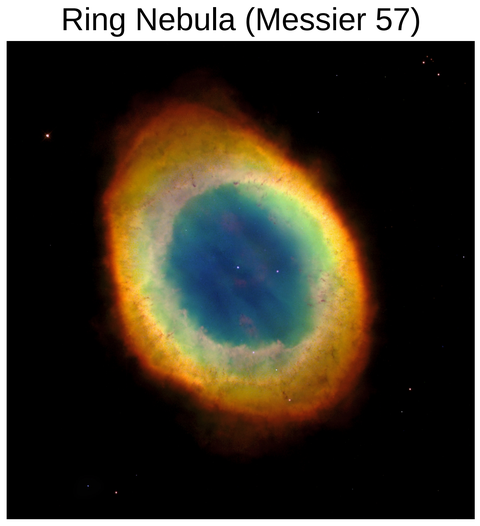
S-PLUS: An atlas of integrated Hα fluxes for planetary nebulae in the Magellanic Clouds

L. A. Gutiérrez-Soto, A. R. Lopes, A. V. Smith Castelli & F. R. Faifer
Instituto de Astrofísica de La Plata, CONICET-UNLP, Argentina

ABSTRACT

We present an atlas of Hα fluxes for planetary nebulae of the Magellanic Clouds (MC PNe) with measurements from the Southern Photometric Local Universe Survey (S-PLUS), a 12 band (7 narrow and 5 broad) imaging survey that allows us to perform an spatial analysis of the Hα emission. Aperture photometry on the continuum-subtracted images was performed to extract Hα + [N II] fluxes of the MC PNe observed by S-PLUS. The dust attenuation and [N II] contribution was corrected with empirical relations. Amongst its many applications, it can provide baseline data for photoionization and hydrodynamical modelling, and allow better estimates of Zanstra temperatures for PN central stars with accurate optical photometry.

Ring Nebula (Messier 57)

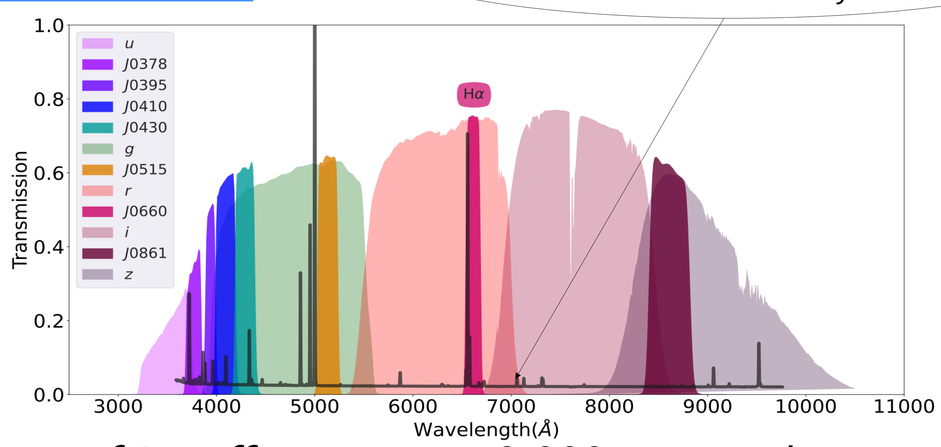


What are planetary nebulae?

Planetary nebulae (PNe) are emission line nebula that represent a short phase on the late evolution of low- and intermediate-mass stars.

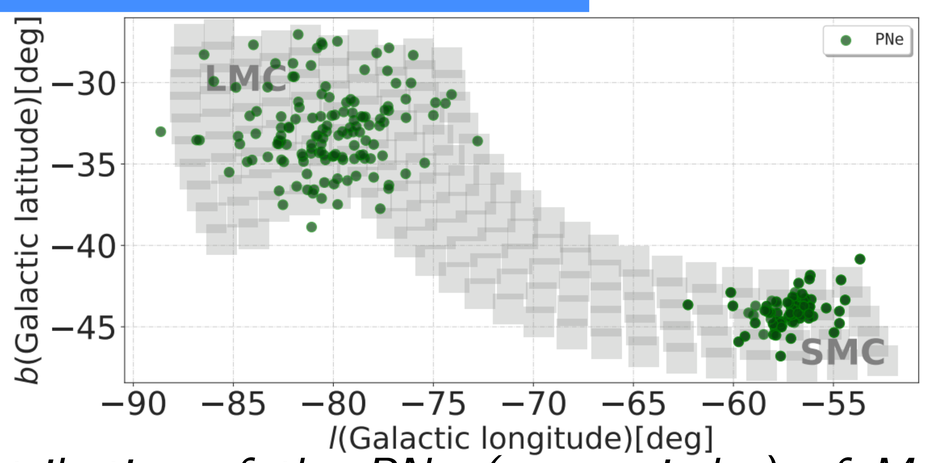
About S-PLUS:

