Contribution ID: **24** Type: **not specified**

A multi-wavelength study of Cygnus

Tuesday 25 October 2022 11:10 (15 minutes)

Star formation is among the most intricate processes building the Universe and deep comprehensive studies of its low mass regime are crucial to understand the related processes like circumstellar disk evolution and its properties, brown dwarf formation. Since most of the star formation takes place in clusters, it is crucial to perform deep studies of low mass stellar population in young massive Galactic star forming regions where the cluster environment has a significant effect on star and planet formation, disk evolution and fundamental parameters like IMF. Cygnus OB2, at 1.6 kpc from the Sun and with ˜ 200 OB-stars hosts extreme environmental conditions analogous to extra-galactic star forming regions and hence, is an ideal laboratory to explore the effect of stellar feedback on surrounding young low mass population. We perform a comprehensive multi-wavelength study of a 1.5 deg diameter region centred at Cygnus OB2, using the deepest and the widest optical photometry obtained with 8m Subaru Hyper Suprime-Cam (HSC), near-IR (UKIDSS), mid-IR (Spitzer) to study the pre-main sequence population reaching down to brown-dwarf limit including a significant census of disk-bearing and diskless objects. We perform the pre-main sequence membership analysis and estimate physical parameters of the sources. We thus obtain the IMF in the cluster down to the sub-stellar limit owing to the high sensitivity of our data set. We perform a statistical interpretation on the role of various factors like age, mass, incident UV radiation, stellar density on disk evolution in the region and compare the disk properties with other nearby star forming regions of diverse properties in terms of density and UV radiation strength. Since, most of such past studies have either been restricted to nearby clusters or limited by sensitivity of the data, this work is a pioneering step towards understanding the role of several external factors on young low mass stellar population in a massive Galactic star forming region.

Author: Ms GUPTA, Saumya (Indian Institute of Science Education and Research, Tirupati, India)

Presenter: Ms GUPTA, Saumya (Indian Institute of Science Education and Research, Tirupati, India)

Session Classification: Stellar astrophysics and interstellar medium