

## **CASPEN exit report**

**August 12 – August 16, 2019**

**Host institution: CCAPP, Ohio State University**

**Host: Annika H. Peter**

Although I didn't have any particular project in mind for my visit to Ohio State University, I've had many fruitful discussions with people at the institution. My research interests overlap to a large extent with those of my host Annika Peter, such as our previous work on dark matter capture by the Sun and other aspects of dark matter particle phenomenology, as well as stellar dynamics.

During my visit, I participated in the daily astro-coffee sessions in the astronomy department, where I gave a summary of my research interests. This led to interesting discussions with Todd Thomson and Jennifer Johnson, mostly about white dwarfs and white dwarf binaries. From Todd I learned about Lidov-Kozai oscillations in triple star systems, which could cause head on collisions between white dwarfs.

I gave two presentations at CCAPP: the first about measuring the local matter density using Gaia, the second about spin-dependent dark matter interactions in the context of 21 cm cosmology. The former led to discussions with Tim Linden and John Beacom about how to constrain the local cold gas density. The local flux of cosmic rays interacts with gas to produce gamma rays; by using cosmic ray data from AMS-02 and gamma-ray data from Fermi LAT, the local gas density could be constrained in a manner that is independent from other difficult measurements of the cold atomic and molecular hydrogen gas. We are currently exploring this project further.

In summary I had a great time at CCAPP, with many interesting and instructive conversations. I would like to give special thanks to my host Annika Peter and CCAPP director John Beacom.

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