 B2095 | 16 350 A2117 B2096 | 17 351 A2118 B2097 | 18 352 A2119 B2098 | 19 353 A2120 B2099 |
| 20 354 A2121 B2100 | 21 355 A2122 B2101 | 22 356 A2123 B2102 | 23 357 A2124 B2103 | 24 358 A2125 B2104 | 25 359 A2126 B2105 | 26 360 A2127 B2106 |
| 27 361 A2127 B2107 | 28 362 A2128 B2108 | 29 363 A2129 B2109 | 30 364 A2130 B2110 | 31 365 A2131 B2111 | | |

In both the above images, Spirit's wheels have churned up light-toned soil lying just beneath the Martian surface soil in Gusev Crater. In the top image, taken by the Pancam on Spirit's sol 788, the bright soil is confirmed by Spirit's instruments to have a salty chemistry dominated by iron-bearing sulfates. In the bottom image, taken on sol 1202, the light-colored soil is found to be predominantly silica. These two minerals share a likely origin in water. While sulfates can form in several ways, water is involved in most. The deposits of nearly pure silica in Gusev Crater may have formed when volcanic steam or hot water (or maybe both) percolated through the ground. Such deposits are found around hydrothermal vents like those in Yellowstone National Park.



December 1, 2009



Dynamic dunes

NASA/JPL-Caltech/Cornell

January 2010

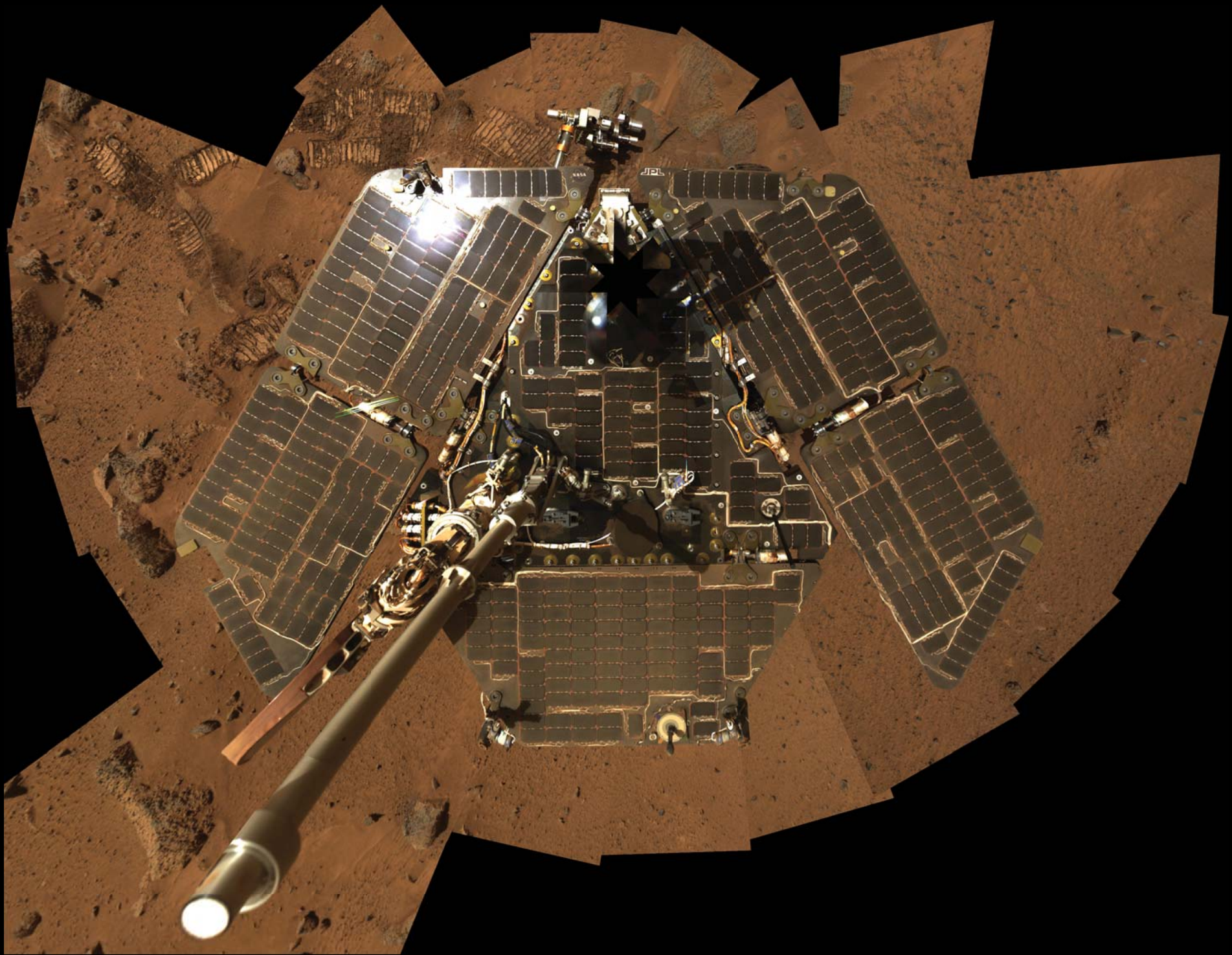
February 2010

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY | SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|----------------------------|---|----------------------------|----------------------------|----------------------------|---|----------------------------|----------------------------|---|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| | | | | | 1 1 L _s =31.5° A2132 B2112 | 2 2 A2133 B2113 | | 1 32 L _s =45.5° B2142 | 2 33 A2163 B2143 | 3 34 A2164 B2144 | 4 35 A2165 B2145 | 5 36 A2166 B2146 | 6 37 A2167 B2147 |
| 3 3 A2134 B2114 | 4 4 Spirit's 6th Earth Anniversary A2135 B2115 | 5 5 A2136 B2116 | 6 6 A2137 B2117 | 7 7 A2138 B2118 | 8 8 A2139 B2119 | 9 9 A2140 B2120 | 7 38 A2168 B2148 | 8 39 A2169 B2149 | 9 40 A2170 B2150 | 10 41 A2171 B2151 | 11 42 A2172 B2152 | 12 43 A2173 B2153 | 13 44 A2174 B2154 |
| 10 10 A2141 B2121 | 11 11 A2142 B2122 | 12 12 A2143 B2123 | 13 13 A2144 B2124 | 14 14 A2145 | 15 15 A2146 B2125 | 16 16 A2147 B2126 | 14 45 A2175 B2155 | 15 46 A2176 B2156 | 16 47 A2177 B2157 | 17 48 A2178 B2158 | 18 49 A2179 B2159 | 19 50 A2180 B2160 | 20 51 A2181 |
