The new asteroid targets of Rosetta mission: 21 Lutetia and 2867 Steins

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The European Space Agency (ESA) has selected 21 Lutetia and 2867 Steins as asteroid targets for the Rosetta mission. This decision has been taken on the basis of observations and analysis carried out by researchers from Paris Observatory.

The European Space Agency has launched successfully on 2 March 2004 the Rosetta mission whose scientific objectives are the study of the primitive materials of the solar system, in order to answer the key questions of its formation. The mission involves passing by two asteroids and the landing on Churyumov-Gerasimenko comet. Thanks to the large precision of the launching in the interplanetary orbit of the Rosetta probe, ESA has announced the availability of more than 120 m/s of Dv to choose between several possibilities the asteroid targets to meet (Barucci et al., 2004a). All candidates were observed during several observing campaigns carried out by the researchers of Paris Observatory with ESO-NTT, the Canaries-Galileo telescope and IRTF at Mauna Kea, Hawaii. The observations with IRTF (Birlan et al., 2004) were carried out in remote control from Meudon, with the system.

During the Scientific Committee of the Rosetta mission on 11 March 2004, M. Fulchignoni from LESIA, as Interdisciplinary Scientist (IDS) for asteroid science proposed to include in the basic program of the mission the overflight of the asteroids 21 Lutetia and 2867 Steins. This proposal was based on the scientific interest of these objects: both have a particular spectrum which seems characteristic of the most primitive asteroids. Moreover, Lutetia has a size which will allow to determine its mass and to deduce its density. The Scientific Committee of the mission accepted this proposal and thus 21 Lutetia and 2867 Steins are the target asteroids of the Rosetta mission.

Figure 1 Spectre V+NIR de 21 Lutetia. Le spectre de la météorite Chulafinee et celui de la météorite Vigaranono sont superposés aux spectres de l'astéroïde. Malgré la similitude de la région du visible du spectre des différents types des météorites et de l'astéroïde, la partie en infrarouge proche montre clairement son analogie aux météorites primitives du type chondrites carbonées (Birlan et al., 2004). Cliquer sur l'image pour l'agrandir.
Figure 2 Spectre V+NIR de 2867 Steins. Ce spectre est intermédiaire entre les spectres (superposés) des météorites Grosnaja (CV3, qui reproduit mieux la partie en infrarouge proche) et Coolidge (C4, qui se superpose à la partie visible), tous les deux primitives du type chondrites carbonées (Barucci et al., 2004). Cliquer sur l'image pour l’agrandir