National Aeronautics and
Space Administration

OPPORTUNITY • MARS EXPLORATION ROVER

CURIOSITY • MARS SCIENCE LABORATORY

2013 2014

ONE MARTIAN YEAR • TWO EARTH YEARS

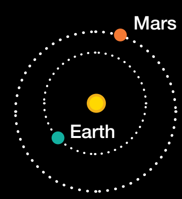
Cover *Artist's concepts of NASA's Mars Exploration Rover Opportunity and Mars Science Laboratory Curiosity.*

Opportunity and its twin, Spirit, landed on opposite sides of Mars in January 2004, each with a planned mission of 90 Martian days (sols). Spirit lasted more than six years, ceasing operation March 22, 2010, on Sol 2210. As of December 2012, Opportunity roved nearly 22 miles (35 kilometers) for more than 3100 sols, and continues to explore and communicate with Earth.

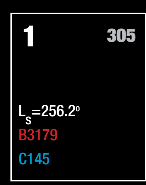
Curiosity landed on Mars August 6, 2012 (UTC) for a planned 23-month mission to investigate whether Mars ever had favorable environmental conditions (habitats) to support microbial life.

Visit mars.jpl.nasa.gov

How to Use the Calendar



A Martian Year Each page of the calendar has a diagram showing the relative positions of Earth and Mars on the first day of the month. Mars is farther from the Sun compared with Earth, so it takes Mars longer to complete one orbit and its year is longer than an Earth year. A Mars year is 687 Earth days long — almost two Earth years. This calendar covers one Martian year and two Earth years.

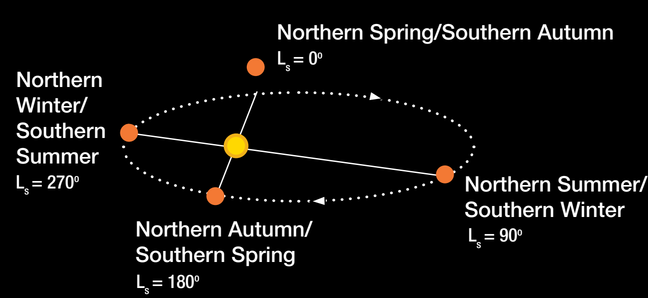


A Martian Day Like Earth, Mars rotates on its axis, but more slowly, so a Mars day is slightly longer than an Earth day. The Mars day (sol) is 24 hours, 39-1/2 minutes long. This calendar tracks how many sols have passed since Opportunity (designated "B" in red type) and Curiosity ("C" in blue type) landed on Mars. (Spirit had the "A" designation while it was in operation.) About every 36 days the calendar skips an Earth day in counting sols, so days and sols can stay synchronized.

Day of the Year Each calendar square representing a day has a number in the top right corner indicating the consecutive day of the year (DOY). Space mission operations typically use DOY as a shorthand way of showing the date.

DSN Week Number This number helps all operating deep space missions schedule use of Earth-based antennas in the Deep Space Network (DSN). DSN Week 1 begins on the first Monday of the calendar year and is numbered sequentially to the end of the year.

Mars Seasons Mars solar longitude (the L_s number on the first day of each month in the calendar) determines seasons on Mars. As Mars travels around the Sun through 360°, it experiences seasons just as Earth does.



ROVER INSTRUMENTS

MARS EXPLORATION ROVERS • SPIRIT & OPPORTUNITY

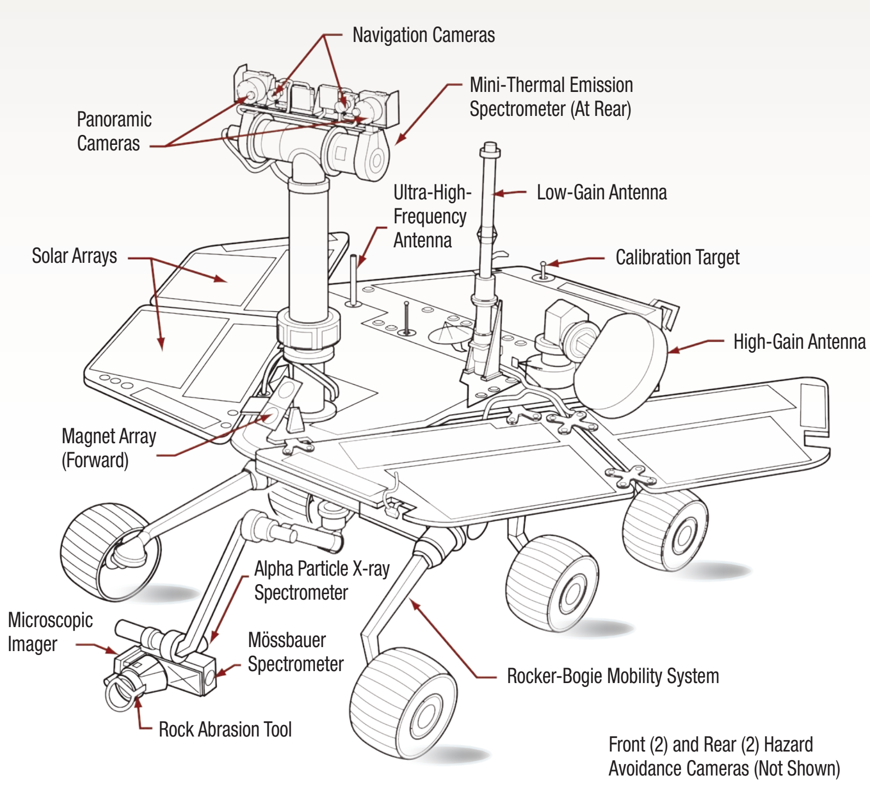
Opportunity has six science instruments, along with engineering cameras.

Remote Sensing Instruments

- **Panoramic Camera (Pancam)** — Creates high-resolution color images with a stereoscopic camera pair that can rotate in a complete circle and look straight up and down.
- **Miniature Thermal Emission Spectrometer (Mini-TES)** — Analyzes infrared light to identify rock-forming minerals; measures the heat-holding properties (thermal inertia) of rocks and soils; measures atmospheric temperatures from the surface to 10 kilometers (6.2 miles) in altitude.

Contact Science Instruments

- **Rock Abrasion Tool (RAT)** — Brushes and grinds rocks to clean away dust and other surface deposits so the spectrometers can analyze their composition.
- **Alpha Particle X-ray Spectrometer (APXS)** — Measures the chemical composition of Martian rocks and soils.
- **Mössbauer Spectrometer (MB)** — Measures iron-bearing mineralogy of rocks and soils.
- **Microscopic Imager (MI)** — Provides high-resolution images of the small-scale features of Martian rocks and soils.



MARS SCIENCE LABORATORY • CURIOSITY

Curiosity has 10 science instruments, along with engineering cameras and sample-collection tools.

Remote Sensing Instruments

- **Mast Camera (Mastcam)** — Takes high-definition color images and video with a telephoto lens for distant views and a medium-angle lens similar to Opportunity's Pancam.
- **Chemistry and Camera (ChemCam)** — Fires a laser to analyze chemical elements of vaporized materials from small areas on Martian rocks and soils.
- **Mars Descent Imager (MARDI)** — Took color video during the rover's descent toward the surface; provides images of the ground beneath the rover.

Contact Science Instruments

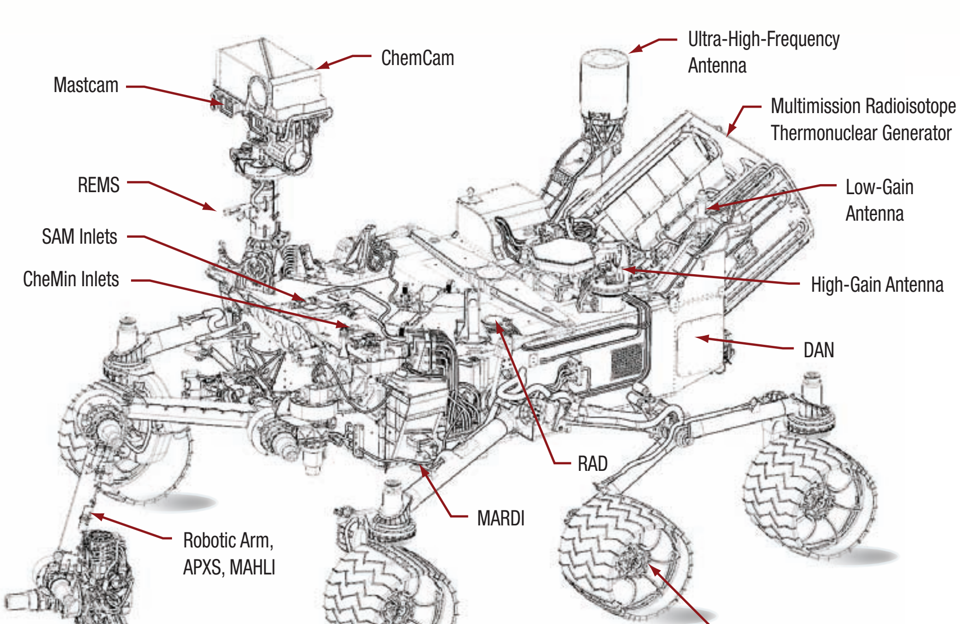
- **Mars Hand Lens Imager (MAHLI)** — Captures close-up views of minerals, textures, and structures in Martian rocks and in the surface layer of rocky debris and dust.
- **Alpha Particle X-ray Spectrometer (APXS)** — Measures chemical elements in rocks and soils in preparation for sample selection.

