Mars rover Opportunity working at 'Matijevic Hill' site

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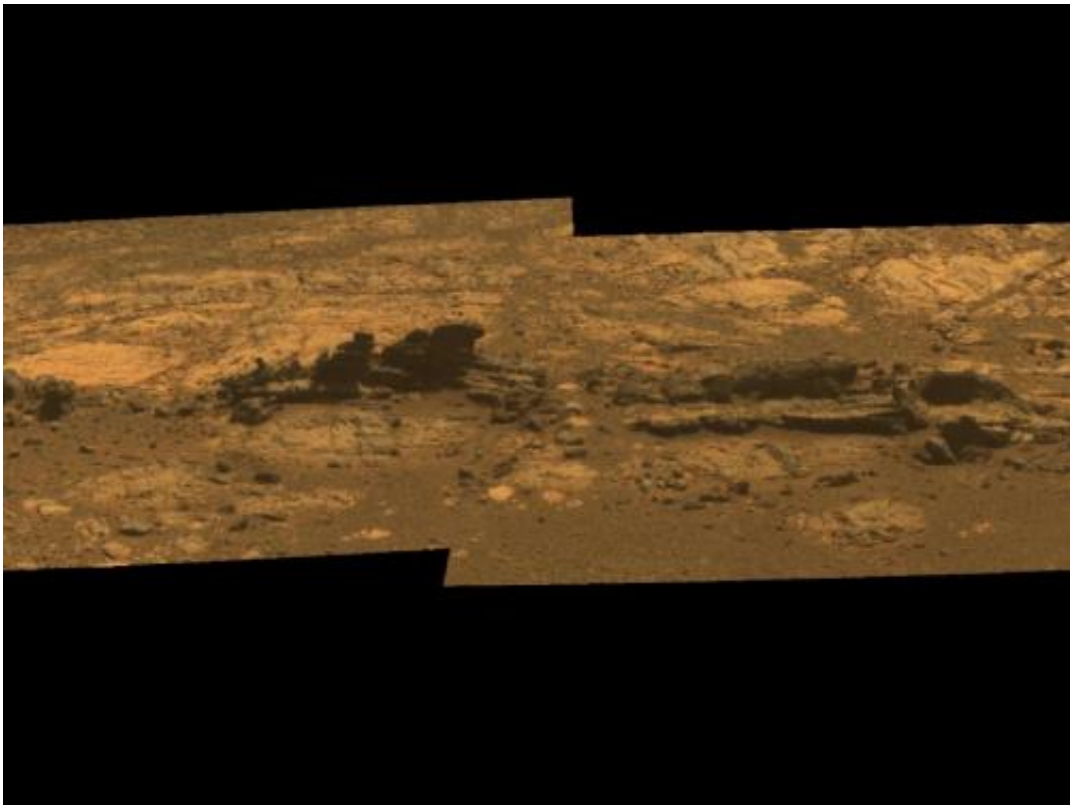

Rock fins up to about 1 foot (30 centimeters) tall dominate this scene from the panoramic camera (Pancam) on NASA's Mars Exploration Rover Opportunity. The component images were taken during the 3,058th Martian day, or sol, of Opportunity's work on Mars (Aug. 23, 2012). The view spans an area of terrain about 30 feet (9 meters) wide. Orbital investigation of the area has identified a possibility of clay minerals in this area of the Cape York segment of the western rim of Endeavour Crater. The view combines exposures taken through Pancam filters centered on wavelengths of 753 nanometers (near infrared), 535 nanometers (green) and 432 nanometers (violet). It is presented in approximate true color, the camera team's best estimate of what the scene would look like if

humans were there and able to see it with their own eyes. Image credit: NASA/JPL-Caltech/Cornell Univ./Arizona State Univ.

(Phys.org)—NASA's Mars rover Opportunity, well into its ninth year on Mars, will work for the next several weeks or months at a site with some of the mission's most intriguing geological features.

The site, called "Matijevic Hill," overlooks 14-mile-wide (22-kilometer-wide) Endeavour Crater. Opportunity has begun investigating the site's concentration of small spherical objects reminiscent of, but different from, the iron-rich spheres nicknamed "blueberries" at the rover's landing site nearly 22 driving miles ago (35 kilometers).

The small spheres at Matijevic Hill have different composition and internal structure. Opportunity's science team is evaluating a range of possibilities for how they formed. The spheres are up to about an eighth of an inch (3 millimeters) in diameter.

The "blueberries" found earlier are concretions formed by the action of mineral-laden water inside rocks, but that is only one of the ways nature can make small, rounded particles. One working hypothesis, out of several, is that the new-found spherules are also concretions but with a different composition. Others include that they may be accretionary lapilli formed in volcanic ash eruptions, impact spherules formed in impact events, or devitrification spherules resulting from formation of crystals from formerly melted material. There are other possibilities, too.

"Right now we have multiple working hypotheses, and each hypothesis makes certain predictions about things like what the spherules are made of and how they are distributed," said Opportunity's principal investigator, Steve Squyres, of Cornell University, Ithaca, N.Y. "Our job

as we explore Matijevic Hill in the months ahead will be to make the observations that will let us test all the hypotheses carefully, and find the one that best fits the observations."

The team chose to refer to this important site as Matijevic Hill in honor of Jacob Matijevic (1947-2012), who led the engineering team for the twin Mars Exploration Rovers Spirit and Opportunity for several years before and after their landings. He worked at NASA's Jet Propulsion Laboratory, Pasadena, Calif., from 1981 until his death last month, most recently as chief engineer for surface operations systems of NASA's third-generation Mars rover, Curiosity. In the 1990s, he led the engineering team for the first Mars rover, Sojourner.

A different Mars rover team, operating Curiosity, has also named a feature for Matijevic: a rock that Curiosity recently investigated about halfway around the planet from Matijevic Hill.

"We wouldn't have gotten to Matijevic Hill, eight-and-a-half years after Opportunity's landing, without Jake Matijevic," Squyres said.

Opportunity's project manager, John Callas, of JPL, said, "If there is one person who represents the heart and soul of all three generations of Mars rovers—Sojourner, Spirit and Opportunity, Curiosity—it was Jake."

Provided by JPL/NASA