



- RAY ASTRONOMY 2019

Current Challenges and New Frontiers in the Next Decade

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The SXPS catalogues: improved transient detection with Swift-XRT

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The study of transient phenomena has entered a new phase with the advent of multi-messenger astronomy, as we now routinely search large areas of sky for an electromagnetic counterpart to a neutrino or gravitational wave trigger. This presents various new challenges. We need to understand the probability of serendipitously observing an X-ray transient during such follow up. We also need fast, reliable techniques to search a large sky area for transients, with a low rate of spurious detections, and ideally with a high level of completeness. However, it is often not easy to distinguish a transient source from a persistent but uncatalogued object.

In this talk I will address these questions using the revised Swift-XRT Point Source catalogues. I will summarise new techniques developed for reducing spurious detections due to artifacts such as stray light – which is of particular importance for other missions, especially Athena. I will also introduce the forthcoming “Live” SXPS catalogue and transient detector. This system will offer near real-time analysis of XRT data, including a constantly-updated upper limit calculator, and a real-time transient search algorithm. I will briefly highlight the transferability of these algorithms to missions such as THESEUS and Athena.

Topic

Multi-messenger and transient astronomy

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