

Mars Exploration Rovers 2019 2020

One Martian Year • Two Earth Years



How to Use the Calendar

Cover An artist's concept portrays a NASA Mars Exploration Rover on the surface of Mars.

Credit: NASA/JPL-Caltech/Cornell Univ./Dan Maas

Spirit landed in Gusev crater on Jan. 4, 2004. Opportunity landed at Eagle crater on Meridiani Planum Jan. 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 accomplishments.

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A Martian Year Each page of the calendar has a diagram showing the relative position 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.

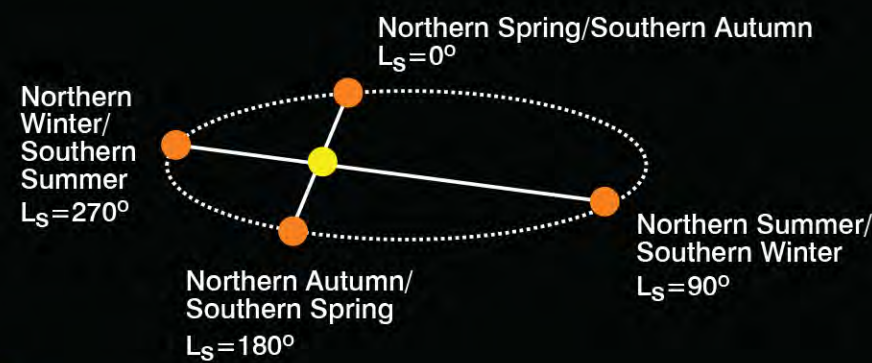


A Martian Day Mars rotates on its axis similarly to Earth, but a little more slowly, so a Mars day is a little longer than an Earth day. The Mars day, which we call a "sol," takes 24 hours, 39-1/2 minutes. The color numbers in the calendar squares indicate how many sols have passed for each active surface mission, "C" in blue type for the Curiosity rover, "N" in green type for the InSight mission (The rover Spirit had the "A" designation and the rover Opportunity had the "B" designation while in operation). For example, on Jan. 1, 2019, the numbers C2277 and N35 mean that this date marks the 2277th sol that Curiosity has spent on Mars and the 35th sol for InSight. 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.

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 one 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

Spirit and Opportunity

Opportunity has six science instruments, along with six 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 6.2 miles (10 kilometers) in altitude. (No longer operational)

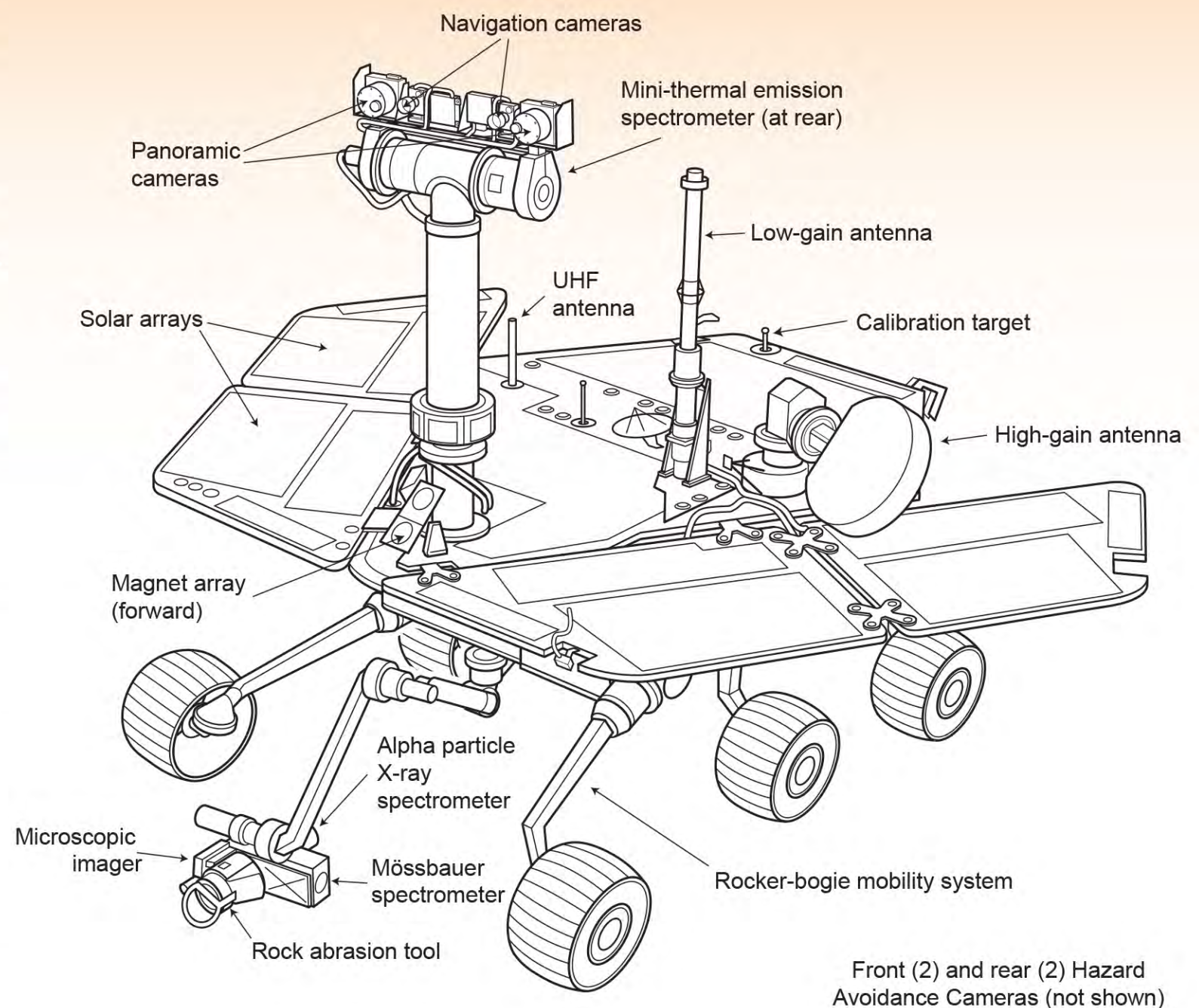
Contact Science Instruments

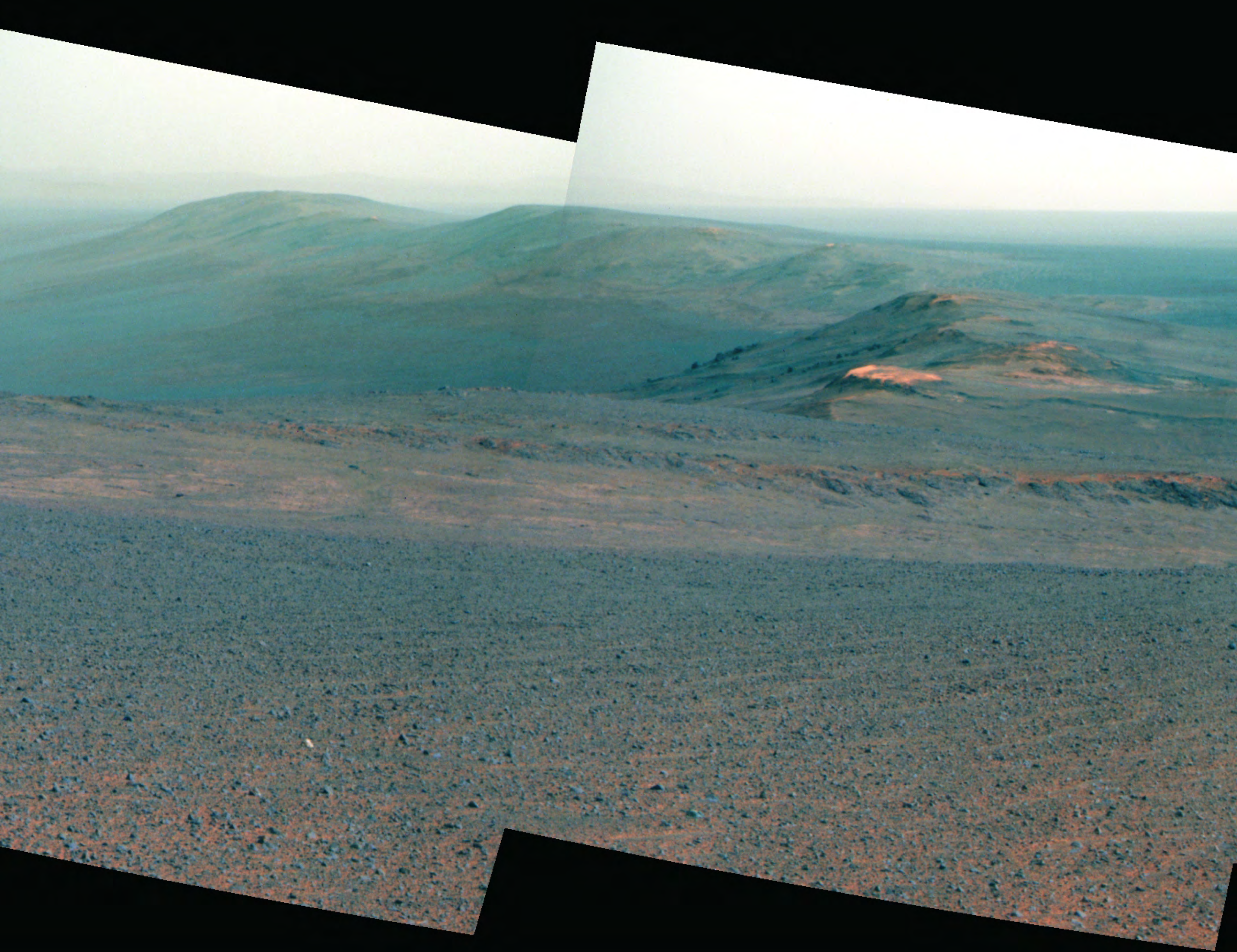
Rock Abrasion Tool (RAT) - Brushes and grinds rocks to clean away dust and other surface deposits so the spectrometers can analyze their composition.

