Seminarium Szkoły Doktorskiej NCBJ

Thursday, 7th April, 9:00
https://www.gotomeet.me/NCBJmeetings/phd-seminar

Speaker:
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Title:
Reverse-engineering galaxy spectra to decode the IRX-β relation at intermediate redshift

Abstract:
In galaxies, different components interact with each other on various timescales. An example of such interaction is the interplay between young and as well evolved stars with dust. This complex interplay influences the total spectra of galaxies. Dust affects the shape of the spectral energy distribution (SED) like no other component, despite its low contribution to the overall mass of the baryonic matter. At higher redshifts, the challenging measurements of FIR emission are overpowered by the easily available rest-frame UV emission. This in turn limits the wavelength range from which the physical properties are inferred, therefore, a correct understanding of physical processes that prevail at short wavelength domain, like dust attenuation, becomes critical. Observationally, many galaxies seem to follow what is known as the IRX-β relation, which links heavily-attenuated UV spectral slope (β) and the IR excess of galaxies characterised by the ratio between the IR (mainly dust) and UV (mostly composed of young stars) luminosities (L(FIR)/L(UV)). However, this relation is not universal, and outliers for it are often encountered. Understanding such relation and its connection to dust attenuation properties will help us uncover and understand the role of dust, and its attenuation at higher redshifts.

Our study used a unique dataset from the "VIMOS Public Extragalactic Redshift Survey" (VIPERS), which mapped in detail 24 deg2 of the sky sampling galaxies at redshift~0.7. We use the robust Oii, Oiii, and Hβ line detections of our statistical sample from VIPERS to estimate the gas-phase metallicities at the redshift range $0.5<z<0.9$. We derive key physical properties that are necessary to study galaxy evolution, such as the stellar masses and the star formation rates, from the SED fitting tool CIGALE.
We find a strong dependence of the IRX-β relation on gas-phase metallicity in our sample and dependencies on stellar properties of galaxies like stellar ages, stellar masses, and specific star formation rates. We have also checked morphological parameters, and we find that the compactness of our sources characterised by the Sérsic indexes is also sensitive to the location on the IRX-β plane.