Colloquium

SFB 956

Conditions and Impact of Star Formation

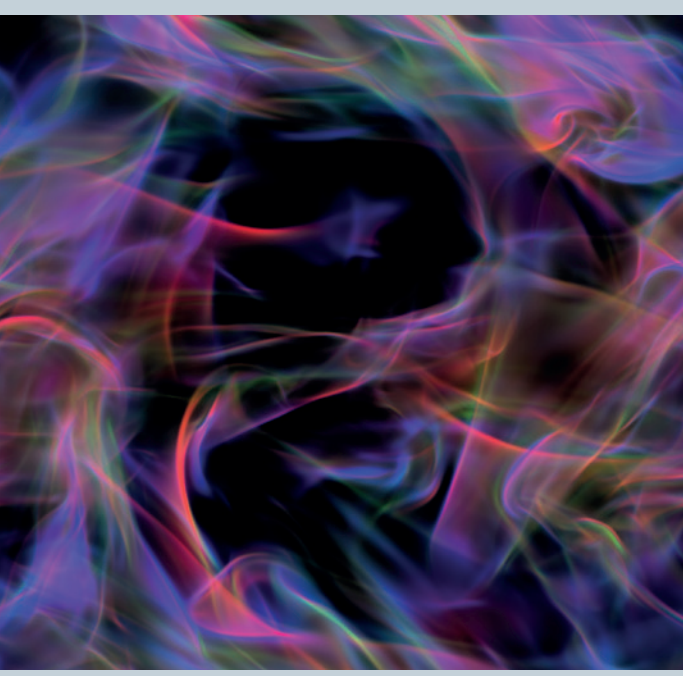
04 June 2018

Monday 3:00 pm

Physikalische Institute Köln

Lecture Hall III

Zülpicher Straße 77 | 50937 Köln



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Shocks and Turbulent Dissipation in the Interstellar Medium

Typical velocities in the interstellar medium (ISM) are within an order of magnitude of the sound speed. Shocks should therefore be a ubiquitous component of this turbulent gas.
Ordered kinetic energy is converted into heat inside a shock's working surface, the thermal collisions excite the gas and the excitation energy is radiated away in their wake. Shocks should then be one of the most efficient ways to probe dissipation in our galaxy. However, their unambiguous observational characterisation has remained elusive in the dilute ISM.
A state-of-the-art shock models such as the Paris-Durham steady-state shock code has made tremendous progress in matching more and more complex observational results. However, its underlying geometry is plane-parallel while actual astrophysical shock working surfaces are likely entangled, or at least bent as in bow-shocks in the wake of runaway stars or at the tip of protostellar jets.
I will illustrate a simple method to approximate the actual geometry of 3D shocks thanks to a distribution of planar shocks. And I will show how in the course of the PhD thesis of Le Ngoc Tram this method could be used with great advantage to explain and reproduce the emission properties (line intensities and shapes) of molecular hydrogen in shocked gas.