Contribution ID: **146** Type: **Contributed Talk**

The high-energy gamma-ray emission of globular clusters

Monday 10 October 2022 16:30 (15 minutes)

There are now 35 confirmed gamma-ray bright globular clusters (GCs) in the Milky Way. The millisecond pulsar (MSP) populations within these clusters are widely considered to be their primary source of gamma-ray emission. There are two proposed mechanisms for high-energy gamma-rays to be created in GCs by MSPs. The first is radiation from charged particles traveling along the open magnetic field lines of the pulsar, and the second is inverse Compton scattering (ICS) due to charged relativistic particles from the MSP upscattering starlight and CMB photons. The degree to which the ICS component contributes to GC gamma-ray emission is currently unknown. In this talk, I will discuss recent efforts by myself and collaborators to further understand the high-energy gamma-ray emission of GCs using data from both Fermi-LAT and the High Altitude Water Cherenkov (HAWC) experiment. In particular, we search for evidence of ICS emission from the M54 globular cluster at the center of the Sagittarius dwarf galaxy. As we find only what appears to be prompt emission from an unseen population of MSPs within the cluster, we report upper limits on its ICS flux and test our methodology on other GCs with a possible ICS component. We successfully recover the ICS component of Terzan 5's spectral energy distribution; a GC which is known to have high-energy gamma-ray emission. Finally, we search for evidence of other gamma-ray sources associated with Sagittarius and compare our results to the total population of gamma-ray GCs.

Track

Pulsars

Primary author: EVANS, Addy

Co-authors: ALBERT, Andrea (Los Alamos National Lab); HARDING, J. Patrick (Los Alamos National Laboratory); STRIGARI, Louis (Texas A&M); SVENBORN, Oskar; LINDEN, Tim; HOOPER, dan

Presenter: EVANS, Addy

Session Classification: Parallel 1