



Contribution ID: 193

Type: **Invited talk in the parallel session**

Phase transitions in the self-gravitating Fermi gas

Wednesday, 7 July 2021 11:05 (25 minutes)

We discuss the nature of phase transitions in the self-gravitating Fermi gas in Newtonian gravity and general relativity. When the particle number is above the Oppenheimer-Volkoff limit, we evidence the existence of a new turning point of mass-energy in the caloric curve leading to the collapse of the system towards a black hole. We mention possible applications of these results to the case of fermionic dark matter halos with a core-halo structure made of a fermion ball surrounded by an isothermal atmosphere.

[1] P.H. Chavanis, G. Alberti, Gravitational phase transitions and instabilities of self-gravitating fermions in general relativity, *Phys. Lett. B* 801, 135155 (2020)

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