



Contribution ID: 342

Type: **Poster Presentation**

The Effect of Dark Matter in the Epoch of Reionization

The problem of dark matter has been of great importance in modern physics since its inception. Many theories have been proposed about the nature of dark matter but perhaps the most studied is the WIMP (Weakly Interacting Massive Particle). This particle has been favoured because it has the properties of dark matter that have been measured experimentally, so far. In this work we present an argument for studying the properties of dark matter in the Epoch of Reionization (EoR) using the redshifted 21 cm background. The 21 cm line of hydrogen provides great potential in studying the Universe at an early stage. This could provide rich information about the thermal and ionization history of the Universe as well as understanding the physics behind the formation of the first stars and galaxies. This will allow us to have a full picture of the global 21 cm background including the effects of WIMPs, if there are any. We also will demonstrate the potential power of HERA and the SKA to probe the high redshift Universe, being able to produce constraints that are highly competitive against current benchmark models of indirect detection of dark matter.

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

MSc

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