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 soil. (No longer operational)

Microscopic Imager (MI) - Provides high-resolution images of the small-scale features of Martian rocks and soils.

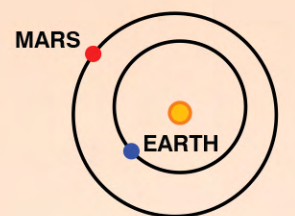




Drive Direction

This enhanced color mosaic, acquired by Opportunity on sol 4668 (Mar. 12, 2017), looks south over a portion of the rim of the Endeavour crater. The view is about 60 degrees wide and was pointed in Opportunity's drive direction towards the entrance to Perseverance Valley. In the far distance just above Endeavour's rim, the large crater Iazu can just be seen through the Martian haze.

Image credit: NASA/JPL-Caltech/Cornell Univ./ASU



February 1, 2019

January 2019

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1 1 DSN Week 1 L _s =316.4° C2277 N35	2 2 C2278 N36	3 3 C2279 N37	4 4 C2280 N38	5 5 C2281 N39 Spirit Landed 2004
6 6 C2282 N40	7 7 DSN Week 2 C2283 N41	8 8 C2284 N42	9 9 C2285 N43	10 10 C2286 N44	11 11 C2287 N45	12 12 C2288 N46
13 13 C2289 N47	14 14 DSN Week 3 C2290 N48	15 15 C2291 N49	16 16 C2292 N50	17 17 C2293 N51	18 18 C2294 N52	19 19 C2295 N53
20 20 C2296 N54	21 21 DSN Week 4 C2297 N55	22 22 C2298 N56	23 23 C2299 N57	24 24 C2300 N58	25 25 C2301 N59 Opportunity landed 2004	26 26 C2302 N60
27 27 C2303 N61	28 28 DSN Week 5 C2304 N62	29 29 C2305 N63	30 30 C2306	31 31 C2307 N64		

February 2019

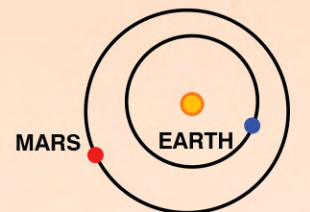
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						1 32 C2308 N66 L _s =333.7°
3 34 C2309 N67	4 35 DSN Week 6 C2310 N68	5 36 C2311 N69	6 37 C2312 N70	7 38 C2313 N71	8 39 C2314 N72	9 40 C2315 N73
10 41 C2316 N74	11 42 DSN Week 7 C2317 N75	12 43 C2317 N76	13 44 C2319 N77	14 45 C2320 N78	15 46 C2321 N79	16 47 C2322 N80
17 48 C2323 N81	18 49 DSN Week 8 C2324 N82	19 50 C2325 N83	20 51 C2326 N84	21 52 C2327 N85	22 53 C2328 N86	23 54 C2329 N87
24 55 C2330 N88	25 56 DSN Week 9 C2331 N89	26 57 C2332 N90	27 58 C2333 N91	28 59 C2334 N92		



Opportunity's View Downhill Catches Martian Shadows

Late-afternoon shadows include one cast by the rover itself in this look down "Perseverance Valley" towards the floor of Endeavour crater by NASA's Mars Exploration Rover Opportunity. The rover recorded this scene on Nov. 11, 2017, during the 4,911th Martian day, or sol, of the rover's work on Mars. That was about a week before Opportunity's eighth Martian winter solstice.

