USAL

The USAL group offers one vacancy to a graduate/master student to participate in a summer visit during the month of September 2015 to initiate a research work in the field of dark matter direct and indirect search, especially in the context of the astrophysical dense environments.

UCM-Th

UCM-Th group offers to incorporate one student. Research topics proposed:

1. - Alternative cosmological models

The project focuses in the so called modified gravity theories and their possible connection to the dark matter and dark energy problems. In particular, we consider the possibility of studying dark energy models responsible for the present phase of accelerated expansion of the universe based on vector-tensor theories and other modifications of gravity such as f(R) gravity. Dark energy models which differ from the standard cosmological constant could have important implications in the determination of the cosmological parameters, and in particular in the present value of the dark matter abundance.

2. - Dark Matter Phenomenology

The identity of the nature of dark matter is a major question in both particle physics and astrophysics. The traditional particle candidates are cold and collisionless, and they predict missing energy and momentum signals at particle colliders. However, recent progress has expanded the list of well-motivated candidates and their possible signatures. In this project, we will study the basic properties of non-standard candidates, their motivation, their expected production mechanisms, and their implications for particle colliders, direct detection, indirect searches, and other astrophysical observations as possible modifications of the cosmic microwave background or primordial abundances.