

A SYNOPTIC VIEW OF THE MAGELLANIC CLOUDS:
VMC, GAIA AND BEYOND

ESO-HQ, GARCHING BEI MÜNCHEN, GERMANY
September 9-13, 2019

Toward A Complete Understanding of the Magellanic Clouds and the Stream

Yang Yanbin, Paris Observatory

The origin of Magellanic Clouds (MCs) and Stream have kept challenging to explain. Moreover, the recent discoveries of a huge amounts of ionized gas associated with the Stream and the extraordinary elongated 3D structure of SMC stars make them more enigmatic. Illustrating with fully-resolved hydrodynamical simulations, I will present comprehensive studies on this system, giving a overall and physical view on their formation history in a "ram-pressure plus collision" scenario. Carefully analyzed the deepest HI survey, we found that the overall Stream is actually structured into two ram-pressure tails. The ram pressure is induced by the diffused multiphase gas in the MW halo. Kelvin-Helmholtz instability in the mixing phase of the stripped gas provides sufficient efficiency to explain the huge amounts ionized gas in the Stream. The collision between the two clouds at 200-300 Myr ago has completely reshaped the system, i.e., radically changed the motion of LMC making it largely offset from the trace of its ram-pressure tail; helped to expel more gas from the Clouds; destroyed SMC stellar system stretching it into 30-kpc long along line of sight but only 5×3 kpc² in sky projection.