Exploring the Evolution of Nugget Galaxies Using Neighbors in the RESOLVE Survey
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Galaxy evolution is driven by interactions and mergers between galaxies, which can be quantified in different ways at the scale of immediate environments. In this project we use galaxy neighbors and nearest neighbor distances. Galaxy neighbors provide insight on specific stages of galaxy evolution. I analyzed galaxies in an early stage of evolution called nuggets. Nuggets are highly compact galaxies, with much smaller radii given their masses compared to "normal" galaxies. They can be divided into three separate classes, which are newborn, aging, and dead nuggets. Newborn nuggets are formed through events involving intense gas inflows and have high rates of star formation, while dead nuggets have ceased star formation. Studying the neighbors of nugget galaxies can help us determine whether their neighbor characteristics are consistent or not with their formation and evolutionary futures. Using the REsolved Spectroscopy Of a Local VolumE (RESOLVE) survey with neighbors identified by two different algorithms and a nugget sample classified by environmental, structural, and star formation features, we study their nearest neighbor distance distributions and neighbor counts. Through visualization and statistical tests such as the Mann-Whitney U Test, we explore how samples of nuggets compare to samples of normal galaxies.