



## SEMINAIRE du Service d'Astrophysique

### FORMATION AND EVOLUTION OF GIANT MOLECULAR CLOUDS IN DISK GALAXIES

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**Mercredi 12 novembre 2008**

**14h00**

The formation of stars from gas in disk galaxies is one of the most basic processes controlling galactic evolution. While there are many other important effects, such as galaxy interactions and infall of diffuse gas, ultimately a large fraction of the gas settles into a rotationally supported disk where the majority of the stellar population is born. Due to restrictions in resolution, galactic-scale simulations have largely modeled star formation using empirical correlations between the gas density and star formation rate. While useful, these methods are unable to tell us about the early stages of star formation and the evolution of the interstellar medium (ISM). In this talk, we show results from a set of high adaptive mesh resolution ( $< 10$  pc) global galaxy simulations (32 kpc) that follows the birth, evolution and death of star-forming clouds in the ISM. We present a technique to track the clouds through their life and compare the properties of clouds at different ages. Our clouds are defined with a density threshold that should give them similar properties to giant molecular clouds, and this allows us to make detailed comparison of our simulation results to observations of the Milky Way and other galaxies.

I finish by outlining a recently completed code comparison project of four of the most utilized codes in astrophysics (Enzo, Gadget2, Flash and Hydra) and highlight features that should be considered when tackling modern astrophysical problems.

**Ce séminaire aura lieu au CEA Saclay – Orme des Merisiers – bâtiment 709, Salle 220.**