| 17 17 A2148 B2127 | 18 18 A2149 B2128 | 19 19 A2150 B2129 | 20 20 A2151 B2130 | 21 21 A2152 B2131 | 22 22 A2153 B2132 | 23 23 A2154 B2133 | 21 52 A2182 B2161 | 22 53 A2183 B2162 | 23 54 A2184 B2163 | 24 55 A2185 B2164 | 25 56 A2186 B2165 | 26 57 A2187 B2166 | 27 58 A2188 B2167 |
| 24 24 A2162 B2141 | 25 25 Opportunity's 6th Earth Anniversary A2155 B2134 | 26 26 A2157 B2136 | 27 27 A2158 B2137 | 28 28 A2159 B2138 | 29 29 Mars Opposition A2160 B2139 | 30 30 A2161 B2140 | 28 59 A2189 B2168 | | | | | | |
| 31 31 A2156 B2135 | | | | | | | | | | | | | |

The top image is the view from Opportunity on sol 211 of the dune field within Endurance Crater. The dust (a lighter color) accumulates near the dune crests, while hematite-rich spherules (like the “blueberries” in the March-April 2009 image), which appear blue against the scene in this false color version, tend to rest in troughs with more gradual slopes. The bottom panorama from Opportunity (taken from sols 456 to 464), shows Purgatory Dune in which the rover was stuck for over a month. These wind-blown sand and dust features are constantly changing, reaffirming the dynamic nature of the Martian environment.



February 1, 2010



Spirit's self-portrait

NASA/JPL-Caltech/Cornell

March 2010

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|--|---|--|--|--|--|--|
| | 1 60 <small>L_s=57.9° A2190 B2169</small> | 2 61 <small>A2191 B2170</small> | 3 62 <small>A2192 B2171</small> | 4 63 <small>A2193 B2172</small> | 5 64 <small>A2194 B2173</small> | 6 65 <small>A2195 B2174</small> |
| 7 66 <small>A2196 B2175</small> | 8 67 <small>A2197 B2176</small> | 9 68 <small>A2198 B2177</small> | 10 69 <small>A2199 B2178</small> | 11 70 <small>B2179</small> | 12 71 <small>A2200 B2180</small> | 13 72 <small>A2201 B2181</small> |
| 14 73 <small>A2202 B2182</small> | 15 74 <small>A2203 B2183</small> | 16 75 <small>A2204 B2184</small> | 17 76 <small>A2205 B2185</small> | 18 77 <small>A2206 B2186</small> | 19 78 <small>A2207 B2187</small> | 20 79 <small>A2208 B2188</small> |
| 21 80 <small>A2209 B2189</small> | 22 81 <small>A2210 B2190</small> | 23 82 <small>A2211 B2191</small> | 24 83 <small>A2212 B2192</small> | 25 84 <small>A2213 B2193</small> | 26 85 <small>A2214 B2194</small> | 27 86 <small>A2215 B2195</small> |
| 28 87 <small>A2216 B2196</small> | 29 88 <small>A2217</small> | 30 89 <small>Mars Aphelion</small> <small>A2218 B2197</small> | 31 90 <small>A2219 B2198</small> | | | |

