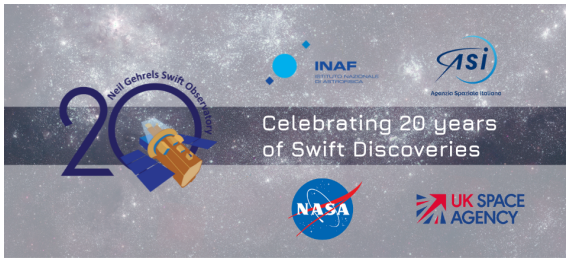

Contribution ID: **135** Type: **Poster**

Swift and multi-wavelength monitoring of the early rise of the black hole X-ray binary, Swift J1753.5-0127

Tuesday 25 March 2025 14:29 (1 minute)

Despite decades of research, predicting outbursts of X-ray transients, and witnessing their beginning stages, remains very challenging. The cause of these X-ray brightenings is thought to be the sudden increase of accretion of matter onto a black hole or neutron star, initiated by the ionization of hydrogen in the accretion disc. I present recent observational advances in our understanding of how X-ray transients first brighten, focussing on the best case, optical and X-ray monitoring of the early rise of the black hole X-ray binary, Swift J1753.5-0127 in 2023. After an initial optical detection from ground-based telescopes, Swift is used to constrain the UV (with UVOT) and X-ray (with XRT) delay of the outburst rise. A delay of ~4 days is measured between a thermal instability developing in the accretion disc, causing heating fronts to begin propagating through the disc (seen by an optical brightening, then UV), and the onset of accretion onto the black hole (X-ray brightening). We witness the propagation of the heating wave, as a steady increase in the flux and surface area of the disc, and we constrain the disc viscosity. I demonstrate the ability of optical monitoring, along with rapid X-ray and UV follow-up with Swift, to be able to constrain disc instability models for X-ray transients.

Primary author: RUSSELL, Dave (New York University Abu Dhabi)

Presenter: RUSSELL, Dave (New York University Abu Dhabi)

Session Classification: Poster Session