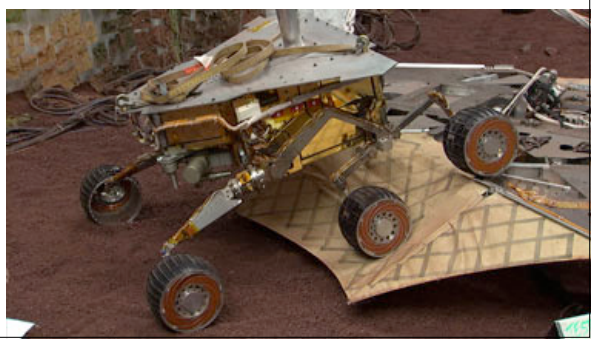
Mars

Image-based Modeling and Rendering

Mars Rovers have 3 cameras

- Panoramic Camera
- Hazard Identification Camera
- Navigation Camera

Testing the roll-off on the ground at the JPL Mars Yard sandbox.

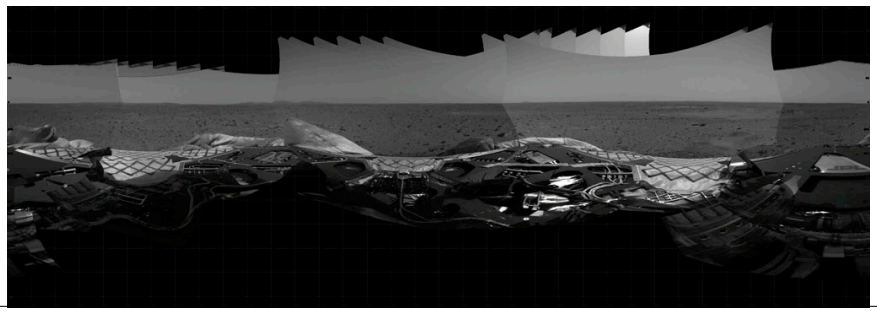


Panorama Camera

- mosaic
- 225 frames taken by Spirit's PanCam
- stereovision color camera mounted atop its mast.
- The image spans
  - 75 frames across
  - three frames tall
  - with color information from shots through three different filters (red, Green, blue).
- Collected over 3 Sol period (3 martian “days”)

Panoramic Cameras

- About 16 degree FOV
- The camera's two eyes sit 30 centimeters (12 inches) apart
- about 1.5 meters (5 feet) above ground level on the rover's mast.
- 14 different types of filters, allowing not only full-color images but also spectral analysis of minerals and the atmosphere.
- Each exposure of each = 1,028 pixels wide by 1,028 pixels wide.



Stereo Images

- Left & Right images of camera combine to form 3D image

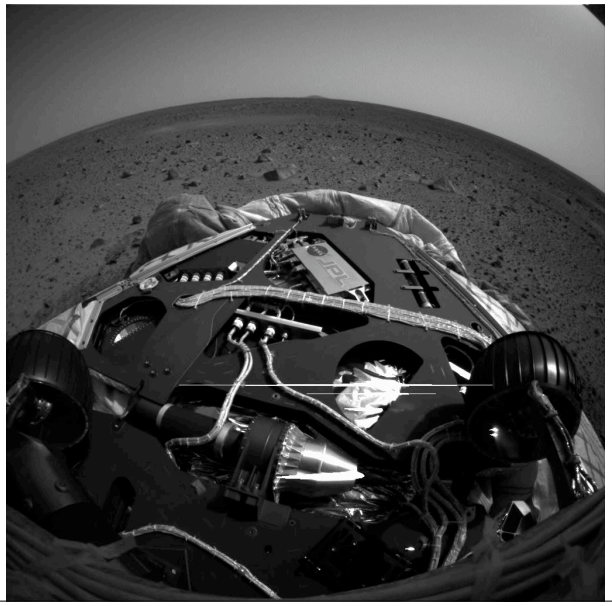
More Stereo Images

- http://www.stereoscopy.com/mars/

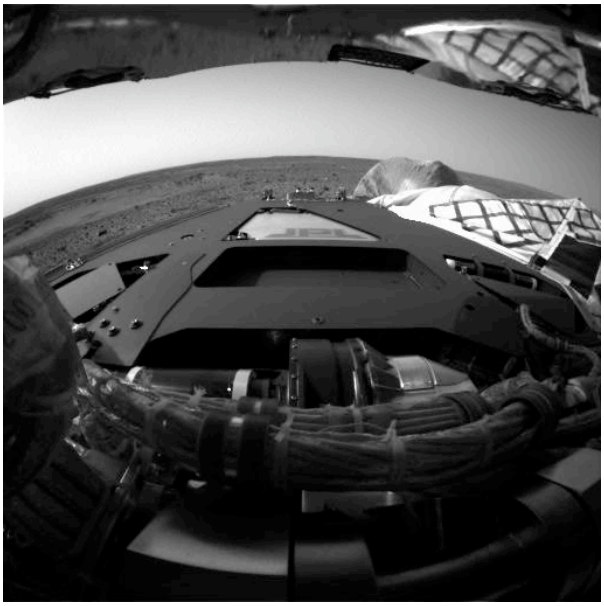
Harzard Identification Camera

- Stereo Pairs
- Fisheye wide angle view of about 120 degrees across
- Black & white
- Analyzed by onboard computing for navigation

