Uncovering Early Galaxy Evolution in the ALMA and JWST Era
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Mapping the structure and source of outflows from star-forming galaxies at $z = 2 - 3$

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Abstract. As we enter the era of JWST our need to characterise the rest-frame UV spectra of star-forming galaxies becomes essential. By combining the NIR capabilities of JWST with our understanding of UV wavelength science, we have the opportunity to explore fundamental properties of the gas, such as its metallicity and density, as well as the extent, velocity, and magnitude of their outflowing gas, in galaxies out to $z \sim 6$. Galaxy outflows in particular play a fundamental role in the evolution of young galaxies at high redshifts, but their properties remain largely unknown as it is difficult to spatially resolve the outflowing gas. To-date, only two attempts to resolve outflows at redshift ~ 2 have been made using lensing magnification, producing contradictory results on the origin of the outflows. In this talk I will present results from one such groundbreaking study where we combine gravitational lensing with VLT-MUSE to perform one of the first spatially resolved absorption line studies of a galaxy at $z = 2 - 3$. I will discuss how the the distinct kinematical structure and uniform column densities obtained from the outflowing gas maps reveal 'global' rather than 'locally' sourced outflows. I will also present preliminary results from our latest attempt to accurately constrain the structure and source of outflows in star-forming galaxies by observing the brightest galaxy-scale lens known with KCWI. I will conclude with the benefits and limitations of spatially resolved observations in this wavelength range, and possible implications on NIRSpec observations of the high-z Universe.