

CARMA Summer School Application

Why I would like to attend

I am a first year graduate student working on submm/mm observations of young stars at the University of Exeter, under the supervision of Dr Jenny Patience. I am very eager to attend, a fellow student at St. Andrews University spoke very highly of her experience last summer. My primary research focuses on observations of protoplanetary disks around young low mass stars. The data are used to determine how circumstellar environment, e.g. binarity and stellar mass, affects the properties, such as size and mass, of the disks. During the course of my PhD I will analyse CARMA observations of pre-main sequence binaries and also an OVRO survey of Ophiuchus. Currently, I am reducing CARMA 1mm and CSO 350 μ m data on the Aquila star forming region to perform a disk census of Aquila.

Since I will make use of CARMA observations, it is vitally important for me to understand the processes involved in both acquiring and analysing the CARMA interferometric data. This summer school gives me the perfect opportunity to learn more about this process and gain hands-on observing experience, which I currently lack. In addition to increasing my knowledge of the observing side of aperture synthesis I will gain a better understanding of the data analysis. The summer school practice sessions will greatly increase upon my current knowledge of the MIRIAD package. I have started using MIRIAD, and am now very interested in learning to use the software to its full potential. Ideally, I would like to volunteer for an observing shift at CARMA in addition to the school. An observing run after the school would be most beneficial but before the school is fine if scheduling constraints require that.

Project

I would propose 3mm observations of two binary systems in Taurus for which I am currently working on 1mm CARMA data. Taurus is up during the day therefore these observations could be carried out in between the lectures in the day. The beam size available at this time, 5.5" x 4.8", would allow one system to be clearly resolved into two separate disks while the other marginally resolved. The sensitivity should be around 1.6mJy for a short 1 hour observation given a signal to noise with one target of ~ 25 and another ~ 7 . This will allow a comparison of reducing resolved and unresolved data.

If the weather is good enough for 1mm observations I would like to observe the disk of a young system in Aquila, HBC682. I have CARMA commissioning time data on this object, which indicates a detection at 1mm, however as it was commissioning time the noise was higher and a firm confirmation of a detection would be publishable. This would be a good target to observe from the perspective of my current work. These observations would take place at night. The correlator would be set up such that band 2 would have a bandwidth of 2MHz to detect CO(3-2) in the disk. The achievable sensitivity for this observation should be around 3.0mJy assuming a shorter observation duration of only 1hr. The preliminary flux is ~ 40 mJy so it should be easily detectable.

Note: Camping is fine unless the time of year coincides with flower blooms as I have pollen allergies.

Supervisor:

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