Highlights of Astronomy, Volume 15
XXVIIth IAU General Assembly, August 2009
Ian F. Corbett, ed.

doi:10.1017/S1743921310011841

The population of Planetary Nebulae in the Milky Way

Romano L. M. Corradi

Instituto de Astrofísica de Canarias, E-38200 La Laguna, Tenerife, Spain

Departamento de Astrofísica, Universidad de La Laguna, E-38205 La Laguna, Tenerife, Spain
email: rcorradi@iac.es

Abstract. Extensive surveys of the Milky Way have provided a global view of the population of planetary nebulae in the Milky Way. Their chemical, dynamical, and morphological properties, the link with their red giant progenitors and white dwarf descendants, and the implications on our understanding of the chemical evolution of the Galaxy, are discussed.

PNe are considered to be tracers of the luminosity, mass, chemistry, and distance in almost any kind of stellar systems. However, recognizing these properties has raised new fundamental questions about the formation and evolution of PNe, among which: Which is the relevance of binarity in the formation of planetary nebulae? Do single stars form PNe at all? Which is the minimum stellar mass to form PNe? Why is the bright cutoff of the PN luminosity function universal? Which chemical elements are pristine in PNe, or how reliably can we adopt the (commonly used) PN oxygen abundances to assess the metallicity of the interstellar medium (ISM) at the time the PN progenitors were born?

Answering these questions relies on a better understanding of the global properties of PNe in our own galaxy, which is the only place where detailed studies of the physics of the nebulae and their central stars is possible. Two recent surface-brightness-limited Hα surveys of the Galactic Plane give us the possibility of making a big step forward in this direction, providing better PN counts, better distances, and better sampling of all the phases of PN evolution. The MASH project (Parker *et al.* 2006) is essentially complete, and is the culmination of an extensive ten year programme of visual identification, multi-wavelength comparison and spectroscopy of 1250 new PNe, which double the number of PNe previously known in the Galaxy. The search and confirmation of PNe in IPHAS (Miszalski *et al.* 2008) is in progress, and we estimate that another 500 to 1000 new PNe will be added in the Northern hemisphere, many of which will be located toward the anti-centre direction. This will substantially improve our knowledge of the properties of PNe and the ISM in the outer regions of the Galactic disc.

Acknowledgements

I am grateful to all the IPHAS collaborators, and in particular to Quentin Parker and David Frew from Macquarie University in Sydney for providing some of their results from MASH. I acknowledge funding from the Spanish AYA2007-66804, and from the Brasilian agency FAPERJ who partly supported my visit to Brasil.

References

Drew, J. E., Greimel, R., Irwin, M. J. *et al.* 2005, *MNRAS* 362, 753
Parker, Q. A., Acker, A., Frew, D. J. *et al.* 2006, *MNRAS* 373, 79
Miszalski, B., Parker, Q. A., Acker, A. *et al.* 2008, *MNRAS* 384, 525