

# DISCUSSION

## Structure formation, from cosmological to ISM scales

**Accurate specification of primordial power spectrum of density fluctuations in the Early Universe is a key first step in predicting basic properties of galaxies, such as their mass functions, sizes and morphologies. Current state-of-the-art simulations resolve few thousand Milky Way type galaxies at a resolution of 1kpc (enough to predict morphology) in boxes of 100 Mpc.**

What are the key observables that ISM simulations should predict?

Are there fundamental observed scaling relations between structure at different scales akin to the galaxy two-point correlation function and higher order statistics that should be matched to constrain the nature of the turbulence? How do such scalings depend on galaxy type, redshift etc?

On what scales does the ISM need to be simulated for meaningful predictions?

Is a section through a disk sufficient, or do we need to model the entire rotating disk and do we even need to include the CGM (circumgalactic medium) and dark matter halo properly ?

How do we systematically constrain/quantify the importance of different physics, e.g. role of magnetic field versus gravity in determining ISM filamentary structure?

Do proto-stellar outflows matter in the same way as supernovae and/or AGN winds?