Regulation of star formation in disk galaxies: stellar feedback or large-scale turbulence?

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It has been known for long that star formation is a very inefficient process, which occurs at a much slower rate than if driven only by gravitational collapse. In nearby and cosmic noon disk galaxies, at least two processes may explain this low efficiency: stellar feedback and turbulence cascading down from galactic scale into the ISM.
In this talk, I will present an original approach to identify the dominant process responsible for the regulation of star formation using a suite of simulations at the kiloparsec and galactic scale.
In particular, I will show that large-scale stirring of the gas is needed to explain observed the star formation rate in gas-rich galaxies. I will also show how these simulations can be used to improve analytical models for star formation.