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## Ultra-Light Dark Matter: Current Constraints and Future Possibilities

*Friday, 5 May 2023 17:00 (20 minutes)*

‘Ultra-Light’ or ‘Fuzzy’ dark matter (ULDM) has been generating interest over recent years as a plausible alternative to weakly interacting CDM. Indeed, the lack of evidence for CDM candidates in direct-detection experiments motivates the exploration of novel dark matter models. Ultra-light scalar fields present a particularly attractive possibility due to their wave-like properties on astrophysically relevant scales. In particular, this wave behaviour has the ability to suppress structure growth on sub-galactic scales while retaining the same predictions for large-scale structure as CDM. It has been suggested that this may offer a natural solution to the so-called ‘small-scale crisis’ of CDM. In this talk I will discuss the theoretical motivations for the ULDM model, the computational tools used to simulate its dynamics, and I will summarise the diversity of halo characteristics obtained through simulations. I will also briefly touch on possible modifications to the ‘vanilla’ ULDM model which may help to alleviate current constraints.

**Primary author:** KENDALL, Emily (The University of Auckland)

**Presenter:** KENDALL, Emily (The University of Auckland)

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