

Neutron Star Heating: WIMP DM vs Others

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Weakly Interacting Massive Particles (WIMPs) in the Universe accumulate in neutron stars (NSs) through their interactions with ordinary matter and their annihilation inside the NS core causes late-time heating. It has been argued that this heating effect maintains the surface temperature of old NSs to be a few thousand K which can be regarded as a smoking gun signature of dark matter (DM) heating in NSs. However if other heating mechanisms exist they may hide this effect of the DM heating making it impossible to search for DM with this strategy. In fact recent observations suggest that there may be some heating sources in NSs. In this talk I will review such heating mechanisms and discuss their implications for the DM search using NS temperature observations.

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