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Paleo-detectors for Galactic Supernova Neutrinos

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Paleo-detectors are a proposed experimental technique where one would search for the traces of nuclear recoils in ancient minerals. Modern read out technologies should allow to reach ~ 1 keV nuclear recoil energy thresholds for exposures as large as $100 \text{ g Gyr} = 100 \text{ kt yr}$. Recently, we investigated the sensitivity of paleo-detectors for dark matter. In this talk, I will demonstrate that paleo-detectors could also be used for the detection of neutrinos from a range of sources. For example, paleo-detectors could be used to measure neutrinos from core collapse supernovae occurring in our galaxy. This would allow for the first direct measurement of the galactic core collapse supernova rate. Further, I will discuss how paleo-detectors could be used to gain some information about the time-dependence of the galactic supernova rate. This would provide a unique opportunity to measure the star formation history of the Milky Way over the past ~ 1 Gyr.

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