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Search for dark matter particles with current and future ground-based gamma-ray observatories

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High-energy gamma rays are one of the most promising tools to constrain or reveal the nature of Dark Matter (DM). During the almost two decades of the Fermi satellite mission, the data from its Large Area Telescope (LAT) were used to set constraints on Weakly Interacting Massive Particles (WIMP) and Axion -Like-Particle (ALP) models as well as to perform various searches for new physics. As a result, current WIMP annihilation cross section limits cut well into the theoretically-motivated region of parameter space for WIMP masses below 100 GeV. At the same time, the Cherenkov Telescope Array Observatory (CTA) is entering the construction phase and will soon offer a chance to probe a complementary parameter space of heavier dark matter (from O(200 GeV) up to several tens of TeV), with unprecedented sensitivity.

In this talk I will describe methods used to search for evidence of dark matter with the LAT, and review the status of the searches. I will also discuss the latest sensitivity predictions on the various targets with CTAO.

Author: ZAHARIJAS, Gabrijela (University of Nova Gorica)

Presenter: ZAHARIJAS, Gabrijela (University of Nova Gorica)

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