Séminaire organisé par

AIM &Le service d'Astrophysique
CEA/DSM/Irfu

Cosmology and Galaxy Evolution Group Seminare: Open to all SAp

THE DYNAMICS OF GALAXY PAIRS IN A COSMOLOGICAL SETTING

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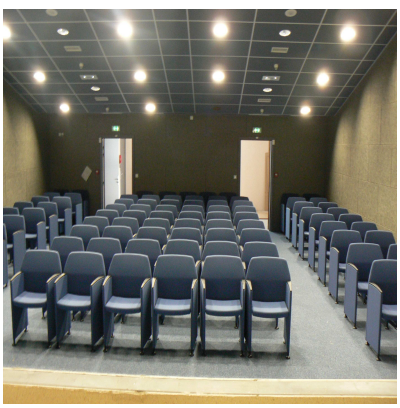
Galaxy pairs provide a unique view of the interaction sequence experienced by merging galaxies. Observationally, interactions have a dramatic influence on galaxies, even during the earliest stages. Theoretically, a large industry of numerical merger simulations has developed. Unfortunately, the latter depend on the assumption that interacting galaxies evolve in isolation. A central goal of this work is to investigate the validity of this assumption. Using the Millennium Simulation, we built a large catalogue of simulated galaxy pairs. For each pair, we searched for a more massive 'third' galaxy in the vicinity. A comparison of the binding-energy of the pair to the binding energy to the third galaxy allows us to rank pairs in terms of their probability of merging. The results are as follows: (a) 12% of the pairs are inevitable mergers in isolation; (b) 37% are likely mergers, with minimal influence of a third massive galaxy in the vicinity; (c) 20% will most likely interact, but not merge because the third galaxy will split them apart; and (d) 30% are chance pairs orbiting a third massive galaxy, and will never merge. This work demonstrates the importance of connecting galaxy pairs to the rest of the Universe, and provides guidance to both observers and simulators on how realistic it is to treat merging galaxies in isolation. Lastly, I will discuss ongoing work based on binary merger simulations. These two complementary methods (semi-analytics and hydro-simulations) will help us bridge the gap between galactic and cosmological scales, and enrich our understanding of the physical processes governing the interaction sequence.

18 juillet 2013

11h00 Salle Galilée bât 713 - Orme des Merisiers



Un café sera servi 15 mn avant le séminaire

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