ORAL CONTRIBUTION

DISCOVERING SYMBIOTIC STARS: APPLICATION OF AN INNOVATIVE, EFFICIENT IMAGING TECHNIQUE

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Symbiotic systems (SySt) are interacting binary stars consisting of, in most cases, a hot white dwarf accreting from a red giant. They are among the contenders for Type Ia SN progenitors. Confirming this requires a census of symbiotics to unveil the relation between the SN rate in a given galaxy and the number of symbiotics at present-time.

SySt share similar characteristics with other celestial objects –like planetary nebulae (PNe), T-Tauri stars, compact H II regions, B[e] stars, among others– leading to misleading classifications. The usual method to search for SySt –based on combinations of colour-colour diagrams, like used by the IPHAS project researchers–, is able to find SySt candidates, but a robust classification can only be achieved by costly spectroscopic follow-up. Spectroscopic analysis of recent Hα surveys in nearby galaxies found several SySt, a great number of them containing the optical emission lines, which primarily appear in symbiotic spectra: the O IV scattered Raman lines located at 6825Å and 7082Å. We have started a systematic survey of SySt in the Small Magellanic Cloud (SMC) via the detection of the O IV λ6825 line.

In 2015 a 34×14arcmin^2 crowded area of the SMC was imaged using FORS2 at the VLT. The number of candidates we expected to identify in this area was 3. However, the technique turned out to be very efficient and 12 bona fide SySt were found, with very strong Raman emission. Note that the presence of the Raman scattering lines is an almost clear-cut proof of the presence of a symbiotic star, as it was detected in only an handful of non-symbiotic objects, such as young PNe and one B[e] star. Moreover, by using the 2MASS colour-colour diagram J-H vs H-Ks (known to be an important discriminator of SySt in the Galactic disk) we found out that our SySt candidates are crowded with the known SySt of the SMC, therefore showing their high probability of actually being symbiotic systems. This thus indicates that our method is very powerful and usable.

In this contribution the above new method of finding SySt, and the first results of our systematic search for them in the SMC will be discussed.

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