

**The Agatharchides Plateau** (60 x 45km) is classified as an intrusive lunar Mega Plateau, similar to the Gardner Mega Plateau. The composition of the rocks is similar to the Gruithuisen domes and the mountain Mons Hansteen. On the eastern edge of the plateau is an extremely narrow - unnamed - rille.

Unofficially this structure is named "**The Helmet**" because its shape is reminiscent of the helmets of the famous Star Wars movies.

**The Aristarch plateau**, with a size of roughly 170 x 200 kilometers, is diamond-shaped structure and one of the most extraordinary lunar regions. It is a raised structure, sometimes with a height of up to 1.5 kilometers above the surrounding lava of Oceanus Procellarum. It lies there like an island. The plateau is clearly of volcanic origin, the entire surface is covered with a 30 to 50 centimeter high layer of pyroclastic ash. To this day the origin of the Aristarchus Plateau is poorly understood and lost in the mists of lunar history.

**Aristarchus** is 40 kilometers in diameter. It is the brightest and one of the youngest craters of the lunar front with an estimated age of "only" 175 million years. It is surrounded by a very asymmetric and extremely bright ray system and the crater walls show a pronounced streaky structure between light and dark material.

**Gassendi** (110 km ) is a classic "Floor Fractured crater", which has a clear incline towards the center of the Humorum basin. The crater floor is covered with narrow intersecting rilles and a large central mountain. The tilting towards Mare Humorum is clearly visible, the northern crater wall is high, the wall next to the basin is considerably lower. On the northern edge of the Humorum Basin lie the craters **Doppelmayr** and **Lee** which are similarly tilted to the basin. Before fundamental changes happened, Gassendi presumably looked very similar to Copernicus. Northeast of Gassendi begins a long and extremely narrow sinusoidal rille, the **Rima Herigonius**.

**The Gruithuisen Domes** (Gamma and Delta, 20 and 27 km) are two of the largest and therefore easily observable lunar Domes. They were built by very slow-moving lava and have relatively steep flanks, similar to Mairan T or Liebig 1. They are probably a mixture of intrusive and effusive lunar volcanism.

**Helicon** (24 km) and **Le Verrier** (21 km) are the only larger craters in the northern region of the Imbrium region. At first glance they are very similar and are one of the best examples of the lunar stratigraphy. When observing the two craters near the terminator (sunrise) impact ejecta can be seen outside Le Verrier but it is completely lacking in Helicon. It can therefore be deduced that Helicon is significantly older than Le Verrier. The ejected material from Helicon was covered by the Imbrium lava and the impact of Le Verrier took place after the lava flows of the Imbrium impact ended.

**Heinzel** (68 x 19km) has, due to its shape, the nickname "Peanut crater". It is the result of a superposition of 3 impacts over a total length of nearly 70 km.

**Kepler** (29 km ) and **Encke** (28 km ) are two almost equally sized craters with a polygonal form. Contrary the crater floors and their depths are very different from each other. Encke is a typical "Floor Fractured crater" with a depth of "only" 700 meter, Kepler shows a standard crater floor with a central peak and a depth of 2.7 kilometers. Kepler is a very young crater with a distinctive ray system while Encke has lost its ray system by erosion (solar wind) and therefore it must be much older than Kepler.

**Mairan T** is with a size of only 7 x 9 km a very small and rarely observed lunar formation. It is a small lunar dome with steep flank angles which was built from very viscous lava. At the top is an irregularly shaped caldera. Nearby are several, very narrow, sinusoidal rilles, the largest of them is Rima Mairan. Near the terminator Mairan T casts a distinctive shadow over the lava field.

**Marius Hills** is the largest lunar dome field. Covering an area with about 230 kilometers in diameter, it contains roughly 300 precipitous volcanic domes, which are crossed by several sinusoidal rilles. The longest rille - with a total length of 250 km - is the **Rima Marius**. It begins north of the crater **Marius** (41km) with a width of only 2 km and gets gradually more narrow. A minor rille, the **Rima Galileo** - lies west of the crater Marius. The Marius Hills are a unique lunar formation.

**Mersenius**, which measures 84 kilometers in diameter, is a very impressive "Floor Fractured crater" with a lifted crater floor and a system of rilles. The two large rilles, **Rima Mersenius** and **Rima Sirsalis** point radially to the large Oceanus Procellarum.

**Hansteen** (45km), **Mons Hansteen** (31km) and **Billy** (46km). Hansteen and Billy are of approximately the same size but different in structure. Billy has a crater floor flooded with very dark lava while Hansteen is probably a "Floor Fractured crater". It is also located very close to the edge of Mare Procellarum.

**Mons Hansteen** is like the **Agatharchides Plateau** an intrusive, volcanic land uplift. The rock material of Mons Hansteen contains much more silicon than the lava around and comes from a greater depth.

**Montes Agricola** (160km) is also a unique structure. It is a drawn-out ridge and certainly not a residue of a basin or crater wall. The surface is structured differently than the **Aristarchus Plateau** and therefore most likely not just a separated part of the plateau. Its origin is also lost in the dark of the lunar history.

**Montes Harbinger** (95 km ) and the **Rimae Prince** - Prince (47 km ) is a crater which is almost entirely flooded with lava crater and whose southwestern wall is completely absent. A number of hills and several sinusoidal rilles indicate that a land uplift and strong lunar volcanism - similar to the of Aristarchus plateau - were responsible for the origin of this region.

**Rima Doppelmayr** is a 130 km long, narrow and linear rille and maybe the origin of the dark pyroclastic ash deposit nearby. In the northern region the rille branched into several segments. In the southeast is a steep lunar dome called **Liebig 1** is located, which is similar to the Dome **Mairan T** .

**Schiller** is one of the most bizarre lunar craters. It is 180 km long but only 75 km wide. Its very unusual shape suggests a grazing impact. The formation Schiller is unique on the front of the moon.

**Sinus Iridum** (250 km) - the Bay of Rainbows. A lunar highlight at sunrise. The bay looks like a safe harbor with a few shallow waves (ridges) rolling toward it from the Sea of Rains (Mare Imbrium).

Sinus Iridium is one of the largest lunar craters (maybe a small basin), which is inclined to the center of the Imbrium basin. Its entire southern and eastern wall were flooded by the Imbrium lava. The two capes, Heraclides in the western area and Laplace in the

eastern region, show significant height differences. Cape Laplace is significantly higher than Cape Heraclides.

**Vallis Schröteri** has a total length of 185 km and a width of 3 to 6 km. It is the largest sinusoidal lava channel of the moon. On the floor there is in addition an extremely narrow rille. The Origin of the lava flow is a great (collapsed) Caldera with the unofficial name "cobra head", situated north of Aristarchus and Herodotus.

© 2016 by Wolfgang Paech + Franz Hofmann