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Super-Eddington accretion under the magnifier: the case of Ultraluminous X-ray sources

Ultraluminous X-ray sources (ULXs) are extremely bright, extragalactic, point-like X-ray sources with isotropic luminosities well in excess of $10^{39} \text{ erg s}^{-1}$. The vast majority of ULXs could be binary systems where a stellar mass black hole or a neutron star accretes matter at super-Eddington rates from the companion.

The number of confirmed ULXs is significantly increasing and now it counts more than a thousand of both persistent and transient sources. Regardless of the nature of the compact objects, ULXs show manifold properties at different energy bands and they currently represent a hot topic for the comprehension of physical processes related to supercritical accretion onto compact objects. Indeed, a number of pulsating ULXs were recently discovered, confirming the existence of neutron stars in such systems. This raises a strong challenge to the understanding of the accretion processes on compact objects.

In this talk, I will give an overview of the most recent discoveries on ULXs, from a multi-wavelength point of view that will comprise, amongst the others, the outflows from ULXs and the link with the nebulae/bubbles around many of them, the ULX main X-ray spectral properties and variability behaviours, and the features of the pulsating ULXs. Such observational results will be discussed within the context on the super-Eddington accretion processes observed in ULXs.

Contribution

Invited talk

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