Recent Surface Changes on Mercury?

• Due to its small size, Mercury was thought to be geologically ‘dead’ today, except for ongoing impact cratering.

• Close-up images from NASA’s MESSENGER spacecraft show that some impact craters contain bright shallow depressions, which scientists have named ‘hollows’.

• The hollows must have formed recently, since they have accumulated few impacts.

• Such features have never been seen elsewhere, and the process responsible for their formation remains a mystery.

A More “Volatile” World Than Expected

• The hollows are found mostly within impact craters, in rocks likely brought up to the surface by an impact event.

• Scientists think that these rocks contain abundant volatile elements (material that vaporizes easily). MESSENGER has measured more volatile elements on Mercury than the Moon.

• High surface temperatures and intense bombardment by the solar wind and micrometeoroids may slowly allow the volatiles to escape the rocks as gas, leading to collapse of the remaining rock.

The Big Picture

• Mercury was expected to form with few volatile elements because the high temperatures close to the Sun should have kept them gaseous, preventing them from being incorporated in the solid material that formed the planet.

• But this and other MESSENGER results indicate that Mercury has a surprisingly large abundance of volatiles. How did they get there?

• These findings suggest that our ideas about the formation of the planets and the early Solar System need to be revised.

For more information…

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