

THE POPULATION OF PLANETARY NEBULAE IN THE GALACTIC BULGE

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Planetary nebulae are one of the latest phases of evolution of low- and intermediate mass stars and can be used as probes of stellar populations and overall chemical evolution in galaxies. Bulge planetary nebulae offer the advantage of being a sample of objects at known distance. Therefore, their study is essential.

We present some results of an extensive study of planetary nebulae in the Galactic bulge, based on the Strasbourg-ESO spectroscopic survey of Galactic planetary nebulae, conducted by Acker and Stenholm.

Our sample of Galactic bulge planetary nebulae contains 270 objects, and is described in Acker et al. (1991).

From a comparison of a set of observational diagrams with simulations based on photoionisation models and taking into account observational errors and selection effects, we have found that the population of planetary nebulae in the Galactic bulge is well represented by a standard model in which the nebulae have a total mass of about $0.2 M_{\odot}$, and are expanding around a central star which evolves according to the theoretical tracks of Schönberner (Stasińska et al., 1991a).

We have been able to derive the masses of the central stars for about 90 objects. The apparent mass distribution for these stars peaks around $0.59 M_{\odot}$, and has a standard deviation of $0.025 M_{\odot}$ (Tylenda et al. 1991).

The observed luminosity function of a complete subsample of Galactic bulge planetary nebulae has been compared to simulated luminosity functions obtained with different characteristics for the central star population and for the surrounding nebulae (Stasińska et al., 1991b). The results are consistent with the studies mentioned above. The total number of planetary nebulae in the galactic bulge is estimated to be about 700.

The next step will be to attempt a comparison of the main parameters of the bulge and disk PN population.

References

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