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Probing the nature of dark matter using stars

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In the last decades, the fields of cosmology, theoretical astrophysics and particle physics have come across one of the most enduring problems in physics of modern times: the search for the origin and nature of dark matter particles. Numerous studies have compared and combined in a self-consistent way the most powerful cosmic probes: the cosmic microwave background, galaxy redshift surveys, galaxy cluster number counts, type Ia supernovae, and galaxy peculiar velocities. All the studies have led cosmologists to conclude that we live in a flat accelerating Universe, dominated by cold dark matter and by dark energy. Although dark energy is a relatively new problem in cosmology, the dark matter problem has been around for quite some time, without any plausible solution so far. This project proposes using stars as a new method to study the properties of dark matter, complementing that way the international efforts to solve the dark matter problem.

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