

GAIA: AN OPPORTUNITY FOR THE PHYSICAL STUDIES OF ASTEROIDS. Aldo Dell'Oro¹ and Alberto Cellino², ¹INAF - Observatory of Turin, Strada Osservatorio, 20 I-10025 Pino Torinese, Italy. delloro@oato.inaf.it, ²INAF - Observatory of Turin, Strada Osservatorio, 20 I-10025 Pino Torinese, Italy. cellino@oato.inaf.it.

GAIA, a cornerstone ESA mission, will be launched in 2011. According to current expectations based on a large body of numerical simulations, this mission will produce a real revolution in the field of the physical studies of the minor bodies of our Solar System. GAIA will observe more than 200,000 asteroids, and will produce a big data-base of astrometric, photometric and spectro-photometric measurements. Based on the collected signals, the direct determination of the sizes of about 1,000 main belt asteroids will be possible. For about 100 of them, the mass will be also measured from gravitational perturbations on other asteroids. As a consequence, the average density of about 100 objects will be derived with good accuracy. The inversion of disk-integrated photometric data will give rotational periods, spin axis orientations and shape parameters for about 10,000 asteroids. A new taxonomy, based on spectral reflectance data of tens of thousands of objects will be obtained. The above mentioned results will be of critical importance for improving our understanding of the properties and the history of the asteroid population.