British Astronomical Association

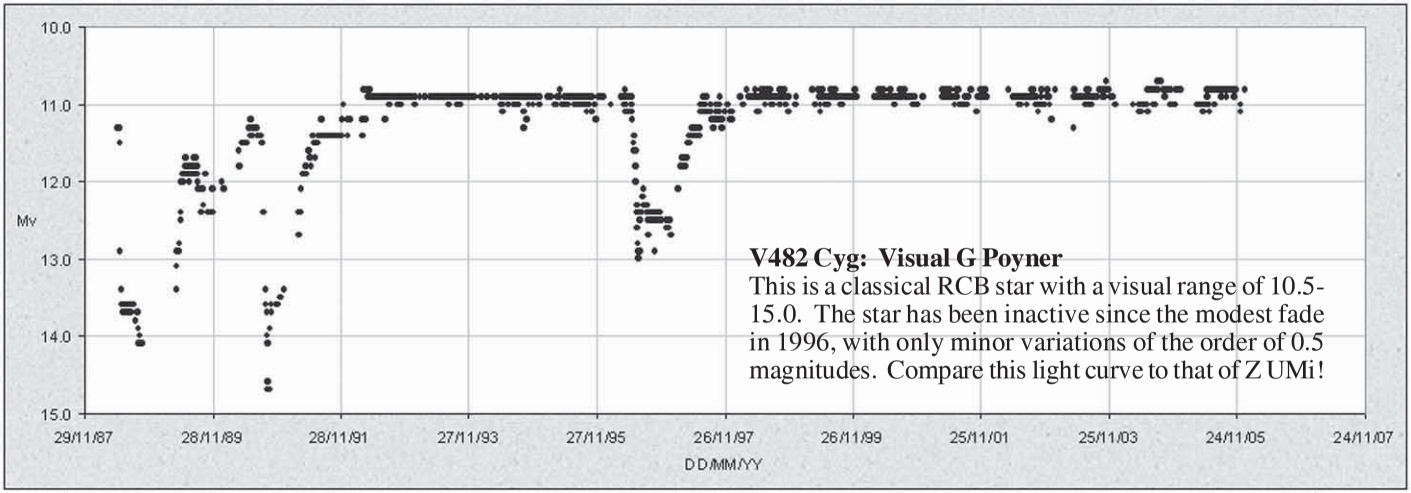
VARIABLE STAR SECTION CIRCULAR

No 129, September 2006

Contents

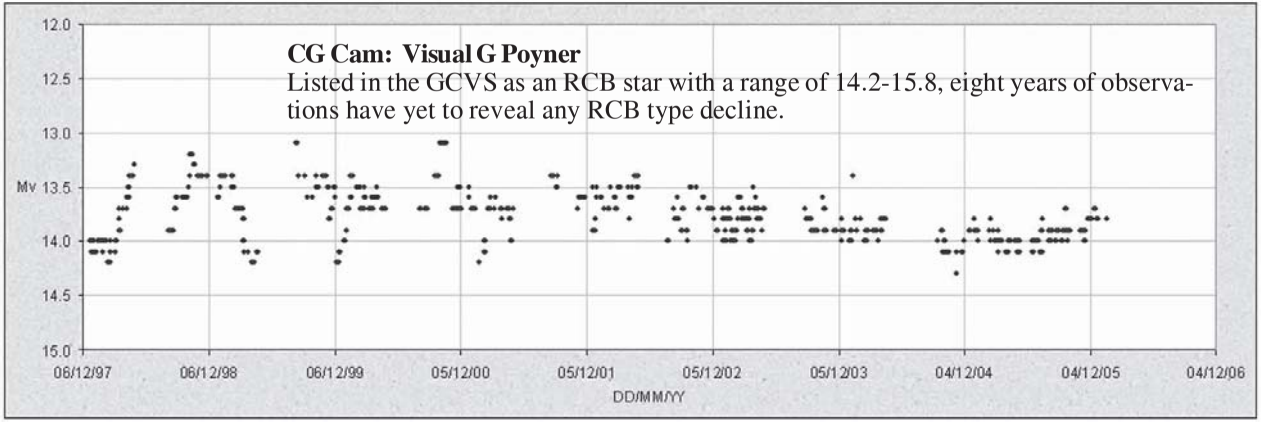
ISSN 0267-9272

Office: Burlington House, Piccadilly, London, W1J 0DU



V482 Cyg: Visual G Poyner

This is a classical RCB star with a visual range of 10.5-15.0. The star has been inactive since the modest fade in 1996, with only minor variations of the order of 0.5 magnitudes. Compare this light curve to that of Z UMi!



CG Cam: Visual G Poyner

Listed in the GCVS as an RCB star with a range of 14.2-15.8, eight years of observations have yet to reveal any RCB type decline.

FROM THE DIRECTOR

ROGER PICKARD

New e-address

I shall be obliged if members would note my new email address of rdp@astronomy.freeserve.co.uk. This change has been forced on me due to continual problems with the University of Kent email system.

New Eclipsing Binary Secretary

I'm very pleased to advise, that following the appeal in the last Circular, Des Loughney has agreed to be our new Eclipsing Binary Secretary. All correspondence relating to these interesting stars should be directed to Des, whose details will now be found on the back page. I'm sure Des will be familiar to most members as he has contributed a number of articles to the Circulars, especially in more recent times. We wish Des every success in his new role.

New Assistant Circulars Editor

I'm also pleased to advise that Janet Simpson has taken on the role of Assistant Circulars Editor. Janet will provide assistance to Karen, but contributors should continue to contact the Circulars Editor in the normal way.

New Mentoring Scheme Administrator

Karen Holland has asked if I might find someone else to administer the VS mentoring scheme that she set up several years ago. I have agreed to take on this role myself, and if anyone therefore feels that they would benefit by being allocated a mentor, for visual, CCD or analytical work, please contact me for more information. Thanks to Karen for setting-up, and running the scheme over the years.

New CCD Target List Co-ordinnator

Karen has also asked if I might find someone else to maintain the CCD target list that she initiated several years ago. I am happy to say that Jeremy Shears has agreed to take on this role, and he should now be contacted if you have any ideas or comments regarding this programme. Thanks, once again, to Karen for setting up and administering this programme for the last few years.

Reversed Charts

Thanks to Gary Poyner and Janet Simpson we can now offer the following reversed charts on-line:

Z Cam, T Crb, RZ Cas, Mira Cet, OJ+287 Cnc, NQ Gem, LS And, CH Cyg, BF Cyg, AG Peg

However, as John Toone has pointed out, observers do need to be careful when using telescopes on binocular stars (except where absolutely necessary) as it always introduces a step in the estimates.

Sequences

Again, following my appeal in the last Circular Ian Miller has updated a large number of the Section's sequences, which should allow John Saxton's software to run much more smoothly. There is still much work to do and John Toone and Ian will be working together to complete this task. My thanks to Ian for undertaking this work.

Scanning of Old Circulars

And yet again, following my appeal in the last Circular for help with the preparation of old Circulars for scanning, Peter Little has come forward and has already made a start. Thank you Peter. In connection with this, if anybody has a copy of Circulars 1-12, 14 and 54 that they no longer require, I shall be pleased to receive them.

Also, there is mention in past BAA Journals of Circulars pre-dating our own No.1 published on 1922 March 31. If anybody has any information regarding these I shall again be pleased to hear from them.

Open European Journal on Variable Stars

I'm sure most of you have heard if not used or submitted items to, the OEJV. Recently, there has been a change in editorial policy which means that the OEJV has changed from a non-refereed to a refereed journal. This means that they required an editorial panel and I'm pleased to advise that Gary Poyner has been appointed to that panel.

New Long Term Polar Monitoring Programme

Further to the article by Dr Boris Gaensicke of Warwick University on page 7 of this Circular, it has been decided to include ALL of the stars listed in a new observing programme ***Long Term Polar Monitoring***.

Although this will be heavily biased towards CCD observers there are a number of objects suitable for visual observers and Gary Poyner has offered the following notes:

BY Cam is a very active AM star in the mid 15's range. Hourly variations of up to 0.7 magnitude are observable at times, and low states (to 17th magnitude) are uncommon. Look out for flickering!
QQ Vul is fairly bright at 14.5 in the high state. Alert if you suspect the star is fading
ST LMi can sometimes be seen rising above 16th magnitude to occasional 'peaks' to the mid-15's, but these are short term events
AN and AR UMa are possible visual targets with the larger telescope in the mid 16's. **AN UMa** occasionally reaches 15.5
MR Ser can usually be seen in the mid 15's.

Gary Poyner has also offered to co-ordinate the programme and so any queries should initially be addressed to him.

Thanks again to Gary for preparing the following sequence information.

AAVSO charts already exist for the following stars:

Star	**Sequence**
BY Cam	Henden
ST LMi	Henden/Sumner
MR Ser	Henden/Price
QQ Vul	Henden/Price
AN UMa	Stanton
AR UMa	Tycho & Henden
EU UMa	Henden/Sumner

And Mike Simonsen has produced a chart for SDSSJ0155 Cet from a Henden sequence.

This means we will need charts and sequences for:-

RXJ1554.2+2721 CrB
V884 Her
GG Leo
DP Leo
V2301 Oph
V1309 Ori
1RXSJ161008+035222 Ser
AI Tri
SDSS J121209+013627 Vir

Dr Arne Henden has been approached and has offered assistance but it will take some time for suitable charts to be prepared. The Director has obtained data for three of these stars, but more may be necessary before a reliable sequence can be produced.

CCD images should still be taken of these stars as there is no reason why monitoring of the fields can't begin immediately. Photometry can always be reduced at a later date once a chart and sequence are available.

