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"Star formation, feedback, and turbulence: towards a unified model of the star-forming ISM"

In this talk I review attempts to build a self-consistent model for the dynamical state of the ISM in star-forming galactic discs. Ideally such a model would unify our understanding of star formation, stellar feedback, and turbulence in the ISM into a single framework, simultaneously explaining the observed correlations between galaxies' gas content, ISM dynamical and chemical state, and star formation rate. I summarise the various ways that theorists have attempted to fit together physical ingredients to reach this goal, the differing physical pictures behind these models, and the strengths and weaknesses of each when it comes to reproducing the observations. I conclude by suggesting ways to combine the best elements of these models into a single, unified picture, and discuss observations and numerical experiments that can be used to test these ideas.