
The CGM as a constraint for star formation and feedback subgrid models.

Maxime Rey*¹

¹Centre de Recherche Astrophysique de Lyon – École Normale Supérieure - Lyon – France

Abstract

Even with ~ 10 -30 pc resolution, galaxy formation simulations require subgrid models to describe unresolved events such as the formation of stars or the explosions of supernovae. Star formation is often described with simple recipes, either using a density threshold or following the multi-freefall model while feedback models deploy different strategies to solve the overcooling problem (delayed cooling, kinetic, momentum or mechanical feedback models). These subgrid models have also been extended to account for processes such as magnetic fields, turbulence or runaway stars. Overall, combinations of these different models allow us to produce simulated galaxies which match relatively well observational constraints and it is unclear which model best represents reality, if any. As galaxy formation is a highly stochastic process, the initial conditions as well as very subtle calibration of model parameters can have a considerable impact on the results.

In this talk, I will present ongoing work where I compare simulations of the same objects run with different combinations of subgrid models. I will show how careful calibration allows to produce similar stellar contents with all models. I will then discuss possible differences in the properties of the CGM and their observational implications.

*Speaker