April 2010

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|---|---|---|---|---|---|---|
| | | | | 1 91 <small>L_s=71.4° A2220 B2199</small> | 2 92 <small>A2221 B2200</small> | 3 93 <small>A2222 B2201</small> |
| 4 94 <small>A2223 B2202</small> | 5 95 <small>A2224 B2203</small> | 6 96 <small>A2225 B2204</small> | 7 97 <small>A2226 B2205</small> | 8 98 <small>A2227 B2206</small> | 9 99 <small>A2228 B2207</small> | 10 100 <small>A2229 B2208</small> |
| 11 101 <small>A2230 B2209</small> | 12 102 <small>A2231 B2210</small> | 13 103 <small>A2232 B2211</small> | 14 104 <small>A2233 B2212</small> | 15 105 <small>A2234 B2213</small> | 16 106 <small>A2235 B2214</small> | 17 107 <small>B2215</small> |
| 18 108 <small>A2236 B2216</small> | 19 109 <small>A2237 B2217</small> | 20 110 <small>A2238 B2218</small> | 21 111 <small>A2239 B2219</small> | 22 112 <small>A2240 B2220</small> | 23 113 <small>A2241 B2221</small> | 24 114 <small>A2242 B2222</small> |
| 25 115 <small>A2243 B2223</small> | 26 116 <small>A2244 B2224</small> | 27 117 <small>A2245 B2225</small> | 28 118 <small>A2246 B2226</small> | 29 119 <small>Spirit surpasses Viking Lander 1 in longevity</small> <small>A2247 B2227</small> | 30 120 <small>A2248 B2228</small> | |



This self-portrait of Spirit, taken on its Sol 586, shows the solar panels still gleaming in the Martian sunlight and carrying only a thin veneer of dust even two years after the rover landed and began exploring the red planet. Spirit's Pancam took this mosaic of images as part of a mammoth undertaking that resulted in the largest panorama ever acquired by Spirit at the time. This image is a subset of that panorama, showing just the rover. The vertical projection used here produces the best view of the rover deck itself, though it distorts the ground and antennas somewhat. This image is an approximate true-color rendering that combines images taken through the camera's 600-nanometer, 530-nanometer, and 480-nanometer filters.