Front HazCam



Rear HazCam



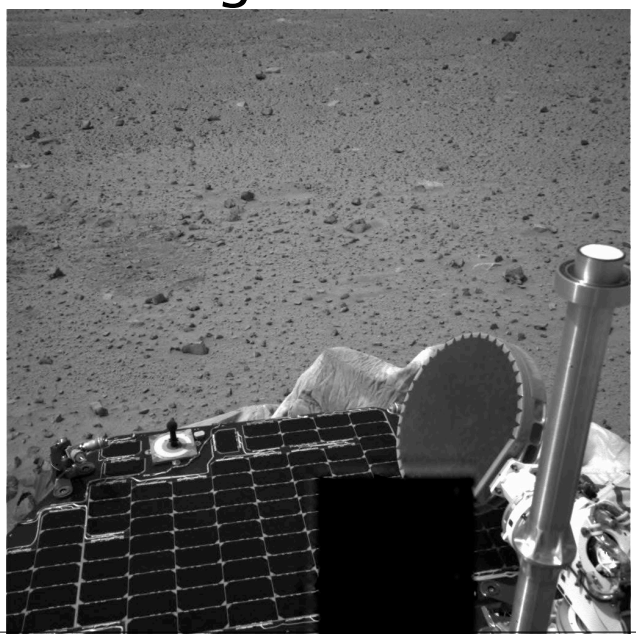
- http://marsrovers.jpl.nasa.gov/gallery/all/spirit_r001.html

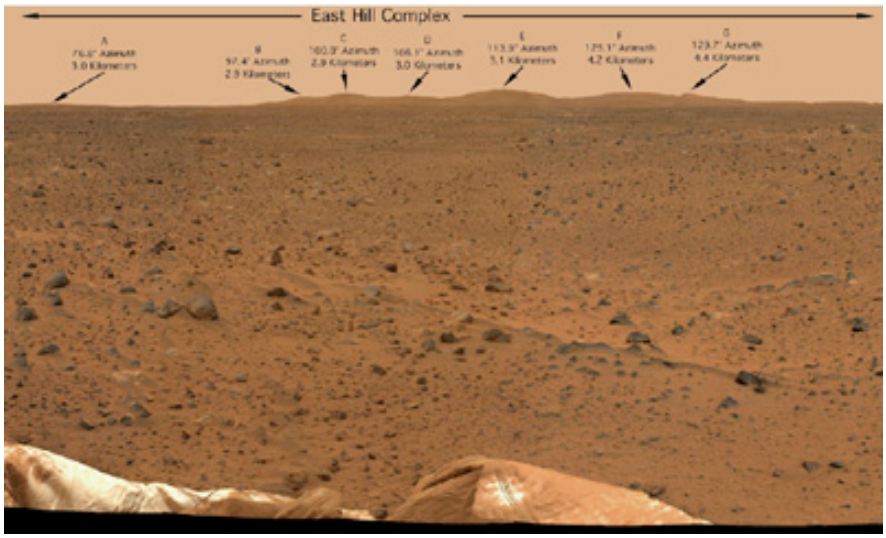
Navigation camera

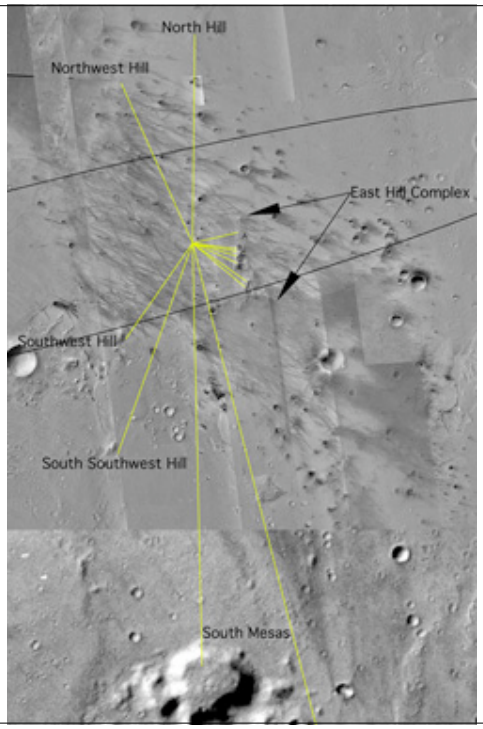
- Stereo black & white
- Rotate and tilt
- Wide angle images (45 degress across)
- Quick panoramas
- Less data transmission than panoramic

Navigation Cam

Navigation Cam







Slide Credits

- All images are courtesy of JPL/NASA/Cornell
- http://planetary.org/html/news/subjectarchive/Mars_Exploration_Rover-idx.html
- http://www.stereoscopy.com/mars/