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**Title:** *"The contribution of Gaia to asteroid dynamics"*

**Abstract.** The ESA mission Gaia, which is currently surveying the sky from the Sun-Earth L2 Lagrangian Point, is providing astrometry of stars and asteroids at few mas at  $V=20$ . The first Gaia Data Release (GDR1), which includes 2 millions of stars with position, parallaxes, and proper motion and a position catalog of 1.1 billion of stars, has already shown the strength of this unprecedented power of investigation.

We have already exploited the contribution of the first Gaia data release to asteroid dynamics. We have found that now the stellar occultations represent a new approach to asteroid astrometry, and this will further be strenghtned by future Gaia data releases (see Spoto et al. 2017). But we have also also to deal with the combination of ground-based astrometry with Gaia observations.

This is a crucial aspect in the orbit determination and in the dynamics itself, because starting from the next data release in April 2018, asteroid observations will be included in the catalog. Thus, the full strength and revolution of Gaia won't be really appreciated if we cannot combine Gaia and ground-based observations.

We have already analyzed the contribution of 5 years of Gaia mission to the improvement of asteroid orbits, working with a sample of simulated Gaia observations. In preparation to the incoming data release, we have studied the impact of the combination of ground-based and Gaia observations to the detection of the Yarkovsky effect or to the next release of the INPOP ephemerides.

Joint work with F. Mignard, P. Tanga, A. Fienga.