R22a The evolution of the GMCs in the barred galaxy M83

藤本裕輔, エリザベス・タスカー, 羽部朝男（北海道大学）

Star formation is one of the key processes governing the evolution of galaxies. Many observations of nearby disk galaxies indicate an empirical relation, the Kennicutt-Schmidt relation, between the gas surface density and the star formation rate surface density. However, with the advance of higher resolution observations, it has been seen that barred galaxies show different star formation activity in the bar and spiral arm regions, even if the gas surface density is comparable in both areas(Momose et al. 2010). What is the physical process that creates this difference? Almost all stars are formed in giant molecular clouds(GMCs). The properties of the GMCs might therefore be suspected to be quite different in these regions of the galaxies. We performed a 3D hydrodynamical simulation of the nearby barred galaxy M83 (NGC5236) using *Enzo*, an adaptive mesh refinement code, and analysed the properties of the GMCs in the bar, spiral arm, disc, and inter-arm region. We found that there were differences in the properties of clouds in each regions. The virial parameter and the number density of the GMCs are higher in the bar region. This suggests that cloud-cloud collisions are far more likely to occur in this region. To make the evolution of GMCs clear, we tracked the motion of all GMCs in the galaxy. We will present the results of the GMC tracking and the characteristics of the GMCs evolution in each region of the barred galaxy.