

Collaboration ProAm – GAIAMOONS Project

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Started in 2022, GAIAMOONS is a collaboration between Observatoire de la Côte d'Azur (Lagrange laboratory), Observatoire de Paris (LTE laboratory) and Poznan University in Poland. The aim of this program is to reveal a population of binary asteroids, by exploiting the very precise astrometry made possible by the GAIA satellite.

Asteroid companions are known for many years now, we estimate that 15% of the main belt asteroids could be binary asteroids. Several detections of this kind have been made.

However, traditional observational techniques like direct imaging (object with distant companion) or optical and radar photometry (close and icy objects) limit the variety of the current available sample, leading to a biased database. The GAIAMOONS projects aims to fill this gap by studying mid/small-sized binaries and completing existing data. In order to unveil this new population of binary asteroids and study them, the program is divided into four parts: (1) analysis of Gaia astrometric data, (2) observational validation of the binary candidates, (3) physical validation of the candidates and (4) final study of their physical and dynamical properties.

Indeed, Gaia's astrometry provides measurements of the photocenter moving around the system's center of mass (wobble effect). Through data analysis, a list of 358 candidates has been established and observational campaigns are underway to confirm the binary nature of these systems using the stellar occultation observation method. The need for a dense ground network of observers is important, and it is in this context that collaborations with professional and amateur astronomers are the most important. By publicizing the various events that can be seen throughout France and throughout the year, astronomers are invited to observe these occultations simultaneously in order to gather valuable scientific data.

This presentation will present the aim and context of this program and focus on the observational part of this project. Observation campaigns began in 2023, leading to a variety of results. These results will be presented with a particular focus on the lessons that these data can provide for future campaigns. It will also discuss the requirements, both from a technical point of view and in terms of coordination during the observations and also concerning data sharing. Finally, a selection of future important occultation campaigns visible from France will be presented.