

Mars Exploration Rover Mission

**Spirit
and
Opportunity**



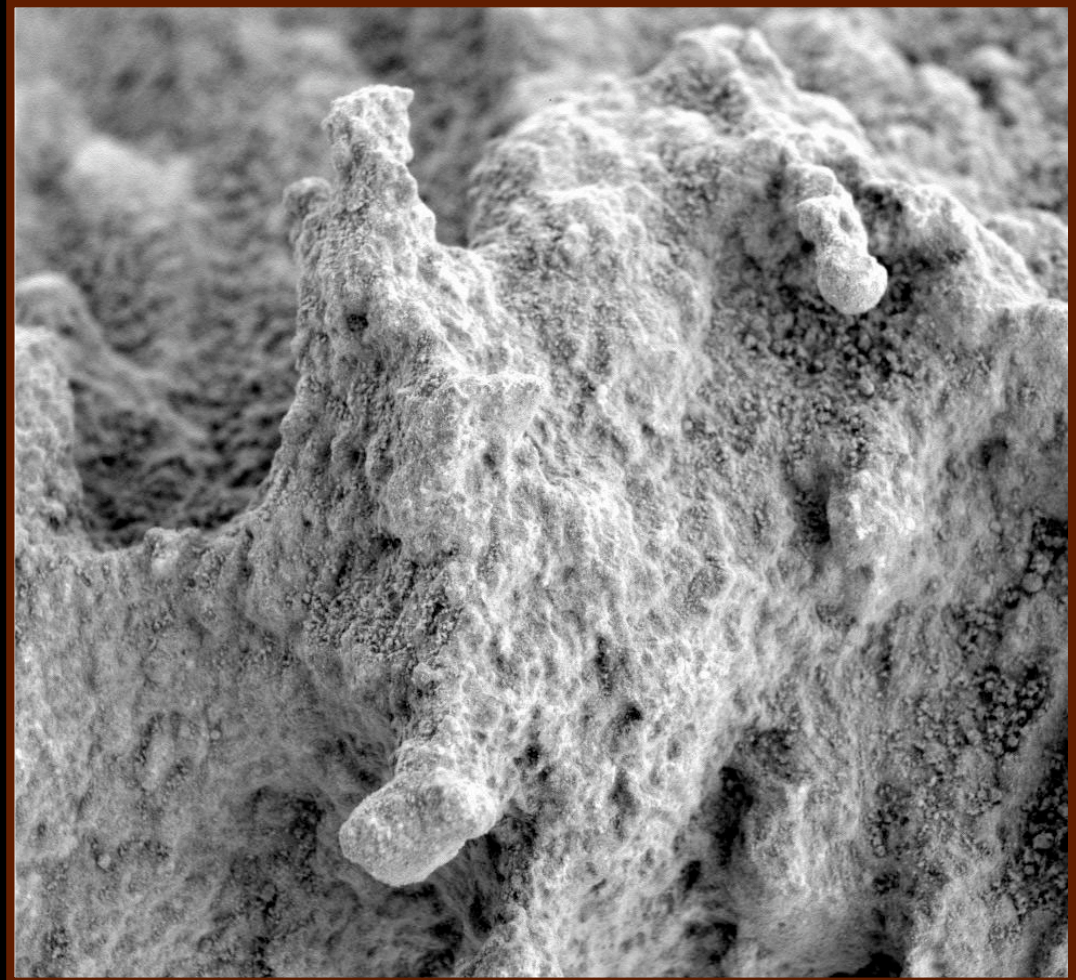
**Week in Review
June 19 - June 25**



The big news on Spirit this week was the discovery of hematite in the rock dubbed "Pot of Gold."

