**Water Silhouettes against the Cosmic Microwave Background from the Most Distant Starburst Galaxies**

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Astrophysical objects can imprint distortions on the observed cosmic microwave background (CMB) that give access to unique information on the fundamental parameters of cosmological models. One of the most commonly used such tools is the Sunyaev-Zel'dovich effect toward massive galaxy clusters at redshifts $z=0$ to 1, which modifies the broad-band continuum shape of the CMB on megaparsec scales. I will present a new source of CMB distortions on kiloparsec scales due to spectral line signals from H$_2$O absorption associated with massive starburst galaxies out to $z>6$, which we have detected for the first time with NOEMA.[1] I will describe the basic mechanisms producing the signal, why it has not been seen before in the present-day universe, how it can be utilized to constrain fundamental properties like the redshift evolution of the CMB temperature, and what the prospects are for establishing larger samples over an extended range in cosmic history. This study opens up a new window to the universe, adding an important tool to our belt for measuring cosmological parameters.

References