

Application for CARMA summer school

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Statement :

The reasons why I apply for CARMA summer school are as follows.

- I would like to learn observation and data reduction methods because I plan to combine CARMA data with the Nobeyama 45m (NRO 45m) data of the nearby barred galaxy for my master thesis.
- I would like to observe and study with CARMA in the future.

I am a second-year master's degree student at the University of Tokyo. I am interested in star formation activity in nearby galaxies. Recently, I started to analyze CO(J=1-0) of NGC 4303 using the NRO 45m and CARMA C-array data to reveal what brings differences in star formation activities in bars and arms in nearby barred spiral galaxies. I obtained the NRO 45m data as the PI in this March, and Jin Koda agreed to collaborate with me and provide the CARMA C-array data taken in the commissioning time. I applied to CARMA D-array time as the PI (No.c0238), to fill the gap in u-v space between C-array data and NRO data. I will combine the NRO 45m with CARMA data, and to verify the cloud-orbit model (Wada 1994, Onodera et al. 2004, Koda & Sofue 2006) for our results in my master thesis. CARMA provides us much higher spatial resolution and enough u-v coverage data, because it has the largest number of antennas among existing interferometers in the world. It allows us to resolve molecular gas to a few hundreds pc scales in nearby galaxies, and we can estimate gas dynamics and distribution more accurately. To reveal of the relation of molecular gas dynamics and star formation in nearby barred spiral galaxies. I believe that CARMA observations are powerful and essential. High resolution images with CARMA form the major part of my master thesis. I need to learn the way and the principles of data reduction as soon as possible, because the master thesis has to be submitted until next January. Therefore, in the summer school, I would like to learn how the interferometer works and how CARMA observations are performed, as well as basic calibrations and data reduction of CARMA data.

In addition, I would like to discuss the molecular gas dynamics and star formation in other nearby barred spiral galaxies in my doctor thesis and to obtain a unified understanding of the relation between star formation activity and gas dynamics in barred spiral galaxies on a few hundreds pc scales. Therefore, I will again apply for observations with CARMA next year. I would like to extend my studies of nearby galaxies and star formation to high-z galaxies in the future.

Although I have never experienced any interferometer observations, I would like to observe and deepen my understanding of the calibration methods, data reduction and synthesis imaging in CARMA. Making use of this experience, I would like to come back to CARMA for my proposed observations for the master thesis (if accepted) and also for my PhD thesis in near future.

For the reasons mentioned above, I apply to participate in the CARMA summer school.