# Dust attenuation in ALMA-detected dusty star-forming galaxies in the COSMOS field

Mahmoud Hamed*[1] and Katarzyna Malek[2]

[1]National Centre for Nuclear Research [Warsaw] – Poland
[2]National Centre for Nuclear Research, Warsaw – Poland

**Abstract**

Despite its low contribution to the total mass of the interstellar medium (ISM), dust plays a crucial role in the stellar evolution and in the evolution of galaxies as a whole, 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 find that dust to stellar mass ratio is distinct for strong starbursts and main-sequence galaxies. Our results also emphasize on the importance of using different attentuation laws in order to recover the evolution of the physical properties of galaxies over redshift. Furthermore, we investigate dust morphology, as well as the environments of dusty star-forming galaxies, and discuss their effects on dust attenuation.

*Speaker