

## DEEP CCD PHOTOMETRY OF OMEGA CENTAURI

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This paper presents a color magnitude diagram for the enigmatic cluster  $\omega$  Centauri (NGC 5139 = Cl328 - 472) tracing the main sequence down to  $V \sim 21.5$ . The spread in color on the upper main sequence is confirmed as intrinsic to the cluster. The CCD observations were made using the SAAO 1 m telescope with the UCL CCD camera and the RGO CCD camera at the prime focus of the AAT.

The fields studied lie approximately 20 arcmin. to the west of the cluster core (Cannon and Stewart 1981) and consist of three sets of observations: deep AAT exposures of one field with total exposure times of 1500 s in V and 1000 s in B, shorter AAT exposures overlapping the deep exposures, and a series of SAAO fields, with a range of exposure times. The analysis of the data was carried out using a profile fitting crowded field photometry program written by one of us (Penny and Dickens 1986). Fig. 1 shows the composite CM diagram for the region studied. The uncertainties in V and B, as derived from the scatter of the individual measures of the same star are approximately 0.02 at  $V = 18$ , increasing to 0.05 at  $V = 21$ .

Isochrones (VandenBerg and Bell 1985) corresponding to values of [Fe/H] of -1.75, -1.5 and -1.23 are plotted in Fig. 2. In Fig. 2a the isochrones have been shifted to represent a distance modulus of 13.9 and reddening of  $E(B-V) = 0.14$ . 18 Gyr isochrones are plotted. In Fig. 2b we show the same metallicities, but with an age of 16 Gyr. For these,  $E(B-V) = 0.17$  and  $(m-M)_V = 14.10$ .

### REFERENCES

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Penny, A. J. and Dickens, R. J. 1986 Monthly Notices Roy. Astron. Soc. 220, 845.  
VandenBerg, D. A. and Bell, R. A. 1985 Astrophys. J. Suppl. 58, 561.

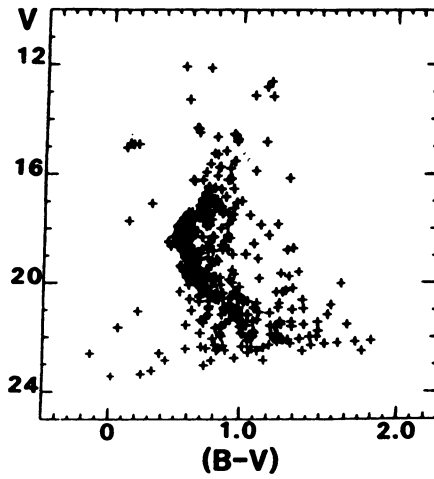


Fig. 1.  $\omega$  Centauri color magnitude diagram.

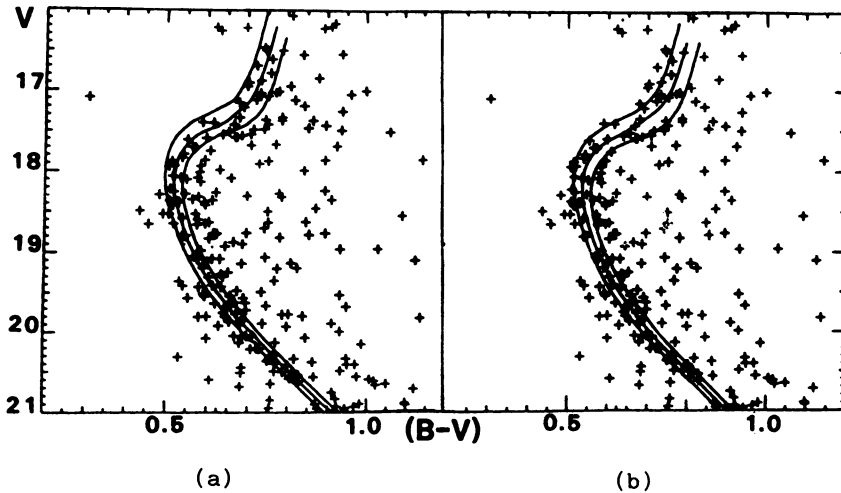


Fig. 2. Isochrones for  $[\text{Fe}/\text{H}] = -1.75, -1.5$  and  $-1.23$ . In 2a the isochrones correspond to an age of 18 Gyr, the distance modulus being 13.9 and a reddening of  $E(\text{B}-\text{V}) = 0.14$ . In 2b they are for an age of 16 Gyr, a distance modulus of 14.1 and  $E(\text{B}-\text{V}) = 0.17$ .