April 1, 2010



Martian sunset

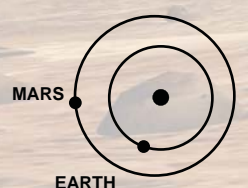
NASA/JPL/Texas A&M/Cornell

May 2010

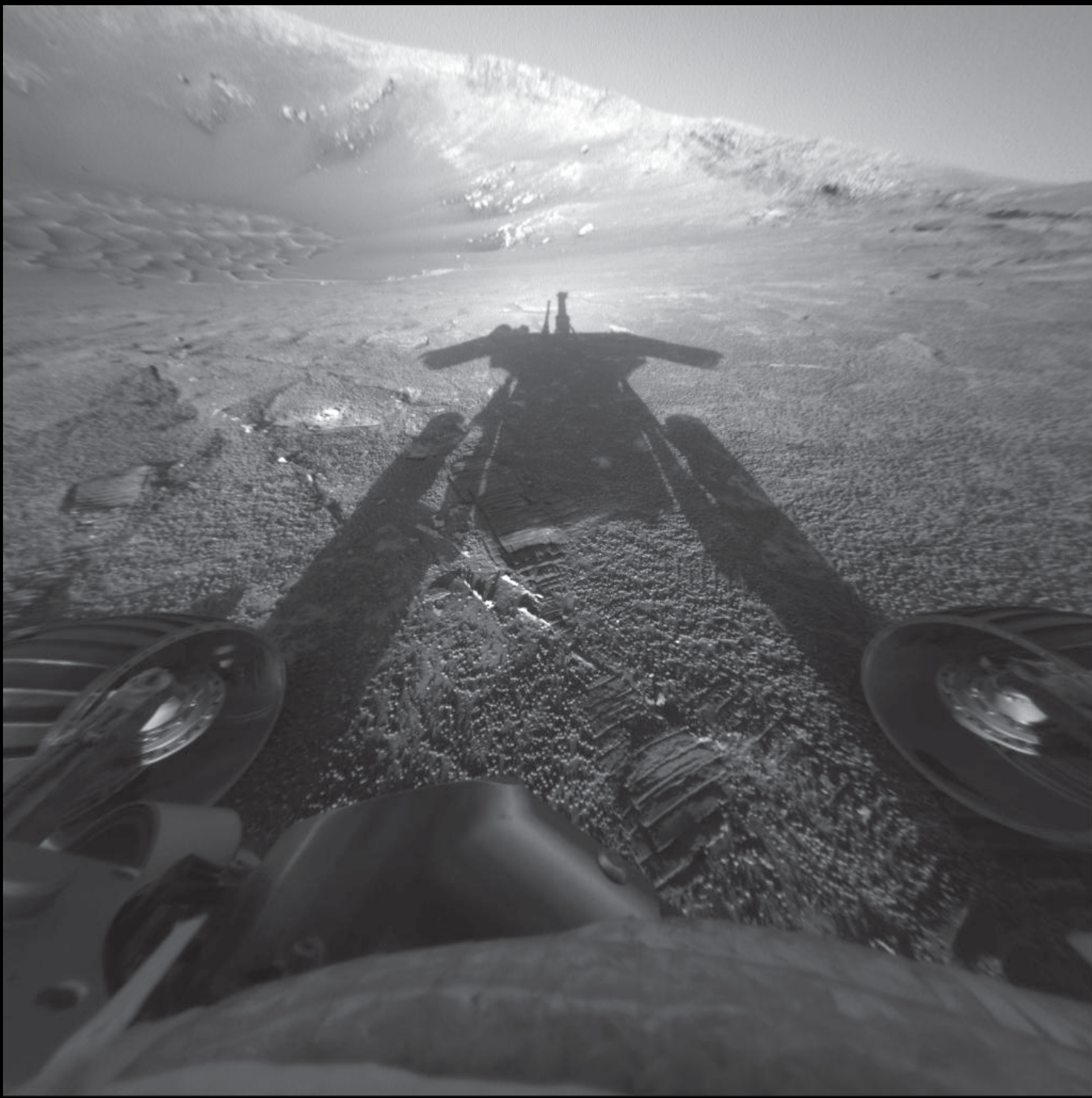
June 2010

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY | SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|--------------------------|--|--------------------------|--------------------------|--|--------------------------|---|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|
| | | | | | | 1 121 <i>L_s=84.5°</i> A2249 B2229 | | | 1 152 <i>L_s=98.3°</i> A2279 B2259 | 2 153 A2280 B2260 | 3 154 A2281 B2261 | 4 155 A2282 B2262 | 5 156 A2283 B2263 |
| 2 122 A2250 B2230 | 3 123 A2251 B2231 | 4 124 A2252 B2232 | 5 125 A2253 B2233 | 6 126 A2254 | 7 127 A2255 B2234 | 8 128 A2256 B2235 | 6 157 A2284 B2264 | 7 158 A2285 B2265 | 8 159 A2286 B2266 | 9 160 A2287 B2267 | 10 161 A2288 B2268 | 11 162 A2289 B2269 | 12 163 A2290 |
| 9 129 A2257 B2236 | 10 130 A2258 B2237 | 11 131 A2259 B2238 | 12 132 A2260 B2239 | 13 133 A2261 B2240 Southern Mars Winter Solstice | 14 134 A2262 B2241 | 15 135 A2263 B2242 | 13 164 A2291 B2270 | 14 165 A2292 B2271 | 15 166 A2293 B2272 | 16 167 A2294 B2273 | 17 168 A2295 B2274 | 18 169 A2296 B2275 | 19 170 A2297 B2276 |
| 16 136 A2264 B2243 | 17 137 A2265 B2244 | 18 138 A2266 B2245 | 19 139 A2267 B2246 | 20 140 A2268 B2247 Opportunity surpasses Viking Lander 1 in longevity | 21 141 A2269 B2248 | 22 142 A2270 B2249 | 20 171 A2298 B2277 | 21 172 A2299 B2278 | 22 173 A2300 B2279 | 23 174 A2301 B2280 | 24 175 A2302 B2281 | 25 176 A2303 B2282 | 26 177 A2304 B2283 |
| 143 A2277 B2257 | 23 144 A2271 B2250 A2278 B2258 | 24 145 A2272 B2251 | 25 146 B2252 | 26 147 A2273 B2253 | 27 148 A2274 B2254 | 28 149 A2275 B2255 | 27 178 A2305 B2284 | 28 179 A2306 B2285 | 29 180 A2307 B2286 | 30 181 A2308 B2287 | | | |
| 30 150 | 31 151 | | | | | | | | | | | | |

Spirit captured this stunning view as the Sun sank below the rim of Gusev Crater on Mars around 6:07 in the evening of Spirit's sol 489. This small panorama of the western sky was obtained using the Pancam's 750-nanometer, 530-nanometer, and 430-nanometer color filters. This filter combination allows false-color images to be generated that are similar to what a human would see, but with the colors slightly exaggerated. In this image, the bluish glow in the sky above the Sun would be visible to us if we were there, but the redness of the sky farther from the sunset is exaggerated. Other images have shown that the twilight glow is visible for up to two hours before sunrise or after sunset. The long Martian twilight is caused by sunlight scattered around to the night side of the planet by abundant high-altitude dust.



