

## **An historic discovery around the corner from school: Ceres, a solar system object with an uncertain identity.**

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Ceres is the largest object in the asteroid belt between Mars and Jupiter, and it was discovered on January 1, 1801, by the Italian astronomer Giuseppe Piazzi.

The study of Ceres is especially relevant to my students because this celestial body was discovered in Palermo, in the astronomic observatory located in the UNESCO world heritage site “Palazzo dei Normanni”, around 500 meters away from the institute where I teach, and because Ceres was considered the patron goddess of Sicily. Moreover, it received scientists and media attention recently because it was explored by the NASA Dawn spacecraft in 2015.

The categorization of Ceres has changed more than once and has been the subject of some disagreement. It was originally considered a planet, but was reclassified as an asteroid in the 1850s when many other objects in similar orbits were discovered. Its status changed again in 2006 when it was promoted to dwarf planet, a classification it shares with Pluto and other Kuiper belt objects.

The study of this celestial body has a notable educational value, since the uncertain identity of Ceres constitutes an occasion to reflect on the criterions of classification of the natural objects.

The history of its discovery allows the students to understand as the scientific method doesn't always consist in the verification of hypothesis through experiments but it sometimes asks for the forecast of facts through mathematical calculations, repeated and methodic observations, the collaboration between scientists of different sectors and nationality.

Furthermore, it is a particularly suitable topic for interdisciplinary connections, as regards both scientific and humanistic matters.

In order to promote the scientific competences of my first class students, I have developed a learning unit on Ceres, thanks to good cooperation with the Palermo Observatory scientists, particularly active in the astronomic dissemination towards the schools and the citizens.

The most meaningful activities of the learning units have been:

- 1) Working in groups: classification of solar system objects through the use of cards with figures and description of the celestial bodies.
- 2) A guided tour to Palermo Astronomic Observatory Museum, where stored instruments used by Piazzi for observation of Ceres and the original scientific documentation regarding this important discovery.
- 3) Internet search of information on the mission Dawn and implementation of Learning objects on this matter.
- 4) A guided visit to the exhibition “Cerere, da Piazzi a Dawn”;

This learning unit, that has aroused interest and active participation among the students, cannot be regarded as closed, because it can be used for the discussion of other matters (for instance the search of the life on other celestial bodies).