

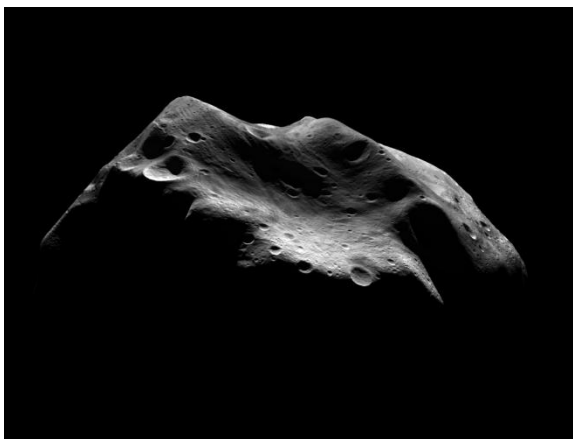
## Properties of the regolith of asteroid 21-Lutetia

S F. Hviid(1) , S.E. Schröder(1), H. U. Keller(2) and the OSIRIS Team.

(1) Max-Planck-Institut für Sonnensystemforschung, Katlenburg-Lindau ([hviid@mps.mpg.de](mailto:hviid@mps.mpg.de)) (2) Institut für Geophysik und extraterrestrische Physik (IGEP), TU Braunschweig

### Abstract

On July 10th 2010 the ESA Rosetta spacecraft flew past the asteroid 21-Lutetia on the way to it's 2014 rendezvous with Comet 67P/Churyumov-Gerasimenko. The closest distance to the asteroid was 3160 km. During the fly-by the asteroid was observed with all the remote sensing instruments of the Rosetta spacecraft. 21-Lutetia is the largest asteroid yet visited by a spacecraft. The surface shows a highly impacted surface with the largest impact craters reaching ~70km. The surface is covered in a layer of regolith with a thickness that in regions is greater than 500m (possibly much more). 21-Lutetia shows an almost featureless reflection spectrum which is almost flat from 250nm to 5000nm with a surprising small drop-off in the UV part of the spectrum. The surface of 21-Lutetia shows very small color variegation and photometric properties indicative of a very fine grained regolith. This paper will discuss what can be learned about the properties of the 21-lutetia regolith from the Rosetta fly-by data together with ground based observational data.



*Asteroid 21-Lutetia as imaged by the OSIRIS NAC camera on the Rosetta Spacecraft. The image was taken on July 10<sup>th</sup> 2010 15:48:39 from a distance of 4567 km*

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