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# Long Range Interactions in Cosmology: Implications for Neutrinos

*Thursday 29 July 2021 16:50 (20 minutes)*

Cosmology is well suited to study the effects of long range interactions due to the large densities in the early Universe. In this talk, I will explore how the energy density and equation of state of a fermion system diverge from the commonly assumed ideal gas form under the presence of scalar long range interactions with a range much smaller than cosmological scales. In this scenario, “small”-scale physics can impact our largest-scale observations. As a benchmark, I will apply the formalism to self-interacting neutrinos, performing an analysis to present and future cosmological data. I will explore how this fully removes the cosmological neutrino mass bound, opening the possibility for a laboratory neutrino mass detection in the near future. I will also discuss an interesting complementarity between neutrino laboratory experiments and the future EUCLID survey.

## Collaboration / Activity

Based on arXiv:2101.05804

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