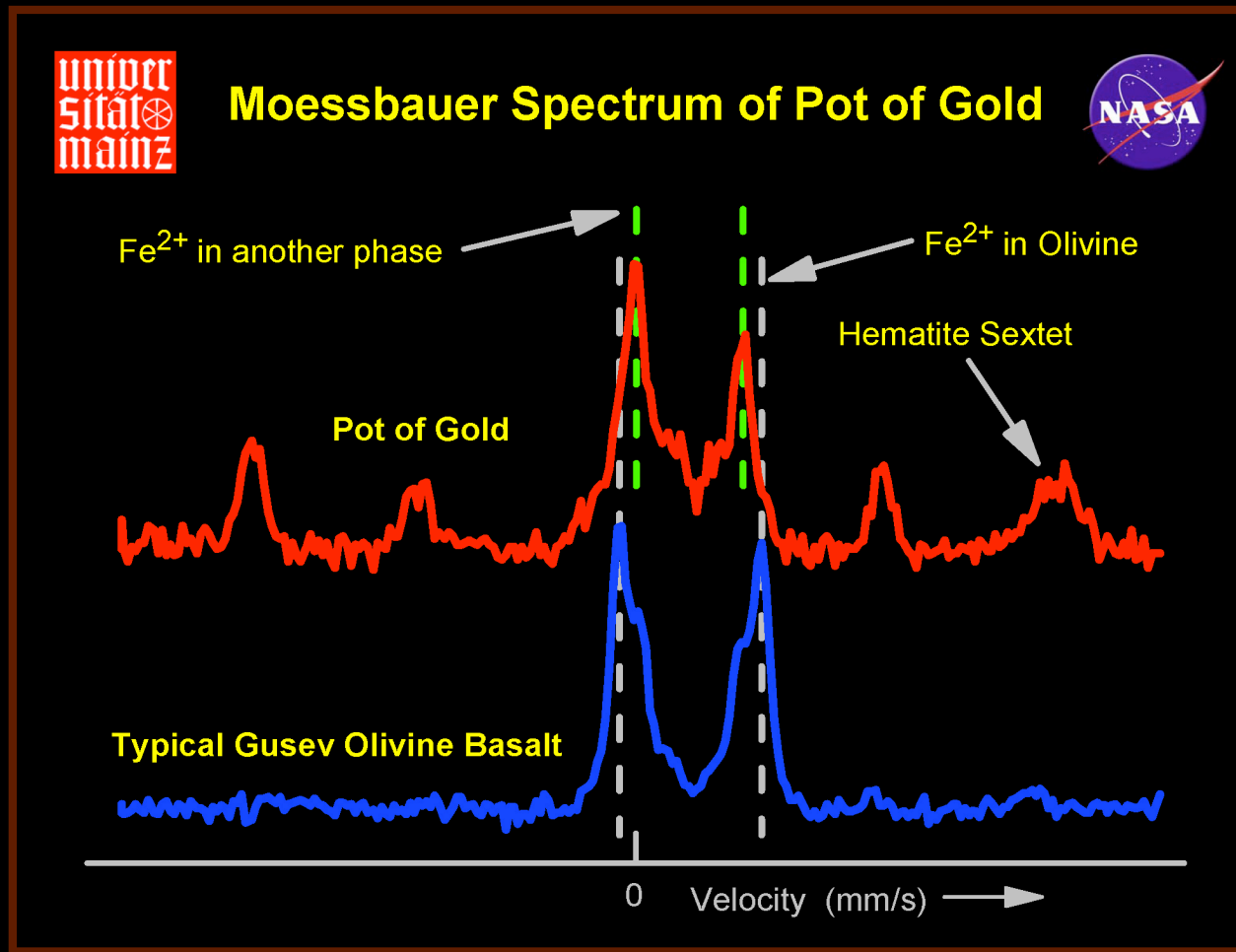
Hematite is a mineral that often forms in liquid water.

Water is a key ingredient for life as we know it on Earth.



