

Supernova 1987A Constraints on Sub-GeV Particles

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Supernova 1987A created an environment of extremely high temperatures and nucleon densities. The rough agreement between predictions of core collapse models and observations of a “neutrino burst” provide an opportunity to set bounds on a wide range of theories of new physics. I will present new bounds on dark sector models, incorporating finite-temperature effects on the production and trapping of a dark photon and millicharged particles, nuclear effects for the coupling to axions, and a more realistic model of the high-mixing parameter space than in previous work. This has dramatic effects for the landscape of such models.

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