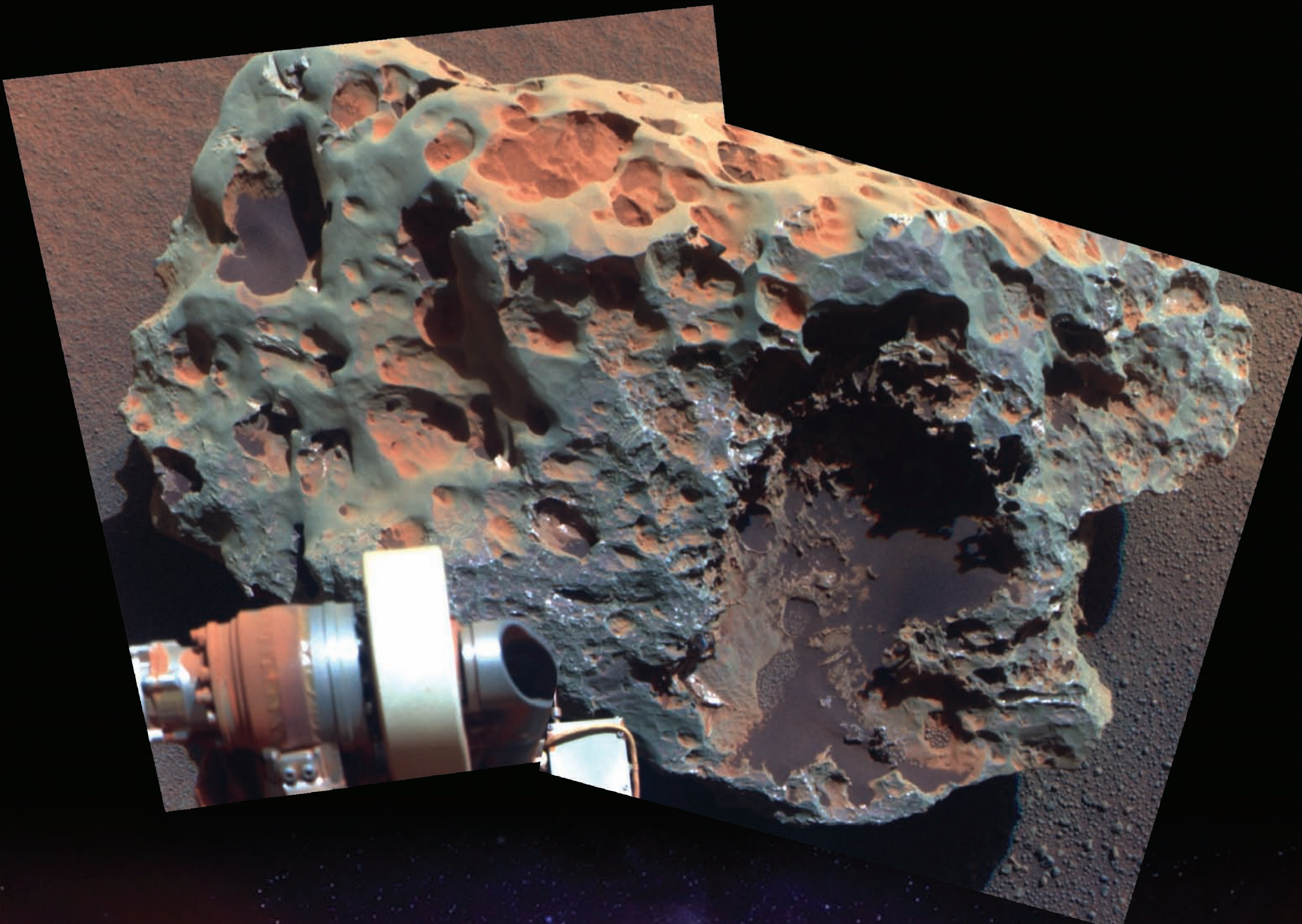
Analytical Laboratory Instruments

- **Chemistry and Mineralogy (CheMin)** — Measures minerals in rock and soil samples, especially those formed in water.
- **Sample Analysis at Mars (SAM)** — Measures the chemical and isotopic composition of rocks, soils, and atmosphere, seeking organics, the chemical building blocks of life.

Environmental Instruments

- **Radiation Assessment Detector (RAD)** — Measures high-energy radiation to understand if habitable conditions for microbial life or future human exploration are possible.
- **Dynamic Albedo of Neutrons (DAN)** — Detects water content as low as one-tenth of 1 percent in the Martian subsurface.
- **Rover Environmental Monitoring Station (REMS)** — Provides daily and seasonal weather reports (atmospheric pressure, humidity, ultraviolet radiation, wind, air and ground temperatures).



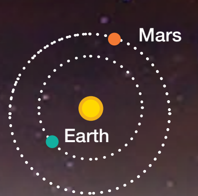


Largest meteorite on Mars

OPPORTUNITY

This watermelon-sized rock discovered by Opportunity, called "Block Island," is the largest meteorite yet found on Mars. It is rich in iron and nickel, similar to some meteorites found on Earth. As the meteorite came blazing in through Mars' atmosphere, smooth, rounded holes formed on its surface. Once the meteorite was on the ground, long-term weathering created the large, irregular pit (right). Landing Block Island in today's thin Martian atmosphere without disintegrating when it hit the ground is difficult. That means Mars once had a much thicker atmosphere or that the meteorite followed a rare, long, shallow flight path on its way down.

Panoramic Camera, Sol 1961 (August 10, 2009). Credit: NASA/JPL-Caltech/Cornell.



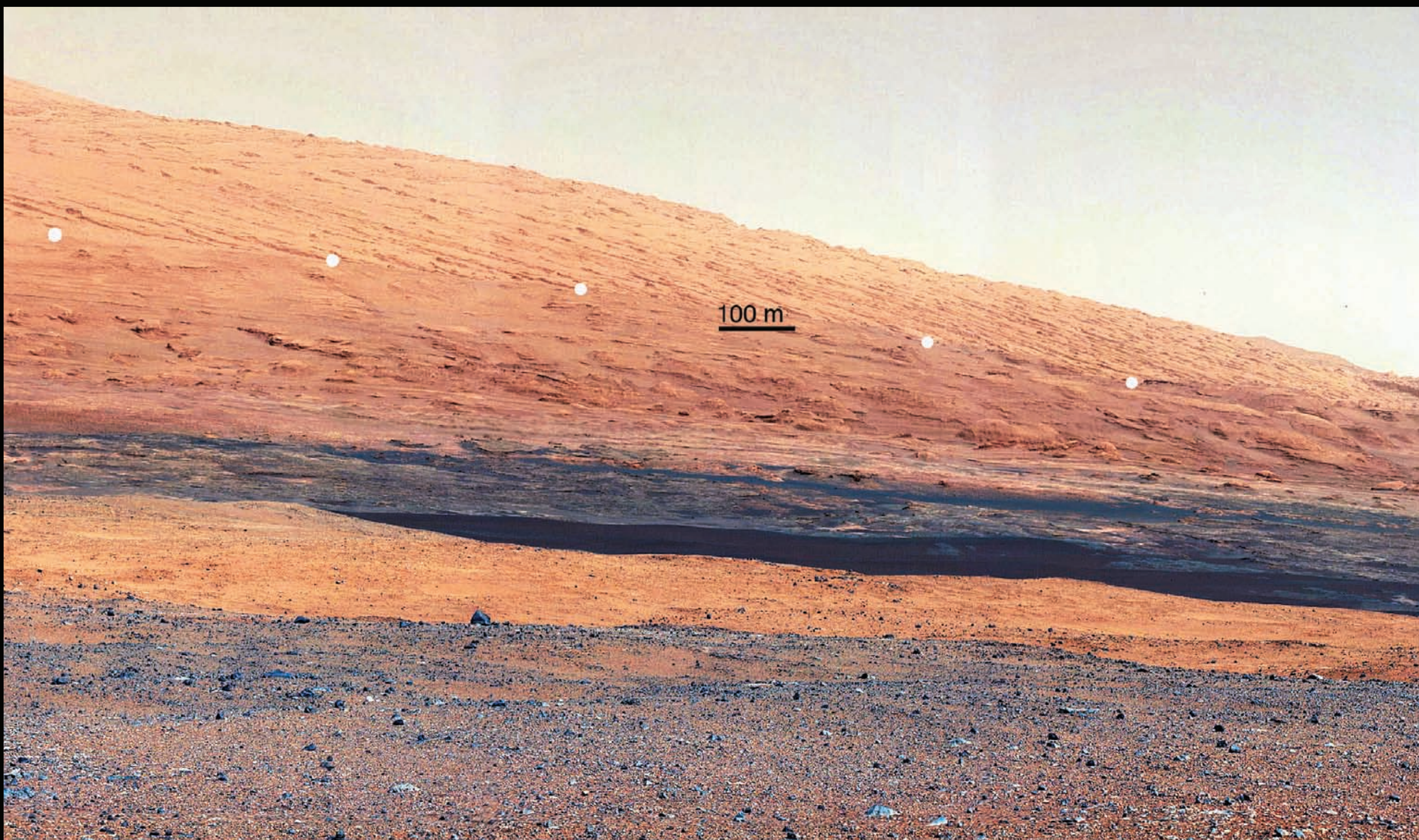
February 1, 2013

January 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 1 L_s=256.2° B3179 C145	**2** 2 C146	**3** 3 B3180 C147	**4** 4 Spirit Landed 2004 B3181 C148	**5** 5 B3182 C149
6 6 B3183 C150	**7** 7 DSN Week 1 B3184 C151	**8** 8 B3185 C152	**9** 9 B3186 C153	**10** 10 B3187 C154	**11** 11 B3188 C155	**12** 12 B3189 C156
13 13 B3190 C157	**14** 14 DSN Week 2 B3191 C158	**15** 15 B3192 C159	**16** 16 B3193 C160	**17** 17 B3194	**18** 18 B3195 C161	**19** 19 B3196 C162
20 20 B3197 C163	**21** 21 DSN Week 3 B3198 C164	**22** 22 B3199 C165	**23** 23 Mars Perihelion B3200 C166	**24** 24 B3201 C167	**25** 25 Opportunity's 9th Earth Anniversary B3202 C168	**26** 26 B3203 C169
27 27 B3204 C170	**28** 28 DSN Week 4 B3205 C171	**29** 29 B3206 C172	**30** 30 B3207 C173	**31** 31 B3208 C174		