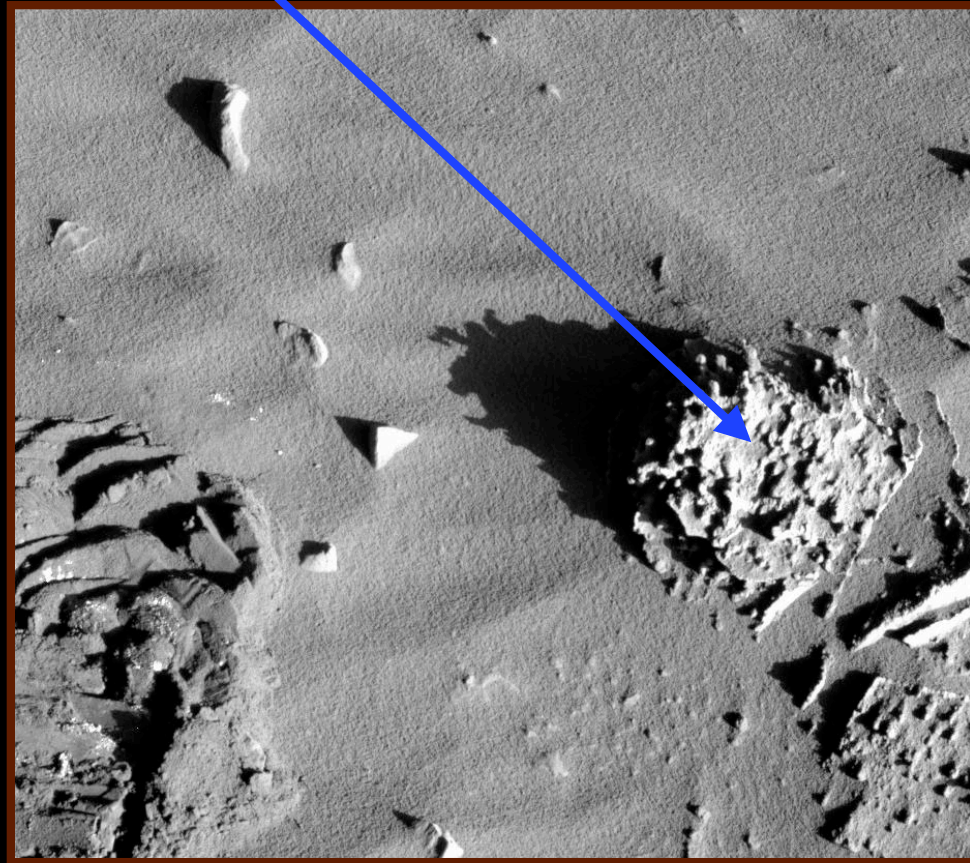
Microscopic camera image taken June 17, 2004.

Scientists wanted to verify exactly how the hematite in Pot of Gold formed, as the mineral can also develop in small amounts of hot fluids (hydrothermal processes) and in volcanic rock (basalts).



Moessbauer spectra taken June 16-18, 2004.
Image credit: NASA/JPL/Cornell/University of Mainz

So, scientists wanted the rock abrasion tool (RAT) to grind into Pot of Gold to reveal its geologic history.



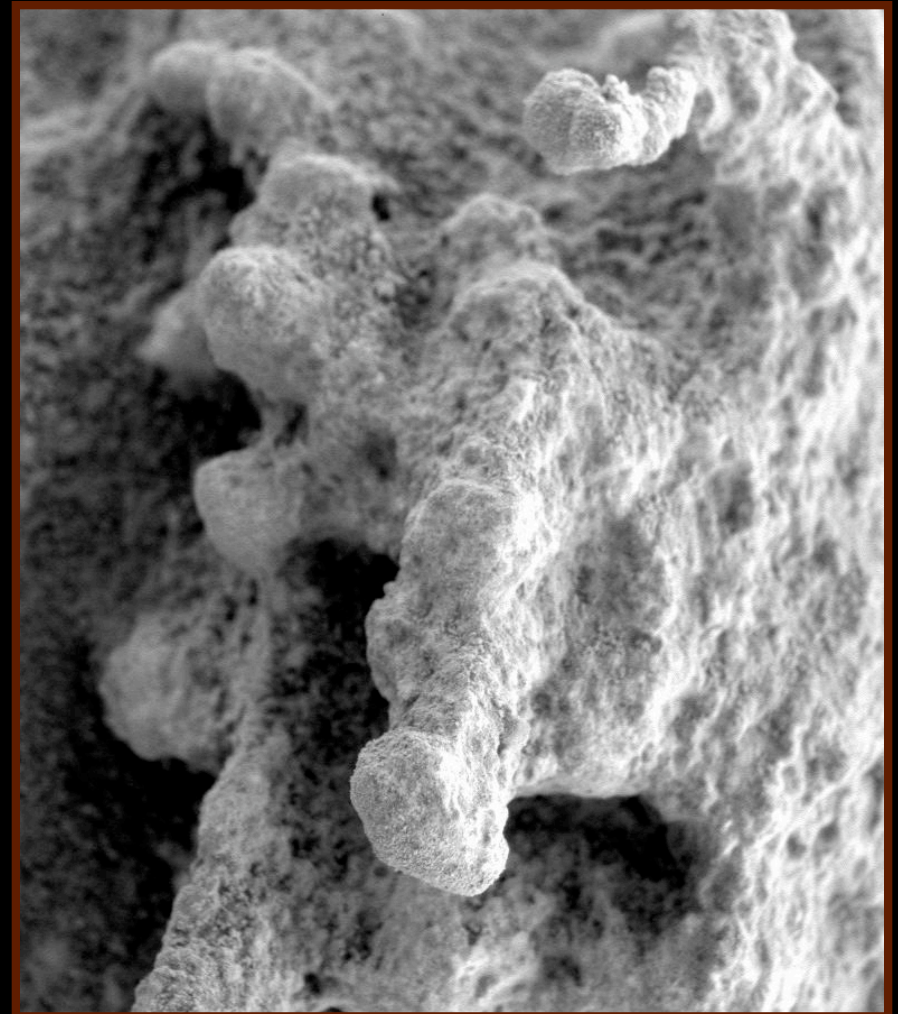
Panoramic camera image taken June 19, 2004.

