PHYSICS & ASTRONOMY SEMINAR

"The Color Magnitude Diagrams of NGC 6553"

Presented by:
Scott Call

Abstract: Globular clusters (GCs) are home to some of the oldest stellar populations. Many of the stars in GCs are near the end of their life and pulsate due to internal mechanisms that are not fully understood. These long-period variable stars (LPVs) vary in magnitude and radius and have periods of months up to hundreds of days. NGC 6553 is a metal-rich globular cluster located in the crowded bulge of the Milky Way. It has been studied extensively due to its location and metal abundance, but the search for variable stars has been limited to short-period surveys.

The dataset consists of images taken in V and I passbands from the Panchromatic Robotic Optical Monitoring and Polarimetry Telescopes (PROMPT) at Cerro Tololo Inter-American Observatory in Chile. Over four years, images were collected on NGC 6553 a few nights a month by previous BGSU students. In this presentation the DAOPHOT process for finding star magnitudes is discussed as well as the calibration of said magnitudes. Color magnitude diagrams (CMDs) and the techniques used to create them are shown for the cluster and field populations.

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"Alpha Element Abundances in Distinct Halo Stellar Populations"

Presented by:
Michael Reinhard

Abstract: Studies have shown that the halo of the Milky Way galaxy is made up of two distinct stellar populations. These two populations, one that is believed to have formed within the Milky Way galaxy itself, and one that is believed to have formed in smaller progenitor galaxies, are made up of stars with differing metallicities. One population that has a high alpha metallicity, simply called high alpha stars, and one that has a lower alpha metallicity, low alpha stars. By studying alpha elements abundances, such O, Mg, S, Si, and Ti, the composition of individual stars can be determined. Due to the fact that certain star forming conditions, such as the Initial Mass Function (IMF) and the Stellar Formation Rate (SFR), lead to different alpha metallicities in stars, we can infer where the star originated. This, combined with other factors such as stellar velocity, allow us to tell if the star was formed within the Milky Way galaxy, or formed in smaller progenitor galaxies, allowing us insight into how the galaxy formed.

Thursday, March 25, 2021
4:00 pm
PSLB 112