

New look at Mercury

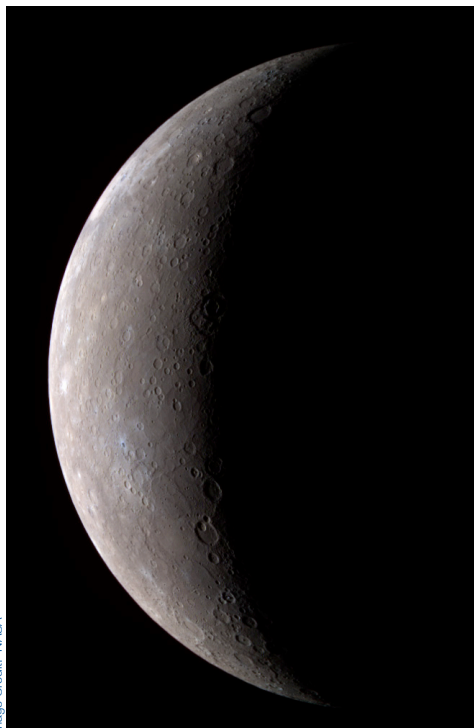


Image Credit: NASA

A new view of Mercury If you look carefully you can see this MESSENGER image is in colour rather monochrome. We have now seen most of the planet's surface

By Colin Johnston, Science Communicator

If our knowledge of the planets of the Solar System is a jigsaw puzzle, then an extra piece was fitted into place in January 2008 thanks to the MESSENGER spacecraft's flyby of Mercury. The surface of the innermost planet was still mostly a mystery. We had seen about 40% of Mercury's surface, thanks to the 1970s visits by Mariner 10 but that was all. Almost 45 million square km (about 17 million square miles) of the Solar System was still unobserved. MESSENGER's

fleeting visit changed that.

Moonless Mercury is a bleak and barren world. With a diameter of about 4880 km (3030 miles) it is a little bit larger than our own Moon. It orbits about 0.39 AU (1 AU = 150 million km, the Earth's orbital distance) from the Sun and has a year of about 88 days. Being so close to the Sun means it receives a lot of solar energy, a 1 square metre solar panel set up on Mercury's surface would collect about 9.2 kilowatts of power, about 6.5 times as much as it would gather on Earth. Inevitably this means Mercury gets hot, estimates suggest surface temperatures reach as high as 430°C (about 800° F), dropping to a chilly -170°C during the long night.

Regarding day and night on Mercury, the planet's rotation was a mystery until the second half of the Twentieth Century. As Mercury is close to the Sun it is difficult to observe. It can only be seen against the less than completely dark skies before sunrise and after sunset. At these times we are seeing the planet through the turbulent lower atmosphere. Observers tried their best to chart features on the planet's surface and see how they moved as Mercury rotated on its axis. In 1934 Eugene Michel Antoniadi, a Franco-Greek astronomer, published his map of the planet which was reckoned to be as accurate as possible. The consensus was that Mercury's day was as long as its year. This meant that one side of the planet was baking in eternal day while the opposite side endured everlasting night. The night side of airless Mercury would be even colder than the surface of Pluto. Mercury would be both the hottest and coldest place in the Solar System! This Dantean vision of the planet was spoiled by radio telescope observations in the 1960s, showing that the planet actually had a day equivalent in length to 59 Earth days.

MESSENGER's images showed no great surprises, no equivalent of the volcanoes of Io or the geysers of Triton. The new areas are much like the previously-known areas. Superficially

Mercury's cratered plains are much like those of the Moon. However the planet is still full of mysteries, for example does it have a molten core? This and other enigmas will be investigated by MESSENGER when it settles into orbit around Mercury in 2011 (there are still two more flybys to come before this).

Now, thanks to NASA (and ultimately the US tax-

payer) we have seen the planet's surface in detail earlier astronomers could only have dreamt of. We are living in a very privileged moment in history. Once the New Horizons probe visits Pluto in 2015 an era will come to an end as we will have close-up views of all the planets known in the Twentieth Century. But remember we are still only beginning the exploration of space.