February 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 32 L_s=255.9° B3209 C175	**2** 33 B3210 C176
3 34 B3211 C177	**4** 35 DSN Week 5 B3212 C178	**5** 36 B3213 C179	**6** 37 B3214 C180	**7** 38 B3215 C181	**8** 39 C182	**9** 40 B3216 C183
10 41 B3217 C184	**11** 42 DSN Week 6 B3218 C185	**12** 43 B3219 C186	**13** 44 B3220 C187	**14** 45 B3221 C188	**15** 46 B3222 C189	**16** 47 B3223 C190
17 48 B3224 C191	**18** 49 DSN Week 7 B3225 C192	**19** 50 B3226 C193	**20** 51 B3227 C194	**21** 52 B3228 C195	**22** 53 B3229 C196	**23** 54 Southern Summer Solstice B3230 C197
24 55 B3231	**25** 56 DSN Week 8 B3232 C198	**26** 57 B3233 C199	**27** 58 B3234 C200	**28** 59 B3235 C201		

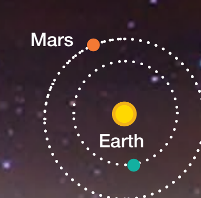


The layers tell the story

CURIOSITY

Each of the stacked layers in 3-mile-high Mount Sharp inside Gale Crater may preserve a record of the Martian environment at a given time in history. Curiosity will study each layer as it climbs. Lower layers contain minerals that formed in the presence of water (below dotted line). Some may preserve organics, the chemical building blocks of life. Top layers that incline sharply from left to right (above dotted line) likely formed under drier environmental conditions than those lower on the slope.

Mast Camera, Sol 23 (August 29, 2012). Credit: NASA/JPL-Caltech/MSSS.



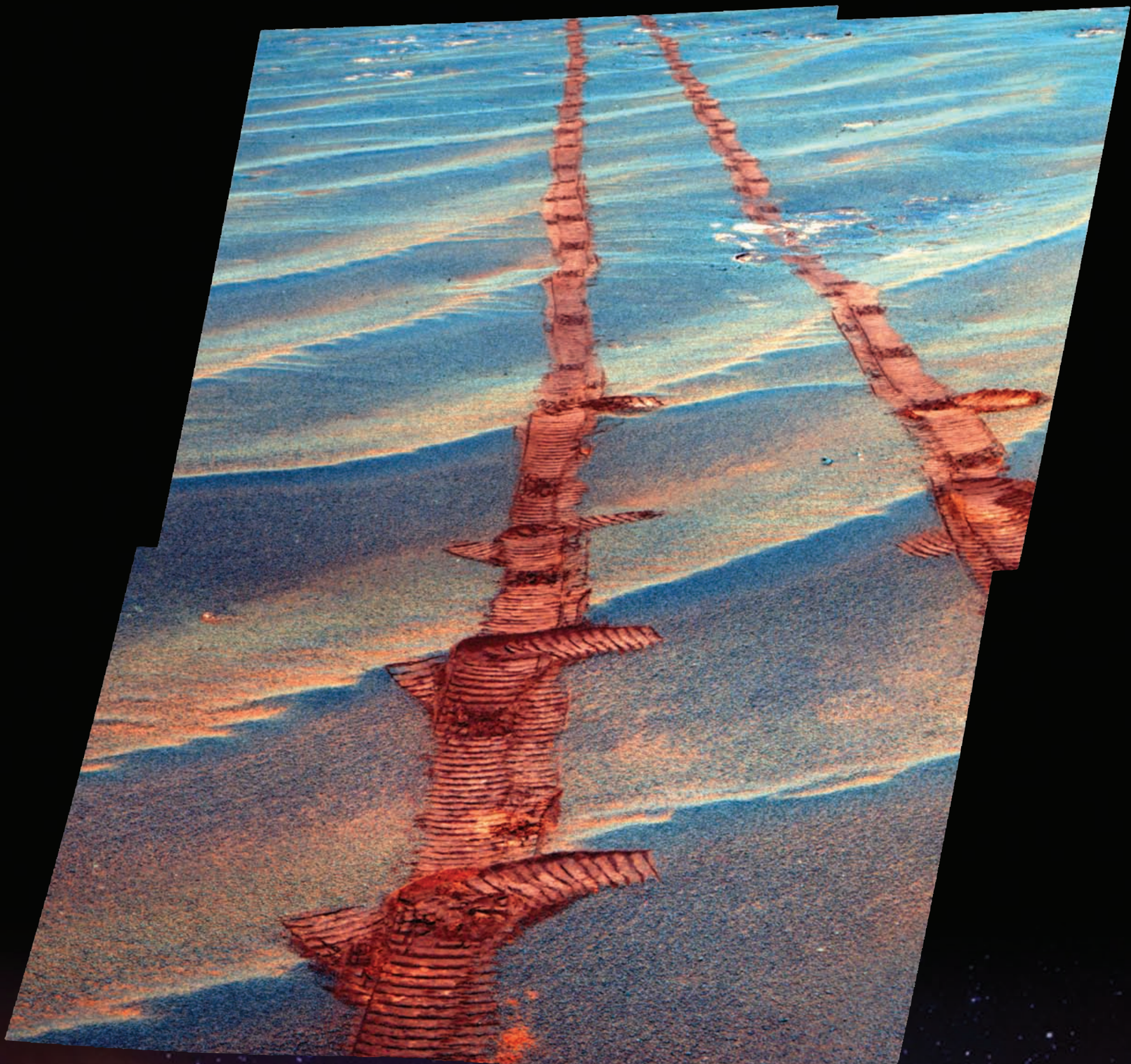
April 1, 2013

March 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 60 L_s=273.5° B3236 C202	2 61 B3237 C203
3 62 B3238 C204	4 63 DSN Week 9 B3239 C205	5 64 B3240 C206	6 65 B3241 C207	7 66 B3242 C208	8 67 B3243 C209	9 68 B3244 C210
10 69 B3245 C211	11 70 DSN Week 10 B3246 C212	12 71 B3247 C213	13 72 B3248 C214	14 73 B3249 C215	15 74 B3250 C216	16 75 B3251 C217
17 76 C218	18 77 DSN Week 11 B3252 C219	19 78 B3253 C220	20 79 B3254 C221	21 80 B3255 C222	22 81 Spirit Ceased Operation 2010 B3256 C223	23 82 B3257 C224
83 24 B3258 C225 B3265 C232 31 90	25 84 DSN Week 12 B3259 C226	26 85 B3260 C227	27 86 B3261 C228	28 87 B3262 C229	29 88 B3263 C230	30 89 B3264 C231

April 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 91 DSN Week 13 L_s=292.7° B3266 C233	2 92 B3267	3 93 B3268 C234	4 B3269 C235	5 95 B3270 C236	6 96 B3271 C237
7 97 B3272 C238	8 98 DSN Week 14 B3273 C239	9 99 B3274 C240	10 100 B3275 C241	11 101 B3276 C242	12 102 B3277 C243	13 103 B3278 C244
14 104 B3279 C245	15 105 DSN Week 15 B3280 C246	16 106 B3281 C247	17 107 B3282 C248	18 108 Earth Mars Solar Conjunction B3283 C249	19 109 B3284 C250	20 110 B3285 C251
21 111 B3286 C252	22 112 DSN Week 16 B3287 C253	23 113 B3288 C254	24 114 C255	25 115 B3289 C256	26 116 B3290 C257	27 117 B3291 C258
28 118 B3292 C259	29 119 DSN Week 17 B3293 C260	30 120 B3294 C261				

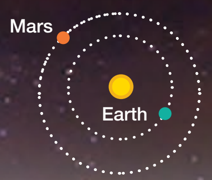


Tracks in the sand

OPPORTUNITY

Using special filters on its camera "eyes" to make subtle differences in terrain more visible, Opportunity captured a striking false-color view of its own rover tracks. Taken at different wavelengths of light, such filtered images help scientists learn more about minerals found in Martian rocks and soil. The bluish hue is from iron-rich spherules nicknamed "blueberries," which likely formed in the presence of water. The rover's tracks are brighter and redder because the "blueberries" are pressed into the surface, exposing brighter, redder rust-colored dust.

Panoramic Camera, False Color, Sol 2642 (June 30, 2011). Credit: NASA/JPL-Caltech/Cornell.



June 1, 2013

May 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1 121 L_s=310.6° B3295 C262	2 122 B3296 C263	3 123 B3297 C264	4 124 B3298 C265
5 125 B3299 C266	6 126 DSN Week 18 B3300 C267	7 127 B3301 C268	8 128 B3302 C269	9 129 B3303 C270	10 130 B3304	11 131 B3305 C271
12 132 B3306 C272	13 133 DSN Week 19 B3307 C273	14 134 B3308 C274	15 135 B3309 C275	16 136 B3310 C276	17 137 B3311 C277	18 138 B3312 C278
19 139 B3313 C279	20 140 DSN Week 20 B3314 C280	21 141 B3315 C281	22 142 B3316 C282	23 143 B3317 C283	24 144 B3318 C284	25 145 B3319 C285
26 146 B3320 C286	27 147 DSN Week 21 B3321 C287	28 148 B3322 C288	29 149 B3323 C289	30 150 B3324 C290	31 151 C291	

June 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 152 L_s=328.2° B3325 C292
2 153 B3326 C293	3 154 DSN Week 22 B3327 C294	4 155 B3328 C295	5 156 B3329 C296	6 157 B3330 C297	7 158 B3331 C298	8 159 B3332 C299
9 160 B3333 C300	10 161 DSN Week 23 Spirit Launched 2003 B3334 C301	11 162 B3335 C302	12 163 B3336 C303	13 164 B3337 C304	14 165 B3338 C305	15 166 B3339 C306
16 167 B3340	17 168 DSN Week 24 B3341 C307	18 169 B3342 C308	19 170 B3343 C309	20 171 B3344 C310	21 172 Opportunity 5th Martian Anniversary B3345 C311	22 173 B3346 C312
174 23 B3347 C313 B3354 C320 30 181	24 175 DSN Week 25 B3348 C314	25 176 B3349 C315	26 177 B3350 C316	27 178 B3351 C317	28 179 B3352 C318	29 180 B3353 C319

Getting ready for a hike

CURIOSITY

Curiosity sent this scenic postcard of its ultimate science destination: the lower reaches of Mount Sharp in Gale Crater. Each rock layer in the mountain may contain evidence of the environmental conditions at a prior time in Martian history. The rover will ascend through them, reading the record of Martian history from older to younger. Scientists adjusted the color to show Mars under lighting conditions found on Earth, which helps in studying features in the terrain. The pointy mound (center) is about 1,000 feet (300 meters) across and 300 feet (100 meters) high.

