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Searching for Dark Matter with White Dwarves

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Weakly interacting massive particles (WIMPs) can be captured in compact stars such as white dwarves (WDs) if they are in a dark matter-rich environment, leading to an increase in the star luminosity through their annihilation process. I will show that if the WIMP interacts with nuclear targets through inelastic scattering the data on low-temperature large-mass WDs in the Messier 4 globular cluster can probe a part of the WIMP parameter space not accessible by terrestrial direct detection searches and from solar neutrino searches. I will discuss this new class bounds in the specific WIMP scenario of a self-conjugate bidoublet in the left-right symmetric model (LRSM), introduced to explain maximal parity violation in weak interactions, showing that it significantly reduces its cosmologically viable parameter space.

Primary author: Prof. SCOPEL, Stefano (Sogang University)

Presenter: Prof. SCOPEL, Stefano (Sogang University)