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Signatures of leptophilic t-channel dark matter from active galactic nuclei

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The Milky Way galactic center has been broadly explored looking for indirect dark matter (DM) signals. However, younger galaxies, such as Centaurus A, are expected to gather a much higher DM component due to the formation of a density spike which would have survived to date contrary to the case of our Galaxy.

In this talk, I will present indirect photon signatures of leptophilic DM coming from Centaurus A. I will consider a model where DM is a Majorana fermion which interacts with right-handed electrons via a scalar mediator. Particular stress is given to the possibility of detecting circular polarised signals from the interaction of DM with high energy electrons of the active galactic nuclei jet, finding that the degree of polarization can reach up to 90-100%. I will estimate the required sensitivity from Fermi-LAT to detect this signal and I will derive constraints based on the self-annihilation of our DM candidate. Notably, the bounds found on the average annihilation cross section are 7 orders of magnitude stronger than the ones from measurements of the Galactic Center.

Finally, since the origin of the photons in the GeV-TeV range from Centaurus A is not completely clear and an exotic origin is compatible with the observations, I will show that this excess could be explained with signals from DM annihilation.

In-person participation

Yes

Primary authors: Prof. DEGRANDE, Céline (CP3, University of Louvain); Dr CERMEÑO GAVILÁN, Marina (CP3, University of Louvain); Dr MANTANI, Luca (DAMTP, University of Cambridge)

Presenter: Dr CERMEÑO GAVILÁN, Marina (CP3, University of Louvain)

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