



MW-Gaia STSM

The bar pattern speed of the Large Magellanic Cloud - Three-months stay at the Observatory of Lund

Óscar Jimenez Arranz, PhD student at the Universitat de Barcelona enjoyed a three months stay (May to July 2023) at the Observatory of Lund thanks to a GP4 STSM grant to collaborate with Dr. Santi Roca-Fàbrega and Dr. Paul McMillan. During these three months, he worked on the production and analysis of N-body simulations to understand the formation and evolution of the Magellanic Clouds at the light of the new observations by the Gaia satellite.

In parallel, they also worked in a project on the determination of the bar pattern speed of the Large Magellanic Cloud.

Óscar participated in most activities in the Lund Observatory, including both academic and outreach, and also presented his work in formal and informal seminars. His research at the Lund Observatory during those months allowed him to attend to the COST Action WG4 meeting "[Science and technology roadmap for \$\mu\$ as studies of the Milky Way](#)" that took place on Lund 18-20 July 2023.

Main achievements

The STSM achieved the expected and planned goals, being the products of this research visit a paper "The bar pattern speed of the Large Magellanic Cloud" submitted to a fully refereed journal, and a second paper that will be submitted shortly afterwards. Those results were presented in the COST workshop "[The Milky Way Revealed by Gaia: The Next Frontier](#)" that was held in Barcelona in September 2023.

The amount of data that the N-body simulations represent suppose an almost endless source of analysis and studies that will continue in the future within the collaboration with Dr. Santi Roca-Fàbrega and Dr. Paul McMillan.

Images:

https://en.wikipedia.org/wiki/Lund_Observatory#/media/File:Lundsobserv.jpg

Related links

<https://www.cosmos.esa.int/web/gaia/edr3-structure-magellanic-clouds>

https://www.cosmos.esa.int/web/gaia/iow_20230131