Image Credit: NASA/JPL-Caltech



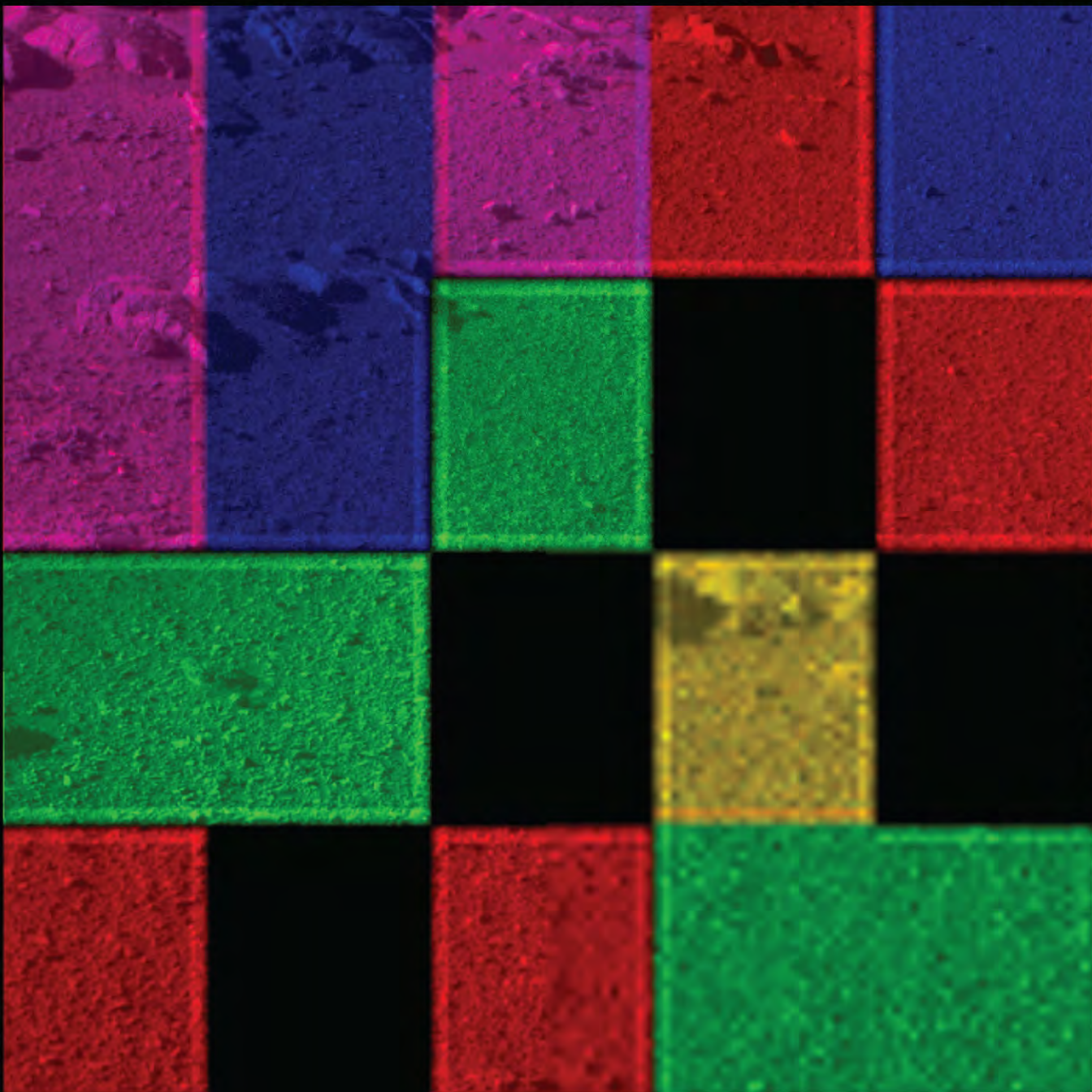
June 1, 2019

May 2019

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1 121 L _s =18.7° C2394 N152	2 122 C2395 N153	3 123 C2396 N154	4 124 C2397 N155
5 125 C2398 N156	6 126 DSN Week 19 C2399 N157	7 127 C2400 N158	8 128 C2401 N159	9 129 C2402 N160	10 130 C2403 N161	11 131 C2404 N162
12 132 C2405 N163	13 133 DSN Week 20 C2406 N164	14 134 C2407 N165	15 135 C2408 N166	16 136 C2409 N167	17 137 C2410 N168	18 138 C2411 N169
19 139 C2412 N170	20 140 DSN Week 21 C2413 N171	21 141 C2414 N172	22 142 C2415 N173	23 143 C2416	24 144 N174	25 145 C2417 N175 Phoenix landed 2008
26 146 C2418 N176	27 147 DSN Week 22 C2419 N177	28 148 C2420 N178	29 149 C2421 N179	30 150 C2422 N180	31 151 C2423 N181	

June 2019

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
						1 152 L _s =33.1° C2424 N182
2 153 C2425 N183	3 154 DSN Week 23 C2426 N184	4 155 C2427 N185	5 156 C2428 N186	6 157 C2429 N187	7 158 C2430 N188	8 159 C2431 N189
9 160 C2432 N190	10 161 DSN Week 24 Spirit launch 2003 C2433 N191	11 162 C2434 N192	12 163 C2435 N193	13 164 C2436 N194	14 165 C2437 N195	15 166 C2438 N196
16 167 C2439 N197	17 168 DSN Week 25 C2440 N198	18 169 C2441 N199	19 170 C2442 N200	20 171 C2443 N201	21 172 C2444 N202	22 173 C2445 N203
23 174 C2446 N204	24 175 DSN Week 26 C2447 N205	25 176 C2448 N206	26 177 C2449 N207	27 178 C2450 N208	28 179 C2451 N209	29 180 C2452
30 181 N210						



Artistic Pancam Frame Sol 4943

This set of Pancam images taken on sol 4943 (Dec. 19, 2017) illustrates the challenge of getting all the data down on the ground. The 'artist' looking checkerboard image on the left is a result of data dropouts in each of the three color images used to form the full color image. After processing all of the data, the complete color Pancam image can be assembled, shown on right.

Image credit: NASA/JPL-Caltech/Cornell Univ./ASU



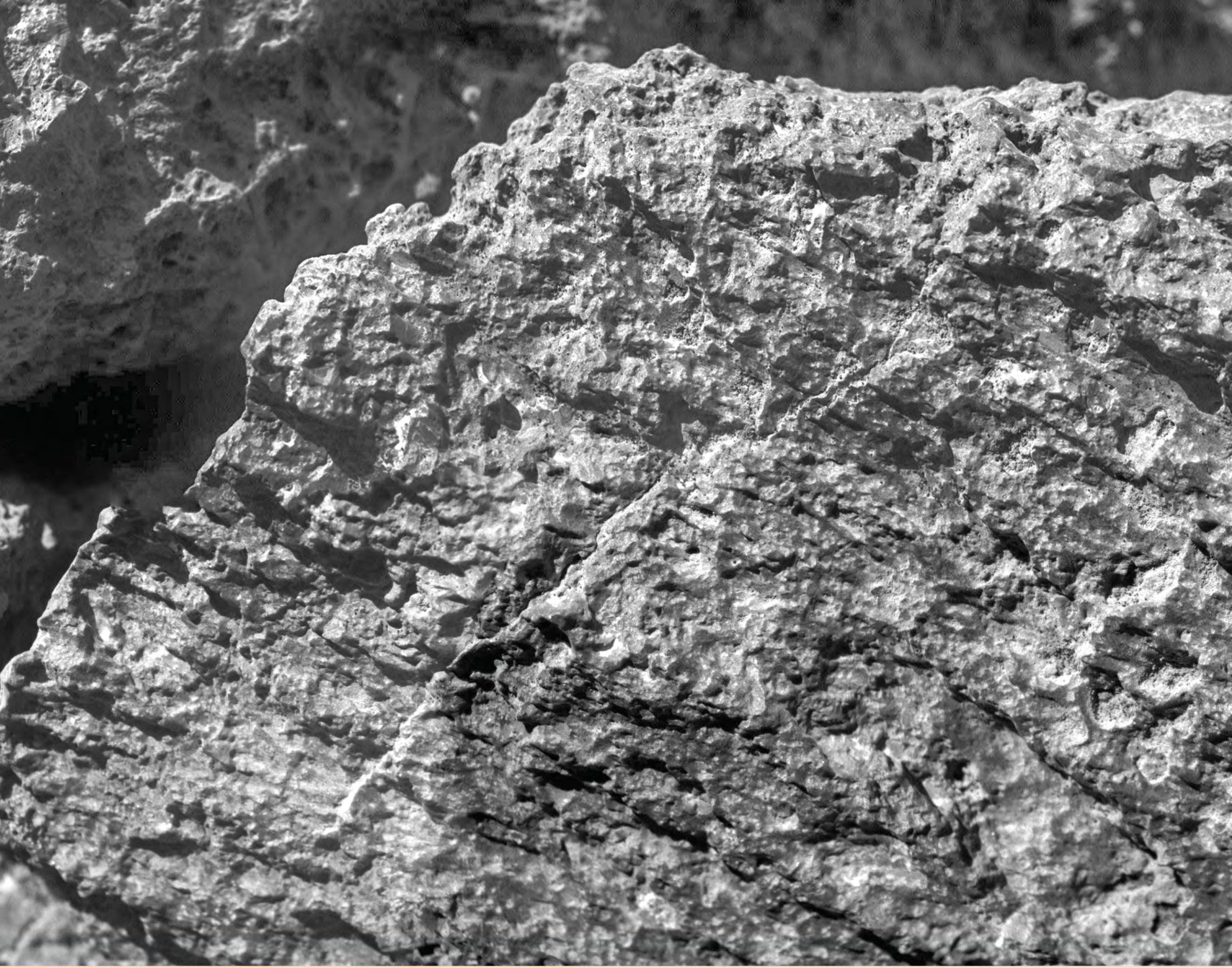
August 1, 2019

July 2019

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1 182 DSN Week 27 L _s =46.6° C2453 N211	2 183 C2454 N212	3 184 C2455 N213	4 185 Mars Pathfinder/ Sojourner landed 1997 C2456 N214	5 186 C2457 N215	6 187 C2458 N216
7 188 C2459 N217	8 189 DSN Week 28 Opportunity launched 2003 C2460 N218	9 190 C2461 N219	10 191 C2462 N220	11 192 C2463 N221	12 193 C2464 N222	13 194 C2465 N223
14 195 C2466 N224	15 196 DSN Week 29 C2467 N225	16 197 C2468 N226	17 198 C2469 N227	18 199 C2470 N228	19 200 C2471 N229	20 201 C2472 N230 Viking 1 landed 1976
21 202 C2473 N231	22 203 DSN Week 30 C2474 N232	23 204 C2475 N233	24 205 C2476 N234	25 206 C2477 N235	26 207 C2478 N236	27 208 C2479 N237
28 209 C2480 N238	29 210 DSN Week 31 C2481 N239	30 211 C2482 N240	31 212 C2483 N241			

