

The search for Quasi-Periodic Eruptions

Erwan QUINTIN, Natalie A. WEBB - Journées SF2A 2023

Quasi-Periodic Eruptions (QPEs) are the latest addition to the ever-growing family of extragalactic transients. The first QPE source was discovered in 2019, with a current total of four known sources (with two additional candidates). From an observational standpoint, they appear as repeated ~ 2 h-long bright bursts of thermal X-rays, with a regular quasi-periodic pattern between peaks in most of them (but not all). They appear to be linked to Tidal Disruption Events (TDEs, when an inbound star gets disrupted by the tidal forces of a Super-Massive Black Hole). Several models have been suggested, trying to account for the complex observed behaviour of these puzzling objects, but they all fall short in some aspects. Understanding these peculiar objects might help us constrain the physics of super-Eddington accretion (that happens in both TDEs and QPEs), and thus the growth of Super-Massive Black Holes.

In this presentation, I will summarize the current state of the art of the study of QPEs, and its most recent developments. I will present a new QPE candidate, Tormund, that was found as part of a larger endeavour that aimed at data-mining the current and past multi-instrument X-ray archives to unearth yet-undetected transient events. Finally, I will conclude with the future prospects of the search and study of QPEs and transient events in general.