Pro/Am Stellar Occultations – results and perspectives of Ganymede campaign 2025/10/14

*Raphaël Lallemand[(1)], Josselin Desmars[(1),(2)], Valéry Lainey[(1)], Arnaud Leroy[(4)], and the co-authors**

[(1)] LTE, Observatoire de Paris, Université PSL, CNRS, France
[(2)] Institut Polytechnique des Sciences Avancées IPSA, France
[(3)] Sorbonne Universités, UPMC Univ Paris 06, France
[(4)] Uranoscope de l'Ile de France, Gretz-Armainvilliers, France

Over the past few decades, collaborations between amateur and professional astronomers in stellar occultation observations have yielded remarkable results. In Europe, projects like GaiaMoons[(a)] Asteroid Collaborative Research via Occultation Systematic Survey (ACROSS) [(b)] or Lucky Star[(c)] showcase these efforts. These collaborations cover a wide range of celestial targets from Near-Earth objects (NEOs) to Trans-Neptunian objects (TNOs). Stellar occultations occur when a solar system object passes in front of a star, briefly blocking its light, creating a shadow detectable by the observer. As the object moves, the shadow also moves along way, creating an occultation path on the surface of the Earth. The analysis of the light curve emitted by the star using aperture photometry allows the determination of key physical parameters of the object - such as size, shape, orientation, and relative component geometry - with sub-kilometric accuracy. Last October 14th, Jupiter's largest natural satellite occulted a 6-magnitude star all over Europe (Figure 1). This occultation has been observed by 52 observers, with 36 positives chords. An overview of this campaign will be presented. A focus will be made on the analysis of the results with the implications for the future flyby of JUICE over Ganymede in 2029.

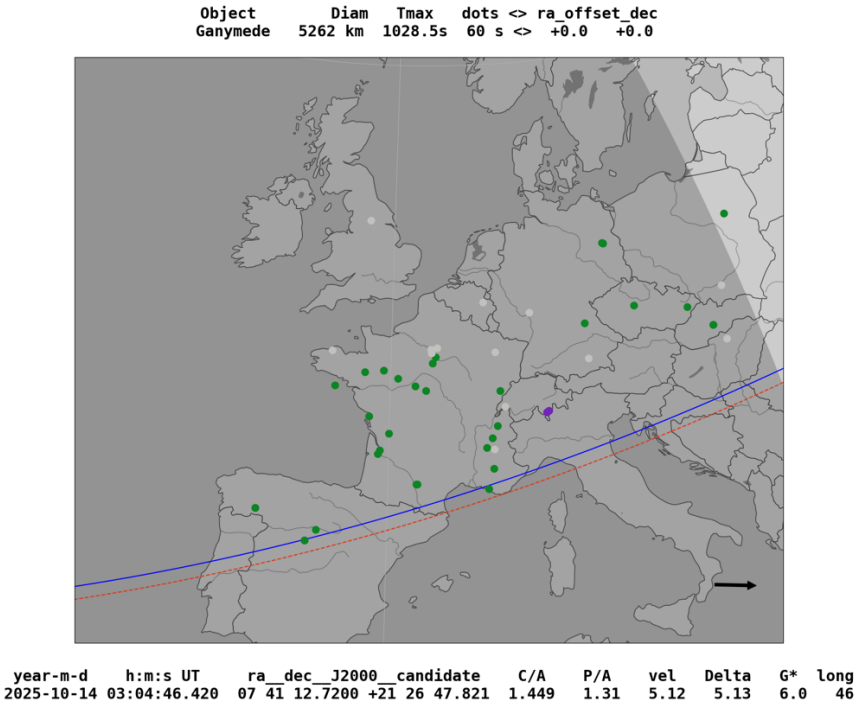

Figure 1: Post occultation map of the stellar occultation by Ganymede on October 14, 2025.

[(a)] https://www.oca.eu/fr/gaiamoons
[(b)] https://www.oca.eu/fr/home-across
[(c)] https://lesia.obspm.fr/lucky-star/

*Stefano Sposetti, Cédric Latgé, Jan Mánek, Aurélien Genin, Michel Giraud, Andrea Manna, Frederic Denjean, Thomas Salomon, Christian Sartini, Yann Pinard, Pascal André, Adrien Stachowicz, Konrad Guhl, C. Weber, M OConnell, Jean-Marie Covet, Eric Barbotin, Lionel Rousselot, Arnaud Debuchy, Laurent Miralabe, Paula Libic, Peter Nosal, Patrick LAGRANGE, Fabien CAVAILLE, Jocelyn Sérot, José Prieto, Pierre Barroy, Sébastien Cretier, Thierry Midavaine, Wojciech Burzynski, Daniel Verilhac, Jean-Baptiste Marquette, Michael Irzyk, Pablo Molina, Enrique Velasco, Jérôme Delpau, Jörg Scholz, Christoph Zielke, Joachim Siegert, Petr Zeleny, José Luis Hernández Verdejo, Aurélien Genin, Alex Pratt, Thomas Mollier, Wolfgang Beisker, Michel Boutet, Oliver Klös, Olivier Schreurs, Róbert Szakáts, Daniel Błażewicz, Isabelle Auvray, Stephane Neveu, Stephane Moulin, Jean Guerard, Ziyu Liu, Jean-François Coliac

[a] https://www.oca.eu/fr/gaiamoons
[b] https://www.oca.eu/fr/home-across
[c] https://lesia.obspm.fr/lucky-star/