



University
of Victoria

PHYSICS AND ASTRONOMY SEMINAR (Hybrid)

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University of Victoria

“Constraints on the Properties of Globular Clusters from Their Horizontal Branch Stars”

Abstract

Zero-age horizontal branch (ZAHB) stellar models, coupled with ultraviolet photometry from the recent Hubble Space Telescope Wide-Field Camera 3 (WFC3) survey by Piotto et al., provide important constraints on the apparent distance moduli and reddenings of globular clusters (GCs), and thereby on their ages. The WFC3 observations, in particular, make it possible to derive the relative distance moduli of second-parameter clusters (those with similar metallicities but very different HB morphologies) to quite high precision. To ascertain whether age is the primary second parameter (after metallicity) in controlling the distribution of HB stars in GCs, new results will be presented for the second-parameter cluster pairs M3, M13 and NGC 288, NGC 362. To check the distance scale that is inferred from ZAHB models, distance moduli are derived from fits of GC main sequences to local Pop. II dwarfs with very accurate and precise Gaia parallaxes. Although there appears to be rather good agreement if such fits are performed on a V-I,V diagram, there are some perplexing inconsistencies when the B-V,V diagram is considered. A possible solution to this dilemma is that local subdwarfs have high abundances of carbon (i.e., $[C/Fe] > 0.0$). This will be discussed, along with some tantalizing evidence for such overabundances in in some GCs.

Monday, February 13, 2023

2:00 p.m. in ECS 130

Zoom: <https://uvic.zoom.us/j/81762773445?pwd=dkdGUDZhbU82Z2c0MXhxbTZUSkdBdz09>