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Estimating Dark Matter Distributions Around Galaxies Using Machine Learning Techniques

Monday, 11 November 2024 12:00 (10 minutes)

This project aims to explore the use of novel machine learning methods to estimate dark matter distributions around galaxies, offering a more flexible approach compared to traditional techniques. Conventional methods, such as analysing galaxy rotation curves, depend on numerous assumptions—many of which may not hold true for real galaxies, leading to potential inaccuracies in dark matter modelling. Machine learning techniques, by contrast, can handle complex and diverse datasets without relying on rigid assumptions. Accurate and precise estimation of dark matter density is critical for both direct and indirect dark matter detection, as the expected signals from potential dark matter candidates are highly dependent on local density distributions. This interdisciplinary effort aims to enhance our understanding of dark matter and improve detection prospects.

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Session Classification: Introduction and brainstorming talks