

# JOINT TUFTS/MIT COSMOLOGY SEMINAR

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## *Ultra-light dark matter: the light and fuzzy side of dark matter*

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The nature of dark matter remains one of the biggest mysteries in cosmology. There are many different models to explain the nature of this elusive component. One of the most interesting class of models and that has become one the leading candidates is the ultra-light dark matter. This class represents the lightest possible dark matter candidates, and it presents a rich phenomenology on small scales, that can potentially reconcile the CDM picture with the small scale behaviour of dark matter. In this talk, I will review the different models where dark matter is made of ultra-light particles describing and classifying the different constructions present in the literature. I will also review their vast cosmological and astrophysical effects on observables from these models, a consequence of the wave nature of this candidate has on Galactic scales. In these models, dark matter might condense in the interior of galaxies, forming a Bose-Einstein condensate or superfluid. We will discuss these interesting quantum phenomena on macroscopic scales, and discuss its formation in galaxies. The current gravitational tests and bounds on these models will be presented, showing that the simplest class, the fuzzy dark matter, is highly constrained in the parameter space where it is originally preferred.

**Tuesday, November 24, 2020, 2:30 pm**

Zoom link will be distributed to joint cosmology seminar mailing list. If not  
subscribed see <https://cosmos.phy.tufts.edu/mailman/listinfo/cosmology-seminar>

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