Mast Camera, Sol 16 (August 23, 2012). Credit: NASA/JPL-Caltech/MSSS.

August 1, /2013

July 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 182 DSN Week 26 $L_S=344.3^\circ$ B3355 C321	2 183 B3356 C322	3 184 B3357 C323	4 185 Mars Pathfinder/ Sojourner landed 1997 B3358 C324	5 186 B3359 C325	6 187 B3360 C326
7 188 Opportunity launched 2003 C327	8 189 DSN Week 27 B3361 C328	9 190 B3362 C329	10 191 B3363 C330	11 192 B3364 C331	12 193 B3365 C332	13 194 B3366 C333
14 195 B3367 C334	15 196 DSN Week 28 B3368 C335	16 197 B3369 C336	17 198 B3370 C337	18 199 B3371 C338	19 200 B3372 C339	20 201 B3373 C340
21 202 B3374 C341	22 203 DSN Week 29 B3375 C342	23 204 B3376	24 205 B3377 C343	25 206 B3378 C344	26 207 B3379 C345	27 208 B3380 C346
28 209 B3381 C347	29 210 DSN Week 30 B3382 C348	30 211 B3383 C349	31 212 Southern Autumnal Equinox B3384 C350			

August 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1 213 $L_S=0.2^\circ$ B3385 C351	2 214 B3386 C352	3 215 B3387 C353
4 216 B3388 C354	5 217 DSN Week 31 B3389 C355	6 218 Curiosity 1st Earth Anniversary B3390 C356	7 219 B3391 C357	8 220 B3392 C358	9 221 B3393 C359	10 222 B3394 C360
11 223 B3395 C361	12 224 DSN Week 32 B3396 C362	13 225 B3397 C363	14 226 C364	15 227 B3398 C365	16 228 B3399 C366	17 229 B3400 C367
18 230 B3401 C368	19 231 DSN Week 33 B3402 C369	20 232 B3403 C370	21 233 B3404 C371	22 234 B3405 C372	23 235 B3406 C373	24 236 B3407 C374
25 237 B3408 C375	26 238 DSN Week 34 B3409 C376	27 239 B3410 C377	28 240 B3411 C378	29 241 B3412 C379	30 242 B3413	31 243 B3414 C380

Destination: ancient history

OPPORTUNITY

A portion of the west rim of Endeavour crater sweeps southward in this enhanced color view from Opportunity. Not only is Endeavour crater 25 times wider than others Opportunity has explored, it offers access to older rock layers than any studied so far. These layers may hold clues to whether Mars provided habitable conditions for microbial life in earlier times. Opportunity has largely seen younger, sulfate-rich rocks that formed in acidic water. However, this west crater rim appears to contain deposits that formed by reacting with neutral water. Seen by the rover since the first days after landing, iron-rich spherules ("blueberries") lie scattered over the land.

Panoramic Camera, Sol 2678 (August 6, 2011). Credit: NASA/JPL-Caltech/Cornell.

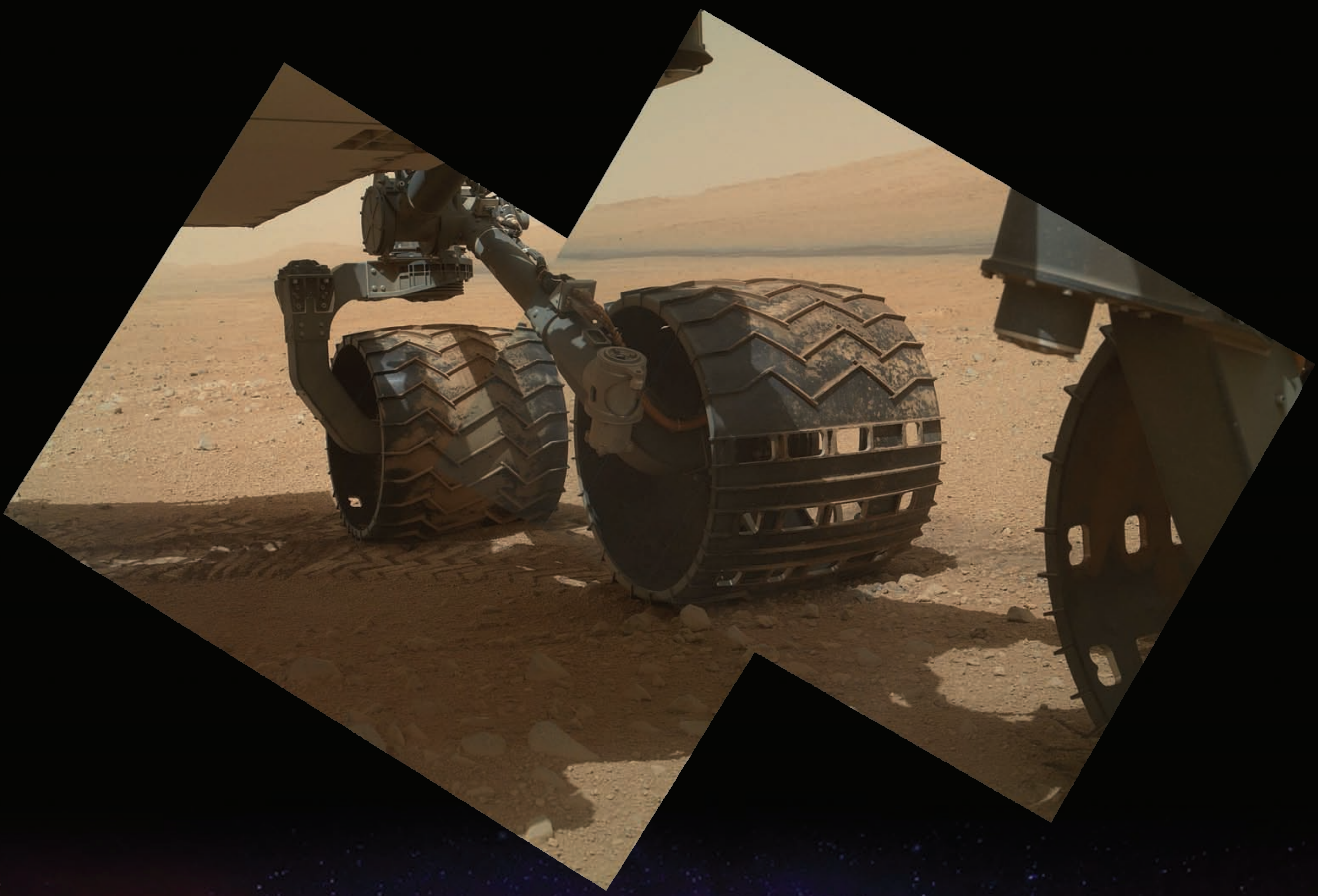
October 1, 2013

September 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 244 L_S=15.3° B3415 C381	2 245 DSN Week 35 B3416 C382	3 246 B3417 C383	4 247 B3418 C384	5 248 B3419 C385	6 249 B3420 C386	7 250 B3421 C387
8 251 B3422 C388	9 252 DSN Week 36 B3423 C389	10 253 B3424 C390	11 254 B3425 C391	12 255 B3426 C392	13 256 B3427 C393	14 257 B3428 C394
15 258 B3429 C395	16 259 DSN Week 37 B3430 C396	17 260 B3431 C397	18 261 B3432 C398	19 262 B3433 C399	20 263 C400	21 264 B3434 C401
22 265 B3435 C402	23 266 DSN Week 38 B3436 C403	24 267 B3437 C404	25 268 B3438 C405	26 269 B3439 C406	27 270 B3440 C407	28 271 B3441 C408
29 272 B3442 C409	30 273 DSN Week 39 B3443 C410					

October 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 274 L_S=29.4° B3444 C411	2 275 B3445 C412	3 276 B3446 C413	4 277 B3447 C414	5 278 B3448 C415
6 279 B3449	7 280 DSN Week 40 B3450 C416	8 281 B3451 C417	9 282 B3452 C418	10 283 B3453 C419	11 284 B3454 C420	12 285 B3455 C421
13 286 B3456 C422	14 287 DSN Week 41 B3457 C423	15 288 B3458 C424	16 289 B3459 C425	17 290 B3460 C426	18 291 B3461 C427	19 292 B3462 C428
20 293 B3463 C429	21 294 DSN Week 42 B3464 C430	22 295 B3465 C431	23 296 B3466 C432	24 297 B3467 C433	25 298 B3468 C434	26 299 B3469 C435
27 300 B3470 C436	28 301 DSN Week 43 C437	29 302 B3471 C438	30 303 B3472 C439	31 304 B3473 C440		



Wheels and a destination

CURIOSITY

Though designed to take close-up, high-resolution views of rocks and soils, the camera at the end of Curiosity's arm can also take snapshots of the surrounding terrain, or even the rover. Here, the arm reached out to peer beneath the rover's body. Two images capture Curiosity's three left wheels on the rocky Martian surface. The wheels will eventually carry the rover on its trek toward Mount Sharp, which rises in the distance above a thin line of dark sand dunes.

