

Star-forming galaxies at the edge of the universe

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Abstract

The most fundamental observational properties that need to be determined to obtain a comprehensive understanding of the physical processes of galaxy formation and evolution are the cosmic star formation history of the Universe and the volume-averaged star formation rate as a function of epoch. However, determining these quantities with high accuracy alone are insufficient for our understanding of galaxy formation and evolution. Which physical mechanisms drive the evolution and how do they depend on environment? Previous studies have made considerable progress in recent years, but even so their measurements are affected by significant scatter and uncertainties due to the use of different star-formation indicators, worsened by small area sampling and the effects of cosmic variance. We aim at overcoming these issues by using wide-field, sensitive un-biased surveys of star-forming galaxies at a range of redshifts. The High-redshift Emission Line Survey (HiZELS) is a successful panoramic extragalactic survey which uses the narrow-band technique (in the J, H and K bands) to search for emission line galaxies and primarily targets H emitters at $z = 0, 84; 1, 47$ and $2, 23$. We present preliminary results from the spectroscopic follow-up of line-emitting galaxies from HiZELS, especially to study the non-H alpha populations, and from a survey of Lyman emitters at $z > 7$ within the Epoch of Reionisation.