Contribution ID: **337** Type: **not specified**

Axion Star Explosions: A New Source for Axion Indirect Detection

Tuesday, 12 September 2023 17:30 (15 minutes)

If dark matter is composed of axions, then axion stars form in the cores of dark matter halos. These stars are unstable above a critical mass, decaying to radio photons that heat the intergalactic medium, offering a new channel for axion indirect detection. Axion star decays lead to efficient reionization of the intergalactic medium during the dark ages. By comparing this non-standard reionization with Planck legacy measurements of the Thompson optical width, we exclude new regions of axion parameter space.

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Session Classification: IDM: Indirect DM searches

Track Classification: Indirect DM searches