Mars Hand Lens Imager, Sol 34 (September 9, 2012). Credit: NASA/JPL-Caltech/MSSS.

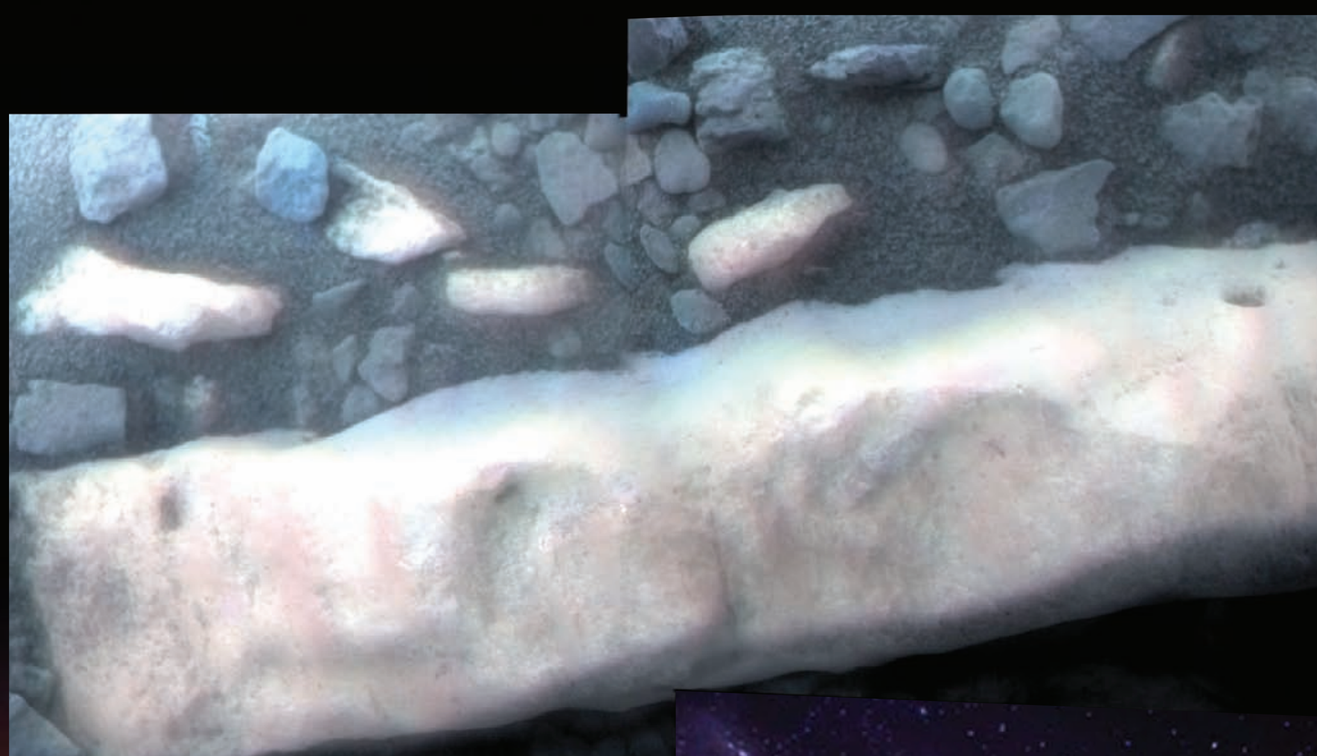
December 1, 2013

November 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 305 $L_s=43.4°$ B3474 C441	2 306 B3475 C442
3 307 B3476 C443	4 308 DSN Week 44 B3477 C444	5 309 B3478 C445	6 310 B3479 C446	7 311 B3480 C447	8 312 B3481 C448	9 313 B3482 C449
10 314 B3483 C450	11 315 DSN Week 45 B3484 C451	12 316 B3485	13 317 B3486 C452	14 318 B3487 C453	15 319 B3488 C454	16 320 B3489 C455
17 321 B3490 C456	18 322 DSN Week 46 B3491 C457	19 323 B3492 C458	20 324 B3493 C459	21 325 B3494 C460	22 326 B3495 C461	23 327 B3496 C462
24 328 B3497 C463	25 329 DSN Week 47 B3498 C464	26 330 Curiosity Launched 2011 B3499 C465	27 331 B3500 C466	28 332 B3501 C467	29 333 B3502 C468	30 334 B3503 C469

December 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 335 $L_s=56.7°$ B3504 C470	2 336 DSN Week 48 B3505 C471	3 337 B3506 C472	4 338 C473	5 339 B3507 C474	6 340 B3508 C475	7 341 B3509 C476
8 342 B3510 C477	9 343 DSN Week 49 B3511 C478	10 344 B3512 C479	11 345 B3513 C480	12 346 B3514 C481	13 347 B3515 C482	14 348 B3516 C483
15 349 B3517 C484	16 350 DSN Week 50 B3518 C485	17 351 B3519 C486	18 352 B3520 C487	19 353 B3521 C488	20 354 B3522	21 355 B3523 C489
22 356 B3524 C490	23 357 DSN Week 51 B3525 C491	24 358 B3526 C492	25 359 B3527 C493	26 360 B3528 C494	27 361 B3529 C495	28 362 B3530 C496
29 363 B3531 C497	30 364 DSN Week 52 B3532 C498	31 365 B3533 C499				



Getting a closer look

OPPORTUNITY

Opportunity closely inspected the mineral vein "Homestake," which cuts a dashing line in the Martian terrain (top). About the width of a thumb and 18 inches (45 centimeters) long in this false-color view, the calcium- and sulfur-rich vein may be the mineral gypsum, which forms in the presence of water. In a close-up view about 5 centimeters across (bottom), subtle lines in the vein show where watery solutions once intruded into the rock and gypsum formed.

Top: Panoramic Camera, False Color, Sol 2769 (November 7, 2011).
Credit: NASA/JPL-Caltech/Cornell.
Bottom: Panoramic Camera and Microscopic Imager, Sol 2766 (November 4, 2011).
Credit: NASA/JPL-Caltech/Cornell/USGS.

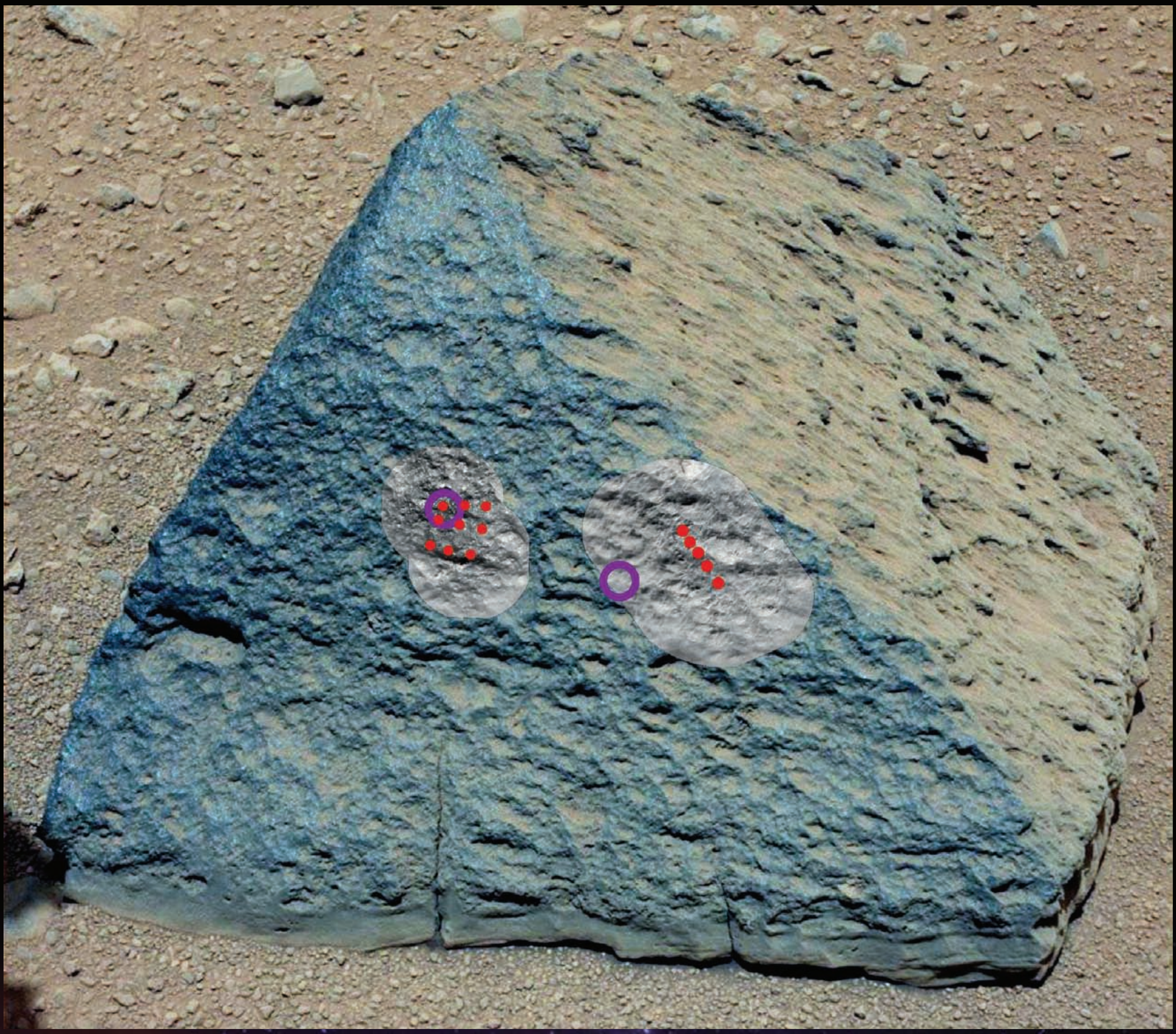
February 1, 2014

January 2014

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1 1 L_S=70.2° B3534 C500	**2** 2 Mars Aphelion B3535 C501	**3** 3 B3536 C502	**4** 4 Spirit Landed 2004 B3537 C503
5 5 B3538 C504	**6** 6 DSN Week 1 B3539 C505	**7** 7 B3540 C506	**8** 8 B3541 C507	**9** 9 B3542 C508	**10** 10 C509	**11** 11 B3543 C510
12 12 B3544 C511	**13** 13 DSN Week 2 B3545 C512	**14** 14 B3546 C513	**15** 15 B3547 C514	**16** 16 B3548 C515	**17** 17 B3549 C516	**18** 18 B3550 C517
19 19 B3551 C518	**20** 20 DSN Week 3 B3552 C519	**21** 21 B3553 C520	**22** 22 B3554 C521	**23** 23 B3555 C522	**24** 24 B3556 C523	**25** 25 Opportunity's 10th Earth Anniversary B3557 C524
26 26 B3558	**27** 27 DSN Week 4 B3559 C525	**28** 28 B3560 C526	**29** 29 B3561 C527	**30** 30 B3562 C528	**31** 31 B3563 C529	

