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The influence of WIMP dark matter on low-mass stars

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The formation and evolution of low-mass stars within dense halos of dark matter (DM) leads to evolution scenarios quite different from the classical stellar evolution. For high DM densities, these stars stop their gravitational collapse before reaching the main sequence. Such stars remain indefinitely in an equilibrium state with lower effective temperatures, the annihilation of captured DM particles in their core being the only source of energy. In the case of lower DM densities, these proto-stars continue their collapse and progress through the main sequence burning hydrogen at a lower rate. I will also show the strong dependence of the effective temperature and luminosity of these stars on the characteristics of the DM particles (mass, scattering cross sections) and how this can be used as an alternative method for DM research.

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