I do hope observers rise to this challenge and I strongly urge you to thoroughly read Boris's article - especially the final paragraph.

RECURRENT OBJECTS PROGRAMME NEWS

GARY POYNER

V337 Cyg

The first ever superoutburst of this object was observed during May 2006. V337 Cyg was first detected by Jeremy Shears on May 21.04UT at 15.8C, rising to 15.2C by May 22.15 before declining to 17.0C by June 3.187. The Bradford Robotic Telescope (BRT) CCD measures helped Shears and Poyner in monitoring the fade of V337 Cyg, as poor weather limited observing opportunities. David Boyd obtained a superhump period of 0.0702 +/- 0.0003d following a combined 13.1 hour times series run. Boyd also finally confirmed the postion of V337 Cyg as RA 19 59 52.93 +/- 0.10, Dec +39 13 59.94 +/- 0.10 (J2000). The position of V337 Cyg had been the topic of much debate in the past.

RZ Leo

A rare outburst of this suspected UGWZ star was detected on May 27.46 by Stephen Kerr (USA) at magnitude 12.5, the first detected outburst since December 20th 2000. G. Poyner, using the BRT, was able to follow the decline to June 11th when RZ Leo had faded to 15.83C. The field was then lost in the evening twilight sky. Ian Miller (Swansea) obtained a two hour unfiltered CCD run on May 30th resulting in the the light curve shown in Figure 1. A superhump profile can be clearly seen, but a curious peak on the ascending branch of the light curve still requires explanation. Extended time series observations were difficult due to the field being low in the western sky during the evening.

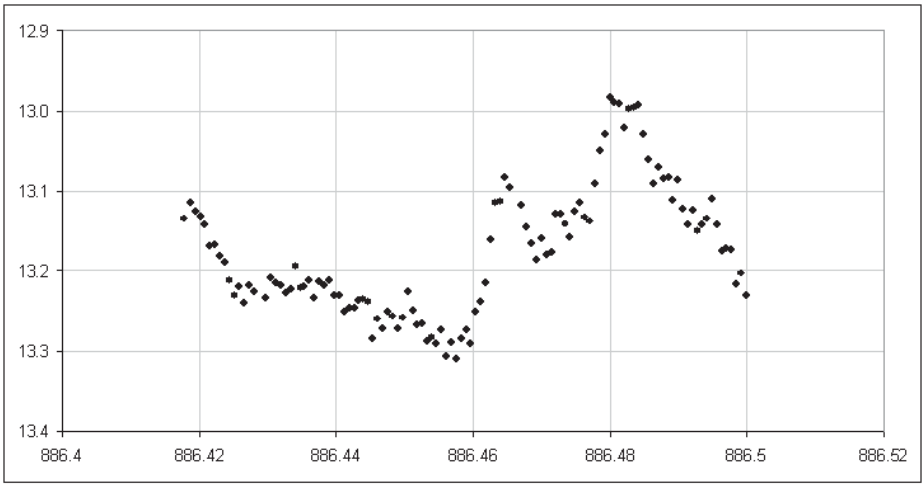


Figure 1: Light Curve of RZ Leo obtained by Ian Miller, unfiltered CCD

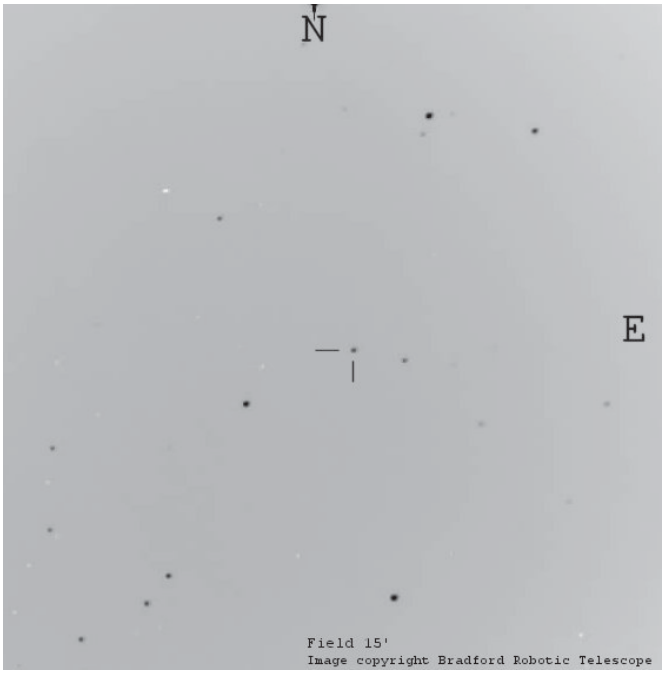


Figure 2: RZ Leo at magnitude 13.7C taken with the BRT on Jun 4.008UT. G. Poyner

V1316 Cyg

This enigmatic UG star was finally observed in superoutburst – the first to be detected. The outburst was detected by David Boyd on Jun 7.92 at 15.9C, peaked on June 9.91 at 14.94C, and by June 21 V1316 Cyg was back at quiescence at 17.1C. Time-series photometry by Boyd on June 9 running over 4 hours, revealed a superhump amplitude of 0.5 magnitudes, with a Psh of 0.0769d. A paper co-authored by Boyd, Shears and Poyner on unusual short period outbursts in V1316 Cyg has been accepted for publication in the BAAJ, and a preprint can be seen at http://arxiv.org/abs/astro-ph/0605284

Campaign to Observe V1316 Cyg

The authors of the aforementioned paper on V1316 Cyg would like to invite observers, both visual and CCD to take part in an observing campaign to monitor V1316 Cyg over the next few years. The aims are as follows:

- Are the brief outbursts we have observed in 2005-2006 still occurring, or were they precursor phenomenon to the most recent superoutburst?
- Do the brief outbursts continue as before unaltered, or will the cycle/amplitude be changed because of the superoutburst?
- Will V1316 Cyg undergo more superoutbursts, normal type outbursts or return to the brief outbursts?"

Historically V1316 Cyg was often misidentified in the field. There is a bright field star ('148' on the AAVSO chart and unmarked on the BAA chart) nearby, which is itself variable. Please make sure you are using the latest BAAVSS or AAVSO charts to observe this star.

Other noteable outbursts include the well-documented outburst of RS Oph in February, V589 Her in March and June, KV Dra in April, CP Dra in January and June, GO Com in March and June. BZ UMa once again entered outburst in June, just six months following the previous outburst in December 2005. Despite extensive CCD time series photometry undertaken by many observers worldwide, superhumps have still not shown themselves. BZ UMa remains an enigma.

Changes to the programme

Four stars have been dropped from the ROP with no additions during this review. These four stars will remain on the Telescopic Programme, and regular monitoring should continue. The stars dropped are:

GO Com

With two outbursts this year (see above) and eleven detected in total since 1995, this is now a well established UGSU star, with a measured superhump period of 0.06327d (VSNET). GO Com remains a most interesting star for further monitoring, especially those infrequent superoutbursts.

CP Dra

This confirmed UGSU star has a measured superhump period (0.08473d, Vanunster), and has been detected in outburst four times since January 2005 during Febuary and August 2005 and January and June 2006. In total seven outbursts have been detected since the star was added to the ROP in 2002.

V589 Her

The superhump period was measured in 2003 by T. Vanmunster as 0.0947d, which suggests that V589 Her is a period gap UGSU star. There have been two outbursts detected so far this year (see above), and ten since 1999.

BZ UMa

There have been twenty outbursts detected since 1991, with two this year. This is a high profile star with Pro-Am and various observing campaigns. Superoutbursts are still elusive (if in fact this is a UGSU star), with speculation that BZ UMa may well be an IP. Certainly nightly coverage should continue, but BZ UMa no longer meets ROP criteria.

Suggestions are always welcome for new additions to the ROP. Basically objects should be poorly studied, and have a recurrence period of greater than one year, although this is very often difficult to determine if the star hasn't been observed.

MAGNETIC CVS: THE KEY TO UNDERSTANDING STELLAR ACTIVITY IN THEIR DONOR STARS

Dr Boris Gaensicke

In 1924 M. Wolf published a short notice in Astronomische Nachrichten announcing the discovery of a new variable star in the constellation Hercules, which much later received the GCVS name AM Herculis. In the many decades that followed, AM Her remained a Sleeping Beauty. Only in the early days of X-ray astronomy, did AM Her again attract attention, as it turned out to be the optical counter part of the bright X-ray source 3U 1809+50 detected with the Uhuru satellite. Strong flickering observed both at optical and X-ray wavelengths led to the suggestion that AM Her is a cataclysmic variable (CV) of the U Geminorum type. A little later, the detection of linearly and circularly polarised light from AM Her (Tapia 1976, IAU Circ 2984, 2987, 2994) uncovered the so far unique nature of this star: a CV containing a strongly magnetised white dwarf. It is because of the strong polarisation found in AM Her and similar stars that they were dubbed "polars".

The vast majority of CVs are made up of a non-magnetic white dwarf and a main-sequence donor. The material lost from the donor forms an accretion disc around the white dwarf, slowly spiralling inwards, and it is these discs that are the source of the dwarf nova outbursts that attract a great deal of attention by visual observers. In polars, the strong magnetic field of the white dwarf, typically exceeding 1000 Tesla and reaching 20000 Tesla in AR UMa, results in a number of fundamental differences. Firstly, the magnetic field keeps the rotation of the white dwarf synchronised with the orbital period of the binary star. In other words, the same hemisphere of the white dwarf always faces the donor star (in dwarf novae, or the weakly intermediate polars, the period of the white dwarf rotation is much shorter than the orbital period). Secondly, the strong field suppresses the formation of an accretion disc. Instead, the material lost from the donor star locks on to the magnetic field lines, and impacts near the magnetic poles of the white dwarf (see Figure 1). It is in those impact regions that the accreting matter is heated to about 100 million degrees, and produces both the observed strong X-ray emission and the polarised optical and infrared light.