February 2014

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 32 L_S=83.8° B3564 C530
2 33 B3565 C531	**3** 34 DSN Week 5 B3566 C532	**4** 35 B3567 C533	**5** 36 B3568 C534	**6** 37 B3569 C535	**7** 38 B3570 C536	**8** 39 B3571 C537
9 40 B3572 C538	**10** 41 DSN Week 6 B3573 C539	**11** 42 B3574 C540	**12** 43 B3575 C541	**13** 44 B3576 C542	**14** 45 Southern Winter Solstice B3577 C543	**15** 46 B3578 C544
16 47 B3579 C545	**17** 48 DSN Week 7 C546	**18** 49 B3580 C547	**19** 50 B3581 C548	**20** 51 B3582 C549	**21** 52 B3583 C550	**22** 53 B3584 C551
23 54 B3585 C552	**24** 55 DSN Week 8 B3586 C553	**25** 56 B3587 C554	**26** 57 B3588 C555	**27** 58 B3589 C556	**28** 59 B3590 C557	

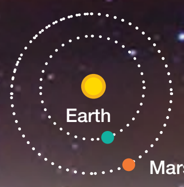


This won't hurt a bit

CURIOSITY

Curiosity used its laser to zap this rock, known as "Jake Matijevic." To increase the visibility of differences within the rock, scientists white-balanced the background image (Mastcam). Superimposed on it are circular black-and-white images (ChemCam) taken to show pits made by the laser when it vaporized small areas in the rock (marked by red dots). To further analyze chemical elements in the rock, the mission team also targeted Curiosity's Alpha Particle X-ray Spectrometer (purple circles).

Mast Camera and ChemCam, Sol 46 (September 22, 2012). Credit: NASA/JPL-Caltech/ MSSS/LANL/ CNES/IRAP/LPGN/CNRS.



