We use a brand new version of the CIGALE code to simultaneously model JWST photometric+spectroscopic data, and study the co-evolution of dust and metals over Cosmic times.
A parent sample of 173 is extracted from the CEERS data with NIRSpec observation. All of them with safe and confirmed spectroscopic redshifts from z=4.0 to z=12.4. We add to this sample the galaxy identified at z = 12.3 with NIRSpec and MIRI spectroscopic data.
After testing the validity of the measurements (line fluxes, equivalent widths, metallicity measurements, etc.) of a sub-sample by comparing it with published papers that use more traditional methods, we check the spectra to flag potential AGNs. Finally, we build diagnostic diagrams, e.g., SFR vs. Mstar, IRX vs. beta, Mstar vs. Z and compare them to published works (observations and models) at lower (and at similar) redshifts to assess any evolution of the galaxy dust/metal characteristics from 0.3 Myrs to 1.6 Myrs after the Big Bang.
This approach also allows to characterize the dust attenuation law, and to identify objects in the studied sample that feature an ultraviolet bump at 217.5 nm.
Finally, we use this information to build consistent physical models, and try and constrain the formation of the first dust grains in the Universe.