June 1, 2010



Sol companion

NASA/JPL

July 2010

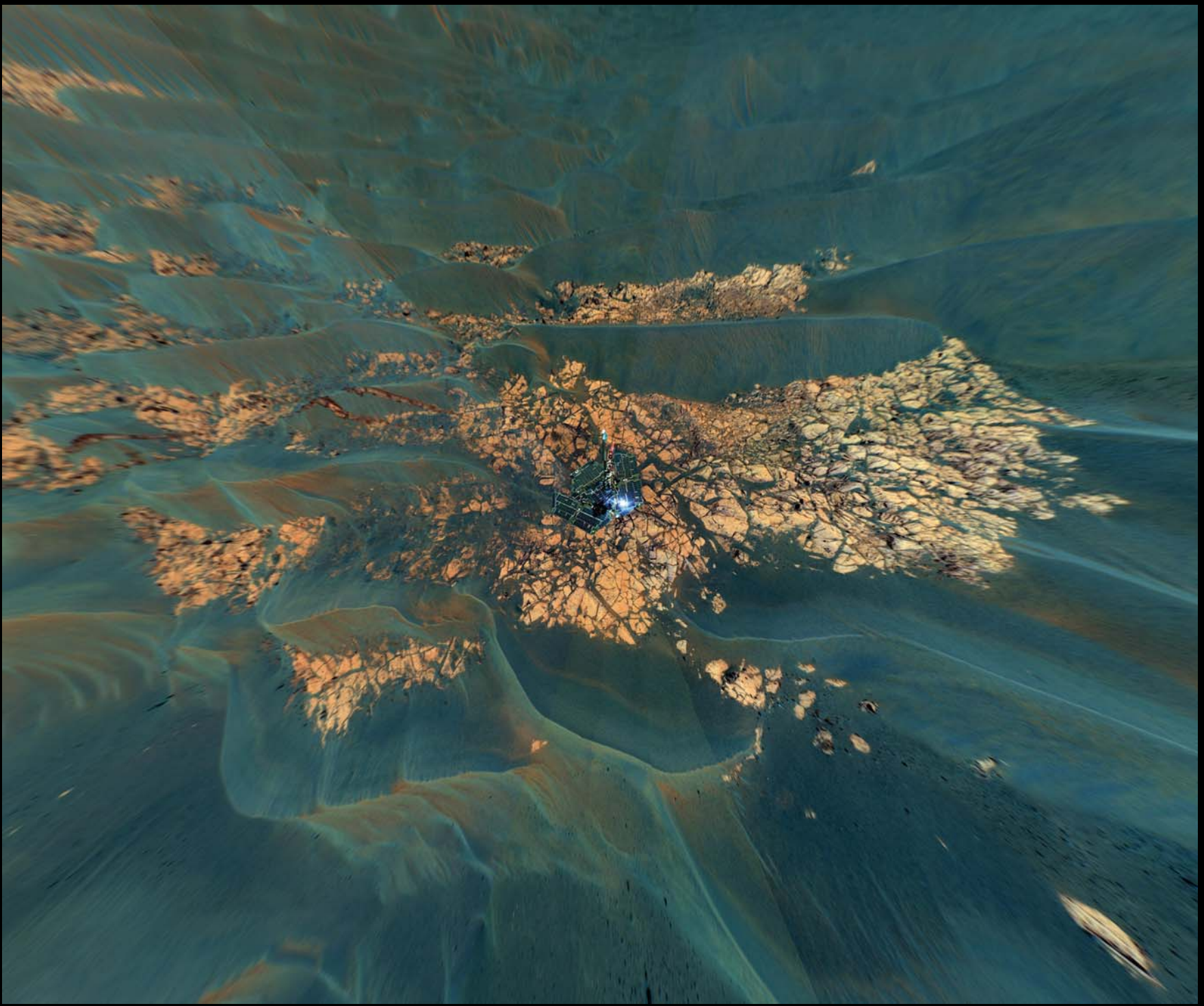
August 2010

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY | SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | | | | 1 182 $L_s=111.8^\circ$ B2288 | 2 183 A2309 B2289 | 3 184 A2310 B2290 | 1 213 $L_s=126.3^\circ$ A2339 B2318 | 2 214 A2340 B2319 | 3 215 A2341 B2320 | 4 216 A2342 B2321 | 5 217 A2343 B2322 | 6 218 A2344 B2323 | 7 219 B2324 |
| 4 185 A2311 B2291 | 5 186 A2312 B2292 | 6 187 A2313 B2293 | 7 188 A2314 B2294 | 8 189 A2315 B2295 | 9 190 A2316 B2296 | 10 191 A2317 B2297 | 8 220 A2345 B2325 | 9 221 A2346 B2326 | 10 222 A2347 B2327 | 11 223 A2348 B2328 | 12 224 A2349 B2329 | 13 225 A2350 B2330 | 14 226 A2351 B2331 |
| 11 192 A2318 B2298 | 12 193 A2319 B2299 | 13 194 A2320 B2300 | 14 195 A2321 B2301 | 15 196 A2322 B2301 | 16 197 A2323 B2303 | 17 198 A2324 B2304 | 15 227 A2352 B2332 | 16 228 A2353 B2333 | 17 229 A2354 B2334 | 18 230 A2355 B2335 | 19 231 A2356 B2336 | 20 232 A2357 B2337 | 21 233 A2358 B2338 |
| 18 199 A2325 B2305 | 19 200 A2326 B2306 | 20 201 A2327 | 21 202 A2328 B2307 | 22 203 A2329 B2308 | 23 204 A2330 B2309 | 24 205 A2331 B2310 | 22 234 A2359 B2339 | 23 235 A2360 B2340 | 24 236 A2361 B2341 | 25 237 A2362 B2342 | 26 238 A2363 | 27 239 A2364 B2343 | 28 240 A2365 B2344 |
| 25 206 A2332 B2311 | 26 207 A2333 B2312 | 27 208 A2334 B2313 | 28 209 A2335 B2314 | 29 210 A2336 B2315 | 30 211 A2337 B2316 | 31 212 A2338 B2317 | 29 241 A2366 B2345 | 30 242 A2367 B2346 | 31 243 A2368 B2347 | | | | |

