

Title

Imaging HI in Lyman continuum emitter Tololo 1247-232

Abstract

Within the first billion year of the universe, primeval galaxies almost completely ionized the neutral intergalactic medium. This epoch, known as cosmic reionization, is the last major phase transition of the universe. However, how ionizing (i.e., Lyman continuum, LyC) photons escaped the neutral interstellar medium of these galaxies with sufficiently little absorption to reionize the intergalactic medium is poorly understood. The neutral gas distribution of a confirmed LyC-emitting galaxy was recently imaged for the first time using MeerKAT. This observation showed that a merger event had displaced up to 82% of the gas from the regions producing LyC, thus facilitating the escape of ionizing radiation from the center of the galaxy. To further constrain the interstellar medium properties of reionization-era analogs and their impact on the escape of ionizing radiation from galaxies, we propose a 21cm observation of Tololo 1247-232. This galaxy is one of only three known systems with confirmed LyC escape that are sufficiently close to be observed in the 21cm HI line with interferometers. The 21cm observation of this galaxy will be an essential contribution to the currently sparse information on the neutral gas properties of LyC-emitting galaxies, and the potential impact of galaxy mergers on reionization.