

Proposal for external collaboratorship by Gloria Sala

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Nova outbursts are explosive events resulting from a thermonuclear runaway in the H-rich envelope of an accreting white dwarf (cataclysmic variable, or symbiotic systems). Since the white dwarf is not disrupted by the event, accretion is resumed some time after the outburst and the rebuilding of the H-rich envelope on the white dwarf leads to a new nova explosion at some point. Recurrence times range from 1 year to 10000 years. Up to 2018, more than 900 nova outburst have been recorded and catalogued.

Nova events are in general discovered in the optical and followed in almost all wavelength of the electromagnetic spectrum. X-ray emission arises during the outburst from shocks in the ejected shell, and a bright supersoft source is in many cases present during weeks or months after the outburst, powered by the H-rich burning white dwarf envelope. Most observing campaigns stop following the novae after H exhaustion and turn-off of the supersoft source. However, the system may remain or reappear as an X-ray source powered by the accretion in the cataclysmic variable system. A few systems were detected by ROSAT during the RASS, and some close by systems are well studied, but in general little is known about the accreting system that has hosted each nova event. The eROSITA survey provides a great opportunity to check on the state of all systems that hosted a nova explosion. I propose to build a catalogue with all old nova events recorded to systematically check on the status of old nova systems and look for correlations between the accretion state in the CV and the properties of the nova outbursts.

- potential collaborators:

Frank Haberl, Axel Schwöpe, Vadim Burwitz, Hauke Worpel

- possible/expected outcome in terms of publications, catalogs, resources...

At least one publication per year of survey is expected with the correlations of accreting CVs detected with the old nova event; a final catalogue of novae hosting systems at the end of the survey.

In addition, novae in outburst will for sure be serendipitously observed during the survey. With a SSS phase lasting for month and the cadence of eROSITA sky survey, I would expect at least one or two to be detected per year. Being bright supersoft sources, even the short visits during the survey will provide us the spectral evolution. I would be interested in contributing also to the analysis of those cases, and for sure, in addition to the outcome of the old nova survey, publications on novae observed in outburst during the survey are to be expected.