Opportunity takes a picture of its own shadow as it continues its descent into Endurance Crater. With the Sun low on the horizon, the rover's rear-facing, black-and-white Hazard Avoidance Camera, or Hazcam, easily picks out details of the surface texture and the rover's own tracks in the loose soil. The rovers have two pairs of Hazcams—front and back—to support automated navigation, scanning the immediate landscape for obstacles that may hinder or damage it. The image was taken on sol 180 (July 26, 2004), a date that marks the achievement of fully double the rover's primary 90-sol mission.



August 1, 2010



Ripples all around

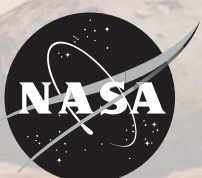
NASA/JPL-Caltech/Cornell

September 2010

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|----------------|----------------|----------------|-------------------------------------|----------------|----------------|----------------|
| | | | 1 244 | 2 245 | 3 246 | 4 247 |
| | | | $L_s=141.4^\circ$ A2369 B2348 | A2370 B2349 | A2371 B2350 | A2372 B2351 |
| 5 248 | 6 249 | 7 250 | 8 251 | 9 252 | 10 253 | 11 254 |
| A2373 B2352 | A2374 B2353 | A2375 B2354 | A2376 B2355 | A2377 B2356 | A2378 B2357 | A2379 B2358 |
| 12 255 | 13 256 | 14 257 | 15 258 | 16 259 | 17 260 | 18 261 |
| A2380 B2359 | A2381 B2360 | B2361 | A2382 B2362 | A2383 B2363 | A2384 B2364 | A2385 B2365 |
| 19 262 | 20 263 | 21 264 | 22 265 | 23 266 | 24 267 | 25 268 |
| A2386 B2366 | A2387 B2367 | A2388 B2368 | A2389 B2369 | A2390 B2370 | A2391 B2371 | A2392 B2372 |
| 26 269 | 27 270 | 28 271 | 29 272 | 30 273 | | |
| A2393 B2373 | A2394 B2374 | A2395 B2375 | A2396 B2376 | A2397 B2377 | | |

