

Fast optical photometry of Sco X-1 with SiFAP2@TNG

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Millisecond pulsars are ideal targets to probe the strong interaction at supranuclear densities and search for continuous gravitational wave sources. Either the rotation of their magnetic field or the infall of matter lost by a companion star is assumed to power their electromagnetic emission. Recently, we exploited the fast optical photometer SiFAP2 at 3.6m INAF's Telescopio Nazionale Galileo to discover optical pulsations from two millisecond pulsars surrounded by an accretion disk. Thanks to the much higher photon counting statistics of an optical telescope compared to high energy instruments, this has opened the intriguing possibility of searching for weak pulsed signals from accreting neutron stars at an unprecedented sensitivity. Being the best candidates for a continuous gravitational wave detection, the brightest accreting neutron stars (e.g., Sco X-1 and Cyg X-2) are the prime targets. I will discuss the properties of the optical millisecond pulsars discovered so far, the first preliminary results of an optical pulsation search from Sco X-1 as well as prospects for the near and mid-term future.

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