

# **Asteroid science with Gaia: sizes, spin properties, overall shapes and taxonomy**

**A. Cellino**(1), P. Tanga(2), A. Dell'Oro(1)

(1) INAF - Osservatorio Astronomico di Torino, Italy, (2) OCA, Nice, France

According to preliminary simulations carried out by different teams, the Gaia mission, scheduled to be launched in 2011, will be a major milestone for asteroid science, being able to directly measure the basic physical properties of large numbers of objects. In particular, Gaia will directly measure sizes of about 1000 objects, will derive spin properties and overall shapes of about 10,000 objects, and will also produce a new taxonomic classification of hundreds of thousands asteroids. A justification of the above mentioned predictions is given, based on a large body of simulations carried out so far. Coupled with the direct determination of the masses for about 100 objects, Gaia should therefore produce accurate measurements of average densities for about 100 objects belonging to a large variety of taxonomic classes. Moreover, Gaia will produce a much better knowledge of the inventory and size and spin distributions of the population, of the distribution of taxonomic classes as a function of heliocentric distance, and of the dynamical and physical properties of dynamical families.