The absence of an accretion disc has a very important consequence: polars do not exhibit dwarf nova outbursts. However, they do exhibit long-term variability, typically with an amplitude of 2 to 3 magnitudes. The best-documented case of this variability is the prototype AM Herculis itself (see Figure 2). The light curve of AM Her shows that the system moves between low states (V=15) and high states (V=12.5-13), but can spend some amount of time at any intermediate level. The timescales on which the system switches from one state into the other varies dramatically, some transitions occur in a few days, i.e. the short high state near JD=2448900, and the short low state near JD=2449100, or gradually over months, as the decline from a high state to a low state at JD=2448400. The only possible explanation for this variability is that the mass transfer from the donor star undergoes large variations. In fact, during the low state, the mass transfer decreases to a trickle, or may even cease totally, and AM Her looks very much like a detached white dwarf plus a main sequence binary. The exact cause of these mass transfer variations are still unknown, but most likely they are due to stellar activity on the donor star, possibly the coming and going of star spots that temporarily

cover the inner Lagrange point, i.e. the point of the donor star that is closest to the white dwarf, and through which the donor loses material onto the white dwarf (e.g. Livio & Pringle 1994, ApJ 427, 956).

In non-magnetic CVs such as dwarf novae, and the high-mass transfer novalike variables, the donor stars are likely to undergo similar changes in stellar activity, modulating the rate at which material is dumped towards the white dwarf. However, in the non-magnetic systems, the accretion disc acts as a buffer, largely smoothing out any variation in the rate at which material is supplied to the disc. Only a few dwarf novae are known to exhibit "low states", i.e. phases where they are substantially fainter than their normal quiescent level, examples are HT Cas, and RX And. It is, however, likely that some of the variations in the outburst activity that we see in dwarf novae are related to changes in the mass transfer rate from the donor.

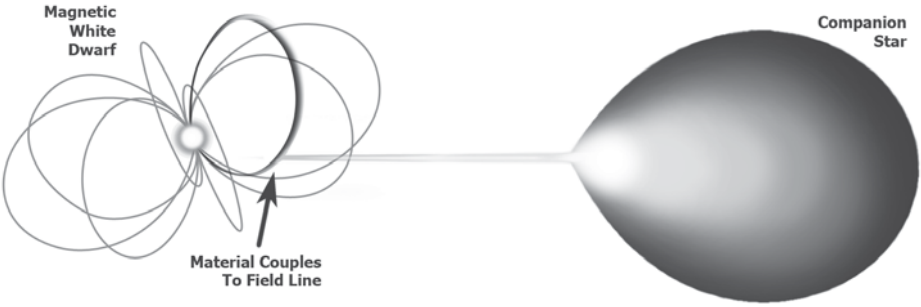


Figure 1, Diagram of a polar, showing how the material lost from the donor star locks on to the magnetic field lines, and impacts near the magnetic poles of the white dwarf. Thanks to Gavin Williams who produced this figure, and gave permission for it to be reproduced here.

As the hallmark of polars is strong X-ray emission, satellite missions such as ROSAT and EUVE have discovered a large number of new polars, with the total number of known AM Her stars being close to 100. As mentioned, the only polar with a well-documented optical light curve covering several decades is AM Her itself, for a simple reason: it is the only polar which even during the low state is visible to visual observers. For all other polars, knowledge of their long-term variability is very poor, but the little data that is available suggests that the systems display a huge variety of variability. Just to name two examples: EF Eri has been found during all pointed observations by ground or space-based observatories in a high state for nearly twenty years, until, in the mid-nineties, it plunged into a deep low state, in which it remained until early this year! QQ Vul, in contrast, has, to my knowledge, never been found in a deep low state where accretion activity dropped close to zero.

With the advent of sensitive and relatively cheap CCD cameras, a large number of observers are now in the position to detect a few dozen polars even in their low states. However, so far the interest in these stars has remained very feeble. It would be of great scientific interest if more CCD observers would add polars to their regular monitoring targets, so that within a few years high-quality light curves such as that of AM Her would be the norm, rather than the exception, for a substantial number of the known

polars. Only at that point would we have a chance to cast some light on the activity cycles of their donor stars, which is an important task for our general understanding not only of polars, but of CVs in general.

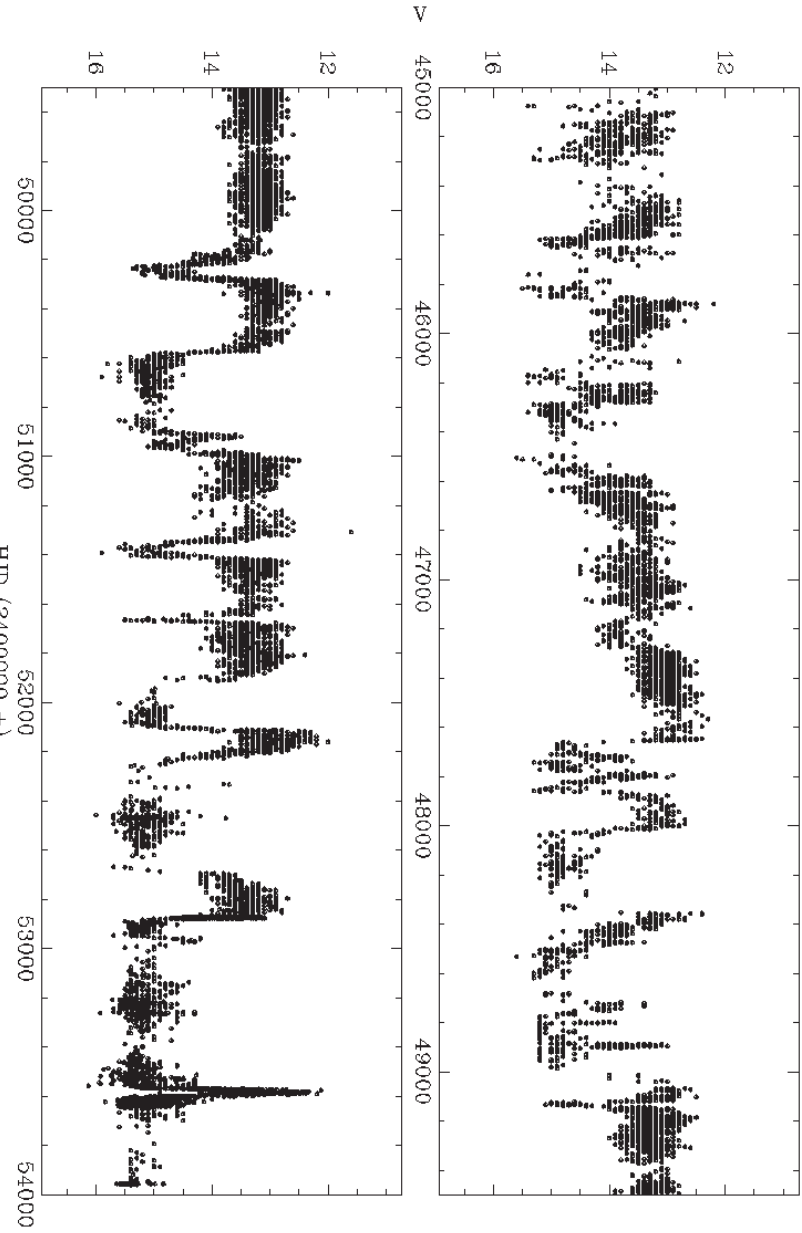


Figure 2: AM Her light curve - a compilation of AAVSO, AFOEV and VSNET data assembled by the author

AG DRACONIS

Melvyn Taylor

James Kaler in his book "The 100 Greatest Stars" described AG Dra as an "unusual erupting symbiotic". As a circumpolar variable for UK observers this binary was seen recently to be active, and during July 2006 it had an outburst. Raw light estimates of The Astronomer and VSS observers; Chris Allen, Len Brundle, Guy Hurst,Tony Markham, Gary Poyner and Jonathan Shanklin are shown in the light curve of this brightening (see Figure 1 below). The star rose from the start of July by about one magnitude to a mean value of 8.8 on 2006 July 25. Normally at minimum the star shows semi-periodic variations around visual magnitude 10.1 to 9.7 but it has been recorded in a very long active state for five years in 1981 to 1986 attaining magnitude 8.2.

The star is at RA 16h 02m Dec.N 66* 48' (2000) and has a catalogued period of 554 days; the VSS chart sequence number is 080.02, and a copy of the chart is shown opposite.

