

# BLUE STARS IN THE DWARF ELLIPTICAL GALAXY NGC 205

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**ABSTRACT.** We present a study of stars in the central ( $2.2' \times 3.5'$ ) area of NGC 205 using *BVRI* CCD photometry obtained at the prime focus of the CFHT 3.6m.

NGC 205 is a peculiar dwarf elliptical galaxy (SO/E5pec), located very close to the Andromeda galaxy. The presence of blue stars in this galaxy has been known since Baade (1951) counted about a dozen bright B stars on a deep U photograph of NGC 205.

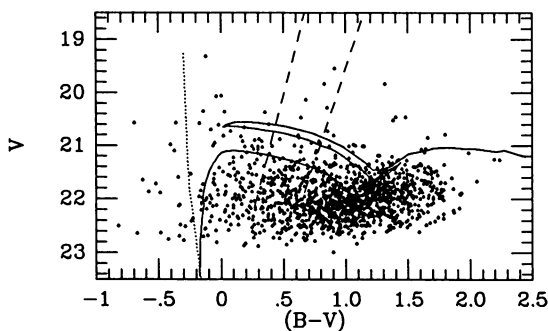
The color-magnitude diagrams show a blue plume extending to  $V \sim 20$  mag. The colors of the blue plume stars indicate that the reddening internal to the central area of NGC 205 is  $E(B - V) = 0.1 - 0.3$ . A significant fraction of the bluest stars and the brightest stars are concentrated inside  $25''$ . Although the numbers of stars measured are small, to within the uncertainties, the slope of the  $V$  luminosity function of these stars for  $20.0 < V < 21.5$  is not much different from that of other nearby galaxies.

In addition to the young stars, the color-magnitude diagrams show a first red giant branch (RGB) population, the tip of which is found at  $I = 20.35 \pm 0.05$ . This value is consistent with the result found by Mould et al. (1984): they detected a tip of the RGB in the field located at  $9.5'$  north from the center, giving  $I = 20.4 \pm 0.1$ . The bright stars located above the tip of the RGB are consistent with the presence of an intermediate-age population. The distance derived from the brightness of the tip of the RGB is  $(m - M)_o = 24.37$ , corresponding to 750 kpc. A value for the foreground reddening of  $E(B - V) = 0.03$  from Burstein and Heiles (1984) was adopted in this study. The mean  $(V-I)$  color at  $M_I = -3.5$  based on the photometry of Mould et al. (1984) is  $(V - I)_{-3.5} = 1.76$ , giving  $[\text{Fe}/\text{H}] = -0.8$ .

Surface photometry shows that the color gets bluer toward the center of the galaxy.

## References

- Baade, W. 1951, *Publ. Obs. Univ. of Michigan*, No.10, 7  
Burstein, D., and Heiles, C. 1984, *ApJS*, 54, 33  
Mould, J. R., Kristian, J., and Da Costa, G. S. 1984, *ApJ*, 278, 575



**Fig. 1:**  $V - (B - V)$  diagram of NGC 205. The dotted line gives the ZAMS with solar metallicity. Two slanted parallel lines represent the position of the LMC Cepheid instability strip. The solid line shows the evolutionary track for  $Z=0.008$  and  $M = 5M_{\odot}$  incorporating convective over-shooting.