

Alessandro Ederoclite

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TÍTULO:

PROPIEDADES DE NOVAS GALÁCTICAS Y EXTRAGALÁCTICAS
PROPERTIES OF GALACTIC AND EXTRA-GALACTIC NOVAE

Trabajo dirigido por:

Paolo A. Mazzali, INAF–Observatorio Astronómico de Trieste (Italia)/ Max–Planck–Institute for Astrophysics – Garching; (Alemania)

Francesca Matteucci, Departamento de Astronomía de la Universidad de Trieste (Italia)

RESUMEN/ABSTRACT:

Classical novae are thought to be the result of the nuclear reactions on the surface of a white dwarf accreting mass from a secondary companion that was filling its Roche lobe in a close binary system. Classical novae contribute significantly to the pollution of the interstellar medium, and it is therefore important to study both the number of novae occurring in different types of galaxies and the properties of individual objects.

It has been proposed by various authors that there is a relation between the number of novae occurring in a galaxy in a year (the nova rate) and the infra-red luminosity (therefore the mass) of the galaxy. Another much debated relation is that between the normalized nova rate (the nova rate divided by the infra-red luminosity of the host galaxy) and the colour of the galaxy (and therefore the morphology). To investigate these relations we measured the nova rate in six spiral galaxies that have been observed for other purposes with the Hubble Space Telescope, and we observed two elliptical galaxies in the Virgo cluster with the ESO Very Large Telescope on Cerro Paranal (Chile).

The knowledge of the number of novae occurring in a galaxy is useless if properties of individual objects are unknown. We carried out observations of Nova Sgr 2004 during outburst and followed it up until the nebular phase. We give a detailed analysis of the dynamical and chemical properties of this object. A detailed photometric study of the old nova RR Pic (which underwent a classical nova outburst in 1925) is also given. We provided the best light curve ever obtained for this object thus showing that the supposed eclipse is shifted with respect to where it was expected and there are hints for a super-hump.

Finally, old novae can be recovered by their colours. We show here the recovery of four old novae from pure photometry. We also made an attempt to model the nova ejecta using a Monte Carlo code. This approach is of fundamental importance for the incoming attempts to observe spectroscopically novae in distant galaxies, thus when only the permitted phase is observable.

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CONTACTO: ale 'at' iac.es