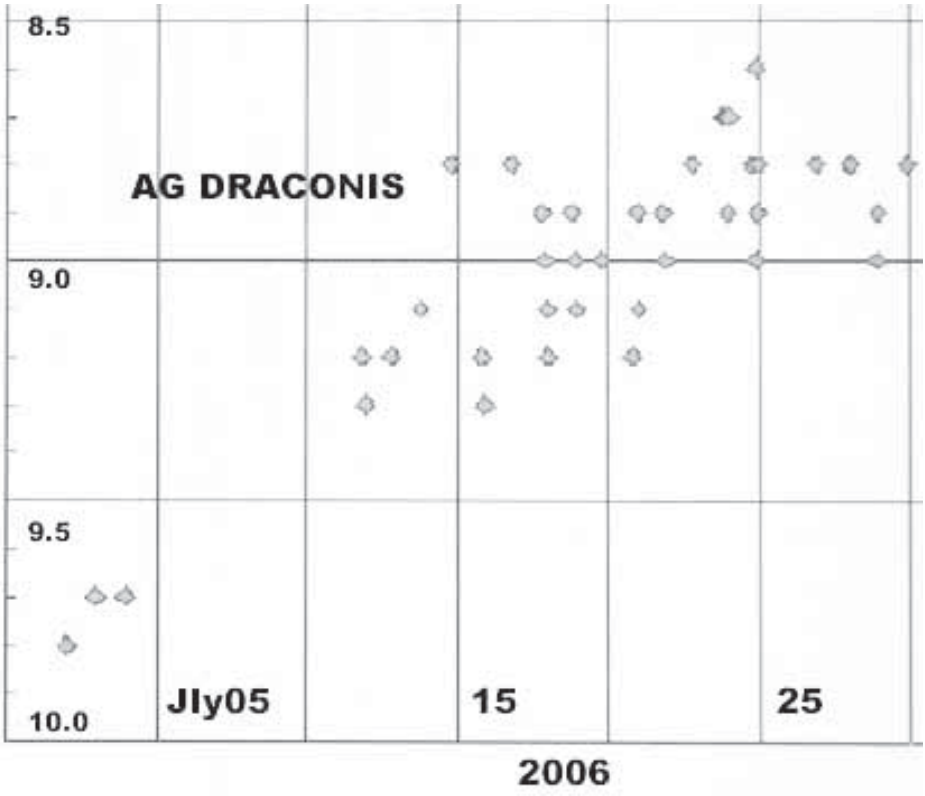
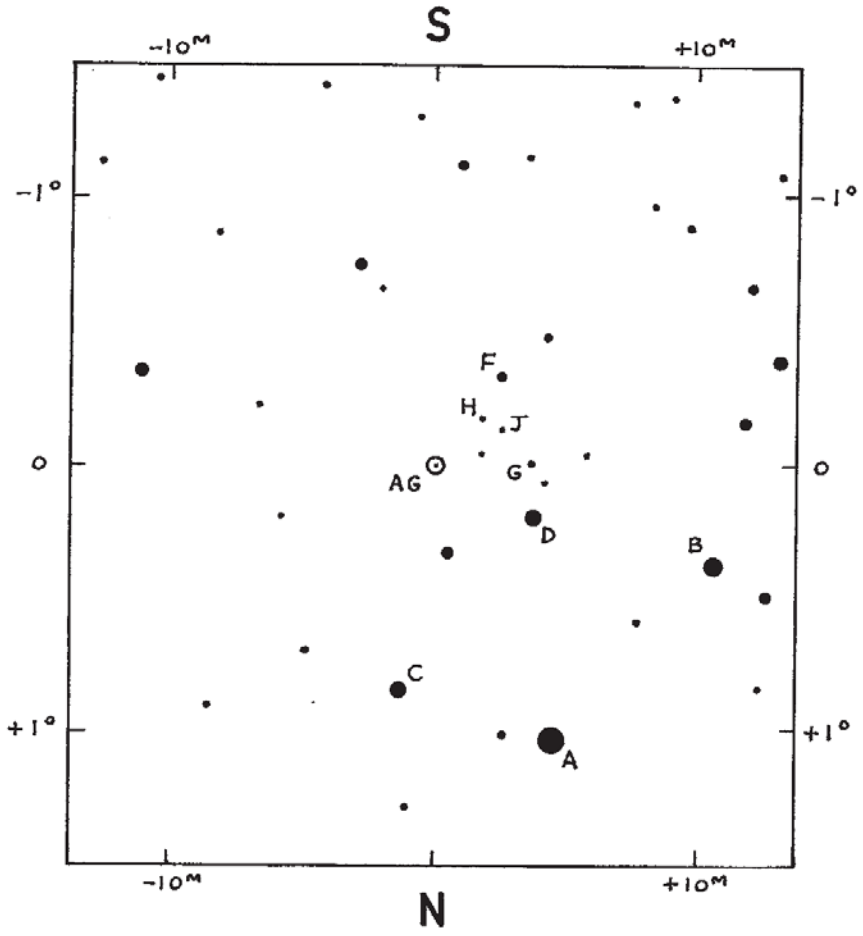


Figure 1: Observations of AG Draconis during 2005-2006

080·02 3° FIELD INVERTED

AG DRACONIS 16H 01M 41S +66° 48·2M (2000)



SEQUENCE: AAVSO
CHART: FROM GUIDE
VERSION 6·0

A	5·4	F	9·4
B	6·2	G	9·9
C	7·0	H	10·3
D	9·0	J	10·8

BAA VSS
EPOCH: 2000
DRAWN: JT 12-9-98
APPROVED: G. POYNER 15-9-98

V2362 CYGNI: A 2006 NOVA IN CYGNUS

GUY HURST

This nova was discovered by H. Nishimura of Japan and first recorded on 2006 April 2.807UT with a 200-mm telephoto lens on Kodak T-Max 400 film at magnitude 10.5. It is located at: RA 21h 11m 32s DEC +44°48'02" (equinox 2000.0). Richard Miles confirmed the object on April 4.995UT and obtained a V value of magnitude 8.5. K. Kinugasa, Gunma Astronomical Observatory, used a 1.5-m telescope around April 5.8UT to obtain a spectrum confirming it was a classical nova.

The chart in Figure 1 shows stars to about magnitude 14 and the sequence in the table is from V measures by Richard Miles and David Boyd

At the time of writing, the light curve (Figure 2) is based on the compilation of 97 estimates reported by observers from 'The Astronomer', BAA and also some V-measures by Japanese observers, primarily K. Nakajima and H. Maehara listed on the VSNET newsgroup. During the latest 50 days plotted, the decline has virtually stopped

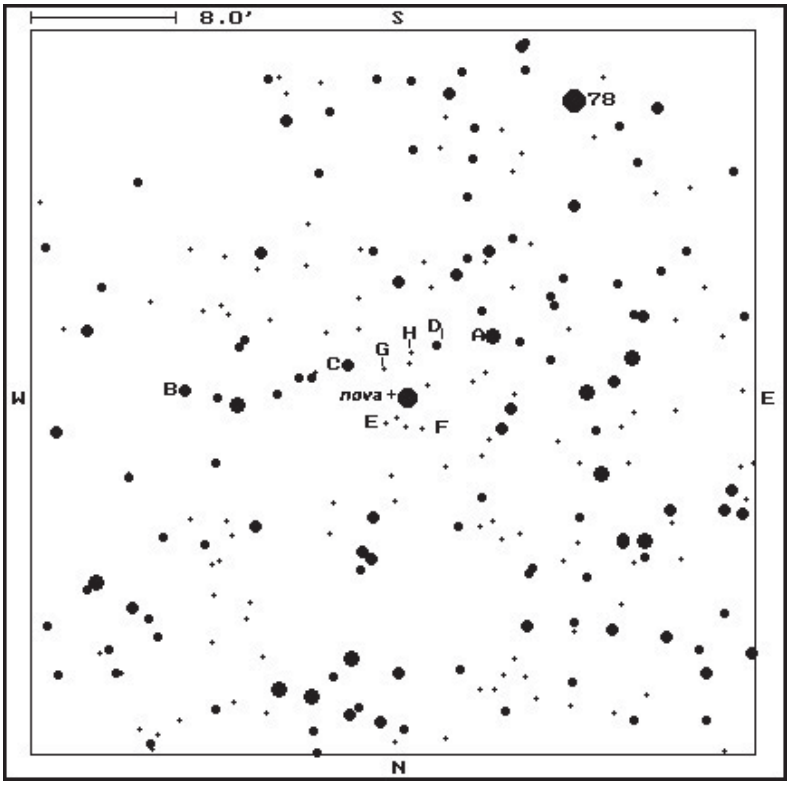


Figure 1: Sequence (V measures) of V2362 Cygni
A 10.15, B 10.90, C 11.27, D 11.63, E 12.51, F 12.79, G 12.91, H 13.13
BAAVSS reference for this sequence: N/051.01

near magnitude 12 so, coupled with Cygnus now being well placed, this presents an excellent opportunity for more people to monitor the next stage in this nova's activity.

A regularly-updated light curve is being maintained on the website of 'The Astronomer' to act as feedback to observers and can be found at: ***http://www.theastronomer.org/vars/2006/V2362CygLC.gif***

Please send monthly reports, preferably by e-mail, quoting dates, times, full estimate, magnitude, class and instrument, together with your full names to guy@tahq.demon.co.uk.