October 2010

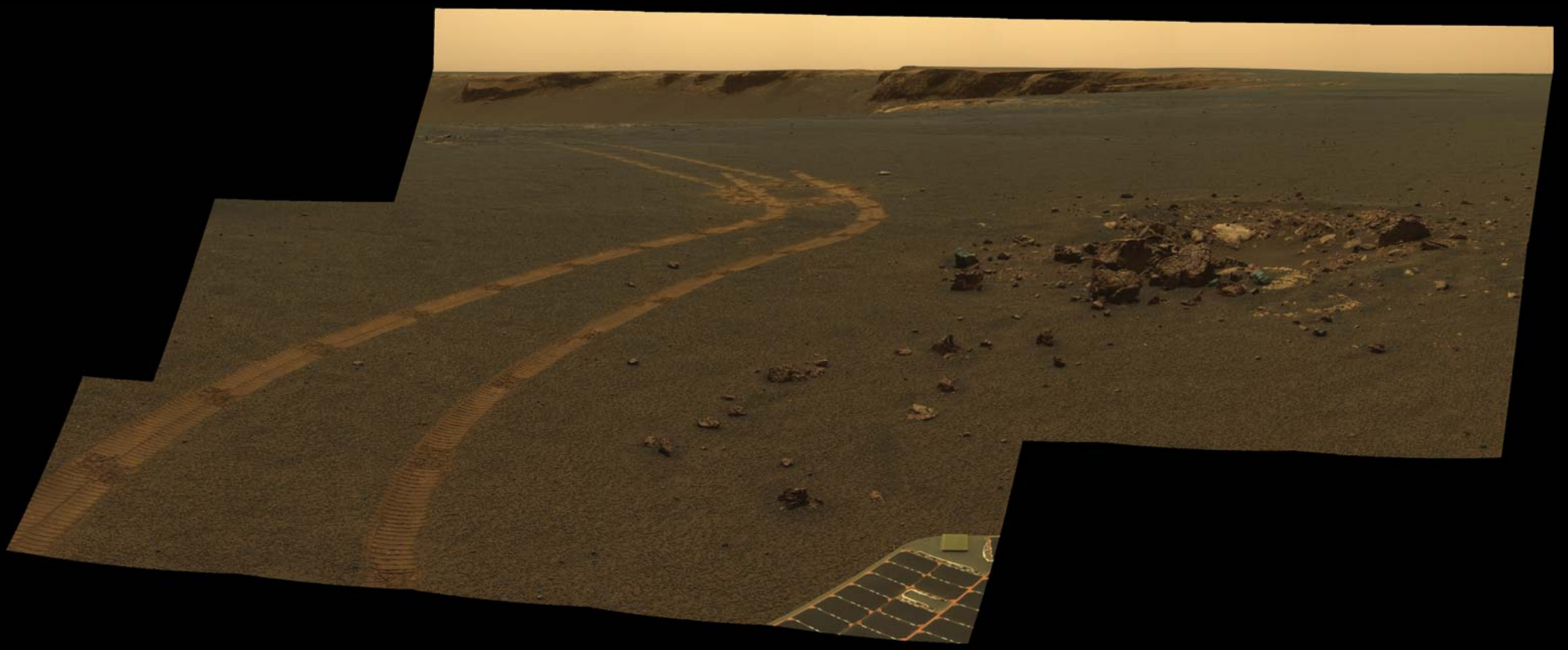
| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|----------------------------------|----------------|----------------|----------------|----------------|-------------------------------------|----------------|
| | | | | | 1 274 | 2 275 |
| | | | | | $L_s=156.7^\circ$ A2398 B2378 | A2399 |
| 3 276 | 4 277 | 5 278 | 6 279 | 7 280 | 8 281 | 9 282 |
| A2400 B2379 | A2401 B2380 | A2402 B2381 | A2403 B2382 | A2404 B2383 | A2405 B2384 | A2406 B2385 |
| 10 283 | 11 284 | 12 285 | 13 286 | 14 287 | 15 288 | 16 289 |
| A2407 B2386 | A2408 B2387 | A2409 B2388 | A2410 B2389 | A2411 B2390 | A2412 B2391 | A2413 B2392 |
| 17 290 | 18 291 | 19 292 | 20 293 | 21 294 | 22 295 | 23 296 |
| A2414 B2393 | A2415 B2394 | A2416 B2395 | A2417 B2396 | B2397 | A2418 B2398 | A2419 B2399 |
| 24 297 | 25 298 | 26 299 | 27 300 | 28 301 | 29 302 | 30 303 |
| A2420 B2400 A2427 B2407 | A2421 B2401 | A2422 B2402 | A2423 B2403 | A2424 B2404 | A2425 B2405 | A2426 B2406 |
| 31 304 | | | | | | |



This view at the edge of Erebus Crater is a false-color composite 360-degree panorama from frames taken by Opportunity's Pancam on Sols 652 through 663. The mosaic is presented as a vertical projection, providing a true-to-scale overhead view of the rover deck and nearby surrounding terrain. The view here shows outcrop rocks, sand dunes, and other features out to a distance of about 25 meters (82 feet) from the rover. The view shows examples of the dunes and ripples that Opportunity crossed as it drove on the Meridiani plains.



October 1, 2010



Toward autonomy: navigation and data capture

NASA/JPL-Caltech/Cornell

November 2010

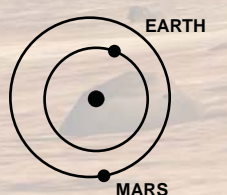
| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|--|--|--|--|--|--|---|
| | 1 305 <small>L_s=173.4° A2428 B2408</small> | 2 306 <small>A2429 B2409</small> | 3 307 <small>A2430 B2410</small> | 4 308 <small>A2431 B2411</small> | 5 309 <small>A2432 B2412</small> | 6 310 <small>A2433 B2413</small> |
| 7 311 <small>A2434 B2414</small> | 8 312 <small>A2435 B2415</small> | 9 313 <small>A2436</small> | 10 314 <small>A2437 B2416</small> | 11 315 <small>A2438 B2417</small> | 12 316 <small>A2439 B2418</small> | 13 317 <small>Southern Mars Vernal Equinox A2440 B2429</small> |
| 14 318 <small>A2441 B2420</small> | 15 319 <small>A2442 B2421</small> | 16 320 <small>A2443 B2422</small> | 17 321 <small>A2444 B2423</small> | 18 322 <small>A2445 B2424</small> | 19 323 <small>A2446 B2425</small> | 20 324 <small>A2447 B2426</small> |
| 21 325 <small>A2448 B2427</small> | 22 326 <small>A2449 B2428</small> | 23 327 <small>A2450 B2429</small> | 24 328 <small>A2451 B2430</small> | 25 329 <small>A2452 B2431</small> | 26 330 <small>A2453 B2432</small> | 27 331 <small>B2433</small> |
| 28 332 <small>A2454 B2434</small> | 29 333 <small>A2455 B2435</small> | 30 334 <small>A2456 B2436</small> | | | | |

