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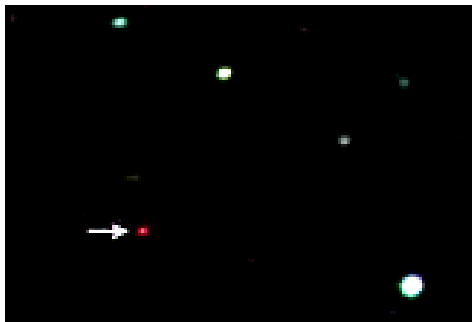
Astro Chatter

by Larry Kalinowski



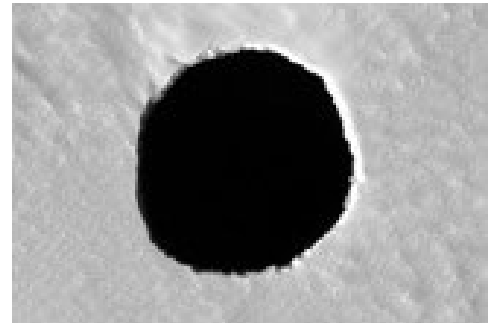
The most distant quasar ever photographed is shown in the picture as the red spot next to the arrow. It was photographed and spectrum analyzed by Chris Willott of the University Of Ottawa. The

quasar is estimated to be about thirteen billion light years away and supposedly five hundred million times the mass of the Sun.



A large hole has been discovered on the surface of Mars. It was discovered by the Mars Reconnaissance Orbiter and appears to be about one hundred meters in diameter (330

feet). The picture was taken at a Sun angle of about thirty-eight degrees, but still doesn't reveal anything at the bottom of the hole, so it must be fairly deep. The right rim of the hole shows a thick layer of something at the surface.



Both the ISS and the shuttle were photographed through a ten inch telescope on June 13. The name on the photo said R. Vandenberg, which is probably the photographer. The photo was passed along to us via Rik Hill and Ken



But future robotic missions to Mars will be asked to go even further below the surface. Scrapers and corers will gather rock samples of substantial size, that, in order to be analyzed by a spectrometer, will need to be crushed into a fine powder.

Crushing rocks on Mars? Now there's a problem that brings to mind a multitude of possible approaches: Whack them with a large hammer? Squeeze them until they explode? How about just chewing them up? It was with this latter metaphor that the planetary instrument engineers struck pay dirt—so to speak.

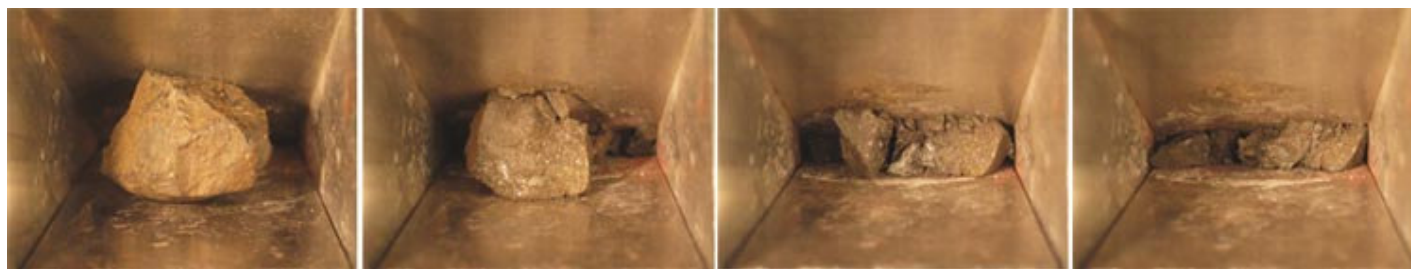
Thanks to NASA's Planetary Instrument Definition and Development Program, a small group of NASA engineers came up with the Mars Rock Crusher. Only six inches tall, it can chew the hardest rocks into a powder.

The Mars Rock Crusher has two metal plates that work sort of like our jaws. One plate stays still, while the other plate moves. Rocks are dropped into the jaw between the two plates. As one plate moves in and out (like a lower jaw), rocks are crushed between the two plates. The jaw opening is larger toward the top and smaller towards the bottom. So when larger rocks are crushed near the top, the pieces fall down into the narrower part of the jaw, where they are crushed again. This process repeats until the rock particles are small enough to fall through a slit where the two plates are closest.

Engineers have tested the Mars Rock Crusher with Earth rocks similar to those expected to be found on Mars. One kind of rock is hematite. The rusted iron in hematite and other rocks help give Mars its nickname "The Red Planet." Another kind of rock is magnetite, so-called because it is magnetic. Rocks made by volcanoes are called basalts. Some of the volcanoes on Mars may have produced basalts with a lot of a mineral called olivine. We call those olivine basalts, and the Rock Crusher chews them up nicely too.

Visit www.jpl.nasa.gov/technology to read the latest about other NASA technologies for exploring other planets and improving life on this one.

This article was written by Diane K. Fisher and provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



Looking down on the jaws of the Mars Rock Crusher, we see a magnetite rock get crushed into smaller and smaller particles.