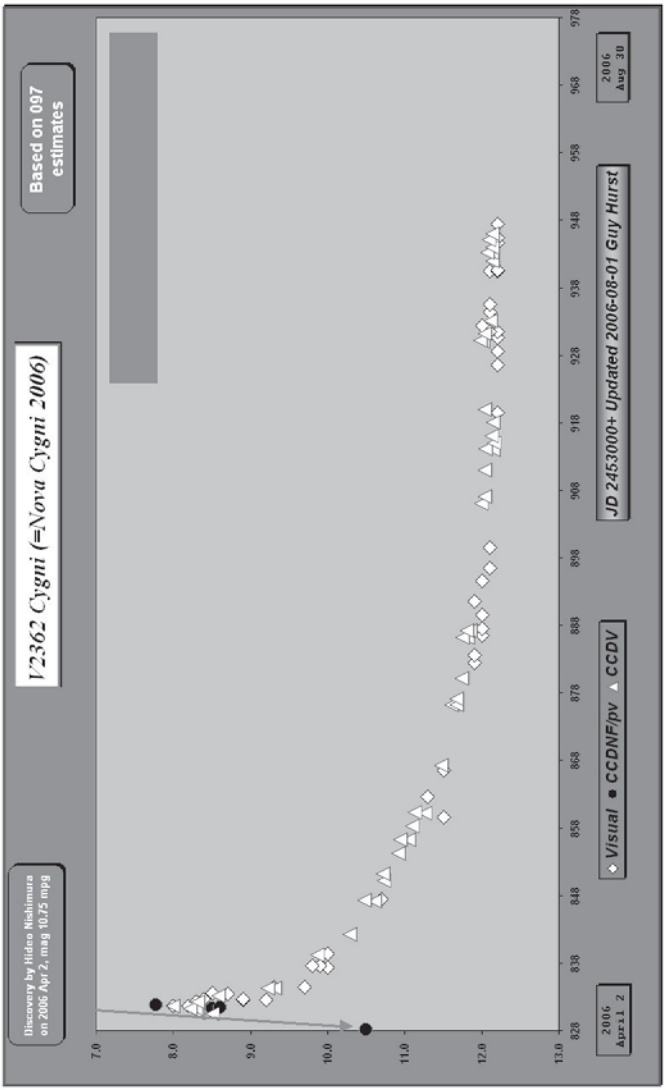


Figure 2: Current light curve based on 97 observations

THE PERIOD OF RZ CAS IN 2005/2006

Des Loughney, Janet Simpson, Melvyn Taylor

Introduction

RZ Cas is seen as an easy eclipsing binary for binoculars, having fairly deep eclipses which last just under five hours; it is also as a good practice object for visual observers [1]. The elements of the system are given within the 'Atlas of O-C Diagrams of Eclipsing Binary Stars' [2]. The standard period is stated as 1.1952498 days (1993) with the most recent determined period being 1.1952578 days (2002).

Fortuitous weather conditions allowed an unusually large number of eclipses to be observed within a sixth month period, which we report on in this article.

19 eclipses were observed between the 5th November 2005 and 4th May 2006 by D Loughney, J Simpson and M Taylor. Three separate observations were made of the eclipse on 2/3/06. Two estimations were made on 6/12/05 and 24/12/05. 19 estimations were made of the time of mid-eclipse. It is submitted that the slow rate of change of the period allows either the 19 midpoints to be considered as virtually simultaneous, or to be divided into two groups of 10 in 2005 and 9 in 2006. The observed times of mid eclipse were compared with the predicted times of mid-eclipse according to the elements stated in [2].

These observations suggest that the period has not increased significantly since 2002.

Observations

All observations, by experienced observers, were made with binoculars using the guidelines of the BAA Handbook [3] and the Webb Society Handbook [1]. Observations were made in Edinburgh (DL), Argyll (JS) and Wakefield (MT).

It is not possible to list here all the observations made during the 19 eclipses. However, the data is available, for those interested, from DL.

Figure 1 shows a plot of the observations made on 24/11/05. The horizontal axis is hours. On this date the light curve was symmetrical. This symmetry has been seen in professional photometric studies [4] and [5]. On these occasions the mid-point of the eclipse was fairly easy to estimate by the bisected chord method. On other occasions the light curves showed features which made it seem less symmetrical. An example is the light curve of 12th February 2006 (Figure 2). This asymmetry is referred to in the literature [5]. RZ Cas can have both partial and 'total' eclipses. The primary is a delta Scuti type pulsator [6]. There may be star spots on the secondary star and a hot spot on the accretion disc [7]. Star spots can cover a significant proportion of the surface of the cooler star in an Algol type binary such RZ Cas [10]. The brightness variations due to cool star spots can only be seen during primary eclipses when the hotter star is hidden. It is possible that the variations in the eclipse light curve of RZ Cas seen by observers may be due to star spots.

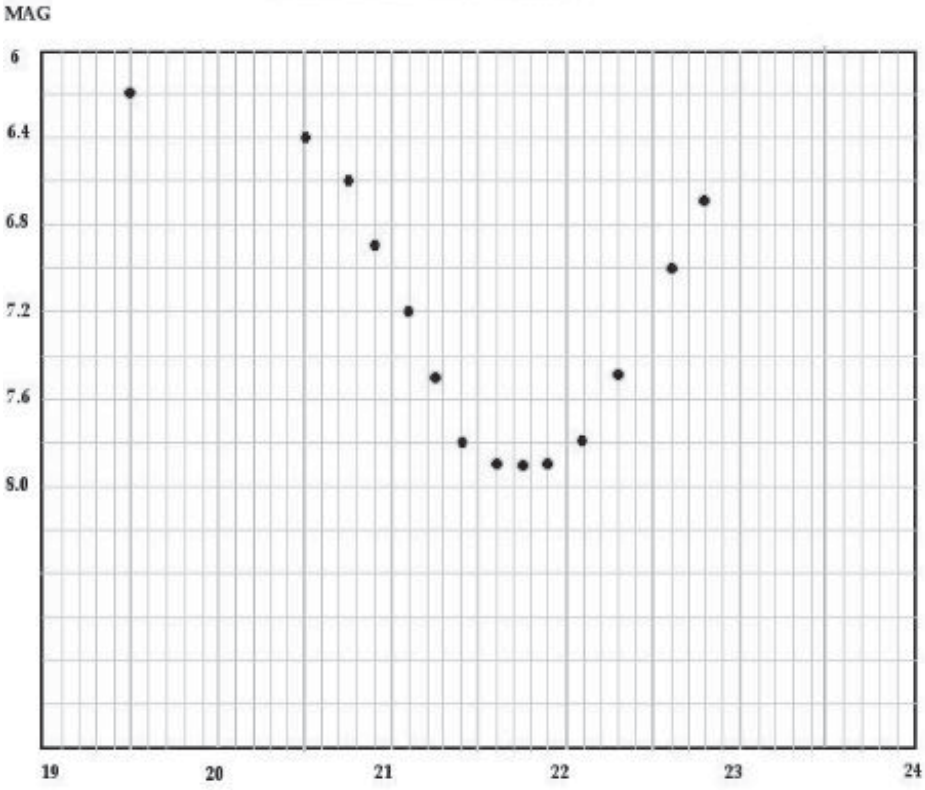


Figure 1: Observations of RZ Cas made on 24th November 2005

These features, when they are present, make it quite difficult to accurately estimate the time of mid eclipse.

The same eclipse was recorded by all three observers on 2nd March 2006 and two observers on 6/12/05 and 24/12/05. The estimated mid-points varied by six minutes and by one minute in the last two. It is suggested that this level of error is likely in all the 19 estimations. Nevertheless it is possible that many errors will not be systematic and will be minimised by the use of 19 estimations (and three observers).

Estimated mid-eclipses

Table 1 presents the results of the observations. Heliocentric Julian Dates were calculated using the web site: ***http://www.physics.sfasu.edu/astro/javascript/hjd.html.***

The column entitled KR1 (days) represents the difference between the predicted time of mid-eclipse according to the 1993 elements quoted in [2] and the observed time. The HJD of the element was subtracted from the HJD of the mid-eclipse. The product of this

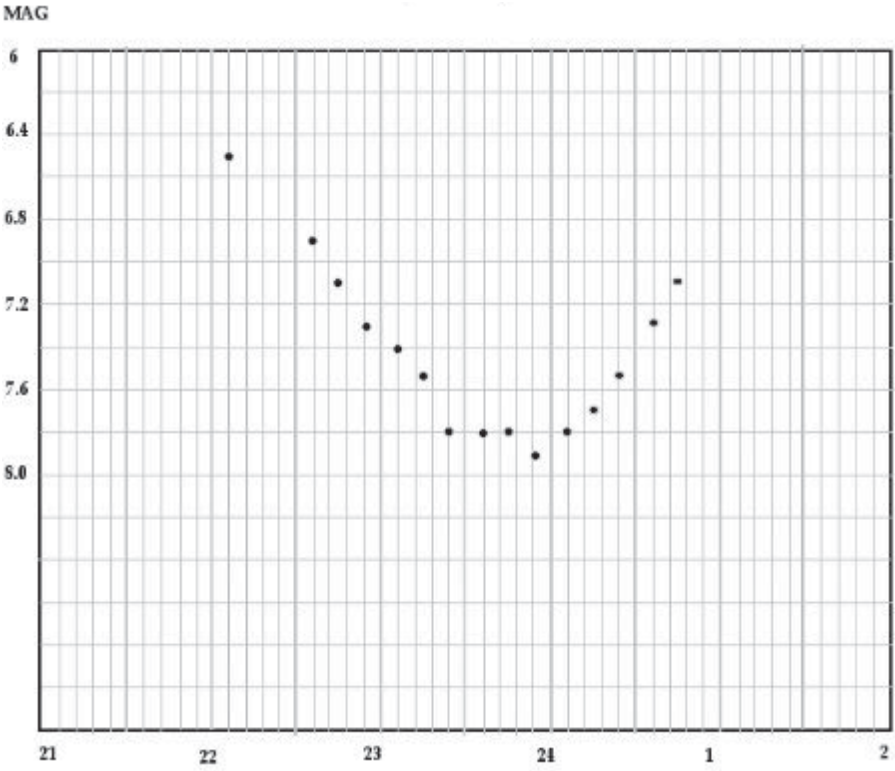


Figure 2: Observations of RZ Cas made on 12/13th February, 2006

was divided by the period of the element. The result gave the number of periods that had occurred since the HJD of the element. The result would be just over or just under an exact period, and this amount over or under the exact period was multiplied by the period, to convert the difference into a proportion of a day. Thus, on the 5/11/05 the difference between the observed and calculated eclipse was plus 0.02 days or 29 minutes.

The column KR2 (days) represents the difference between the predicted times of mid-eclipse according to the 2002 elements quoted in [2] and the observed times. Using the same procedure described in the previous paragraph, the difference was minus 0.002 days on 5/11/05. The mid-eclipse was apparently 3 minutes earlier than the time predicted by the 2002 elements.