Typical spectrum of a PN: the Hα and [N II] emission lines are detected by J0660 filter



*As part of its effort to map 9,000 square degrees of the Southern Hemisphere, the S-PLUS project has a crucial feature: images of the entire field captured using the Hα narrow-band **J0660** filter.*

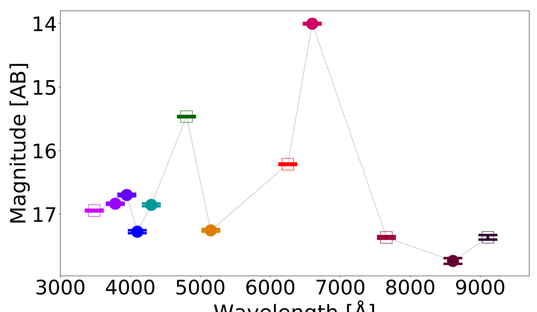
PNe in the Magellanic Clouds

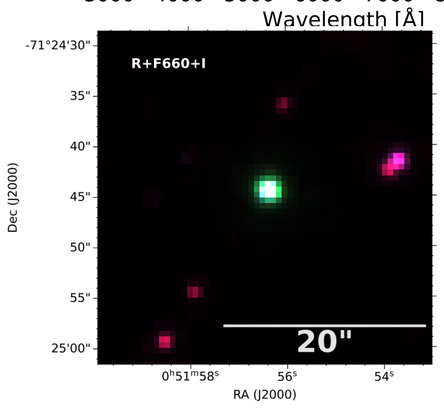


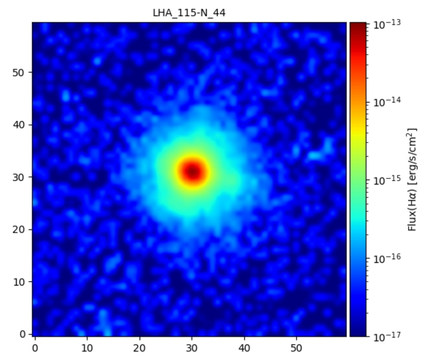
Distribution of the PNe (green circles) of Magellanic clouds. The big gray squares represent the area observed by S-PLUS in this region of the sky.

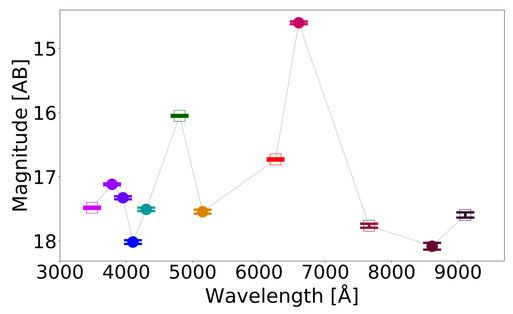
Extracting Hα flux from photometric data

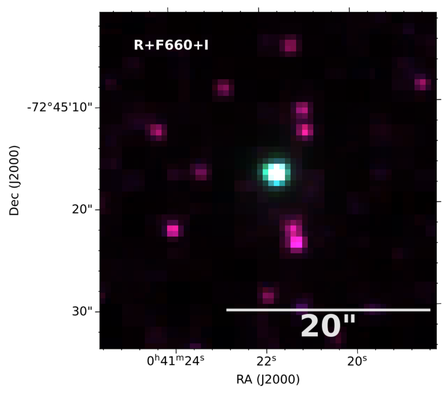
The Hα flux for the MC PNe observed by S-PLUS were extrated using the two broad-band and one narrow -band filters (r, i and J0660)

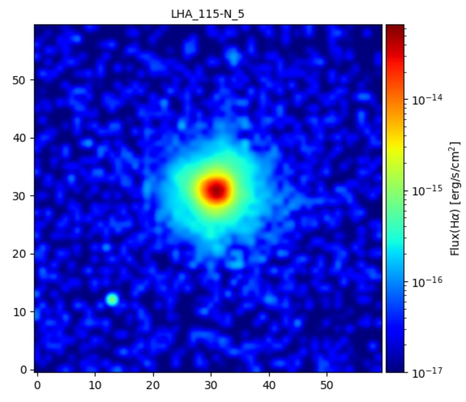












References

Mendes de Oliveira C. et al., 2019, MNRAS, 489, 241
Vilella-Rojo, G. et al. 2015, A&A, 580, A47

gsotoangel@fcaglp.unlp.edu.ar