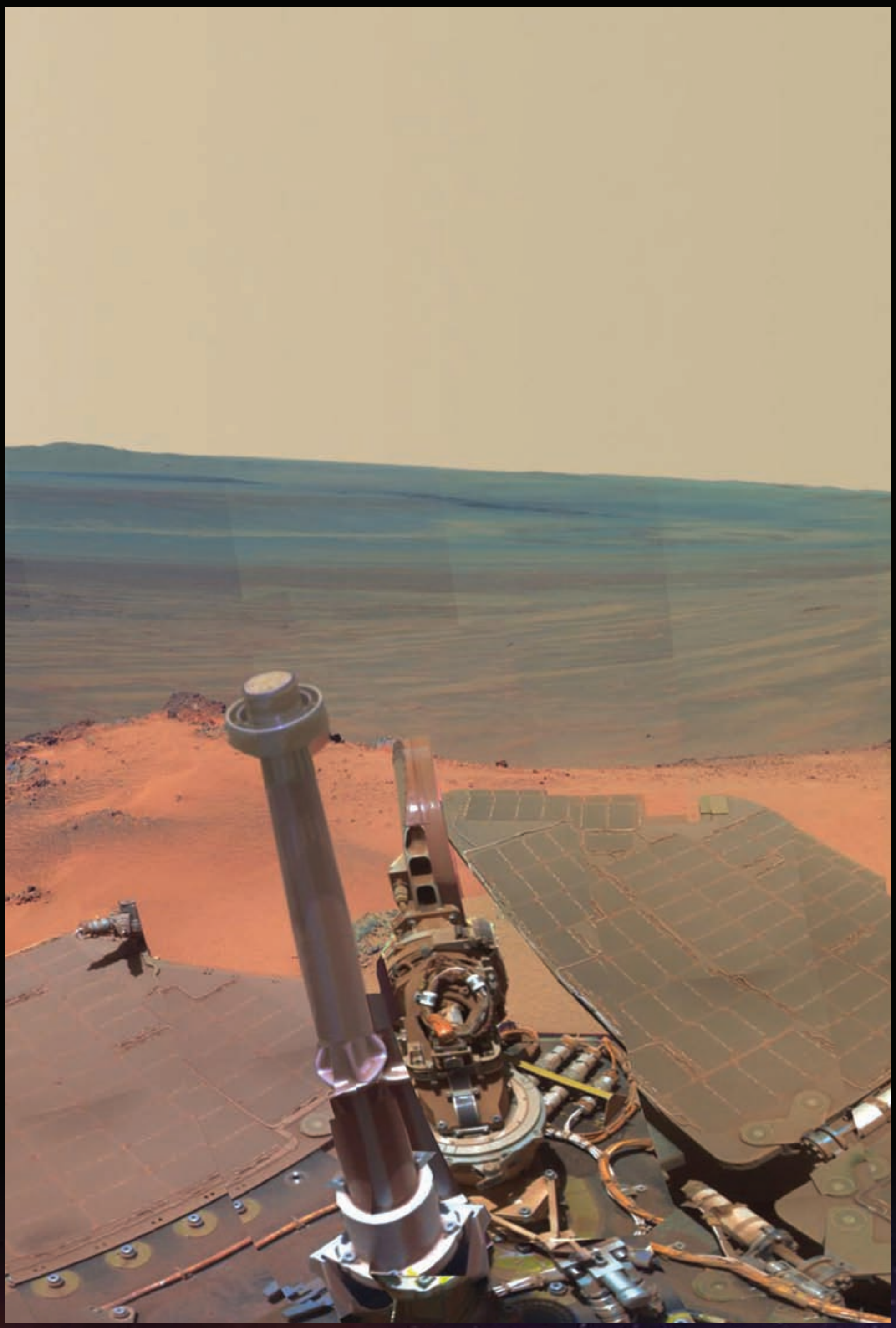
April 1, 2014

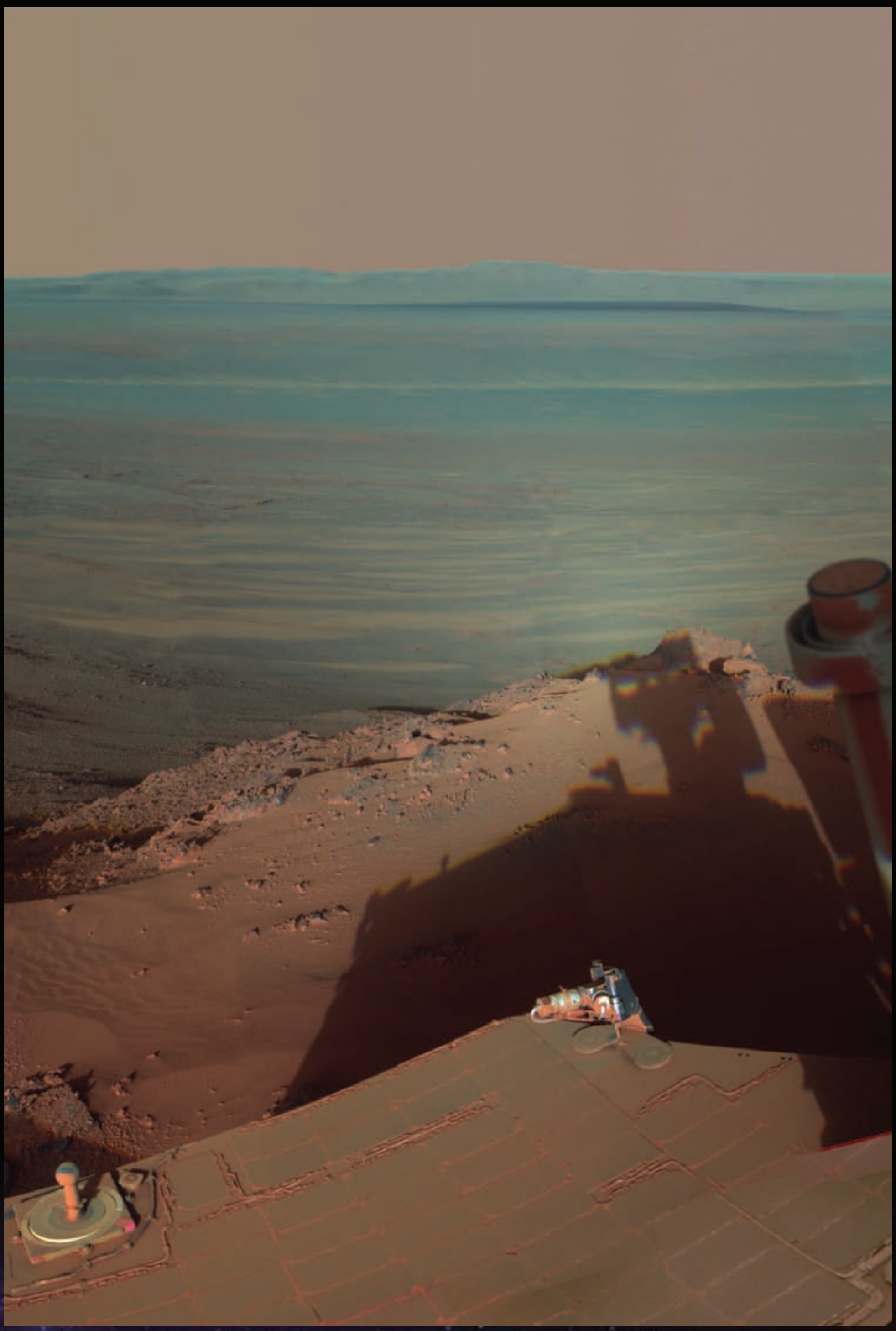
March 2014

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 60 L_s=96.1° B3591 C558
2 61 B3592 C559	3 62 DSN Week 9 B3593 C560	4 63 B3594 C561	5 64 B3595	6 65 B3596 C562	7 66 B3597 C563	8 67 B3598 C564
9 68 B3599 C565	10 69 DSN Week 10 B3600 C566	11 70 B3601 C567	12 71 B3602 C568	13 72 B3603 C569	14 73 B3604 C570	15 74 B3605 C571
16 75 B3606 C572	17 76 DSN Week 11 B3607 C573	18 77 B3608 C574	19 78 B3609 C575	20 79 B3610 C576	21 80 B3611 C577	22 81 Spirit Ceased Operation 2010 B3612 C578
82 23 B3613 C579 B3619 C586 30 89	83 24 DSN Week 12 B3614 C580 B3620 C587 DSN Week 13 31 90	25 84 B3615 C581	26 85 C582	27 86 B3616 C583	28 87 B3617 C584	29 88 B3618 C585

April 2014

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 91 L_s=110.1° B3621 C588	2 92 B3622 C589	3 93 B3623 C590	4 94 B3624 C591	5 95 B3625 C592
6 96 B3626 C593	7 97 DSN Week 14 B3627 C594	8 98 Earth Mars Opposition B3628 C595	9 99 B3629 C596	10 100 B3630 C597	11 101 B3631	12 102 B3632 C598
13 103 B3633 C599	14 104 DSN Week 15 B3634 C600	15 105 B3635 C601	16 106 B3636 C602	17 107 B3637 C603	18 108 B3638 C604	19 109 B3639 C605
20 110 B3640 C606	21 111 DSN Week 16 B3641 C607	22 112 B3642 C608	23 113 B3643 C609	24 114 B3644 C610	25 115 B3645 C611	26 116 B3646 C612
27 117 B3647 C613	28 118 DSN Week 17 B3648 C614	29 119 B3649 C615	30 120 B3650 C616			





Wintering over

OPPORTUNITY

Opportunity captured these sweeping vistas of Endeavour Crater during a long Martian winter. Pointing solar panels toward the Sun to gain power, Opportunity parked for four months of work on a northward outcrop called "Greeley Haven" (left). In an eastward view across Endeavour Crater, the rover caught its own late-afternoon shadow (right).

The dark areas in Endeavour Crater are deposits of dark sand. Comparisons of high-resolution orbital images show that the sand deposits move over time. Opportunity is also monitoring them for changes.

Panoramic Camera, Sols 2811–2947 (December 21, 2011–May 8, 2012).
Credit: NASA/JPL-Caltech/Cornell/ASU.

June 1, 2014

May 2014

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1 121 L_S=124.0° B3651 C617	2 122 C618	3 123 B3652 C619
4 124 B3653 C620	5 125 DSN Week 18 B3654 C621	6 126 B3655 C622	7 127 B3656 C623	8 128 B3657 C624	9 129 B3658 C625	10 130 B3659 C626
11 131 B3660 C627	12 132 DSN Week 19 B3661 C628	13 133 B3662 C629	14 134 B3663 C630	15 135 B3664 C631	16 136 B3665 C632	17 137 B3666 C633
18 138 B3667	19 139 DSN Week 20 B3668 C634	20 140 B3669 C635	21 141 B3670 C636	22 142 B3671 C637	23 143 B3672 C638	24 144 B3673 C639
25 145 B3674 C640	26 146 DSN Week 21 B3675 C641	27 147 B3676 C642	28 148 B3677 C643	29 149 B3678 C644	30 150 B3679 C645	31 151 B3680 C646

June 2014

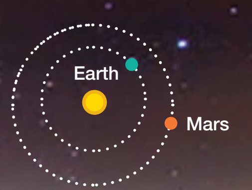
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 152 L_S=139.0° B3681 C647	2 153 DSN Week 22 B3682 C648	3 154 B3683 C649	4 155 B3684 C650	5 156 B3685 C651	6 157 B3686 C652	7 158 B3687 C653
8 159 B3688 C654	9 160 DSN Week 23 C655	10 161 Spirit Launched 2003 B3689 C656	11 162 B3690 C657	12 163 B3691 C658	13 164 B3692 C659	14 165 B3692 C660
15 166 B3694 C661	16 167 DSN Week 24 B3695 C662	17 168 B3696 C663	18 169 B3697 C664	19 170 B3698 C665	20 171 B3699 C666	21 172 B3700 C667
22 173 B3701 C668	23 174 DSN Week 25 B3702 C669	24 175 Curiosity 1st Martian Anniversary B3703 C670	25 176 B3704	26 177 B3705 C671	27 178 B3706 C672	28 179 B3707 C673
29 180 B3708 C674	30 181 DSN Week 26 B3709 C675					

To see a world in a grain of sand ...

CURIOSITY

Curiosity's wheel leaves a scuff mark in a wind-blown ripple of Martian sand. A number of larger grains originally on top of the ripple fell into the shallow trench made by the rover's wheel. Eight images, each taken at a slightly different focus setting, combine to bring out details on the wall, slopes, and floor of the wheel scuff. The rover's arm camera merged them onboard to reduce the amount of data sent to Earth.

Mars Hand Lens Imager, Sol 58 (October 4, 2012). Credit: NASA/JPL-Caltech/MSSS.



August 1, 2014

July 2014

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 182 L_S=154.2° B3710 C676	**2** 183 B3711 C677	**3** 184 B3712 C678	**4** 185 Mars Pathfinder/ Sojourner Landed 1997 B3713 C679	**5** 186 B3714 C680
6 187 B3715 C681	**7** 188 DSN Week 27 Opportunity Launched 2003 B3716 C682	**8** 189 B3717 C683	**9** 190 B3718 C684	**10** 191 B3719 C685	**11** 192 B3720 C686	**12** 193 B3721 C687
13 194 B3722 C688	**14** 195 DSN Week 28 B3723 C689	**15** 196 B3724 C690	**16** 197 C691	**17** 198 B3725 C692	**18** 199 B3726 C693	**19** 200 B3727 C694
20 201 B3728 C695	**21** 202 DSN Week 29 B3729 C696	**22** 203 B3730 C697	**23** 204 B3731 C698	**24** 205 B3732 C699	**25** 206 B3733 C700	**26** 207 B3734 C701
27 208 B3735 C702	**28** 209 DSN Week 30 B3736 C703	**29** 210 B3737 C704	**30** 211 B3738 C705	**31** 212 B3739 C706		

August 2014

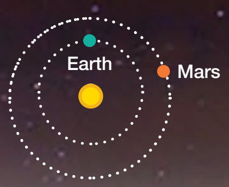
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 213 L_S=170.7° B3740	**2** 214 B3741 C707
3 215 B3742 C708	**4** 216 DSN Week 31 B3743 C709	**5** 217 B3744 C710	**6** 218 Curiosity Landed 2012 B3745 C711	**7** 219 B3746 C712	**8** 220 B3747 C713	**9** 221 B3748 C714
10 222 B3749 C715	**11** 223 DSN Week 32 B3750 C716	**12** 224 B3751 C717	**13** 225 B3752 C718	**14** 226 B3753 C719	**15** 227 B3754 C720	**16** 228 B3755 C721
17 229 Southern Spring Equinox B3756 C722	**18** 230 DSN Week 33 B3757 C723	**19** 231 B3758 C724	**20** 232 B3759 C725	**21** 233 B3760 C726	**22** 234 B3761 C727	**23** 235 C728
24 236 B3762 C729 **31** 243 B3769 C736	**25** 237 DSN Week 34 B3763 C730	**26** 238 B3764 C731	**27** 239 B3765 C732	**28** 240 B3766 C733	**29** 241 B3767 C734	**30** 242 B3768 C735

Ancient weather report

OPPORTUNITY

The large flat rock called “Whitewater Lake” shows signs of alteration. A rind (blue-colored in this false-color view) covers portions of its 30-inch (0.8-meter) surface. A rind is an exterior rock layer that shows signs of weathering. Opportunity has seen similar weathering rinds on rocks elsewhere within Meridiani Planum, where the rover has worked since landing in 2004.

Panoramic Camera, Sol 3064 (September 6, 2012). Credit: NASA/JPL-Caltech/Cornell.



