

A PHOTOMETRIC STUDY OF TWO GALACTIC BULGE GLOBULAR CLUSTERS

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We present a comparative study of two metal-rich globular clusters in the Galactic bulge, NGC 6316 and NGC 6624, based on Washington CCD photometry. These two clusters are very close to the Galactic center. NGC 6624 is known to be dynamically in a post-core-collapse stage, while NGC 6316 is not. CMT_1T_2 CCD images of these clusters were obtained at the CTIO 0.9m telescope. We adopt the reddening values of $E(B - V) = 0.61$ for NGC 6316 and $E(B - V) = 0.26$ for NGC 6624 in this study.

Color-magnitude diagram: The color-magnitude diagrams of these clusters show a well-defined red giant branch and a red horizontal branch (**Fig. 1**). The morphologies of the unreddened color-magnitude diagrams of these two clusters are very similar.

Metallicity : We have estimated the metallicity of the bright red giants in these clusters using the color-color diagrams. The mean of four estimates based on four kinds of color-color diagrams is derived to be $[Fe/H] = -0.45 \pm 0.18$ for NGC 6316 and $[Fe/H] = -0.56 \pm 0.27$ for NGC 6624. The ranges of previous estimates are $[Fe/H] = -0.62$ to $+0.23$ for NGC 6316 and $[Fe/H] = -1.06$ to -0.35 for NGC 6624.

Distance : The distance is estimated from the mean magnitude of the horizontal branch stars: $d = 9.38 \pm 0.43$ kpc for NGC 6316 and $d = 7.87 \pm 0.45$ kpc for NGC 6624. The corresponding galactocentric distances are 1.69 kpc and 1.17 kpc, respectively. **Fig. 2** shows the metallicity vs. galactocentric distance of these clusters in comparison with other globular clusters.

Surface photometry : The radial profile of the surface brightness of NGC 6624 shows a cusp in the cluster center, while that of NGC 6316 shows

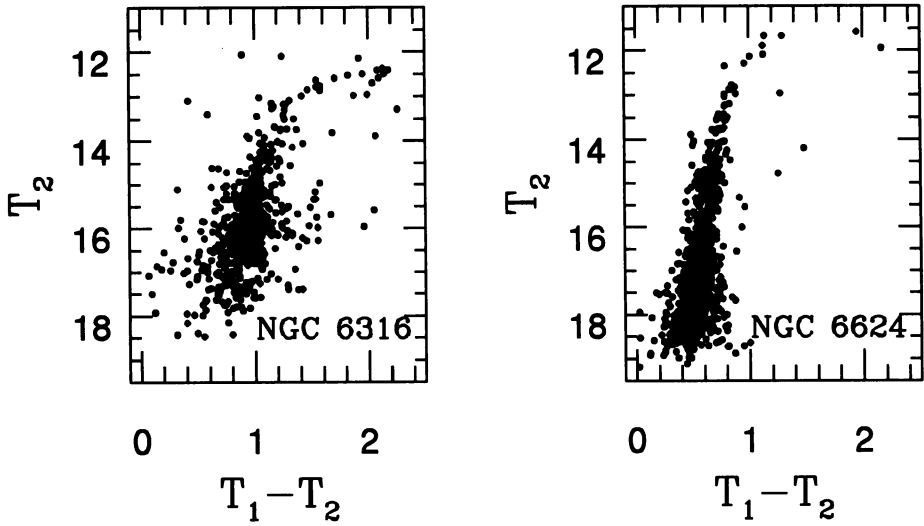


Figure 1. Color-magnitude diagrams of NGC 6316 and NGC 6624.

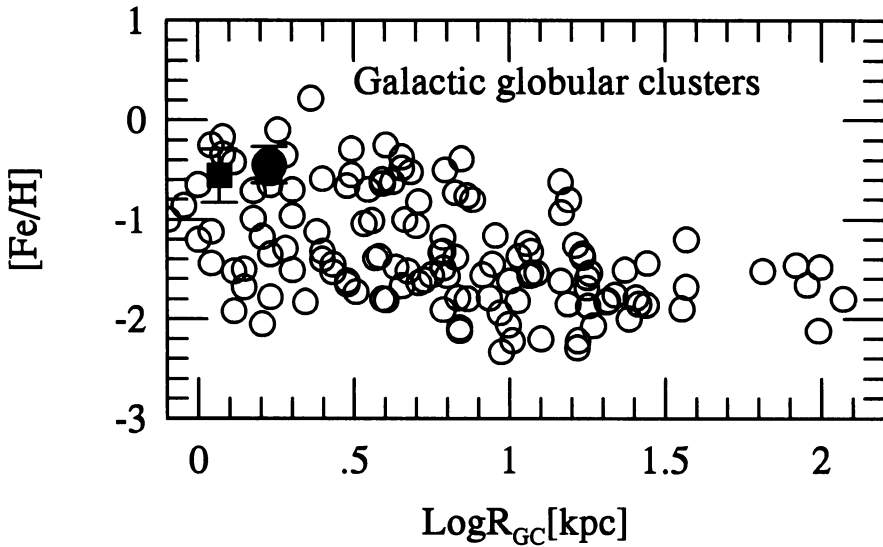


Figure 2. Metallicity vs. galactocentric distance for NGC 6316 (filled circle) and NGC 6624 (filled square) in comparison with other Galactic globular clusters (open circles).

a flat core. The radial profiles of the surface colors of these clusters show little gradient.