Cosmic Radiation Fields - Sources in the early Universe



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Observational Signatures of Lyman Alpha Emission from Early Galaxy Formation.

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The Lyman Alpha (Lya) emission line is robustly predicted to be the most prominent intrinsic spectral feature of the 'first'galaxies that initiated the reionization process in our Universe. Unfortunately, the large Gunn-Peterson optical depth of the surrounding neutral intergalactic medium (IGM) is thought to render this line extremely difficult to detect prior to reionization. However, I will discuss how radiative transfer (RT) effects in the interstellar medium (ISM) can cause Lya flux to emerge from galaxies at frequencies where the Gunn-Peterson optical depth is reduced tremendously. This substantially enhances the prospects for detection of the Lya line at high redshift (say z=10-15) with JWST or ground-based, thirty meter telescopes. Similar RT effects boost the detectability of the Lya line from galaxies during the latter stages of reionization, and quantitatively affect the imprint of cosmic reionization on the observed distribution, and redshift evolution, of Lya selected galaxies.

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