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Potential to search for Dark Matter with multi-wavelengths light sources

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Nambu and Goldstone have predicted emergence of massless boson (NGB) as a result of spontaneous symmetry breaking of a global symmetry. Originally the lightness of the pion mass was explained because pion is NGB as a result of chiral symmetry breaking. This guiding principle can be applied to any kinds of global symmetries. There are theoretically predicted NGBs which can be dark components in the universe if their couplings to matter are very weak. However, these masses cannot be exactly zero due to complicated quantum corrections and these theories cannot exactly predict where these masses physically appear. Therefore, it is important to perform searches for such Dark Matter candidates over a wide range of the mass scale. I would like to discuss how we can extend the search window by introducing laser fields from sub-eV to 10 keV.

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