Contribution ID: **21** Type: **not specified**

Role of space plasma instabilities in blazar probes of the intergalactic magnetic field

Monday, 3 June 2024 11:45 (45 minutes)

Prompt emissions from TeV blazars pair produce on the extragalactic background light and the resulting e+e- pairs then undergo inverse Compton scattering, giving rise to secondary gamma-rays. The non-observation of such reprocessed emission implies a suppression of cascades from TeV blazars. In addition to the deflection of the pairs away from the line of sight by the intergalactic magnetic field (IGMF), collective plasma processes such as plasma instabilities can transport some of the energy away from the pair beam and into the intergalactic medium (IGM). Based on the observed blazar population and the physics of electromagnetic cascades, a tension emerges where a bright isotropic GeV gamma-ray signal from blazars should be detectable but is not found in the existing Fermi-LAT data. This tension intensifies with stronger IGMFs and can potentially be alleviated by either modifying the astrophysical models of blazars or assuming a weaker IGMF with implications for specific modes of plasma instability arising from the pair beam-IGM plasma interactions. In addition, heating of the IGM due to plasma instabilities can lead to a suppression of structures, in particular in baryonically underdense regions such as voids. Lyman-alpha observations indicate low to moderate degrees of plasma heating.

Primary author: GHOSH, Oindrila (Stockholm University & the Oskar Klein Centre)

Presenter: GHOSH, Oindrila (Stockholm University & the Oskar Klein Centre)