December 2010

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|--|--|--|--|--|--|--|
| | | | 1 335 <small>L_s=190.3° A2457 B2437</small> | 2 336 <small>A2458 B2438</small> | 3 337 <small>A2459 B2439</small> | 4 338 <small>A2460 B2440</small> |
| 6 339 <small>A2461 B2441</small> | 6 340 <small>A2462 B2442</small> | 7 341 <small>A2463 B2443</small> | 8 342 <small>A2464 B2444</small> | 9 343 <small>A2465 B2445</small> | 10 344 <small>A2466 B2446</small> | 11 345 <small>A2467 B2447</small> |
| 13 346 <small>A2468 B2448</small> | 13 347 <small>A2469 B2449</small> | 14 348 <small>A2470 B2450</small> | 15 349 <small>A2471 B2451</small> | 16 350 <small>A2472</small> | 17 351 <small>A2473 B2452</small> | 18 352 <small>A2474 B2453</small> |
| 20 353 <small>A2475 B2454</small> | 20 354 <small>A2476 B2455</small> | 21 355 <small>A2477 B2456</small> | 22 356 <small>A2478 B2457</small> | 23 357 <small>A2479 B2458</small> | 24 358 <small>A2480 B2459</small> | 25 359 <small>A2481 B2460</small> |
| 27 360 <small>A2482 B2461</small> | 27 361 <small>A2483 B2462</small> | 28 362 <small>A2484 B2463</small> | 29 363 <small>A2485 B2464</small> | 30 364 <small>A2486 B2465</small> | 31 365 <small>A2487 B2466</small> | |



NASA's twin Mars Exploration Rovers have grown smarter as they've grown older. The top image from Opportunity shows the tracks left by a drive executed with more onboard autonomy than ever before. Opportunity was testing a navigational capability called "Field D-star," which enables the rover to plan optimal long-range drives around any obstacles in order to travel the most direct, safe route to a destination. Opportunity and its twin, Spirit, acquired this capability in their third year on Mars. The bottom image is one frame of a movie taken by Spirit's navigation camera of a passing Martian dust devil. How did the rover know a dust devil was passing? It—and Opportunity—had acquired some new artificial intelligence software called "autonomous sciencecraft" that enabled it to recognize and capture just such a transient event without any commands from Earth.



December 1, 2010

Mars Exploration Rovers Quick Facts

Launch vehicles: Boeing Delta II

Launch date:

Spirit—June 10, 2003 UTC
Opportunity—July 7, 2003 UTC

Arrival date:

Spirit—January 4, 2004 UTC
Opportunity—January 25, 2004 UTC

Landing site:

Spirit—Gusev Crater (14.57°S, 175.47°E)
Opportunity—Eagle Crater on Meridiani Planum (1.95°S, 354.47°E)

Landing technology: Atmospheric entry aeroshell, backshell with parachute and retro rockets, and airbags to cushion landing.

Mission objective: Assess the history of environmental conditions at sites that may once have been wet and favorable to life.

Duration of primary mission: 90 Martian days (sols)

Duration of primary plus extended mission: Over five years

Total distance covered in first five years:

Spirit—7.5 kilometers (4.7 miles)
Opportunity—13.6 kilometers (8.5 miles)

One day Martian driving record:

Opportunity, 140.9 meters (462 feet) on April 30, 2004

Number of images sent to Earth: Over 220,000

Amount of data returned: More than 36 gigabytes

Mars Exploration Rovers Project Management

John Callas, JPL, Pasadena, CA

Project Manager

Bruce Banerdt, JPL, Pasadena, CA

Project Scientist

Diana Blaney, JPL, Pasadena, CA

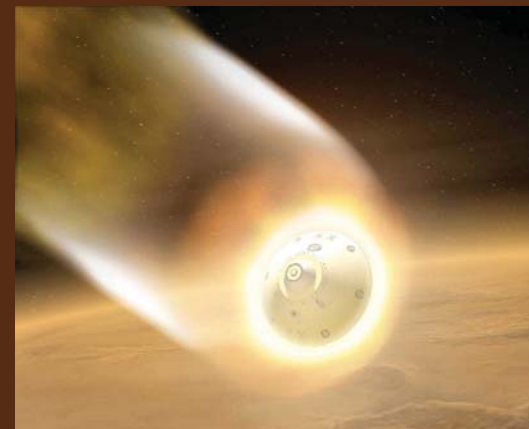
Deputy Project Scientist

Steven Squyres, Cornell University, Ithaca, NY

Athena Science Payload
Principal Investigator

Ray Arvidson, Washington University, St. Louis, MO

Deputy Athena Science
Payload Principal
Investigator



The aeroshell protects the rover from fiery temperatures as it enters the Martian atmosphere. (Artist's rendering)

For more information, visit marsrovers.jpl.nasa.gov and mars.jpl.nasa.gov.

National Aeronautics and Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

www.nasa.gov