Period Change - 1993 Elements

The average of the observed/calculated times of the 19 mid-eclipses in the column KR1 is 0.0216 days or 31 minutes in relation to the 1993 elements.

Observer	Date	UT of mideclipse (hrs/ mins)	Heliocentric JD	KR1 (days)	KR2 (days)
DL	5/11/05	18.49	53680.2874	0.02	-0.002
DL	6/11/05	23.33	53681.4847	0.022	0
DL	12/11/05	23.03	53687.464	0.027	0.003
DL	18/11/05	22.26	53693.4384	0.022	0.001
DL	24/11/05	21.46	53699.4106	0.018	-0.003
DL	6/12/05	20.46	53711.3689	0.022	0.003
JS	6/12/05	20.45	53711.3682	0.024	0.0024
M T	12/12/05	20.11	53717.3446	0.026	0.002
DL	24/12/05	18.57	53729.2929	0.02	0
JS	24/12/05	18.58	53729.2936	0.021	0
JS	26/1/06	1.29	53761.5637	0.019	-0.003
DL	12/2/06	23.51	53779.4945	0.021	0
JS	18/2/06	23.24	53785.4754	0.026	0.003
JS	20/2/06	4.04	53786.6698	0.024	0.003
DL	2/3/06	22.03	53797.4177	0.016	-0.007
M T	2/3/06	22.09	53797.4225	0.021	-0.002
JS	2/3/06	22.09	53797.4225	0.021	-0.002
JS	14/4/06	22.54	53840.4514	0.02	-0.0025
DL	4/5/06	1.51	53859.5737	0.019	-0.004

Table 1

The Atlas of O-C Diagrams of Eclipsing Binary Stars [2] has an O-C diagram for RZ Cas based on the 1993 elements. It shows an upward trend or increasing period since about 1990. If that trend is extrapolated to 2005/2006 it suggests a value around 0.02 days.

Period Change - 2002 Elements

The average of the observed/calculated times of the 19 mid-eclipses in the column KR2 is plus 0.00043 days, or plus one minute and two seconds. This implies that the period has not changed since 2002.

If the rate of change of the period between 1993 and 2002 had continued until 2006, one can calculate that rather than plus one minute and two seconds the difference between observed and calculated should be plus 7 minutes. If the rate of change had continued then it would just be picked up by visual observation.

If the KR2 results are divided into those of 2005 and those of 2006 then the difference between observed and calculated becomes plus 0.00064 days (or 55 seconds) in 2005. This implies the period has not changed. However, the 2006 results have an average difference of minus 0.00161 (2 minutes 19 seconds). Apparently there has been a period

change. The trend that has existed since 1990 may have been reversed and the period is now decreasing. We clearly cannot be confident about this as the times involved are so near to, or within the margins of error.

Professional Estimations in 2005

We were able to find two professional timings of mid-eclipse which date from March 2005. The first was at HJD 53431.6769 (8). Using the elements described in the previous two sections the difference between observed and calculated times are 0.021 days and 0.002 days.

The other observation was made on HJD 53454.3881 (9). The difference between observed time and calculated time is 0.023 days and 0.0032 days.

These professional photometric estimates are broadly consistent with our observations.

It will be noted that the difference between these two estimates of the eclipse midpoints (0.023 and 0.021 days), separated by 23 days, is about 3 minutes (compared with the 1993 elements). This suggests that the variations in our observations may not just be a product of errors inherent in visual observations.

Conclusion

19 estimates of the mid-eclipse timings of RZ Cas in 2005/2006, based on visual observations through binoculars, suggest that the period has not changed since 2002. There is a possibility that the period has changed in 2006 and is decreasing. Hopefully photometric estimates will in due course shed light on this possibility.

References

1 John Isles ' Webb Society: Deep Sky Observers Handbook, Vol. 8, ' Variable Stars', p100.
2 ' An Atlas of O-C Diagrams of Eclipsing Binary Stars' by J M Kreiner, Chum-Hwey Kim, Il-Seong Nha. at < http://www.as.ap.krakow.pl/o-c/index.php3>.
3 BAA Handbook ' Observing Guide to Variable Stars'.
4 IBVS 4509 (1997) ' BVRI Observations of an eclipse of RZ Cas';
5 IBVS 4738 (1999) ' CCD Light Curves and Minima Times of the Eclipsing Binary RZ Cas';
6 Mon.Not.R.Astron.Soc.347, 1317-1326 (2004): ' Delta Scuti-type pulsations in eclipsing binary systems: RZ Cas' . E Rodriguez et al.
7 JAAVSO Vol 34, 2006: ' On the question of the Behaviour of O-C Residuals of the Active Algol-Like Binary RZ Cassiopeiae' , Golovin and Pavlenko.
8 IBVS 5684 (2006) ' New Times of Eclipsing Binary Systems and of Maximum of SXPHE Type Stars' , I.B. Biro et al.
9 IBVS 5690 (2006) ' Photoelectric Minima of Some Eclipsing Binary Stars' T. Krajci.
10 ' Starspots: A Key to the Stellar Dynamo' by S V Berdyugina: [Section 2.4 RS CVn stars and Section 2.7 Algols]. LivingRev. SolarPhys. 2(2005) Website: < http://www.livingreviews.org/lrsp-2005-8>

NEW CHART

JOHN TOONE

277·01 9° FIELD DIRECT

X PERSEI 03h 55m 23·1s +31° 02′45″ (2000)

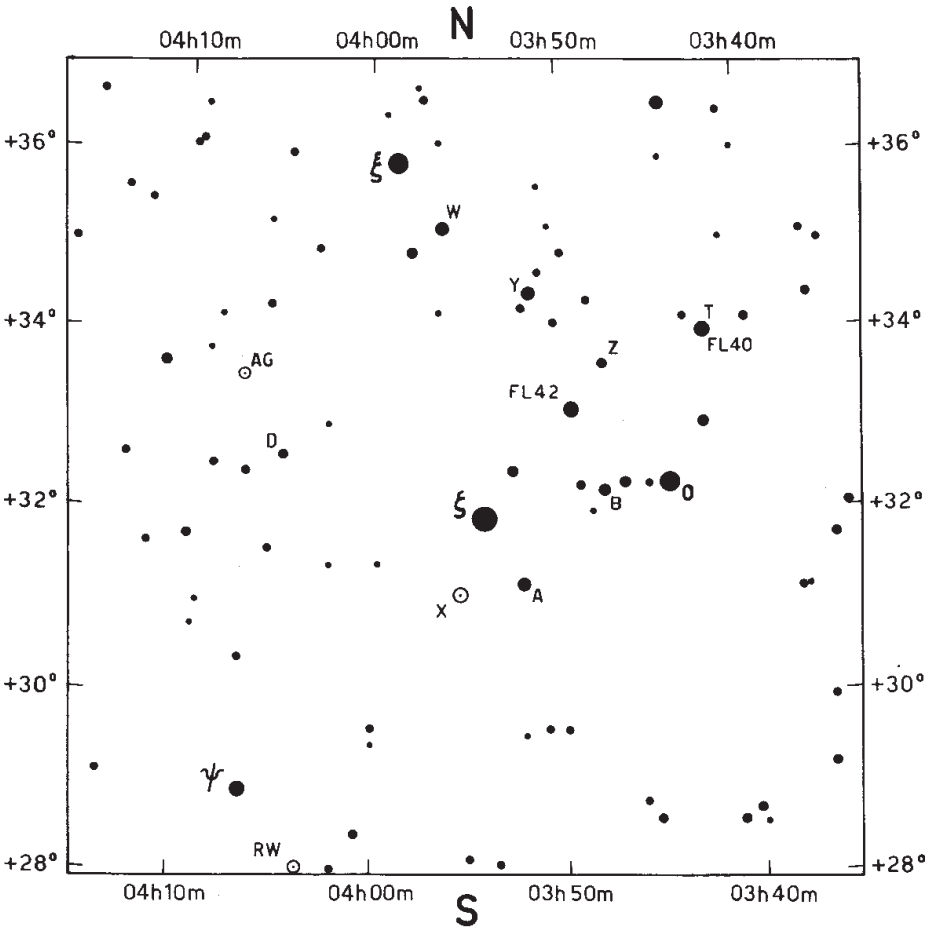


CHART: BOREALIS

SEQUENCE: Z PICKARD, OTHERS TYCHO 2 VJ

T 5·0 B 6·3
W 5·5 Z 6·6
Y 5·8 D 6·9
A 6·2

BAA VSS
EPOCH: 2000
DRAWN: JT 12-04-04
APPROVED: RDP

ALGOL - MY FAVOURITE STAR

Melvyn Taylor

Algol is located at right ascension 03h 08m 10s, declination +40 degrees 57' 21" (epoch 2000), about 29 pc distant. Its visual magnitude varies from 2.1 to 3.4 magnitudes in a period of 2.867328 days. The secondary eclipse is only 0.07 magnitude in depth, and so is only measurable by instrumental methods, not with the human eye. Normally at a brightness of visual magnitude 2.1, its light takes about 5 hours to fade, then in another 5 hours the usual state is attained. For backyard observers the brightness changes are quite dramatic some 3 hours before and after the faintest phase. This was one of the first stellar objects that grabbed the attention of a novice Taylor observer.

Attempts at understanding magnitudes, brightness factors and the "numbers" were initially done for checking meteor magnitudes, but once nova HR Delphini (see page 22 for *My favorite star - HR Delphini* article) had captivated this observer, variable stars became a real interest, and Algol was, and still is a favourite. Observers watching for Perseid meteors over the night of August 11/12 may care to follow Algol as its light slowly "winks" to about 03h UT on that morning. Observations of the star made at 10 to 15 minute intervals can be fitted in to other observational programmes.

