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Velocity-dependent dark matter annihilation from simulations

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If the dark matter annihilation cross section is velocity dependent, the dark matter pair-wise relative velocity distribution enters into the calculation of the annihilation signals and the so-called J-factors. Studies of velocity-dependent dark matter annihilation commonly rely on simplified analytic models for the dark matter phase space distribution, which need to be tested against cosmological simulations. I will present the dark matter density profiles and relative velocity distributions extracted from state-of-the-art hydrodynamical simulations of Milky Way-like galaxies. I will then discuss the J-factors and expected annihilation signals from the Milky Way, dark matter subhalos, and Milky Way dwarf spheroidal analogues for velocity-dependent annihilation models.

Collaboration name

Primary authors: Dr FATTAHI, Azadeh (Durham University); Prof. FRENK, Carlos (Durham University); Ms PICCIRILLO, Erin (Texas A&M University); STRIGARI, Louis (Texas A&M); BOZORGNIA, Nassim (York University, University of Alberta); MARINACCI, Federico (University of Bologna); Prof. NAVARRO, Julio (University of Victoria); OMAN, Kyle (Durham University); Prof. GRAND, Robert (Max-Planck-Institut fur Astrophysik)

Presenter: BOZORGNIA, Nassim (York University, University of Alberta)

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