

Stellar Populations in the Local Group: Contribution from Planetary Nebulae

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Abstract. Planetary nebulae (PN) are favourite objects in the study of stellar populations both in the Galaxy and in other objects as well, due to their high brightness and the considerable range in their kinematic properties and chemical composition. In this work, we take into account available data samples of PN in Local Group galaxies and compare the derived information from different objects, particularly regarding their chemical composition, space distribution, kinematics, and the PN luminosity function.

Keywords. planetary nebulae, stellar populations

In this work, we have considered three different aspects of the contribution of planetary nebulae to stellar populations studies in the Local Group.

First, we have analyzed the elements which are not produced by the PN progenitor stars (S, Ar, Ne), and are manufactured in the late evolutionary stages of massive stars. Their abundances as measured in PN should then reflect the interstellar composition at the time the progenitor stars were formed, and can be compared with results from other galaxies in the Local Group. PN are also extremely useful to determine the metallicity distribution, using basically O/H abundances. For details see Costa *et al.* (2004), Maciel (1999), Escudero *et al.* (2004), Maciel *et al.* (2005), and Maciel *et al.* (2006).

Second, the planetary nebulae luminosity function (PNLF) is considered as one of the most accurate “standard candles” in order to determine extragalactic distances. We have derived the PNLf from the $\lambda 5007\text{\AA}$ flux for the galactic disk and bulge, and compared these results with other data for the Local Group.

Third, we have studied the kinematic properties of galactic PN, especially the galactic rotation curve, as discussed by Maciel & Lago (2005). Four distance scales were adopted and the derived curve is similar to the curves obtained from HII regions for the Milky Way and M31. Other properties such as the average height above the galactic plane and the velocity dispersion in the perpendicular direction can also be derived for PN of different populations, so that a rather complete picture can be obtained.

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