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## **pNGB Dark Matter, Cosmic Strings, and Gravitational Waves**

*Friday, 7 July 2023 14:00 (25 minutes)*

We propose a UV completion model for pseudo-Nambu-Goldstone dark matter with a hidden  $U(1)$  gauge symmetry. Dark matter scattering off nucleons is highly suppressed by the UV scale and direct detection constraints can be easily evaded. The kinetic mixing between the hidden  $U(1)$  and the  $U(1)_\gamma$  gauge fields would lead to dark matter decays. The current bound on the dark matter lifetime implies that the UV scale should be higher than  $10^9$  GeV. The spontaneous  $U(1)$  symmetry breaking at such a high scale would induce cosmic strings with high tension, resulting in a stochastic gravitational wave background with a high energy density. The constraints from current gravitational wave experiments as well as the future sensitivity are investigated. We find that most of the viable parameter points could be well studied in future gravitational wave experiments.

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