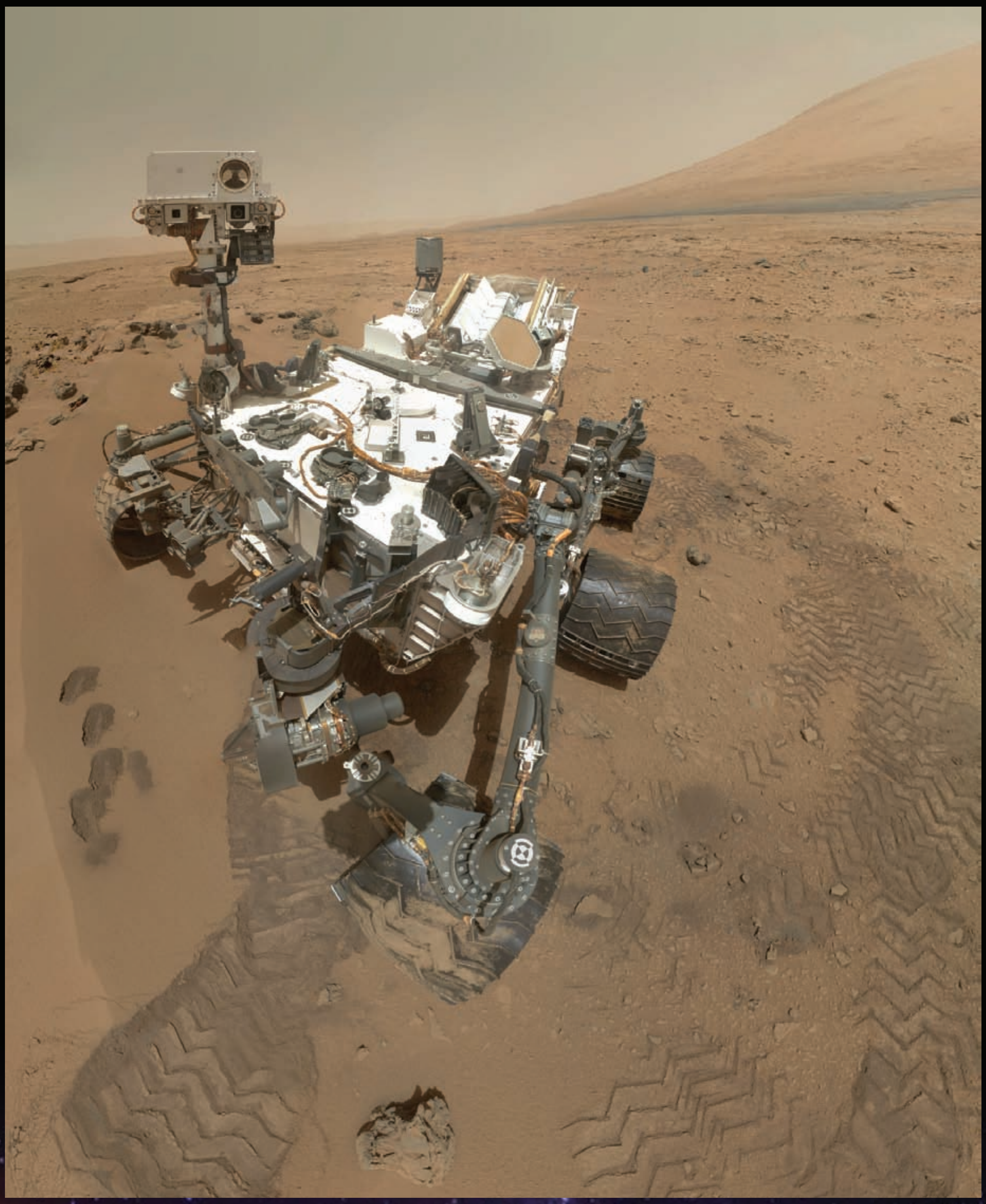
October 1, 2014

September 2014

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 244 DSN Week 35 L_s=188.2° B3770 C737	2 245 B3771 C738	3 246 B3772 C739	4 247 B3773 C740	5 248 B3774 C741	6 249 B3775 C742
7 250 B3776	8 251 DSN Week 36 B3777 C743	9 252 B3778 C744	10 253 B3779 C745	11 254 B3780 C746	12 255 B3781 C747	13 256 B3782 C748
14 257 B3783 C749	15 258 DSN Week 37 B3784 C750	16 259 B3785 C751	17 260 B3786 C752	18 261 B3787 C753	19 262 B3788 C754	20 263 B3789 C755
21 264 B3790 C756	22 265 DSN Week 38 B3791 C757	23 266 B3792 C758	24 267 B3793 C759	25 268 B3794 C760	26 269 B3795 C761	27 270 B3796 C762
28 271 B3797 C763	29 272 DSN Week 39 C764	30 273 B3798 C765				

October 2014

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1 274 L_s=205.9° B3799 C766	2 275 B3800 C767	3 276 B3801 C768	4 277 B3802 C769
5 278 B3803 C770	6 279 DSN Week 40 B3804 C771	7 280 B3805 C772	8 281 B3806 C773	9 282 B3807 C774	10 283 B3808 C775	11 284 B3809 C776
12 285 B3810 C777	13 286 DSN Week 41 B3811 C778	14 287 B3812 C779	15 288 B3813	16 289 B3814 C780	17 290 B3815 C781	18 291 B3816 C782
19 292 B3817 C783	20 293 DSN Week 42 B3818 C784	21 294 B3819 C785	22 295 B3820 C786	23 296 B3821 C787	24 297 B3822 C788	25 298 B3823 C789
26 299 B3824 C790	27 300 DSN Week 43 B3825 C791	28 301 B3826 C792	29 302 B3827 C793	30 303 B3828 C794	31 304 B3829 C795	

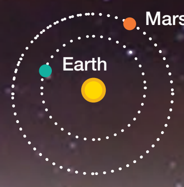


Portrait of a Martian

CURIOSITY

Curiosity snaps its own self-portrait! Using its robotic arm camera, Curiosity took a set of images that scientists stitched together to create this "glamour shot" of the rover in its Martian home. Curiosity is by "Rocknest," the spot in Gale Crater where the rover collected its first scoop. Scoop scars lie in front of the rover. Behind Curiosity, Mount Sharp rises (top right), while the northern wall of Gale Crater looms hazily in the distance (top left).

Mars Hand Lens Imager, Sol 84 (October 31, 2012). Credit: NASA/JPL-Caltech/MSSS.



December 1, 2014

November 2014

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 305 L_S=224.9° B3830 C796
2 306 B3831 C797	3 307 DSN Week 44 B3832 C798	4 308 B3833 C799	5 309 C800	6 310 B3834 C801	7 311 B3835 C802	8 312 B3836 C803
9 313 B3837 C804	10 314 DSN Week 45 B3838 C805	11 315 B3839 C806	12 316 B3840 C807	13 317 B3841 C808	14 318 B3842 C809	15 319 B3843 C810
16 320 B3844 C811	17 321 DSN Week 46 B3845 C812	18 322 B3846 C813	19 323 B3847 C814	20 324 B3848 C815	21 325 B3849	22 326 B3850 C816
327 23 B3851 C817 B3858 C824 30 334	24 328 DSN Week 47 B3852 C818	25 329 B3853 C819	26 330 Curiosity Launched 2011 B3854 C820	27 331 B3855 C821	28 332 B3856 C822	29 333 B3857 C823

December 2014

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 335 DSN Week 48 L_S=243.8° B3859 C825	2 336 B3860 C826	3 337 B3861 C827	4 338 B3862 C828	5 339 B3863 C829	6 340 B3864 C830
7 341 B3865 C831	8 342 DSN Week 49 B3866 C832	9 343 B3867 C833	10 344 B3868 C834	11 345 B3869 C835	12 346 Mars Perihelion B3870 C836	13 347 C837
14 348 B3871 C838	15 349 DSN Week 50 B3872 C839	16 350 B3873 C840	17 351 B3874 C841	18 352 B3875 C842	19 353 B3876 C843	20 354 B3877 C844
21 355 B3878 C845	22 356 DSN Week 51 B3879 C846	23 357 B3880 C847	24 358 B3881 C848	25 359 B3882 C849	26 360 B3883 C850	27 361 B3884 C851
28 362 B3885 C852	29 363 DSN Week 52 B3886	30 364 B3887 C853	31 365 B3888 C854			

QUICK FACTS

MARS EXPLORATION ROVERS • SPIRIT & OPPORTUNITY

marsrovers.jpl.nasa.gov

Mission Objective	To determine the climatic and geologic history of two sites on Mars with evidence of past, persistent water activity that may have supported microbial life.
Primary Mission	90 Martian days (sols) **Primary/Extended Mission** Over 9 years
Launch Vehicle	Boeing Delta II
Launch	Spirit – June 10, 2003 (UTC); Opportunity – July 7, 2003 (UTC)
Landing	Spirit – January 4, 2004 (UTC) at Gusev Crater (14.57°S, 175.47°E) Opportunity – January 25, 2004 (UTC) at Eagle Crater, Meridiani Planum (1.95°S, 354.47°E)
Landing Technology	Atmospheric entry aeroshell, backshell with parachute and retrorockets, and airbags to cushion landing
Size	About the size of a golf cart — ~5 feet (1.5 meters) long, ~7 feet (2.2 meters) wide, ~5 feet (1.6 meters) tall
Arm Reach	~2.3 feet (0.7 meters)
Wheel Diameter	~10 inches (25 centimeters)
Mass	~400 pounds (180 kilograms)
Total Distance	Spirit – 4.8 miles (7.7 kilometers) Opportunity – 22+ miles (35+ kilometers)
Images Sent to Earth	290,000+ **Data Returned** 50+ gigabytes

MARS SCIENCE LABORATORY • CURIOSITY

mars.jpl.nasa.gov/msl

Mission Objective	To seek signs of past or present environmental conditions capable of supporting microbial life, including studies of rocks and minerals that formed in water and special clay minerals that can preserve organics, the chemical building blocks of life.
Primary Mission	One Mars year — about 23 Earth months
Launch Vehicle	United Launch Alliance Atlas V
Launch	November 26, 2011 (UTC)
Landing	August 6, 2012 UTC at Gale Crater (4.59°S, 137.44°E)
Landing Technology	Guided entry, powered descent, large parachute, and sky crane
Size	About the size of a car — ~10 feet (3 meters) long, ~9 feet (2.7 meters) wide, ~7 feet (2.2 meters) tall
Arm Reach	~7 feet (2.2 meters)
Wheel Diameter	~20 inches (50 centimeters)
Mass	~2,000 pounds (900 kilograms)
Images Sent to Earth	27,000+

National Aeronautics and Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

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