

Department of Physics and Astronomy



Summer 2019— Yuxin (Vic) Dong

Dr. Milisavljevic Group

My project is to constrain the progenitor systems of an intriguing new class of supernovae called Ca-rich transients by investigating the properties of their host galaxies. Presently, the progenitor systems of Ca-rich transients remain unclear. Based on multi-wavelength observations, they are very similar to core-collapse Type Ib/c supernovae. However, because some events occur in the outskirts of their host galaxies that can often be elliptical, it is widely believed that Ca-rich transients are associated with white dwarf stars in binary systems. The possibility of having heterogeneity in the progenitor systems has also not been ruled out.

We first synthesize the stellar populations of host galaxies by modeling the spectral energy distributions from UV to infrared wavelengths with sophisticated stellar population inferencing software. We then compare these fits to those made from host galaxies of type Ia and core-collapse supernovae to uncover potential correlations. Through this project, I have learned advanced coding techniques in python including Markov Chain Monte Carlo sampling to infer high-dimensional stellar population properties, and how to achieve precise photometry from leading ground and space-based observing facilities. I'm grateful for the experience that helped me develop problem-solving, coding, and communication skills. I'm excited to continue working in professor Milisavljevic's group.