



X-RAY ASTRONOMY 2019

Current Challenges and New Frontiers in the Next Decade

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X-ray/Optical Rapid Timing Correlations and the Resolving of Jet Base Activity in MAXI J1820+070

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Accreting LMXBs have long been known to emit relativistic jets from regions close to the compact object, but studying these regions is rendered difficult by the prohibitively short time scales associated with the inner jets, and the need to disentangle various compact emission components. In this talk, I will present some of the latest results in this field, where the new NICER instrument provides incredible coverage on last year's outburst of the BHB MAXI J1820+070, showing stunning sub-second variability. Combining with the optical instrument HiPERCAM/GTC, we have probed down to millisecond (optical) scales with unprecedented levels of clarity; a distinct lag in Optical/X-ray correlations of 170 milliseconds is seen in five different bands, with clear separation and differing levels of correlation dependant on wavelength, in accordance with expectations of MHD jet acceleration models. This work represents the highest quality data in the field to-date, greatly extending the work possible at the lower time resolutions of previous observations (such as GX 339-4 and V404 Cyg), and demonstrates the exciting potential of rapid coordinated multiwavelength timing.

Topic

Multi-messenger and transient astronomy

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