August 2019

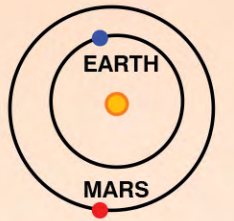
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				1 213 L _s =60.2° C2484 N242	2 214 C2485 N243	3 215 C2486 N244
4 216 C2487 N245	5 217 DSN Week 32 C2488	6 218 N246 Curiosity landed 2012	7 219 C2489 N247	8 220 C2490 N248	9 221 C2491 N249	10 222 C2492 N250
11 223 C2493 N251	12 224 DSN Week 33 C2494 N252	13 225 C2495 N253	14 226 C2496 N254	15 227 C2497 N255	16 228 C2498 N256	17 229 C2499 N257
18 230 C2500 N258	19 231 DSN Week 34 C2501 N259	20 232 C2502 N260	21 233 C2503 N261	22 234 C2504 N262	23 235 C2505 N263	24 236 C2506 N264
25 237 C2507 N265	26 238 DSN Week 35 Mars Aphelion C2508 N266	27 239 C2509 N267	28 240 C2510 N268	29 241 C2511 N269	30 242 C2512 N270	31 243 C2513 N271



Jornada del Muerto

While in Perseverance Valley, Opportunity visited the northern branch of a bifurcating trough to investigate some rocks with prominent wind abraded streaks. The rock shown in this MI mosaic taken on Sol 4984 (Jan. 31, 2018) was named Jornada del Muerto after one of the stops along El Camino Real de Tierra Adentro, a route used for centuries by Spanish and Mexican colonists to reach New Mexico from Mexico, and used by the MER team to name the rocks and features of Perseverance Valley. Despite the prominence of the streaks seen at the larger scale, at the small scale of the MI scene, which is ~2 inches (~5 cm) wide, the streaks are difficult to discern against the rough, pitted texture.

Image credit: NASA/JPL-Caltech/Cornell Univ./ASU



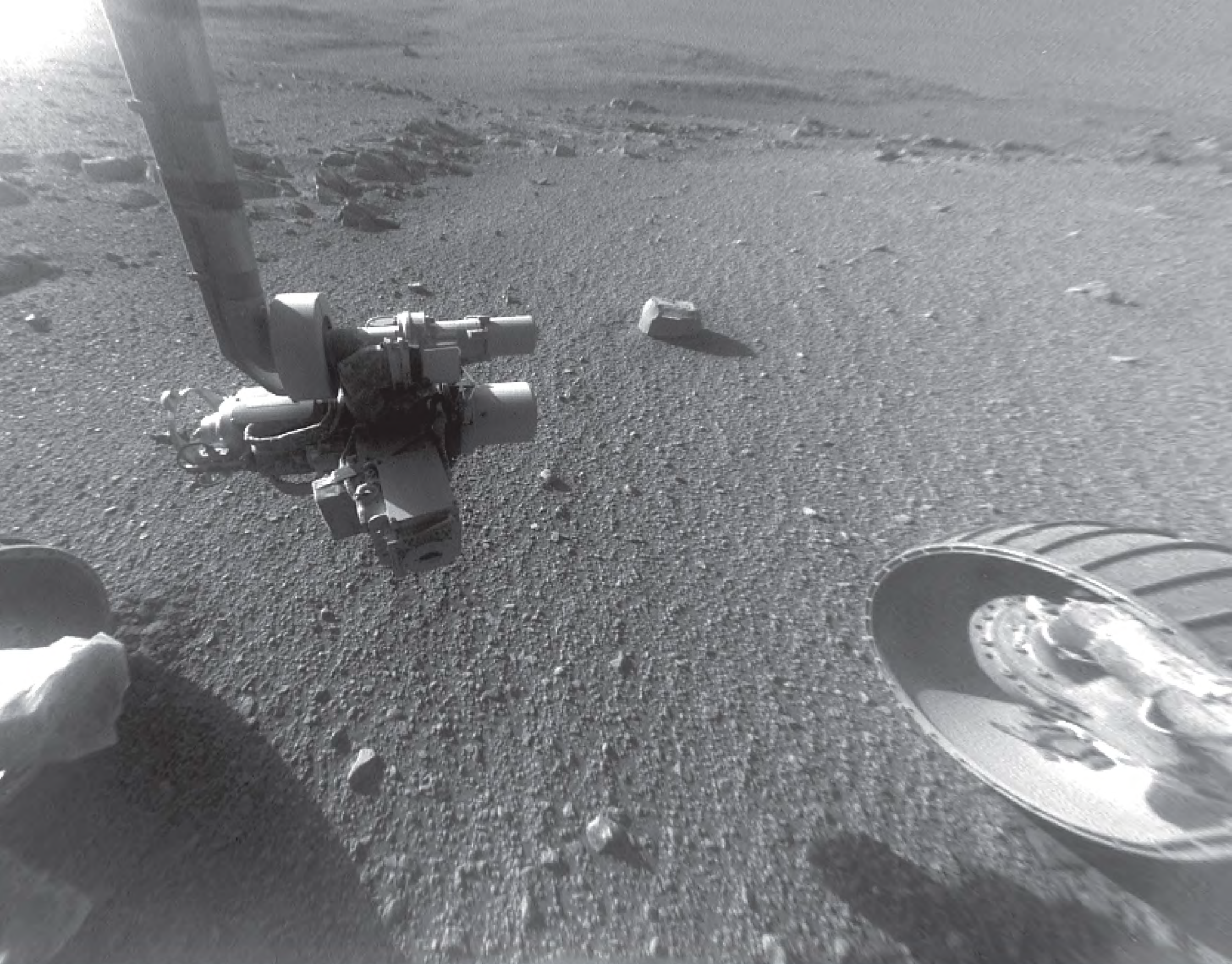
October 1, 2019

September 2019

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1 244 L _s =73.8° C2514 N272	2 245 DSN Week 36 Earth-Mars Solar Conjunction C2515 N273	3 246 Viking 2 landed 1976 C2516 N274	4 247 C2517 N275	5 248 C2518 N276	6 249 C2519 N277	7 250 C2520 N278
8 251 C2521 N279	9 252 DSN Week 37 C2522 N280	10 253 C2523 N281	11 254 C2524 N282	12 255 C2525 N283	13 256 C2526 N284	14 257 C2527 N285
15 258 C2528 N286	16 259 DSN Week 38 C2529 N287	17 260 C2530 N288	18 261 C2531 N289	19 262 C2532 N290	20 263 C2533 N291	21 264 C2534 N292
22 265 C2535 N293	23 266 DSN Week 39 C2536 N294	24 267 C2537 N295	25 268 C2538 N296	26 269 C2539 N297	27 270 C2540 N298	28 271 C2541 N299
29 272 C2542 N300	30 273 DSN Week 40					

October 2019

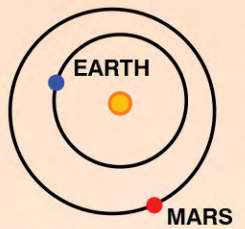
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
6 279 C2548 N306	7 280 DSN Week 41 C2549 N307	8 281 L _s =86.9° C2543 N301 Southern Winter Solstice (L _s =90°) C2550 N308	9 282 C2544 N302 C2551 N309	10 283 C2545 N303 C2552 N310	11 284 C2546 N304 C2553 N311	12 285 C2547 N305 C2554 N312
13 286 C2555 N313	14 287 DSN Week 42 C2556 N314	15 288 C2557 N315	16 289 C2558 N316	17 290 C2559 N317	18 291 C2560 N318	19 292 C2561 N319
20 293 C2562 N320	21 294 DSN Week 43 C2563 N321	22 295 C2564 N322	23 296 C2565 N323	24 297 C2566 N324	25 298 C2567 N325	26 299 C2568 N326
27 300 C2569 N327	28 301 DSN Week 44 C2570 N328	29 302 C2571 N329	30 303 C2572 N330	31 304 JPL		



Opportunity Rover Views Ground Texture 'Perseverance Valley'

This image was taken inside "Perseverance Valley," on the inboard slope of the western rim of Endeavour crater, on sol 4958 (Jan. 4, 2018). The linear patterned ground reflects modern processes that are shaping the floor of the valley.

