Challenges in (numerical) galactic wind modeling

• How predictive are large-scale (unresolved ISM, prescribed feedback models) vs. local (large GMC formation resolved, local feedback) models: they show very different SF histories, gas phase structure and kinematics?

• How reliably can we model important mechanisms, HII region formation and expansion, radiation pressure, and energy and momentum input from SN on currently resolvable scale in galaxy formation simulations?

• What processes regulate the clumping of outflowing material and how this affects its phase evolution in halos? Do we have strong observational constraints on this?

• Do winds suppress gas infall and how?

• What is the role of metal mixing and how this affects gas recycling (so far recycling was studied without mixing). How should we model such mixing?

• Do we have reliable hydrodynamical codes to model the dominant processes?

• What is the role of cosmic rays pressure and magnetic fields in ISM regulation and wind generation (there are very few studies in which this is coupled to radiation +SN energy and momentum injection)?