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## Constraints to SFDM from Internal Structure and Orbital Parameters of Milky Way Satellites

*Wednesday, 29 September 2021 10:40 (25 minutes)*

Recent measurements of both internal density structure and global orbital properties of Milky Way dwarf galaxies hold the promise of tightly constraining or ruling out the allowed parameter space of ultra-light (scalar field) dark matter (SFDM) models. Recent SFDM simulations evolving the Schroedinger-Poisson system have led to new insights into the structure of isolated scalar field dark matter halos, revealing a compact and dense central soliton surrounded by quantum interference. However, the computational demands of current simulations render them unsuitable to capture the evolution of satellite halos, which then requires semi-analytical models. In this talk, I will present for the first time a new formalism that establishes the survivability of a soliton subhalo accreted into the Milky Way virial radius and show the implied tight constraints on the dark matter particle mass when comparing with the MW satellite dynamical and orbital constraints from Gaia. My results reveal a small region for the particle mass where the SFDM model is consistent with astrophysical data.

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