Image credit: NASA/JPL-Caltech



December 1, 2019

November 2019

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1 305 $L_s=100.6^\circ$ C2573 N331	2 306 C2574 N332
3 307 C2575 N333	4 308 DSN Week 45 C2576 N334	5 309 C2577 N335	6 310 C2578 N336	7 311 C2579 N337	8 312 C2580 N338	9 313 C2581 N339
10 314 C2582 N340	11 315 DSN Week 46 C2583 N341	12 316 C2584 N342	13 317 C2585 N343	14 318 C2586 N344	15 319 C2587 N345	16 320 C2588 N346
17 321 C2589 N347	18 322 DSN Week 47 C2590 N348	19 323 C2591 N349	20 324 C2592 N350	21 325 C2593 N351	22 326 C2594 N352	23 327 C2595 N353
24 328 C2596 N354	25 329 DSN Week 48 C2597 N355	26 330 InSight landed 2018 C2598 N355	27 331 N356	28 332 C2599 N357	29 333 C2600 N358	30 334 C2601 N359

December 2019

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1 335 $L_s=114.3^\circ$ C2602 N360	2 336 DSN Week 49 C2603 N361	3 337 C2604 N362	4 338 C2605 N363	5 339 C2606 N364	6 340 C2607 N365	7 341 C2608 N366
8 342 C2609 N367	9 343 DSN Week 50 C2610 N368	10 344 C2611 N369	11 345 C2612 N370	12 346 C2613 N371	13 347 C2614 N372	14 348 C2615 N373
15 349 C2616 N374	16 350 DSN Week 51 C2617 N375	17 351 C2618 N376	18 352 C2619 N377	19 353 C2620 N378	20 354 C2621 N379	21 355 C2622 N380
22 356 C2623 N381	23 357 DSN Week 52 C2624 N382	24 358 C2625 N383	25 359 C2626 N384	26 360 C2627 N385	27 361 C2628 N386	28 362 C2629 N387
29 363 C2630 N388	30 364 DSN Week 1 C2631 N389	31 365 C2632 N390				



New Day for Longest-Working Mars Rover

NASA's Mars Exploration Rover Opportunity recorded the dawn of the rover's 4,999th sol with Pancam on Feb. 15, 2018. This processed, approximately true-color scene, is pointed towards the eastern rim of Endeavour crater, some 14 miles (22 kilometers) away. By sol 5000, Opportunity had driven a little over 28.02 miles (45.1 kilometers) since its landing in Meridiani Planum in January, 2004.

Image credits: NASA/JPL-Caltech/Texas A&M

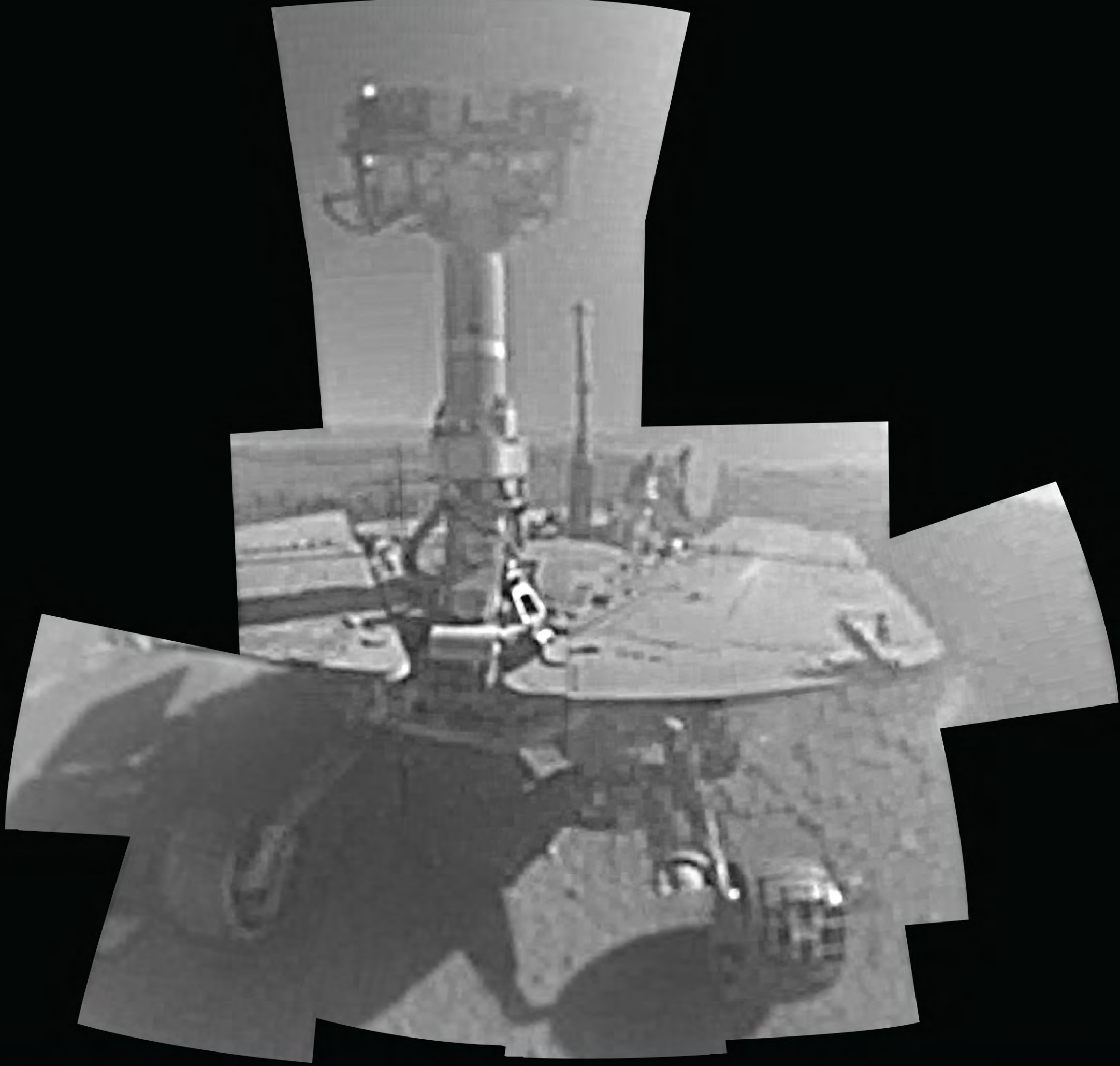


February 1, 2020

January 2020

February 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1 1 L _s =128.8° C2633 N391	2 2 C2634	3 3 N392	4 4 Spirit landed 2004 C2635 N393							1 32 L _s =144.0° C2663 N421
5 5 C2636 N394	6 6 DSN Week 2 C2637 N395	7 7 C2638 N396	8 8 C2639 N397	9 9 C2640 N398	10 10 C2641 N399	11 11 C2642 N400	2 33 C2664 N422	3 34 DSN Week 6 C2665 N423	4 35 C2666 N424	5 36 C2667 N425	6 37 C2668 N426	7 38 C2669 N427	8 39 C2670
12 12 C2643 N401	13 13 DSN Week 3 C2644 N402	14 14 C2645 N403	15 15 C2646 N404	16 16 C2647 N405	17 17 C2648 N406	18 18 C2649 N407	9 40 N428	10 41 DSN Week 7 C2671 N429	11 42 C2672 N430	12 43 C2673 N431	13 44 C2674 N432	14 45 C2675 N433	15 46 C2676 N434
19 19 C2650 N408	20 20 DSN Week 4 C2651 N409	21 21 C2652 N410	22 22 C2653 N411	23 23 C2654 N412	24 24 C2655 N413	25 25 C2656 N414	16 47 C2677 N435	17 48 DSN Week 8 C2678 N436	18 49 C2679 N437	19 50 C2680 N438	20 51 C2681 N439	21 52 C2682 N440	22 53 C2683 N441
26 26 C2657 N415	27 27 DSN Week 5 C2658 N416	28 28 C2659 N417	29 29 C2660 N418	30 30 C2661 N419	31 31 C2662 N420		23 54 C2684 N442	24 55 DSN Week 9 C2685 N443	25 56 C2686 N444	26 57 C2687 N445	27 58 C2688 N446	28 59 C2689 N447	29 60 C2690 N448



Opportunity's First Selfie

This unique self-portrait of NASA's Opportunity rover was collected on sol 5000 (Feb. 16, 2018) within Perseverance Valley on the slopes of Endeavour crater. The "selfie" was collected using the Microscopic Imager at the end of the rover's robotic arm. That imager was designed for only close-in images of rocks and soils with a working distance of a few centimeters, thus the selfie images are out of focus. Image processing was applied to improve the focus of the images. This very unusual and innovative application of both the rover's robotic arm and the Microscopic Imager celebrates 5,000 days on the Martian surface.

