

Road to CTA: the Quest for Dark Matter with Cherenkov Telescopes

Friday, 27 November 2015 13:00 (30 minutes)

Arrays of Cherenkov telescopes constitute the instrumental frontier for the ground-based gamma-ray astronomy. Their activity has presently led to great improvements in high-energy imaging and source discovery, also providing new tools to study cosmic rays, photon propagation in the Universe and dark matter (DM). In particular, the indirect search for DM through the detection of gamma rays produced by DM self-interaction in astrophysical objects (the Milky Way halo, dwarf spheroidal galaxies, nearby galaxy clusters) is one of the major research topics which will be exploited by the future Cherenkov Telescope Array (CTA). With a sensitivity ~ 10 times better than current Cherenkov instruments, a large field of view, a small angular resolution and a covered energy range up to ~ 100 TeV, CTA should be able to detect gamma-ray emission from annihilation of DM particles with mass between ~ 0.1 and ~ 10 TeV in the Milky Way center at the “natural-scale” DM cross section; for less contaminated candidates, such as dwarf spheroidal galaxies (dSphs), more reliable estimates of their DM content, based on large sets of photometric and kinematic data of their stellar members, must be computed in order to accept or remove them as potential targets for future CTA observations.

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Session Classification: Session II