

The Swift Nova-CV group has an ongoing mission to explore strange new worlds follow bright novae, particularly when they enter the super-soft X-ray state (that is, when surface nuclear burning becomes visible). We present a sample of such novae and compare and contrast their X-ray and UV light-curves.

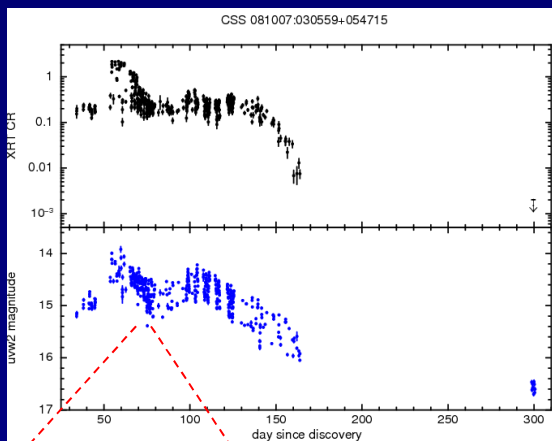
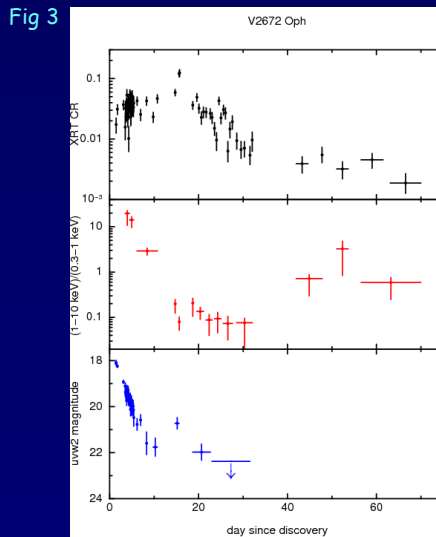
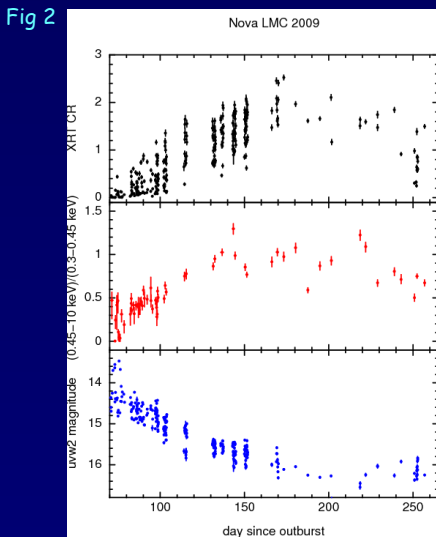
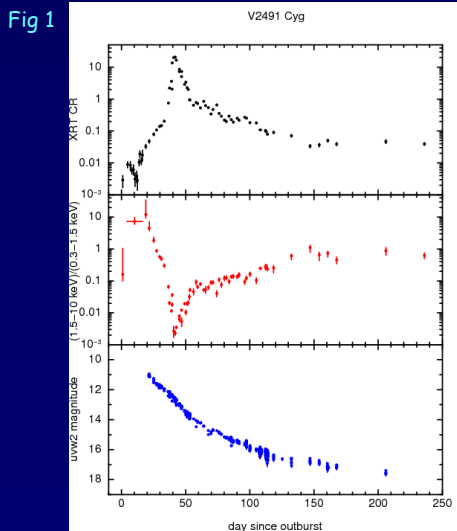


Fig 4

Fig. 4 demonstrates that CSS 081007 has always been a soft source in the X-ray band, with little hardness variation despite the large changes in count rate.

The X-ray and UV data collected for CSS 081007 both show a  $\sim 1.77$  day period and are correlated with each other.

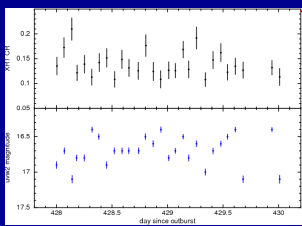
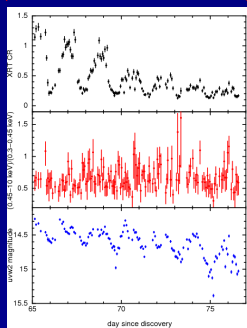


Fig 6

The figures on this poster show examples of the high-quality, detailed datasets Swift has been collecting on a range of novae. The X-ray count-rate, hardness ratio and UV magnitude can all vary dramatically with time.

Most novae are initially detected as a hard X-ray source, with the emission arising from shocks within the ejecta. As the ejected material expands, it becomes optically thin and surface nuclear burning becomes visible as soft X-ray emission - the Super-Soft Source (SSS) phase.

V458 Vul (Fig. 5) shows the X-ray and UV emission to be roughly anti-correlated, which could be due to an effective temperature change at constant bolometric luminosity.

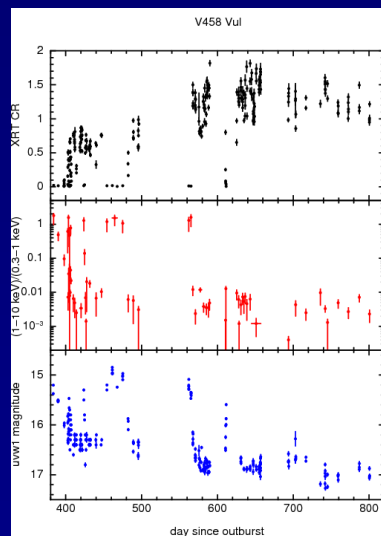
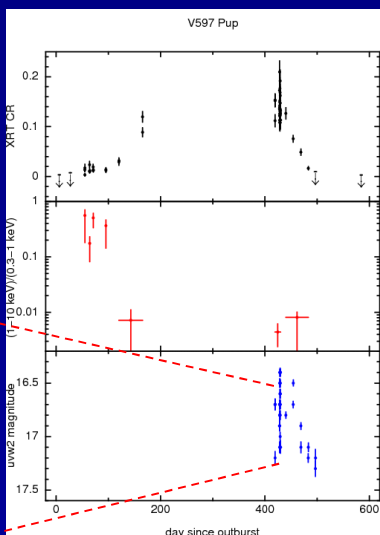


Fig 5



### Results

Swift has observed more than 40 novae at the request of the Nova-CV group; of these, at least 15 have been observed as a SSS. It has been found that novae behave in a variety of ways: the hardness of the X-ray emission is sometimes, though not always, inversely correlated with the count rate, while the X-ray and UV bands have been seen to vary in phase, anti-phase and completely independently. The duration of the SSS phase differs greatly between novae and the X-rays can be highly variable throughout. Occasionally, periodic oscillations (such as in Nova LMC 2009 and CSS 081007) are detected - over the X-ray and/or UV bands. The quest to understand novae continues!



The X-ray source is clearly softer when brighter for V2491 Cyg, V458 Vul and V597 Pup (Figs. 1,5&6), but Nova LMC 2009 (Fig. 2) gradually hardened over time, while V2672 Oph (Fig. 3) softened as it became brighter, then stayed soft as the rate decreased, before finally re-hardening.