The biggest challenge was to position Spirit in a way that the RAT could reach the knobby treasure.



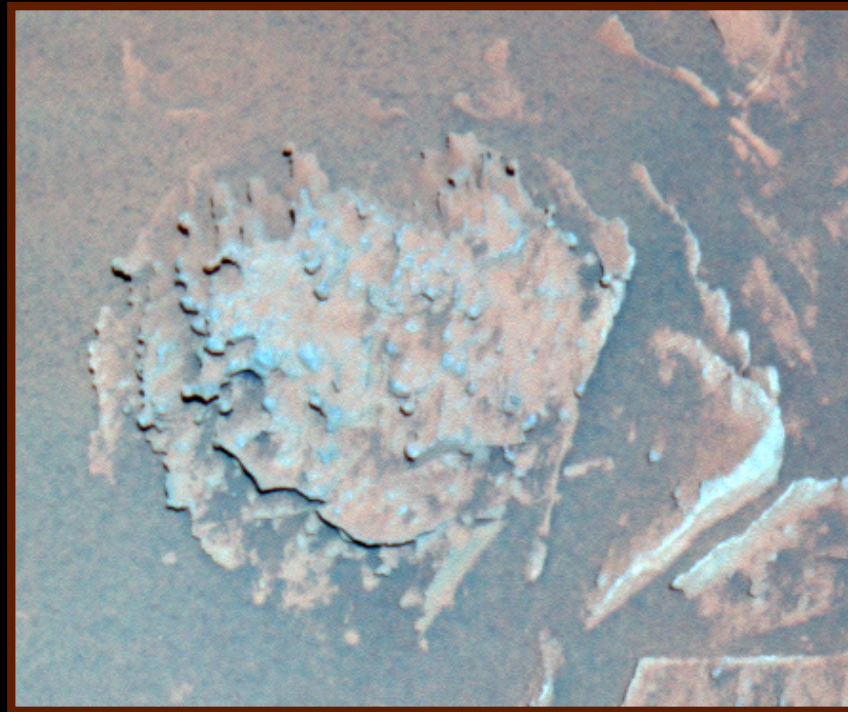
After a couple of overshoots, side-to-side tilts, and a bump backwards on difficult terrain, the tireless Spirit team conquered the slippery sand at the base of the Columbia Hills and put Pot of Gold within reach of the rock abrasion tool.

Microscopic image of Pot of Gold.



The observed area is 3 centimeters by 3 centimeters (1.2 inches by 1.2 inches).

Pot of Gold was moved by the rock abrasion procedure because the rock was small and the tool inflicts about 15 pounds (6.8 kilograms) of pressure.



False-color panoramic camera image taken before the abrasion.

The 0.008-inch (0.2-millimeter) grind was not quite visible in post-RAT images, but the other science instruments were able to investigate the newly exposed inner layer. Results are pending.

