

DARK MATTER IN THE MILKY WAY

FROM THE SKIES TO THE UNDERGROUND, HOW
ASTROPHYSICAL UNCERTAINTIES AFFECT THE SYNERGIC
SEARCHES FOR DM. CHAPTER ONE: A GALAXY CLOSE BY

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Fascinating to the eye and endless source of awe, the disk of stars of the Milky Way is bound together by a halo of invisible matter, which constitutes most of our Galaxy's gravitational mass. Of yet unknown nature, the presence of Dark Matter is inferred in diverse astrophysical systems, and it is crucial to the formation of structures as observed today. The distribution of Dark Matter within galaxies is thus of remarkable interest for both cosmology and particle physics: on the one hand it is a prediction of structure formation theory within the cosmological paradigm, on the other no known particle complies with its observational requirements, and physics beyond the standard model is required.

Experiments aimed at unveiling the nature of Dark Matter rely on the knowledge of its local distribution, an information which is retrievable through analysis of astrophysical data, carrying with them inherent uncertainties. In this talk I will review recent results in the effort to determine the distribution of Dark Matter within the Milky Way, and how the uncertainties on the astrophysical data propagate through the analysis of direct, indirect, and collider searches, hindering our knowledge of the very nature of Dark Matter.