The mythology around this object meant that not only modern folk could appreciate the brightness changes, but that it was seen ages ago, the lure a connection with ancient observers. Algol has had curious names in history, to the Hebrews it was Satan's Head, and some star maps have named it The Spectre's Head. Over the centuries it has been cast in a sinister and dangerous light. The name Algol derives from the Arabic Al Ra's al Ghul or the Demon's Head, the head of Medusa which Perseus encountered in his infamous exploits. Whilst some historians believe the variations were seen by Arabic observers (or even Chinese), the discovery is normally attributed to G. Montanari, professor at The University of Bologna in 1667.

John Goodricke and Edward Pigott in York made the original brightness estimates of its variations. Their independently made observations from November and December of 1782, suggested a number of common factors about the nature of the variability of the star. Its minimum brightness was always the same, the shape of the minimum light curve was symmetrical, and the duration between fadings was constant. The physical explanation of the eclipse of one star, in orbit by another, darker star. The vogue among astronomers of the day for stellar variability seems to have been star spots, since those on the Sun had been known about from the early 1600s. However the two friends may have been influenced by the fairly novel idea of orbiting bodies such as double stars, and they saw in Algol a star being eclipsed by a darker body. Uranus had only been discovered by William Herschel in 1781.

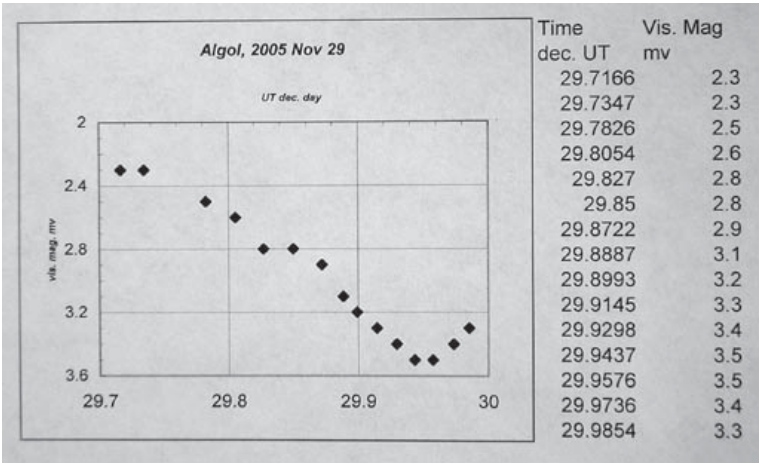
Goodricke was born on the 17th September 1764. He was a deaf mute from birth until his death on the 20th April 1786, and was buried at Hunsingore, near Ribston Hall, North Yorkshire. The family lived partly in England, and in the low countries, notably Holland, but at some time settled in this area of Yorkshire. The Goodricke family in York apparently lived in the Treasurer's house to the north-east of the Minster (see Figure 1 for image of plaque attached to the house). There is the possibility that he made observations from a vantage point of the Treasurers' House. Much of his early learning was done at a

Figure 1: Plaque attached to Garden Wall of Treasurer's house

special school in Edinburgh, which was run for the benefit of wealthy parents who wanted the best specialist education for their children. In York 1781 he started writing his astronomical journals, and during this time he became friends with Edward Pigott, another young observer of the stars. It seems Pigott's father owned a local observatory, and together with Goodricke they made carefully timed observations of Algol.

The 1783 May edition of the Philosophical Journal of the Royal Society, contained several items from Goodricke's journals, and a paper about the "Light Variation of the star Algol" appeared. The interest that Goodricke had in clocks came to the fore with a paper in his journal titled "Of the Going of My Clock", in which he notes referring his clock to that of the nearby York Minster. In 1783 he was awarded the Gold Medal of the Royal Society, for his remarkable work about the development of stellar processes, and was made a fellow of the Royal Society in February 1786.

The time interval of primary minima, the period of rotation of the twin star system, varies slightly. This is the result of dynamical interactions between the stars, which alters masses, energy levels, and as a consequence the orbit. One of the reasons eclipsing binaries are followed is to check on the period changes. In 1991, there was a paper in the British Astronomical Association Journal, number 101, page 3, showing an ephemeris which was derived from 95 visual timings, (with errors), of Algol's primary eclipse, between 1972 and 1990, which was about 0.8h earlier than that given in the 2006 British Astronomical Association Handbook. The current ephemeris used is based on Julian Date 2452207.684 + 2.867328d.E issued by the Jagiellonian University, Krakow .



Time dec. UT	Vis. Mag mv
29.7166	2.3
29.7347	2.3
29.7826	2.5
29.8054	2.6
29.827	2.8
29.85	2.8
29.8722	2.9
29.8887	3.1
29.8993	3.2
29.9145	3.3
29.9298	3.4
29.9437	3.5
29.9576	3.5
29.9736	3.4
29.9854	3.3

Figure 2: A Taylor plot of a recently observed minimum is from observations made on the 29th November 2005.

HR DELPHINI - MY FAVOURITE STAR

Mike Gainsford

When it was suggested that observers might like to contribute a short article to the Section Circulars on the above subject, I racked my brains and eventually came up with the very first nova I ever observed, which was, by coincidence, one of the most interesting novae of the 20th century, and which I have been observing ever since (a period of 39 years). It is one of the few variables on my original list which I observe to this day.

I joined the British Astronomical Association in 1966 after acquiring a 200mm Fullerscopes Newtonian, and commenced 'serious' observing (by which I mean submitting observations to the British Astronomical Association) at once. However I had been interested in astronomy for many years even then, serving my apprenticeship in seeking out Struve objects with a 2.1 inch refractor. Ownership of a decent sized telescope opened up a wide field of observing, including comets, which led directly to the eventual obsession with variable stars. In this I received much encouragement from the then new magazine The Casual Astronomer, which soon became The Astronomer, and also from John Isles.

In 1967 July George Alcock discovered a nova in Delphinus. Alerted by a British Astronomical Association Circular, my first observation was on the evening of July 17th, with Delphinus high in the sky, when I made it magnitude 6.0. It soon became evident that this was not a 'normal' nova. Over the next month it slowly increased to around magnitude 4.7, where it seemed to reach a plateau lasting to just before my birthday in early December, by which time it was becoming rather low in the sky. There then appeared to be a further slight brightening to 4.5 magnitude. But on December 14th an early Christmas present arrived, the nova shone brightly at around magnitude 3.6. Well, I say it shone brightly - actually I was lucky enough to catch a tantalising glimpse in a break in the clouds of an almost totally overcast night. Was it a reliable observation? I noted it as 'class 3', but the peak was confirmed in the next issue of TA.

Delphinus is not that easy to observe in January and February, and the number of estimates I managed dropped off; furthermore, because of conditions (twilight, low elevation etc.) the results show considerable scatter, but by January 6th I made it magnitude 5.8 - on the way down at last, I assumed. But by March it staged a comeback and rose again to magnitude 5.0, and by May 4th I made it magnitude 4.5. What would it do next? Well, what it did at last, was to show a more conventional nova-like rapid decline followed by a more conventional slow decline, and by September 1969 it required a telescope to follow it.

The object was given the designation HR Delphini, and classified as a type NB slow nova. It remains on the Variable Star Section programme, and I continue to observe it whenever possible. At declination 19 degrees 10' north it is a nicely placed object, very easy to find, with what appear to be some decent comparison stars in the same field. It seems from my estimates to be varying between about 11.8 and 12.2 magnitude, although Sky Catalogue 2000 lists it at magnitude 12.38 visual. Perhaps the comparison star magnitudes are out.

I do not expect I'll be around if and when it 'goes off ' again, and perhaps my sanity should be questioned for continuing to observe it. But it seems like an old friend to me, and was far more interesting than my second nova, Nova Vulpeculae 1968 (another Alcock object, I believe).

SW URSAE MAJORIS - MY FAVORITE STAR

Robert Paterson

I can think of many stars that are pleasing to observe. For instance, R Andromedae or Chi Cygni with their great magnitude ranges, their 'disappearing' at minimum and then their re-emerging from the black of the night sky as they rise to maximum, becoming bright and red are elegant. They are a bit like old friends as they turn up in the sky! Or AB Draconis, with its frequent outbursts, is, to me, a satisfying star to follow. But SW Ursae Majoris must rank as "favourite". I can't see it at minimum, using the 32 cm reflector, and its bright and relatively short lived maxima are so infrequent that when I do "catch" one I am overjoyed! It is quite possible, given the various adversities of observing in the UK, not to see anything at its position for years! And then, one night, there it is, bright and splendid. That is such a delight and surprise that I have to be careful not to fall off the observing ladder in my jubilation!

POSSIBLE ECLIPSING BINARY STAR

Alex Vincent

The star HD 221670 in Cassiopeia [1] is an eclipsing binary star some five degrees north of Beta Cassiopeiae. It is possible that it is an eclipsing binary. Its magnitude at maximum is 7.36; its right ascension is 23hours 33.6minutes, and declination is +60 degrees 28 minutes (2000.0). It is very close to the 7.18 magnitude star HD 221639, which can be used as a comparison star.

The last dates of possible eclipses were on May 10th 1994, December 7th 1995, July 5rd 1997, February 1st 1999, August 30th 2000, March 29th 2002, October 26th 2003 and May 24th 2005. It seems to have a period of about 576 days, so the next minimum is due on or around the 21st December 2006. The dates are accurate to a few days and the duration of the eclipse could last several days, and so observations should be made between December 5th and the January 6th.