Opportunity



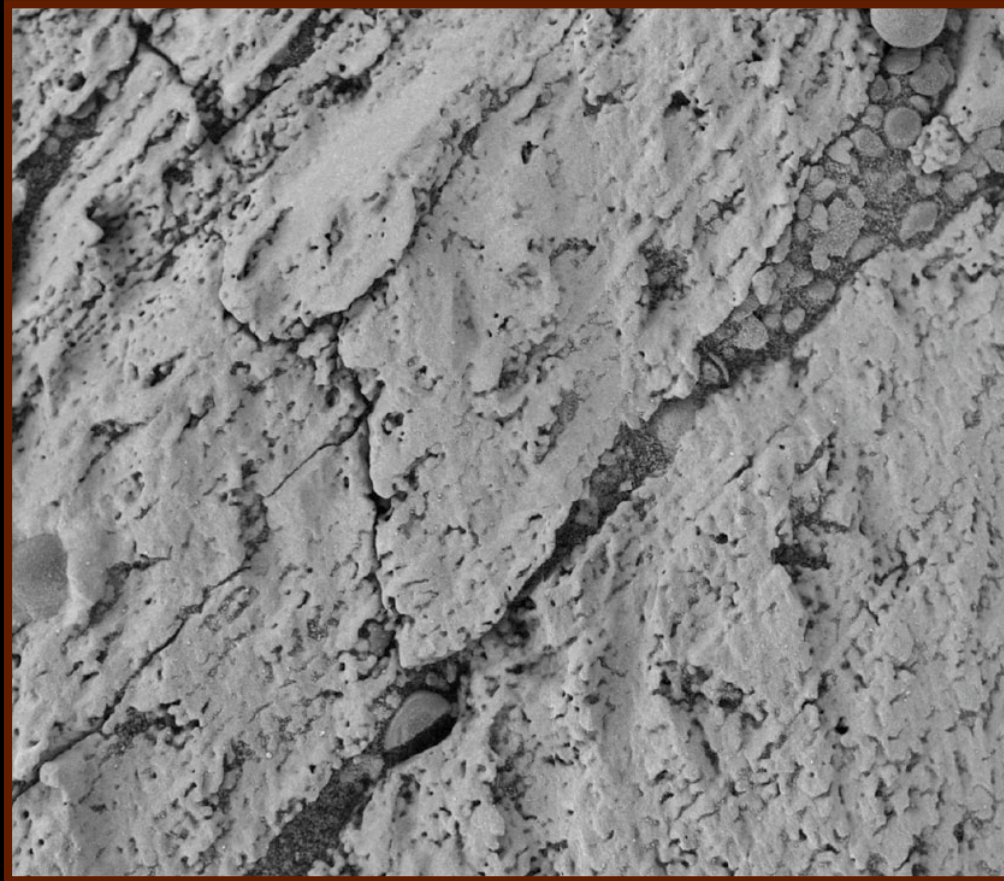
Meanwhile, Opportunity did get to dig deep into a feature dubbed “Cobble Hill” inside Endurance Crater.

The rock abrasion tool cut away a hole 1.8 inches (4.5 centimeters) in diameter.



Microscopic image mosaic from June 19, 2004.

