

# Stellar Composite Spectrum

A composite spectrum (2-D above, 1-D below) using all publicly available low-resolution multi-object spectra with redshifts above 5. A plethora of intergalactic medium (*IGM*), stellar, and interstellar medium (*ISM*) features are made visible. These include the Lyman break/Balmer break at short wavelengths (where radiation is absorbed by neutral gas), rest-frame ultraviolet emission lines (that probe electron densities, gas-phase abundances, metallicities, and ionisation parameters of the emitting star-forming galaxies and their environments), and optical line emission. This plethora of features allows for characterisations of IGM opacity, stellar ages and masses, and gas-phase metallicities, to only name a few. Dashed vertical lines represent the positions of all detected emission (grey) and absorption (black) lines. The individual spectra are all obtained by the Near Infrared Spectrograph (*NIRSpec*), an instrument on the James Webb Space Telescope with unprecedented sensitivity and wavelength coverage. The plot is adapted from Roberts-Borsani et al. (2024).

This graphic was developed during the breakthrough workshop 'The Chronology of the Very Early Universe According to JWST: The First Billion Years' at the International Space Science Institute (ISSI) in Bern, Switzerland.

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