

## An Hour With the Lander

Red is subjective. To Spirit's Pancam, it was a binary conversation, but behind the filtration, the discourse took hue. Leading back to its lander, the soil described a twin path from home. Its traveled conveyance, splayed open like a sun-reaching flower, showed a cacophony of techno-glitter panels, ruddy deflated airbags, and origin.

Ahead lay uncertainty. An alien horizon, so curved by earthly standard, presented a line of enquiry, the intervening ground littered with rock, and thickly dust. Each sedimentary, and igneous clump stood as an object to be passed over, or sundered by a man-made tool.

The IDD deployed with patience un-human, its tiny worm drives spinning to an autonomous electrical orchestra. The RAT, or Rock Abrasion Tool, positioned, its rotary cutting surface upon a chunk of this new world, spun, and exposed fresh structure. The turret turned, and a microscope peered down deep as the knowledge it sought.

Moving to within 5 mm, the Microscopic Imager, or MI removes its protective lens cover, and takes a 1024 x 1024 pixel snapshot. Reacting to light frequencies in the 400 to 680 nm range, it "sees" most of the colors we perceive, but that interpretation is still millions of miles away.

Like all cameras, it has limitations imposed by the physics of refraction, which is the study of light moving through substances like glass. As the lens gets ever closer to the object of study, the depth of clear focus diminishes. The MI has no focusing knob, and when it gets close enough for a good shot, its zone of focus is only 3 mm deep. That's like shooting a twenty feet long picket fence from one end to the other, and only seeing one picket sharply.

On the same instrument turret are two spectrometers used to measure non-visual frequencies of light, and high energy particles. The Mossbauer spectrometer looks for iron by physically touching a rock, or soil sample of known temperature, and measuring for 12 hours. Differing concentrations of iron help scientists understand the early Martian environmental conditions.

The other spectrometer, the Alpha Particle X-Ray Spectrometer, or APXS also physically touches rocks, or soil, and shows the relative abundance of all rock forming elements except hydrogen. This provides scientists with information about crustal formation, weathering processes, and water activity.

And after another day of geology, the Rovers begin the process of sending their data Home. Whether direct to earth, it through our Mars-orbiting relay satellites, that journey will take over ten minutes at the speed of light. One bit at a time.