



# PHYSICS AND ASTRONOMY SEMINAR

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### 21cm from Dark Radiation

#### Abstract

The cosmological absorption of 21cm photons probes the spectrum of Cosmic Microwave Background (CMB) photons at energies far below direct measurements. The EDGES experiment has presented the first tentative detection of the absorption of 21cm photons from the reionization epoch, when the first stars formed in our Universe. EDGES sees deeper absorption than predicted by the standard cosmology, which can be explained if there are more 21cm photons than predicted by the blackbody spectrum of the CMB. After reviewing the basics of 21cm cosmology, I will describe how dark radiation composed of dark photons may have injected photons with wavelength 21cm into the primordial plasma, distorting the spectrum of the CMB. Therefore, 21cm cosmology provides a novel probe of dark radiation, and the unexpected EDGES result may be evidence for a new dark radiation component. I will also comment on how low energy photons from dark radiation may be the origin of the ARCADE radio excess.

Thursday, February 28, 2019

2:00 p.m.

HSD Building Room A250