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Bat 713, salle de séminaires Galilée , CEA Saclay, Orme des Merisiers

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## **Turbulent molecular gas in galaxies**

The formation of stars and galactic disks results from the ability of interstellar gas to cool. Gas needs to cool to form new stars, but galaxy build-up, the formation of gravitationally bound systems and feedback from newly formed stars and AGNs release huge quantities of energy that heats it. This opposition between cooling and heating is one of the keys of galaxy evolution, which is yet to be explored. How does it impact the content and physical state of the gas in galaxies, and thereby star formation? The answer to this question involves interstellar turbulence. I will present observations of template extragalactic sources, which show that galaxy interactions, stellar and AGN feedback drive turbulence in the cold interstellar medium. Much of the kinetic energy in bulk motions is observed to cascade down to smaller scales and lower velocities. The dissipation of turbulence involves the formation and dynamical heating of molecular gas, which acts as a cooling agent. I will present the physical understanding of the energetics of the multi-phase interstellar medium, which arises from the data, highlighting the link between the dissipation of interstellar turbulence and star formation.