Image credit: NASA/JPL-Caltech/USGS



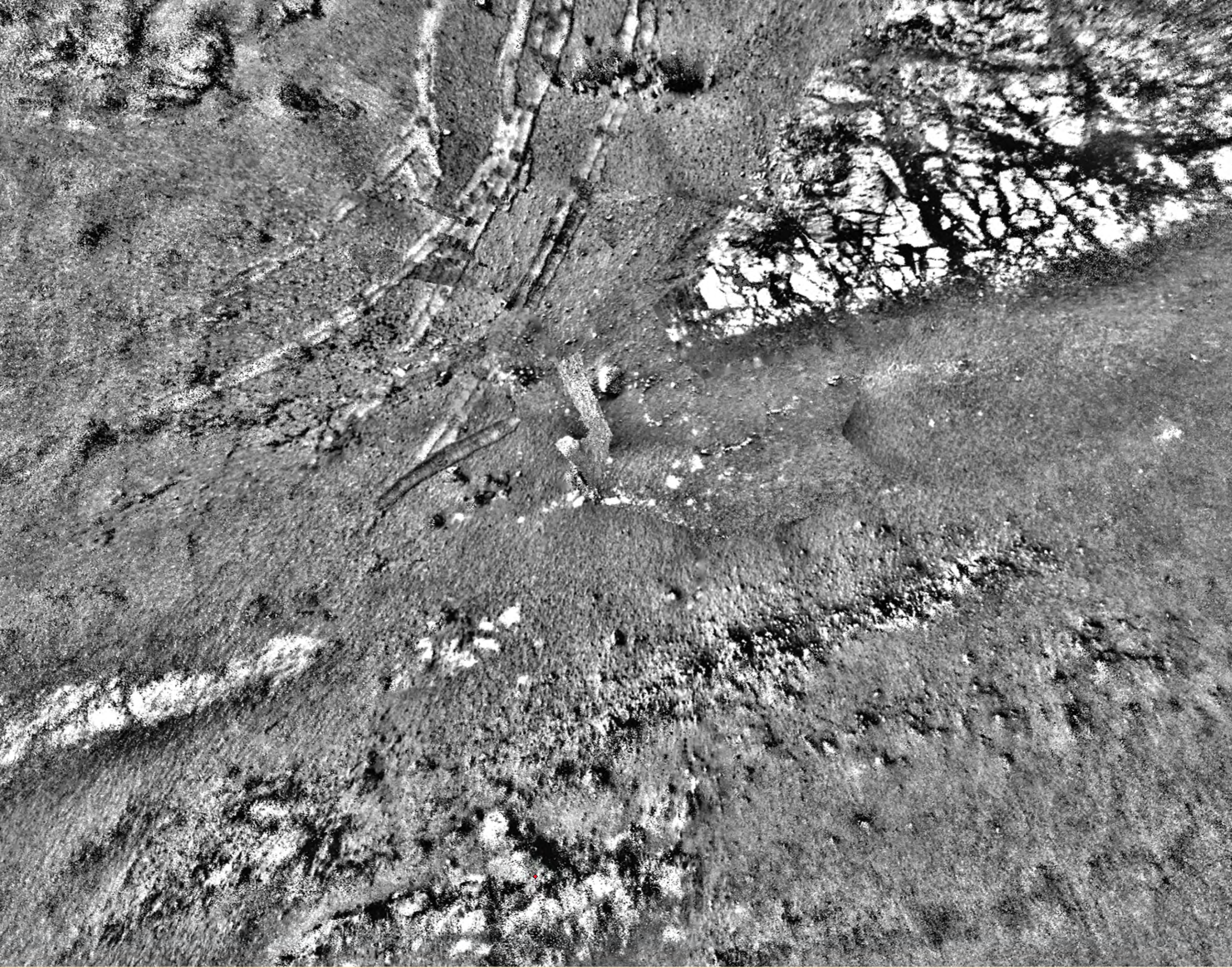
April 1, 2020

March 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1 61 C2691 N449	2 62 DSN Week 10 C2692 N450	3 63 C2693 N451	4 64 C2694 N452	5 65 C2695 N453	6 66 C2696 N454	7 67 C2697 N455
8 68 C2698 N456	9 69 DSN Week 11 C2699 N457	10 70 C2700 N458	11 71 C2701 N459	12 72 C2702 N460	13 73 C2703 N461	14 74 C2704 N462
15 75 C2705 N463	16 76 DSN Week 12 C2706 N464	17 77 C2707	18 78 N465	19 79 C2708 N466	20 80 C2709 N467	21 81 C2710 N468
22 82 C2711 N469	23 83 DSN Week 13 C2712 N470	24 84 C2713 N471	25 85 C2714 N472	26 86 C2715 N473	27 87 C2716 N474	28 88 C2717 N475
29 89 C2718 N476	30 90 DSN Week 14 C2719 N477	31 91 C2720 N478				

April 2020

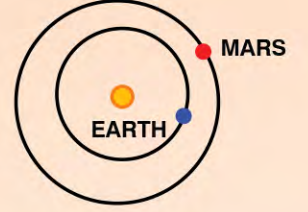
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			1 92 C2721 N479	2 93 C2722 N480	3 94 C2723 N481	4 95 C2724 N482
5 96 C2725 N483	6 97 DSN Week 15 C2726 N484	7 98 C2727 N485	8 99 Southern Spring Equinox (L _s =180°) C2728 N486	9 100 C2729 N487	10 101 C2730 N488	11 102 C2731 N489
12 103 C2732 N490	13 104 DSN Week 16 C2733 N491	14 105 C2734 N492	15 106 C2735 N493	16 107 C2736 N494	17 108 C2737 N495	18 109 C2738 N496
19 110 C2739 N497	20 111 DSN Week 17 C2740 N498	21 112 C2741 N499	22 113 C2742 N500	23 114 C2743	24 115 N501	25 116 C2744 N502
26 117 C2745 N503	27 118 DSN Week 18 C2746 N504	28 119 C2747 N505	29 120 C2748 N506	30 121 C2749 N507		



Sol 5038 Location Vertical Projection

An overhead projected mosaic, centered on the rover's position on Sol 5038 (Mar. 27, 2018) showing Opportunity's tracks in "Perseverance Valley" using images from the Opportunity Rover's Navigation camera collected between sols 5000-5033. This mosaic has a resolution of 1 cm/pixel and consists of vertically map-projected images processed by JPL's Multimission Image Processing Laboratory. Shading differences between frames has been adjusted so subtle surface details are more visible. The rover wheel tracks are about 3 feet (1 meter) apart, the scene width is about 61.6 feet (20 meters), and the scene height is about 39.4 feet (12 meters).

