The Rosetta Mission so far

On Wednesday 18th November Five Members of K&D U3A STAR Group attended this very interesting lecture by **Matt Taylor** at Nottingham Trent University.

Matt is the ***European Space Agency (ESA) Project Scientist on The Rosetta Mission***.

The Rosetta Mission is the third cornerstone mission of the ESA Programme – Horizon 2000. The aim of the mission is to:-

1. Map the comet 67-P/Churyum-Gerasimenko by remote sensing.

2. Examine its environment in-situ and;

3. Discover its evolution in the inner solar system.

How big is comet 67-P/Churyum-Gerasimenko?

Photo credit: Max Wang, Flickr: anosmicovni. **European Space Agency Comet relative to Downtown Los Angeles.**

The lander Philae is the first device to land on a comet and perform in-situ science on the surface.

Launched in March 2004 and after a number of gravity assists and various asteroid fly-bys, the spacecraft passed through a ‘hibernation’ period in order to save power resources – from June 2011 to January 2014 to enter its main mission phase at the comet.

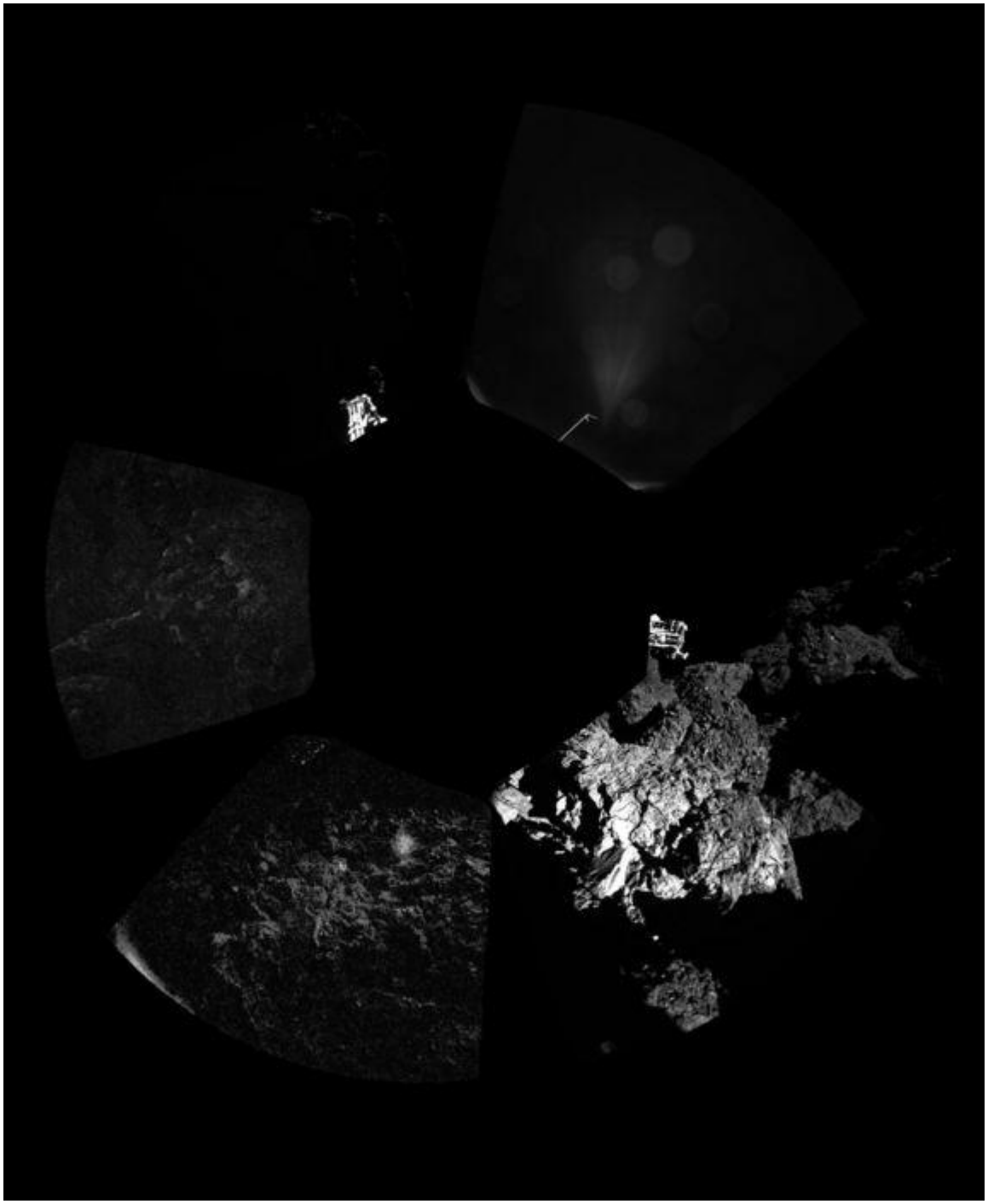
In 2014 the spacecraft successfully entered into orbit around its target comet and deployed Philae to the surface.

To put the tasks of this mission into some context The spacecraft was some 317 Million miles from Earth and only 14 Miles from the comet when the Rosetta orbiter released the lander (Philae).

The Philae lander fell towards the comet for 7 hours and the approach had to be gradual and measured because due the very low gravity of the comet Philae weighs only one gram (about the weight of a paper-clip).

Unfortunately the rocket and harpoons fail to fire thus causing Philae to hit the comet at one meter per second. This caused Philae to bounce twice before coming to rest in partial darkness at the foot of an icy cliff.

On its first rebound Philae ascended with a speed of 15 inches per second. It bounced up to a distance of 0.6 mile and an equal distance across the comet taking 1 hour and 50 minutes before it bounced again. This time it only hung for about 7 minutes before coming to rest on the comet.



This first panorama from the surface of comet 67-P/Churyum-Gerasimenko was captured by the Philae lander on 12th November 2014 after its historic landing during the European Space Agency's Rosetta Mission. ESA released this image on 13th November to show the first glimpses ever from the surface of a comet.

Whilst the bounces were not planned they did give the Rosetta Scientists the advantage of being able to search for a magnetic field on the comet – something that would not have been possible if Philae had landed as planned.

2015 has seen the Rosetta Orbiter continue its epic ride along with the comet, as well as the lander coming out of ‘hibernation’ itself. The Rosetta Scientists and Engineers have been assessing issues like power resources and remaining fuel on the spacecraft to establish a programme for the final phase of the mission.

Because the instrumentation is nearing its sell-by date now and because of power and fuel constraints on board the orbiter the decision has been taken to try to land the Rosetta orbiter on the comet (possibly before September 2016) and to continue with the good science. The risks associated with this are much reduced now with the knowledge gained from the Philae landing.

This mission has astounded the world. To travel through space for nearly ten years gaining speed from various slingshots and then to ACTUALLY land on the comet and find out so much about this very ancient comet.

It is now thought that the water on Earth may not have come from this type of comet because of studies conducted during this mission but may have come from asteroids or from water already stored beneath Earth’s surface prior to the surface water having been lost..

STAR Group wish to offer our thanks for the excellent lecture and to congratulate him and the Rosetta Team for such a memorable mission..