STELLAR EVOLUTION IN NGC 6791

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The extraordinary galactic open cluster NGC 6791 falls in the Kepler field. NGC 6791 is ancient with an age of 8 Gyr, metal rich with [Fe/H]= +0.30, and one of the most massive open clusters known. We propose to obtain Kepler time series photometry for a sample of stars on the RGB/AGB of this cluster. From the population of the cluster and the stellar evolutionary time scales we know that a small fraction of the program objects are AGB stars but the only way to distinguish the RGB/AGB stars with certainty is to look at the interior structure. We will do this using Kepler data and the tools of asteroseismology. This will give us a text book perspective of how stellar interior structure changes up the RGB, to the giant clump, and then up the AGB for a set of stars of the same initial composition and near solar mass. Classification of the evolutionary status of the RGB/AGB stars will enable additional studies of stellar composition, mixing, and mass loss. This will produce a case study into the cycling of matter through cluster stars stars and back into the ISM. This project is being undertaken in collaboration with the Kepler Asteroseismic Science Consortium.