Image credit: NASA/JPL-Caltech

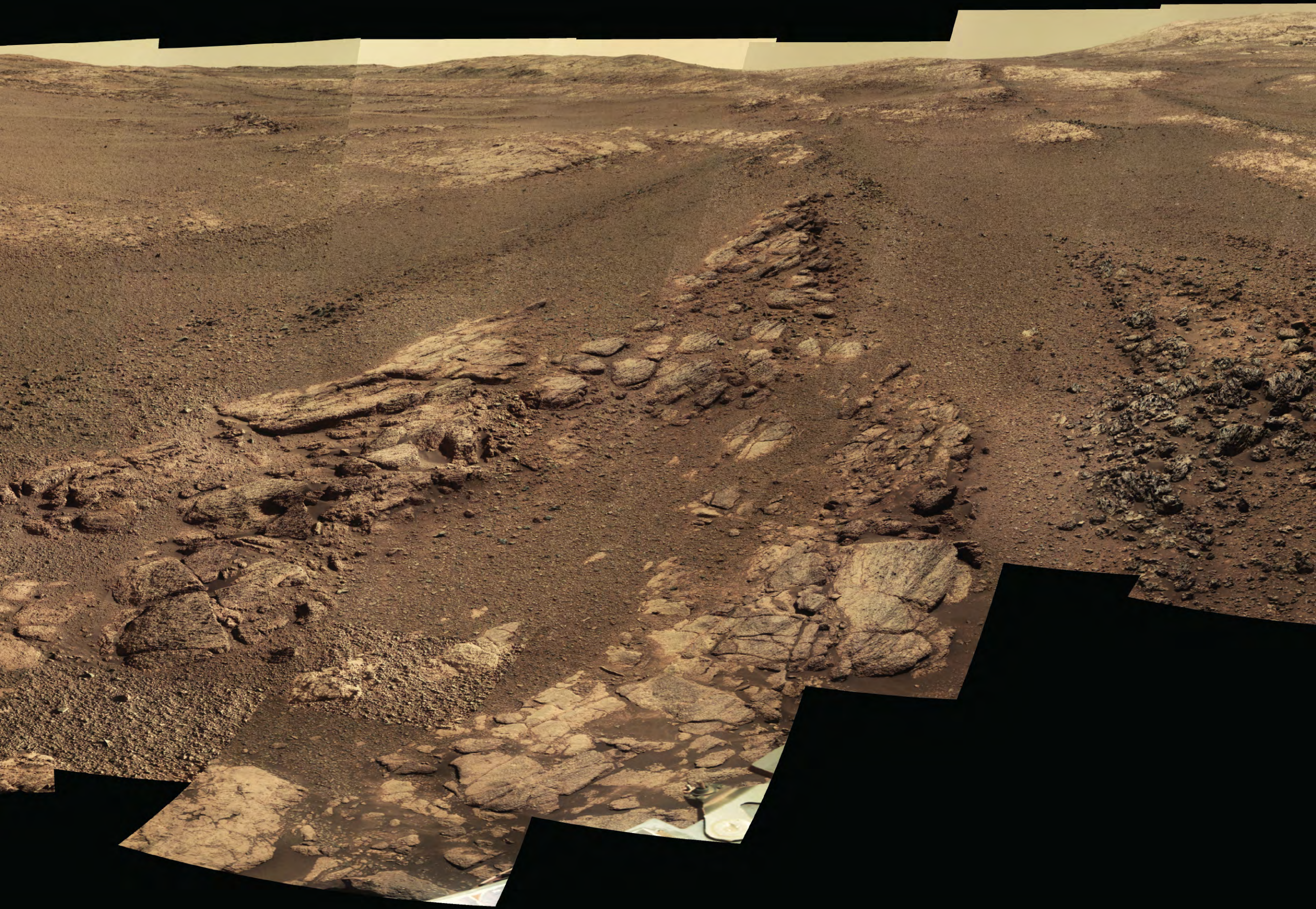


June 1, 2020

May 2020

June 2020

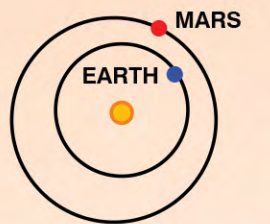
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1 122	2 123		1 153	2 154	3 155	4 156	5 157	6 158
					$L_s=192.9^\circ$ C2750 N508	C2751 N509		DSN Week 23 $L_s=211.4^\circ$ C2780 N538	C2781 N539	C2782 N540	C2783 N541	C2784 N542	C2785 N543
3 124	4 125 DSN Week 19	5 126	6 127	7 128	8 129	9 130	7 159	8 160 DSN Week 24	9 161	10 162	11 163	12 164	13 165
C2752 N510	C2753 N511	C2754 N512	C2755 N513	C2756 N514	C2757 N515	C2758 N516	C2786 N544	C2787 N545	C2788 N546	C2789 N547	C2790 N548	C2791 N549	C2792 N550
10 131	11 132 DSN Week 20	12 133	13 134	14 135	15 136	16 137	14 166	15 167 DSN Week 25	16 168	17 169	18 170	19 171	20 172
C2759 N517	C2760 N518	C2761 N519	C2762 N520	C2763 N521	C2764 N522	C2765 N523	C2793 N551	C2794 N552	C2795 N553	C2796 N554	C2797 N555	C2798 N556	C2799 N557
17 138	18 139 DSN Week 21	19 140	20 141	21 142	22 143	23 144	21 173	22 174 DSN Week 26	23 175	24 176	25 177	26 178	27 179
C2766 N524	C2767 N525	C2768 N526	C2769 N527	C2770 N528	C2771 N529	C2772 N530	C2800 N558	C2801 N559	C2802 N560	C2803 N561	C2804 N562	C2805 N563	C2806 N564
145 24 C2773 N531	25 146 DSN Week 22 Phoenix landed 2008	26 147	27 148	28 149	29 150	30 151	28 180	29 181 DSN Week 27	30 182				
N537 31 152	C2774 N532	C2775 N533	C2776 N534	C2777 N535	C2778 N536	C2779	C2807 N565	C2808 N566	C2809 N567				



Within 'Perseverance Valley'

This multi-framed color panorama was taken at the rover's last location on Sol 5100 (May 30, 2018), during a campaign of extensive robotic arm (IDD) work on rocks within the rover's work volume. The panorama started as separate smaller mosaics on various areas, including the the tabular outcrop in front of the rover, the tracks in the rear, and the area to the southeast. The IDD campaign lasted long enough that a nearly complete panorama was collected. The planet-encircling dust storm prevented further image taking.

Image credit: NASA/JPL/Cornell Univ./ASU



August 1, 2020

July 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1 183 L _s =230.0° C2810 N568	2 184 C2811 N569	3 185 C2812 N570	4 186 Mars Pathfinder/ Sojourner landed 1997 C2813 N571
5 187 C2814 N572	6 188 DSN Week 28 C2815 N573	7 189 C2816	8 190 N574	9 191 C2817 N575	10 192 C2818 N576	11 193 C2819 N577
12 194 C2820 N578	13 195 DSN Week 29 C2821 N579	14 196 C2822 N580	15 197 C2823 N581	16 198 C2824 N582	17 199 C2825 N583	18 200 C2826 N584
19 201 C2827 N585	20 202 DSN Week 30 Viking I landed 1976 C2828 N586	21 203 C2829 N587	22 204 C2830 N588	23 205 C2831 N589	25 206 C2832 N590	25 207 C2833 N591
26 208 C2834 N592	27 209 DSN Week 31 C2835 N593	28 210 C2836 N594	29 211 C2837 N595	30 212 C2838 N596	31 213 C2839 N597	

August 2020

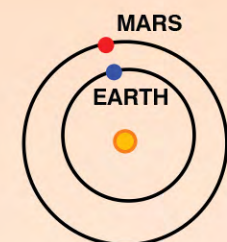
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
						1 214 L _s =249.6° C2840 N598
2 215 C2841 N599	3 216 DSN Week 32 Mars perihelion C2842 N600	4 217 C2843 N601	5 218 C2844 N602	6 219 Curiosity landed 2012 C2845 N603	7 220 C2846 N604	8 221 C2847 N605
9 222 C2848 N606	10 223 DSN Week 33 C2849 N607	11 224 C2850 N608	12 225 C2851 N609	13 226 C2852	14 227 N610	15 228 C2853 N611
16 229 C2854 N612	17 230 DSN Week 34 C2855 N613	18 231 C2856 N614	19 232 C2857 N615	20 233 C2858 N616	21 234 C2859 N617	22 235 C2860 N618
23 236 C2861 N619	23 237 DSN Week 35 C2869 N627	24 238 C2862 N620	25 238 C2863 N621	26 239 C2864 N622	27 240 C2865 N623	29 242 C2866 N624
30 243 C2868 N626	31 244 C2869 N627					



In-Situ Instrument Laboratory (ISIL) Team Panorama

As part of the development of new flight software for the rover Opportunity, a full system test of the new software was performed on the engineering rover at NASA's Jet Propulsion Laboratory. Members of the rover team posed for this Navcam panorama in the rover sandbox on Sep. 6, 2018 during that system test. One member of the team moved between image frames as the panorama was being collected. Can you find him?

