Seminarium Studium Doktoranckiego NCBJ

Thursday, 25 March, 9:00
https://www.gotomeet.me/NCBJmeetings/phd-seminar

Speaker:
Mahmoud Hamed (Szkoła Doktorska NCBJ)

Title:
Dust attenuation in ALMA-detected Ultra Dusty Star-Forming galaxies up to z = 4

Abstract:
Despite its low contribution to the total mass of the interstellar medium (ISM), dust plays a crucial role in the evolution of galaxies, and it has the biggest impact on the shape of their total emission. The affluence of infrared and radio detections of millions of galaxies in the COSMOS field, provided by powerful instruments such as Herschel and ALMA, has allowed us to study the cold dust in galaxies and its variation over a wide range of redshift. A key element in reproducing the total spectral energy distribution of galaxies, is assuming a dust attenuation law which accounts for the behaviour and the imprints of dust in the ISM. However, different studies have shown that a single law cannot fully model dust in a large sample of galaxies. This non-universality of attenuation laws should be considered in order to accurately account for dust, and therefore in deriving the physical properties of galaxies. In this work, we study different attenuation laws in a statistical sample of ALMA-detected galaxies in the COSMOS field. We probe the resulting variation of key physical properties of these galaxies such as the star formation rate, the stellar mass and the dust to stellar mass ratio. We also investigate the dust temperatures in the ISM and spatial extent of the dust continuum and the implication that it might have on the attenuation curve. We find that a bouquet of attenuation curves must be used in order to reproduce the UV spectrum. Although these curves are not redshift-dependent, they are correlated to the relative spatial distribution to the stellar population of heavily dust-obscured galaxies, and we find a dependence of attenuation laws on the cold dust emission temperatures constrained by ALMA.