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Dark matter neutrino interactions and implications for core-collapse supernovae

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We discuss the implications in a core-collapse supernova environment of a light dark matter particle that sees the standard model exclusively through its interaction with neutrinos. We consider the case of a light dark matter candidate which couples to neutrinos through a heavy mediator, and examine parameter regimes of interest from the point of view of supernova cooling, neutrino decoupling, and proto-neutron star heat transport.

Primary authors: PATWARDHAN, Amol (UC Berkeley); Prof. REDDY, Sanjay (Institute for Nuclear Theory, U Washington)

Presenter: PATWARDHAN, Amol (UC Berkeley)

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