Contribution ID: **57** Type: **Talk/seminar**

Axionlike clouds in the vicinity of compact objects

Tuesday 7 September 2021 15:10 (20 minutes)

It is an observationally established fact that dark matter forms large scale structures in the intergalactic space. However it is not fully known if any structures can emerge on the stellar scale and if so, what would they look like.
In this short talk I will discuss the possibilities of the emergence of axionlike particle (ALP) clouds around compact objects, such as black holes. Using Einstein-Maxwell-ALP theory I will present how the geometrical structure of the clouds depends on the kind of the hosting object and its parameters. By virtue of the system' s free energy I will indicate the most probable scenarios for ALP clouds formation.

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Session Classification: Regular Sessions