

Variable Star of the Year RS Ophiuchi

RS Oph is the second brightest member of a rare class of cataclysmic variable star known as recurrent novae (Nr). These stars are novae where more than one outburst has been observed and appear to be intermediate in class between the classical novae (single major outburst) and dwarf novae (frequent minor outbursts). RS Oph is an interacting binary star system with a particularly long orbital period of 460 days. The binary components consist of a blue/white dwarf and a red giant secondary. There have been several theories proposed on the outburst mechanism but nothing so far has proved to be conclusive. This makes the next outburst an important target for the sensitive multi-wavelength measuring devices that were not available for use during the previous outbursts.

Outbursts in RS Oph have been seen in 1933, 1958, 1967 & 1985. Another outburst in 1898 went unseen but was recorded on photographic plates at Harvard. The outbursts have peaked between magnitudes 4.3 and 5.1 thus making it very briefly a naked eye object. The only other recurrent nova that can exceed this brightness level is T CrB. The outbursts are brief and the star is normally back at minimum light within three months following a smooth and steady decline.

When at minimum the star oscillates irregularly between magnitudes 10.0 & 12.5 and a 20cm telescope is sufficient to monitor it even in bright moonlight. It tends to be more active at the brighter end of this range prior to an outburst and deep minima are usually recorded immediately after an outburst. If the observer sees RS Oph brighter than comparison star N at magnitude 9.8 an alert should be immediately sent out as the 7 magnitude rise to outburst can be fully accomplished within just two days.

RS Oph lies just 3 degrees north preceding the 3rd magnitude star Nu Oph that in turn lies directly 10 degrees south of the prominent V shaped asterism formed by the 4th magnitude stars 66, 67, 68 & 70 Oph. Although it has a southern declination RS Oph is 17 degrees north of the ecliptic and can be seen to advantage in northern temperate latitudes. In fact the last two outbursts were first detected from the northerly latitudes of Germany and Canada respectively. From the UK it is invisible only for a month from early December to early January. In spite of the adverse weather conditions keen UK observers have been able to report observations in excess of 100 nights in single years. It has now been 20 years since the last outburst and the next one is due at any time. It is likely that an amateur observer will first detect it and give early warning to professional astronomers who in turn will hopefully finally resolve the puzzle of the outburst mechanism.

RS Oph

