Contribution ID: **74**   Type: **not specified**

Dust and nebular emission from star-forming regions: A new template library in SKIRT

Tuesday 31 May 2022 16:30 (15 minutes)

The current state-of-the-art cosmological simulations do not treat dust physics. Given the significant impact of dust on the observables, this is done at a post-processing stage. A number of post-processing studies using the SKIRT radiative transfer code have shown that the UV broadband fluxes and IR colors are a source of tension with observational data. Various reasons have been attributed to this mismatch, e.g., the limited resolution of the post-processed simulations could be in part responsible for inadequate dust heating. At the same time, it is very likely that some inadequacies stem from the sub-grid physics employed. The UV flux and dust heating are strongly impacted by the treatment of star-forming regions in the post-processing radiative transfer simulations, for which SKIRT currently employs the MAPPINGS-iii set of templates. In the present work, we explore a new template library for star-formation regions in SKIRT aimed at improving the shortcomings of the previously used templates. An effort has been put to make these templates physically motivated. We take into account stellar feedback due to mechanical luminosity and radiation pressure, as well as the gravitational force on the gas around the stellar clusters. In this talk, we present the results obtained using the new library. We use the Auriga zoom simulation suite as our test-bed and discuss global SEDs, resolved MIR-FIR colors, and the multi-wavelength morphology of these galaxies vis-à-vis MAPPINGS-iii.

Presenter: KAPOOR, Anand Utsav (Ghent University)

Session Classification: Parallel Session: Extreme Astrophysics / Galaxies & Cosmology