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Title: Almost Regular, Always Surprising: The State of QPE Research

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Abstract: Quasi-Periodic Eruptions (QPEs) are among the latest members of the ever-growing family of extragalactic transient events. First identified in 2019, they are characterized by extreme bursts of thermal X-rays, lasting a few hours and repeating quasi-periodically, reaching AGN-like luminosity at their peak. The current sample consists of only 13 sources, and shows a puzzling correlation with the seemingly independent Tidal Disruption Events (TDEs). The nature of QPEs is still a mystery, although the currently favored model invokes an Extreme-Mass Ratio Inspiral (EMRI) in which a low-mass object orbits around a massive black hole, and then collides with the newly formed accretion disk of an independent TDE. If confirmed, QPEs would represent the first (and possibly only) electromagnetic counterpart to EMRIs, a key source of gravitational waves for LISA.

In this talk, I will review the current state of this rapidly developing field, including recent progress in constraining the existing models. I will also discuss observational challenges and prospects for QPEs in the post-NICER era, highlighting upcoming opportunities with SVOM and Einstein Probe, as well as future missions such as NewAthena and LISA