

Variable Star of the Year R CrB

Corona Borealis is one of the more distinctive constellations, as well as one of the smallest, being listed as 73 out of 88 in terms of size covering just 179 degrees of the sky. It is surprising therefore, to find two of the most famous variable stars in the sky within its small borders. T CrB is the brightest of the known recurrent novae and R CrB is the prototype of the "novae in reverse" category of variable stars.

R CrB was identified as early as 1795 by E Piggott, who observed a small recovery and fade in the very same year in which he discovered the variability of R Sct ("Variable Star of the Year" in the 1996 Handbook).

R CrB normally shines at magnitude 6, and it is usually the brightest star within the main circlet of Corona Borealis. At unpredictable intervals however, it can fade in brightness by anything between 0.5 to 9 magnitudes. The fades can be short, lasting just a few weeks, or sometimes much longer, extending for several years. The deeper minima are often characterised by partial recoveries that do not quite reach normal maximum light. To illustrate the extreme irregularity of the star there was a deep fade that lasted 10 years from 1863 whereas in the period 1925 to 1934 the star was effectively constant at maximum.

This class of variable (type RCB) consist of very luminous, hydrogen poor, carbon rich stars, which are normally of spectral class F to G. It is believed that the fades may be caused by the ejection of a cloud of hot carbon material, that obscures the light from the star. Some RCB stars also exhibit secondary quasi-periodic pulsations of a few tenths of a magnitude that can just about be detected visually in R CrB itself, when it is at maximum brightness. Although R CrB itself is a famous and well observed star, the RCB variable star class is very small and there is still much to be learned to fully understand their behavior.

Small binoculars are ideal for observing R CrB when it is at, or near, maximum, and for checking for fades. However, a 20 – 25cm telescope is necessary when deep fades occur, as the star may dip below magnitude 14. Observations should be made on every clear night, but the observer should take care not to be biased by the previous night's observation, as the fades can be very sudden. If R CrB appears to fade below comparison star E on the chart opposite, an alert should go out to the Director of the Variable Star Section. When a fade does occur it is never certain how faint the star will go, or for how long it will remain faint, before it returns to maximum.