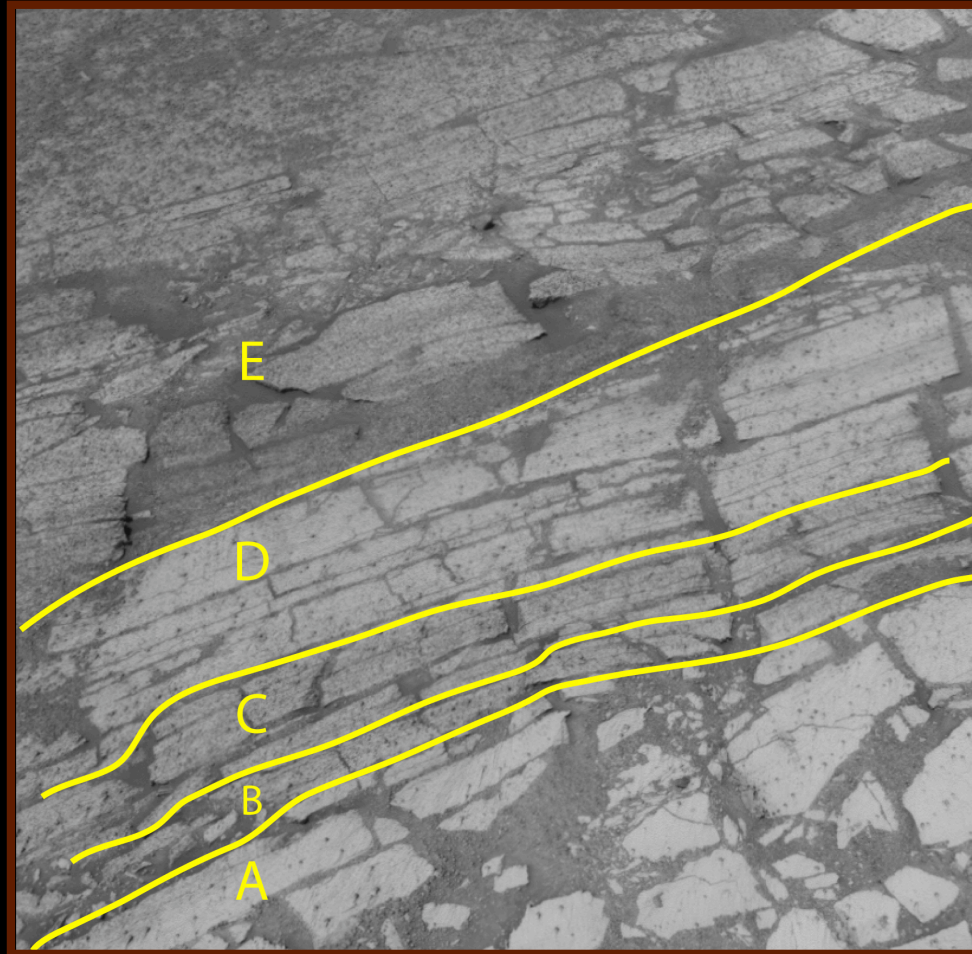
Scientists are investigating Cobble Hill to determine if the layers are rich in sulfates.



Microscopic image mosaic from June 19, 2004.

Sulfates are often left behind after water evaporates.

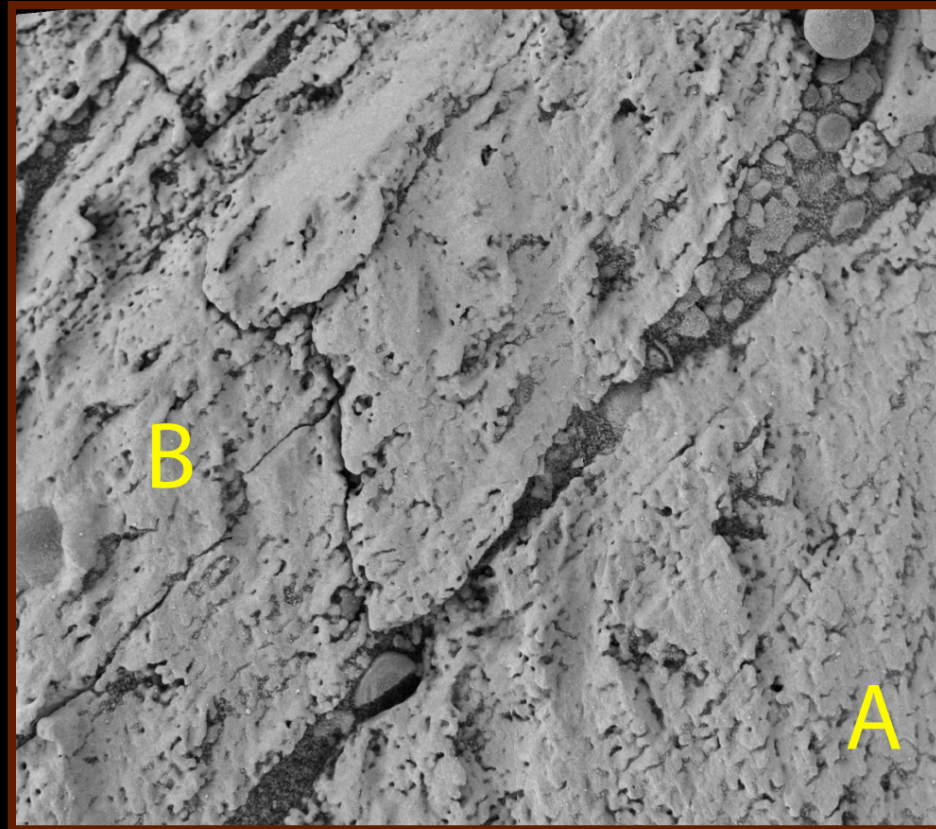
Scientists are currently examining many distinct layers of rock inside Endurance Crater.



