Contribution ID: **40** Type: **not specified**

Towards probing the diffuse supernova neutrino background in all flavors

Monday 9 May 2022 17:30 (15 minutes)

To fully understand the whole core-collapse supernova population, it is essential to observe neutrinos from multiple supernovae events - the diffuse supernova neutrino background (DSNB). The Super-Kamiokande (SK) detector achieved the most stringent upper limit on the electron antineutrino component of the DSNB. This limit is only a factor of 2-3 above most of the theoretical predictions. In addition, SK is now enriched with gadolinium which will help to reduce backgrounds for the DSNB search and most probably lead to the detection within the near future. The electron neutrino component of the DSNB has a ten times weaker upper limit than the electron antineutrino component. The limit may change into observation with the upcoming Deep Underground Neutrino Experiment (DUNE). But capturing the complete picture of the core-collapse supernova landscape and investigating new astrophysics or physics requires probing DSNB in all flavors. The upper limits on the non-electron component of the DSNB (muon and tau neutrinos and antineutrinos) are ˜ a thousand times weaker than the theoretical predictions. In this talk, I will present how the large-scale direct dark matter detectors can help significantly tighten the upper limits on the non-electron component of DSNB. In addition, I will talk about plausible beyond the Standard Model scenarios, which could alter the non-electron neutrino emission from the core-collapse supernovae.

Authors: SULIGA, Anna M. (UC Berkeley and U. of Wisconsin); TAMBORRA, Irene; BEACOM, John

Presenter: SULIGA, Anna M. (UC Berkeley and U. of Wisconsin)

Session Classification: Neutrinos I