AICS Makino Team -CPS Seminar on Sep 8

category：Seminar 2015年8月24日

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date: Sep 8, 2015 16:00-17:00(two talks, roughly 30 min. each)

Place: Seminar Room, CPS, Kobe University

Everyone is welcome!

1st Speaker: Alex Pettitt (Hokkaido University)

Title: The morphology of spiral galaxies

Abstract: Disc galaxies visible in the night sky show a wealth of different morphologies. Some are barred, some armed, and some effectively featureless. While there has been a long history of investigation into galactic structure using numerical simulations and observations, there is still confusion as to the mechanisms governing the ensemble of galactic spiral morphologies observed. Theories include the formation by steady density waves, swing-amplified local instabilities, tidal interactions with nearby bodies, and the rotation of inner bars. I will discuss the various mechanisms of spiral generation, specifically focusing on the tidal triggering of arm formation and how the properties of the galaxy differ compared to other mechanisms. I will also discuss the origin of spiral arms in the context of the morphology of our own Milky Way galaxy.

2nd Speaker: Hsi-An Pan (Hokkaido University)

Title: What is a GMC? Are observers and simulators discussing the same star-forming clouds?

Abstract: Observations and simulations have now reached the point where the giant molecular cloud (GMCs) populations can be studied over a whole galaxy. This is immensely helpful for understanding star formation, since the cloud properties set the conditions for new star birth. Yet, are these two groups really comparing the same objects? While simulators work in position-position-position (PPP) space, observers see projected properties along the line of sight, identifying clouds in position-position-velocity (PPV) space. If these methods do not identify the same objects, then the interpretation and comparisons between the data sets may be highly misleading.

In this research we generated PPV and PPP data for a high-resolution simulated galaxy and compared the identified cloud properties in both data sets. Results show that the physical properties of molecular clouds in the individual galactic environments (bar, spiral, and outer disk) are highly similar among the two data structures. About 70% of clouds have single

counterpart in each dataset, and their cloud properties scatter mostly within a factor of two. Therefore, it is potential to compare GMC properties between simulations and observations.