Cyg X-1 and its friend in the Galactic center: What 20 yrs of monitoring taught us

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Abstract

We present an overview of two long-running INTEGRAL campaigns spanning most of the mission lifetime: the monitoring campaign of Cyg X-1, and that of the X-ray binary population in the Galactic Center region. The INTEGRAL monitoring provides unprecedented coverage of Cyg X-1, allowing us to trace the long-term spectral evolution. We expand on the previously published state definitions incorporating soft X-ray data from NICER monitoring to complement the hard X-ray information from INTEGRAL. We discuss these state-dependent spectral and timing properties in the context of recent polarimetry results and compare them with the behavior of the Galactic Center black hole binary population, specifically focusing on the search for hard spectral tails. We conclude by highlighting the discovery of exceptionally bright flaring activity from Cyg X-1 on minute timescales, reaching a 1–100 keV peak luminosity of 2.6×10ˆ38erg/s, a factor 20 above the persistent flux, sparking questions on the underlying physical mechanisms and connections to supermassive black holes.

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