



Contribution ID: 573

Type: **Plenary talk**

## Dark matter in galactic structure

*Thursday, 11 July 2024 09:30 (30 minutes)*

The nature of dark matter (DM) is one of the most relevant questions in modern astrophysics. I will present a brief overview of recent results that inquire into a possible fermionic quantum nature of the DM particles, focusing mainly on the interconnection between the microphysics of the neutral fermions and the macro-physical structure of galactic halos. I will show how such an interconnection when analyzed through a first principle physics model based on statistical mechanics and thermodynamics of self-gravitating fermions, leads to a richer core-halo structure for the DM halos than the one obtained from N-body simulations. I will discuss the many distinct applications of such a fermionic model both on halo scales -including morphology constraints from rotation curves and stellar streams- all the way to galaxy center scales -including the case of SgrA\* and supermassive BH formation-. In particular I will highlight the possibility that the Milky Way center harbors a dense DM fermion-core instead of a supermassive black hole (SMBH), as well as the role of baryons and the possibility to cause an induced collapse into a massive BH. Further details of each application will be given in different parallel sessions of this Meeting.

**Presenter:** ARGÜELLES, Carlos Raúl (La Plata National University & ICRANet)

**Session Classification:** Thursday plenary session