

Colloquium

SFB 956

Conditions and Impact of Star Formation

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The Origin of Interstellar Turbulence

In this talk, I review attempts to build a self-consistent model for the origin of turbulence in the interstellar medium (ISM) of star-forming galactic discs. Ideally such a model would incorporate all potential sources of turbulence: stellar feedback, gravitational and other instabilities, and driving by stellar gravity, and would be able to explain observed correlations between ISM turbulence and other properties of galaxies, such as their star formation rates. 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 then show that it is possible to combine the best elements of these models into a single, unified picture that explains the relative roles of the various sources of turbulence, and successfully reproduces most of the major observations. I suggest future observations that can be used to test this unified model.