

*Contributed Talk //*

X-ray and Gamma-Ray Binaries (XRBs)



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I will give an overview of three compact binary transients that were recently studied as part of the SAAO/SALT Transient Programme, which formed part of my MSc thesis research. SGRt 062340.2-265751, a previously unrecognized optically bright ( $V \sim 12$ ) novalike, and possible magnetic, cataclysmic variable, was detected by the eROSITA mission as an X-ray transient. Analysis on  $\sim 31$  h of time-resolved spectroscopy with the SAAO 1.9-m telescope, including a period analysis of the radial velocity measurements of the Balmer spectral lines, revealed a low amplitude modulation at 3.166 h, interpreted as the orbital period. A period analysis of  $\sim 56$  h of high-speed optical photometry, obtained with the SAAO 1-m telescopes, revealed a possible weak ( $\sim 2\%$ ) 24.905 min white dwarf spin period, plus the spin-orbital beat period. These results support the classification as an intermediate polar. Swift J1357.2-0933, a black hole low-mass X-ray binary candidate, has been observed to go into outburst in 2011, 2017, 2019 and 2021. Results are shown of time-resolved SALT spectroscopy of the 2019 and 2021 outbursts, where periodic Balmer and He II 4686 absorption appear, coincident with dips seen in the continuum flux. CXOU J1109-6502 is a transitional millisecond pulsar candidate, which formed part of a dedicated SALT campaign to spectroscopically observe the system nightly for just over a week. The observations revealed dramatic changes in the morphology of the H emission line, particularly its width, through the course of the observations. These are potentially attributed to changes in the accretion rate due to a strong pulsar wind.