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Supporting the search for continuous-waves from low-mass X-ray binaries: PEGS

Electromagnetic onstraints on the orbital (and pulsation) parameters of low-mass X-ray binaries are crucial to facilitate sensitive searches for the continuous gravitational waves these systems are theorised to emit.

I will present recent results on behalf of the Precision Ephemerides for Gravitational-wave Searches project on Scorpius X-1 (Killestein et al., 2023), building on previous efforts (Galloway et al. 2014, Wang et al. 2018) and analysing over 20 years of high-resolution (WHT, VLT) spectroscopy of the system. A novel Bayesian framework for mitigation of systematics yields the most precise ephemeris for the system thus far. I will also update on the ongoing observational efforts (with the South African Large telescope) to further enhance the Sco X-1 ephemeris ready for analyses post-O4, alongside new efforts on other LMXBs.

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