*Navigation camera image
taken on June 9, 2004.*

Each layer is defined by subtle color and texture variations and may represent a separate chapter in Mars' history.

This microscopic image mosaic shows the contact line between two distinct layers of rock.

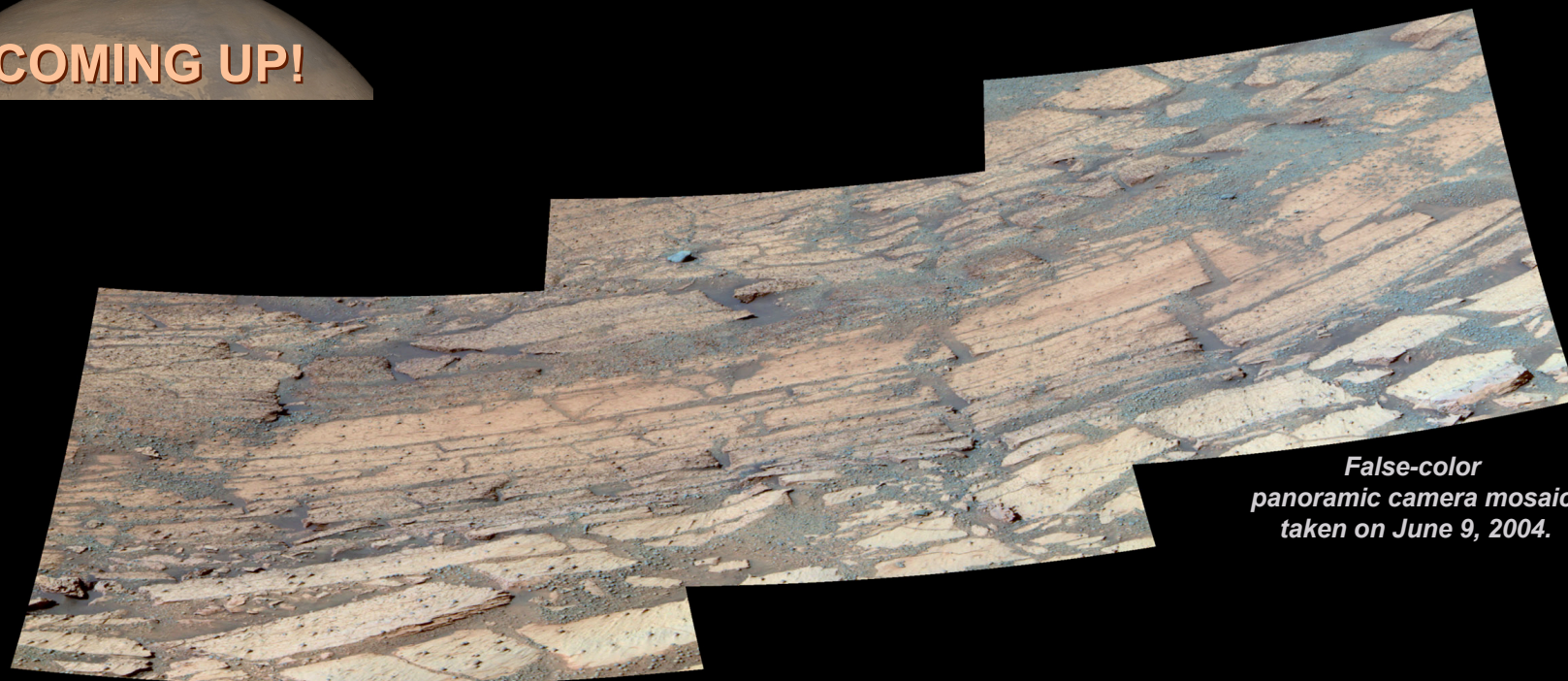


Contact lines between differing sedimentary rock layers on Mars and Earth represent a time interval when environmental conditions changed.



COMING UP!

Opportunity will continue studying the layers inside Endurance Crater.



False-color panoramic camera mosaic taken on June 9, 2004.

Spirit will continue working around to the inner basin in the hills.



Panoramic camera image of the hillside portion of the Columbia Hills taken at the base of the hills on May 31, 2004.