Galaxy Evolution across the Hubble Time
Proceedings IAU Symposium No. 235, 2006
F. Combes & J. Palouš, eds.

doi:10.1017/S1743921306010039

The San Pedro Mártir Open Cluster Survey: Progress, Techniques, Preliminary Results

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Abstract. A CCD UBVRI survey of northern open clusters is being undertaken at San Pedro Mártir, México, and performed using always the same instrumental setup (telescope, CCD, filters), reduction methods, and system of standards of Landolt (1992). To date more than 300 clusters (mostly unstudied previously) have been observed, and about half the data reduced using aperture-photometry and PSF techniques. Our analysis procedures are being refined by studying in detail a small subset of these clusters. For example, the heavily reddened clusters Be80 and Be95 are being examined in the color-color diagrams: (B-V, U-B) and (B-V, R-I) to better understand the problems of curvature and variable reddening. For clusters for which our U data reaches the F-type stars, such as NGC2192 and NGC7296, techniques are being examined for estimating both the reddening E(B-V) and metallicity [Fe/H] via the use of the (U-B) excess. If the clusters also have "red clump" stars, such as NGC1798 and Do02, these procedures can be iterated between the clump and main sequence stars to establish even better the values of E(B-V) and [Fe/H]. Finally, color-magnitude diagrams, such as (B-V, V) and (V-I, V), are being employed together with the Schmidt-Kaler (1982) colors and Padova isochrones of Girardi *et al.* (2000) to obtain distances and ages for these clusters. A java-based computer program is being developed to help in the visualization and analysis of these photometric data. This system is capable of displaying each cluster simultaneously in different color-color and color-magnitude diagrams and has an interactive way to identify a star, or group of stars, in one diagram and to see were it falls in the other diagrams, facilitating the elimination of field stars and the apperception of cluster features. This program is capable of displaying up to 16 different diagrams for one cluster and processing up to 20 clusters at the same time. Our aims are the following: (1) a common UBVRI photometric scale for open clusters, (2) an atlas of color-color and color-magnitude diagrams for open clusters, (3) a homogeneous set of cluster reddenings, distances, and ages, (4) an increased number of old and distant open clusters, and (5) a selection of interesting clusters for further study.

Keywords. Stars: distances, stars: fundamental parameters (ages), (ISM:) dust, extinction, (Galaxy:) open clusters and associations: individual (NGC1798, NGC2192, Be15, Be80)

Acknowledgements

This project was supported by CONACyT (Mexico) grants 33940, and 45014.

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