

Construction of a color-magnitude diagram for NGC 957

Abstract

The goal of this individual project was to construct a color-magnitude (CMD) of a chosen open cluster, NGC 957. NGC 957 is a low population open cluster located in the Perseus constellation, approximately 5920 light years away. This was performed using CCD images taken from different filters using the ERAU 1-m telescope, namely the green and red filters. Different data filtering techniques are used to maximize the effectiveness of results, such as the Johnson-Kron photometric system and the Landolt standard system. In this case, in order to maximize our data's functionality, the CCD images would need to be calibrated and a meticulous data conversion would need to be performed, in what is known as aperture photometry, so that the actual diagram can be constructed. The alignment process for the red filter was not as accurate as the green filter, possibly due to Fall weather conditions, creating a master image frame (SUM) with heavy star trailing, leading to less amounts of data flux being extracted for the diagram's construction. Additionally, the Landolt calibration system which uses the filters UVBRI was not implanted to the data which makes inferring information such as temperature, age and distance less dependable, but even with those constrictions, the CMD still retains trendlines seen with higher data filtering, such as the data points accumulating about the center, alluding to its main-sequence belt along with a possible horizontal branch near the upper left of the diagram, which arises speculation to the data filtering threshold needed to notice familiar trendlines seen in typical CMD's and Hertzsprung-Russell diagrams.

