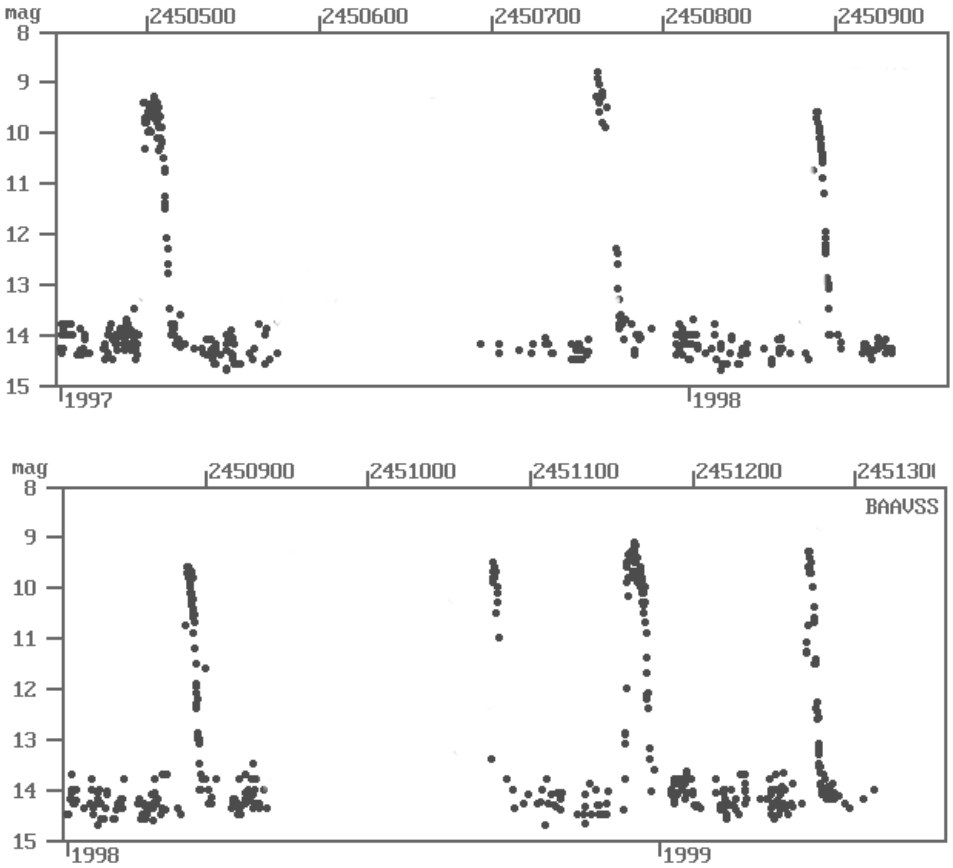
Variable Star of the Year
U Geminorum

U Geminorum was the first known Dwarf Nova. Discovered in 1855, it is the prototype of this important class of eruptive variable star. Dwarf Novae are close interacting binary systems that usually consist of a white dwarf and a cool main sequence star. Matter from the cool star is transferred into an unstable accretion disk around the white dwarf. It is this instability in the disk that is the direct cause of the observed outbursts. If the disk brightens from the outside inwards, this corresponds to an asymmetrical outburst in the light curve (rapid rise, slower decline). If the inside of the disk produces the outburst, this is manifested as a symmetrical outburst. These outbursts are very dramatic and several can be seen on the light curve illustrated here. The orbital inclination of the U Gem system is such that eclipses can be seen when the star is at minimum, and on rare occasions some observers have suspected flickering (rapid variations on a timescale of a few minutes).



Light Curve 1998-1998

Visually, U Gem is normally around magnitude +14.0 to 14.5 at minimum, but when in eclipse the star can drop below magnitude 15.0 rendering it visible in only medium to large telescopes. Details of when eclipses of U Gem occur can be found on the VSS web pages. The outbursts occur on average every 100 days but the time between them has been seen to fluctuate between extremes of 33 and 256 days. When in

outburst the star often peaks at around magnitude 9.0 and can then be glimpsed even with binoculars. This level of brightness can only be exceeded by two other dwarf novae, namely SS Cyg and VW Hyi.

Two distinct types of outbursts are normally observed, and are termed “longs” and “shorts”, lasting on average 16 and 10 days respectively. “Longs” and “Shorts” normally alternate but 7 successive “longs” and 4 successive “shorts” were observed during the period 1928-1979. Then in 1985 an outburst lasting 42 days occurred which was twice as extended as the longest “long” on record. This was followed by the shortest “short” on record lasting just 6 days. There then followed two more successive “shorts” (unless a “long” was missed during the Summer of 1986) which completed a unique spell of activity for this star.

The rise to maximum is usually at a rate in excess of 3 magnitudes per day and is often fully accomplished within 30 hours. Anyone who catches U Gem rising should make further observations during the remaining hours of darkness as a rise of a magnitude can be seen within just 6 hours. Because it is an ecliptic star, U Gem cannot be observed from early June to late August and also for a few days each month when the Moon passes through Gemini and Cancer. But for the rest of the time it should be looked at on every clear night and it will be only a matter of time before the observer is rewarded with a spectacular outburst.