Image credit: NASA/JPL-Caltech



October 1, 2020

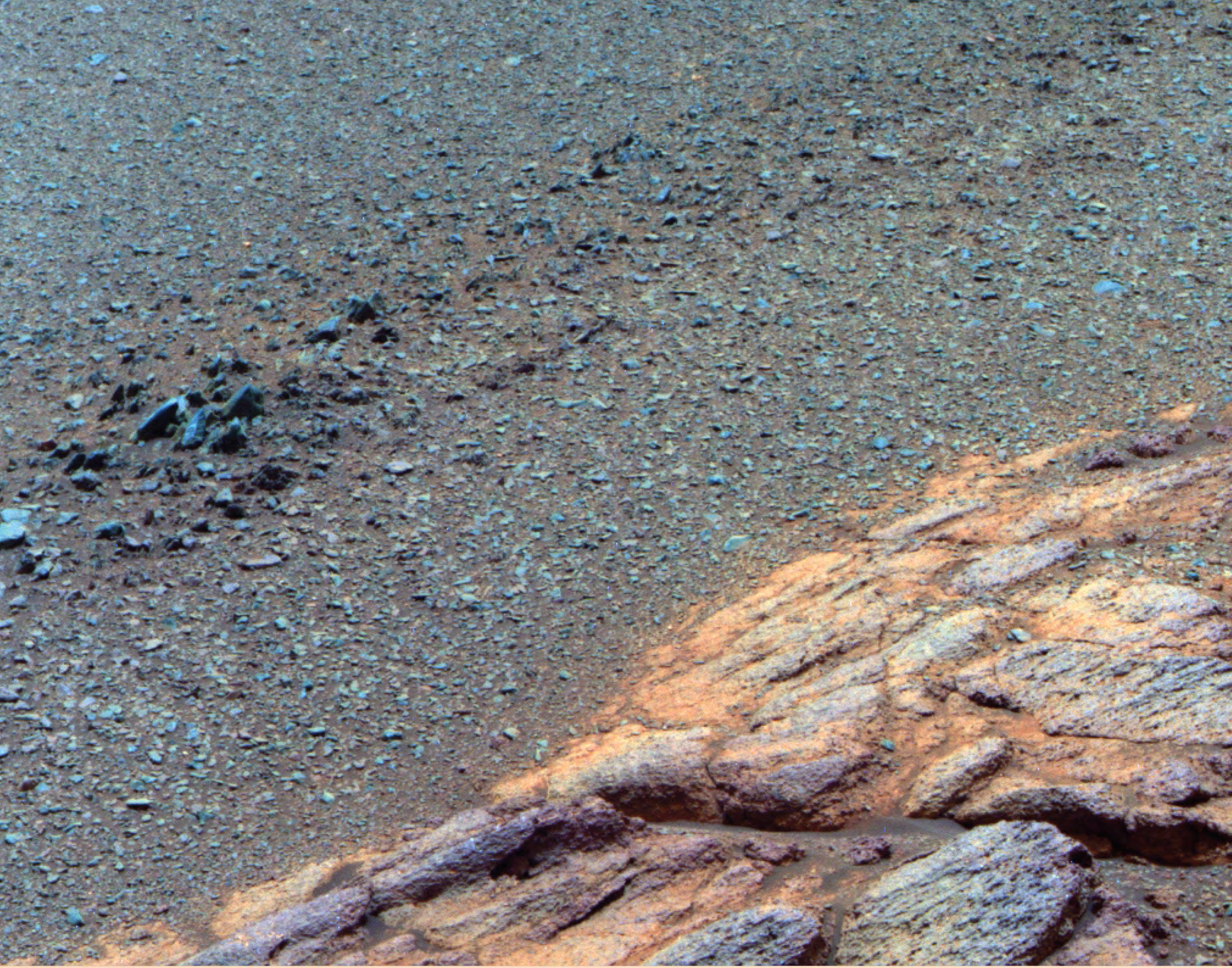
September 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1 245 DSN Week 36 L _s =269.2° C2870 N628	2 246 Southern Summer Solstice (L _s =270°) C2871 N629	3 247 Viking 2 landed 1976 C2872 N630	4 248 C2873 N631	5 249 C2874 N632
6 250 C2875 N633	7 251 DSN Week 37 C2876 N634	8 252 C2877 N635	9 253 C2878 N636	10 254 C2879 N637	11 255 C2880 N638	12 256 C2881 N639
13 257 C2882 N640	14 258 DSN Week 38 C2883 N641	15 259 C2884 N642	16 260 C2885 N643	17 261 C2886 N644	18 262 C2887 N645	19 263 C2888
20 264 C2889 N646	21 265 DSN Week 39 N647	22 266 C2890 N648	23 267 C2891 N649	24 268 C2892 N650	25 269 C2893 N651	26 270 C2894 N652
27 271 C2895 N653	28 272 DSN Week 40 C2896 N654	29 273 C2897 N655	30 274 C2898 N656			

October 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				1 275 L _s =287.9° C2899 N657	2 276 C2900 N658	3 277 C2901 N659
4 278 C2902 N660	5 279 DSN Week 41 C2903 N661	6 280 C2904 N662	7 281 C2905 N663	8 282 C2906 N664	9 283 C2907 N665	10 284 C2908 N666
11 285 C2909 N667	12 286 DSN Week 42 C2910 N668	13 287 C2911 N669	14 288 Earth-Mars Opposition C2912 N670	15 289 C2913 N671	16 290 C2914 N672	17 291 C2915 N673
18 292 C2916 N674	19 293 DSN Week 43 C2917 N675	20 294 C2918 N676	21 295 C2919 N677	22 296 C2920 N678	23 297 C2921 N679	24 298 C2922 N680
25 299 C2923 N681	26 300 DSN Week 44 C2924 N682	27 301 C2925 N683	28 302 C2926 N684	29 303 C2927 N685	30 304 C2928 N686	31 305 C2928 N686

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Last Color Image

This color image, taken on sol 5104 (Jun. 3, 2018), shows a portion of an outcrop named “La Joya,” found in “Perseverance Valley.” Opportunity was completing contact science investigations at this target when a planet-wide dust storm darkened the skies and prevented the solar-paneled rover from collecting energy. This was the last color image Opportunity sent back before losing contact with Earth after sol 5111 as a result of the dust storm.

Image credit: NASA/JPL-Caltech/Cornell Univ./ASU



December 1, 2020

November 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1 306 C2929 N687 L _s =306.5°	2 307 DSN Week 45 C2930 N688	3 308 C2931 N689	4 309 C2932 N690	5 310 C2933 N691	6 311 C2934 N692	7 312 C2935 N693
8 313 C2936 N694	9 314 DSN Week 46 C2937 N695	10 315 C2938 N696	11 316 C2939 N697	12 317 C2940 N698	13 318 C2941 N699	14 319 C2942 N700
15 320 C2943 N701	16 321 DSN Week 47 C2944 N702	17 322 C2945 N703	18 323 C2946 N704	19 324 C2947 N705	20 325 C2948 N706	21 326 C2949 N707
22 327 C2950 N708	23 328 DSN Week 48 C2951 N709	24 329 C2952 N710	25 330 C2953 N711	26 331 InSight landed 2018 C2954 N712	27 332 C2955 N713	28 333 C2956 N714
29 334 C2957 N715	30 335 DSN Week 49 C2958 N716					

December 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1 336 L _s =323.8° C2959 N717	2 337 C2960 N718	3 338 C2961 N719	4 339 C2962 N720	5 340 C2963 N721
6 341 C2963 N721	7 342 DSN Week 50 C2964 N722	8 343 C2965 N723	9 344 C2966 N724	10 345 C2967 N725	11 346 C2968 N726	12 347 C2969 N727
13 348 C2970 N728	14 349 DSN Week 51 C2971 N729	15 350 C2972 N730	16 351 C2973 N731	17 352 C2974 N732	18 353 C2975 N733	19 354 C2976 N734
20 355 C2977 N735	21 356 DSN Week 52 C2978 N736	22 357 C2979 N737	23 358 C2980 N738	24 359 C2981 N739	25 360 C2982 N740	26 361 C2983 N741
27 362 C2984 N742	28 363 DSN Week 53 C2985 N743	29 364 C2986 N744	30 365 C2987 N745	31 366 C2988 N746		

QUICK FACTS

Mars Exploration Rovers

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)
Total Surface Mission	Spirit - 6 years Opportunity - 14.5 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 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.
Size	5.2 feet high, 4.9 feet long, 7.2 feet wide (1.6 meters high, 1.5 meters long, 2.2 meters wide)
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 - 28.1 miles (45.2 kilometers)
Images Sent to Earth	Spirit - 125,000 Opportunity - 217,600

The Jet Propulsion Laboratory in Pasadena, California, designed and built the rovers Spirit and Opportunity. JPL also manages the Mars Exploration Rover Project for NASA's Science Mission Directorate in Washington, D.C.

National Aeronautics and Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

www.nasa.gov

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