

Detection and characterization of exoplanets using Gravitational Microlensing: OPD detections with a worldwide effort

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The identification and characterization of exoplanets have surpassed 5000 celestial bodies, by using various techniques, such as the transit method, which depends on the periodic transits caused by the planet passing in front of the star, and the radial velocity method which relies on the oscillations in absorption line positions in stellar spectra. Each technique has specific advantages; the transit method excels in detecting close giant planets, while radial velocity identifies high-mass planets effectively. In this talk, we will go into gravitational microlensing (GM), a highly sensitive method for detecting low-mass exoplanets at greater distances from their hosts. Attention is dedicated to statistically surveying our galaxy for exoplanets, emphasizing Gravitational Microlenses. The transient nature of these events, coupled with collaboration with observatories around the World, enhances the significance of the probability of detection. We will explore the data and results of the collaboration between the National Laboratory of Astrophysics (LNA) and Ohio University through the MicroFun network that started in 2021. The Pico dos Dias Observatory (OPD), managed by LNA, has observed hundreds of GM events since 2021, in particular, the KB20414Lb, which is a stellar system that hosts an Earth-mass planet.

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