



The Rosetta Encounters with (2867) Steins and (21) Lutetia

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ESA's Planetary Cornerstone Mission Rosetta is on its way to rendezvous with Jupiter-family comet 67P/Churyumov-Gerasimenko in 2014, after which it will accompany the comet into the inner solar system, while releasing the Lander Philae onto the surface of the comet nucleus. During the long cruise phase to the main target the Rosetta spacecraft has performed close fly-bys at two very different main-belt asteroids. The first encounter took place on 5 September 2008, when Rosetta flew by the 5-km sized asteroid (2867) Steins at a distance of 802.6 km. On 10 July 2010 Rosetta passed its main asteroid target, the 100-km sized asteroid (21) Lutetia, at a distance of 3162 km. For both close fly-bys a strategy was arranged that allowed for continuous observations of each asteroid before, during and after closest approach whilst the spacecraft passed through phase angle zero. Most of the scientific instruments on board Rosetta were switched on for investigations of the asteroids and their surrounding environment. Imaging and spectral observations were obtained covering wavelengths from the UV to sub-mm. In addition the asteroids' gas, dust, plasma, magnetic, and radiation environments were characterized in-situ by various instruments on board Rosetta. Both targets were selected after careful evaluation of the scientific significance of all reachable asteroids constrained by the available fuel budget, and have turned out to be extraordinarily interesting objects for close inspection. This is not just because (21) Lutetia is the largest asteroid, and (2867) Steins is the only E-type asteroid ever visited by a space mission, but rather the results reveal the complex morphology, dynamics, and composition of both. A detailed overview of the two Rosetta asteroid fly-bys will be given.