The amplitude may be very small, probably less than 0.5 magnitude. On observations made by the author during August 2000, he estimated a fade of about 0.5, which also showed on photographs he had taken. These were submitted to the British Astronomical Associations' Variable Star Section archives. Photometry was attempted, but errors of around 0.5 magnitude prevented the eclipse from showing. This means that either the amplitude is too small to be seen visually or photographically; no eclipse took place at the time; or the star doesn't eclipse at all. Nightly, but not continuous, PEP and other measurements, may be needed at the next predicted minimum in December to detect any fade. A finder chart, for the purpose of locating the star is given on the next page in Figure 1.

References

[1] Spectroscopic Binary Orbits from Photoelectric Radial Velocities, Paper 113, HD 221670 by R. F. Griffin, Cambridge Observatories. Available on-line at http://adsabs.harvard.edu/abs/1993Obs...113..294G

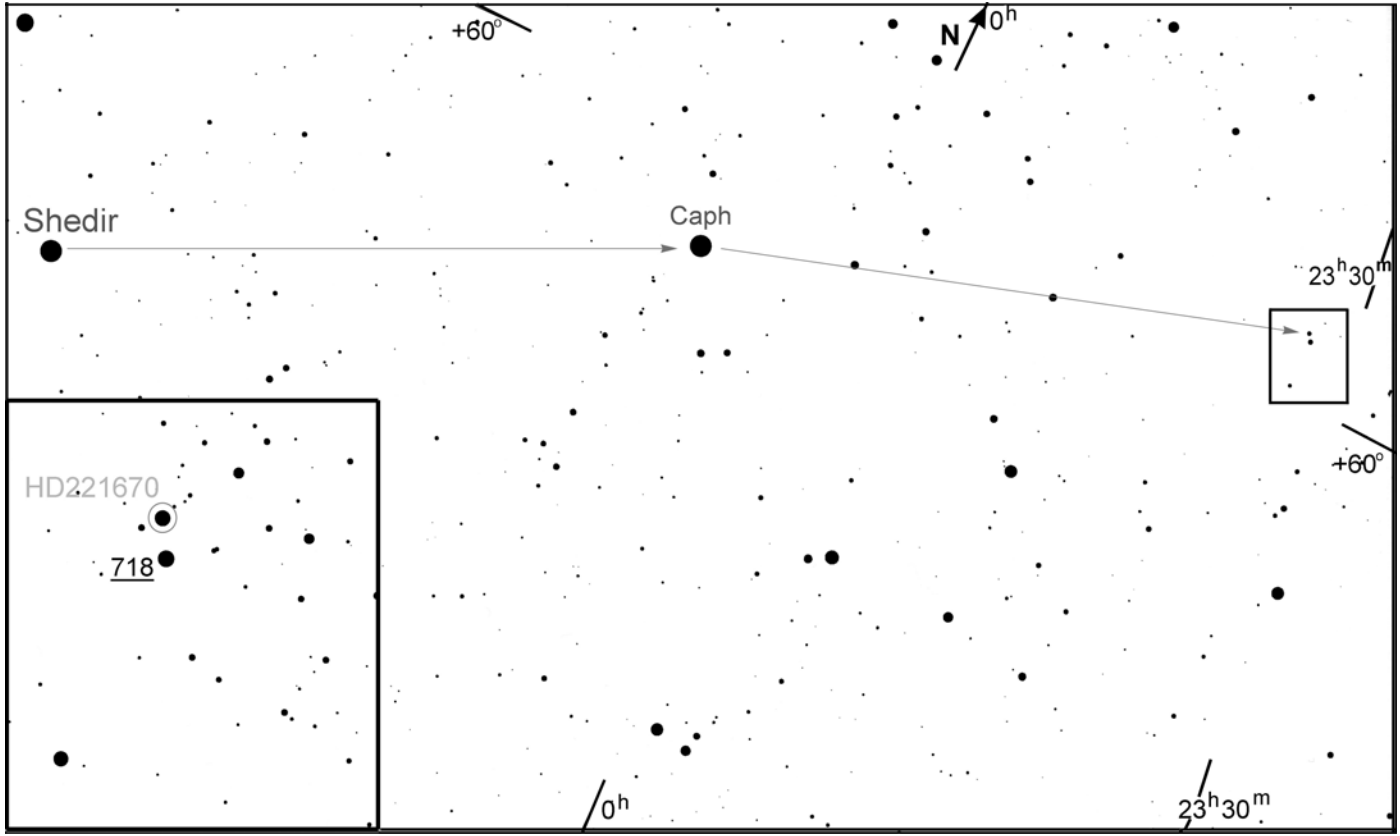


Figure 1: Finder Chart showing position of HD221670, for the purpose of locating the star only

IBVS 5662-5700

Gary Poyner

5662 New times of minima of some eclipsing binary stars (Bakis et al, 2005)
5663 Unsuccessful optical search for the 0.006223HZ pulsar frequency from the X ray binary MX0656-072 (Bartolini et al, 2006)
5664 TT Ari: Out from the positive superhump state (Andronov et al, 2005)
5665 Search for photometric eclipses of the runaway star 9 Sge (Barannikov, 2005)
5666 On the distribution of the modulation amplitudes of Blazhko type RRab stars (Jurcsik et al, 2005)
5667 Five new Beta Cephei stars revealed in ASAS photometry (Handler, 2005)
5668 New minima of selected eclipsing close binaries (Pribulla et al, 2005)
5669 Discovery of the short-periodic pulsating component in the Algol-type eclipsing binary system IV Cas (Kim, et al 2005)
5670 New times of minima of some eclipsing binaries (Lacy, 2006)
5671 Southern cool stars misclassified as carbon stars (Macconnell, 2006)
5672 CCD minima for selected eclipsing binaries in 2005 (Nelson, 2006)
5673 VZ Gru: A Blazhko type RR Lyr, not a CV (Tappert et al, 2006)
5674 New elements for 80 eclipsing binaries VIII (Otero et al, 2006)
5675 Photometric times of minima of some eclipsing binaries (Mossakovskaya,2006)
5676 Precise CCD times of minima of selected eclipsing binaries (Kotkova & Marek, 2006)
5677 Times of minima for neglected eclipsing binaries in 2005 (Dvorak, 2006)
5678 Long term variations of the supergiant in the X-ray binary Cyg X1 (Karitskaya et al, 2006)
5679 New eclipsing variables in the field of M67 (Sandquist, 2006)
5680 The fast apsidal motion system NSV 18773 (Otero & Wils, 2006)
5681 50 new eccentric eclipsing binaries found in the ASAS, Hipparcos and NSVS databases (Otero et al, 2006)
5682 RW Lacertae: A new photometric triple star (Wolf et al, 2006)
5683 VRI light curve of V1647 Ori during August 2004-November 2005 (Semkov,2006)
5684 New times of minima of eclipsing binary systems and of maximum of SXPHE type stars (Biro et al, 2006)
5685 Z Gru and GSC 9092-1397 are double mode RR Lyrae variable stars (Wils, 2006)
5686 The GEOS RR Lyr survey. (Le Borgne et al, 2006)
5687 The first light curve analysis of HD 162905. (Tas & Evren, 2006)
5688 The first ground based photometry of V1123 Tauri. (Ozdarcan et al, 2006)
5689 Photometric analysis of the contact binary V513 Herculis. (Byboth & Markworth, 2006)
5690 Photoelectric minima of some eclipsing binary stars. (Krajci, 2006)
5691 Recent outburst of V1118 Ori (2004-2006). (Garcia et al, 2006)
5692 The first complete BVRI light curves of the near contact binary V370 Cyg. (Niarchos & Manimanis, 2006)
5693 New light on the peculiar star HD 108. (Naze et al, 2006)
5694 New CCD times of minima of eclipsing binary systems. (Kim et al, 2006)
5695 V380 Cygni - request for new observations. (Roman & Roman, 2006)

5696 BVRI CCD observations and analysis of the W UMa contact binary AR Bootis. (Samec et al, 2006)
5697 GSC 1419 0091, and extreme mass ration contact binary. (Samec et al, 2006)
5698 Seven new double mode RR Lyrae stars. (Bernhard & Wils, 2006)
5699 Observations of Variables. The Editors
5700 Reports of new discoveries. The Editors

The Information Bulletin on Variable Stars (IBVS) can be accessed through the WWW in HTML format at the following URL…. http://www.konkoly.hu/IBVS/IBVS.html

If anyone would like a list of IBVS's (as seen above with titles, authors etc.) from numbers 4126-5700, let me know and I'll e-mail the document in whichever format is preferred.

RECENT VS PUBLICATIONS

VSS members have put the following papers up on astro-ph recently (thanks to Hazel McGee for typesetting). These have all been accepted for publication in the Journal.

Brief outbursts in the dwarf nova V1316 Cygni
Jeremy Shears, David Boyd & Gary Poyner
http://arxiv.org/abs/astro-ph/0605284

CCD photometry and visual observations of V1663 Aquilae (Nova Aquilae 2005)
David Boyd & Gary Poyner
http://arxiv.org/abs/astro-ph/0605650

CG Draconis, a particularly active dwarf nova
Jeremy Shears, Roger Pickard & Gary Poyner
http://arxiv.org/abs/astro-ph/0608081

Determination of the superhump period of the dwarf nova V701 Tau during the 2005
December superoutburst
Jeremy Shears & David Boyd
http://arxiv.org/abs/astro-ph/0608082

Observations of the recently discovered dwarf nova 1RXS J053234.9+624755 during the 2005 March superoutburst
Gary Poyner, Jeremy Shears
http://arxiv.org/abs/astro-ph/0605394

Measurement of the orbital and superhump periods of the eclipsing cataclysmic variable SDSS J170213.26_322954.1
David Boyd, Arto Oksanen, Arne Henden
http://arxiv.org/abs/astro-ph/0601712

NEW CHART

JOHN TOONE

030·02 9° FIELD DIRECT

R AQUILAE 19h 06m 22·3s +08° 13′ 49″ (2000)

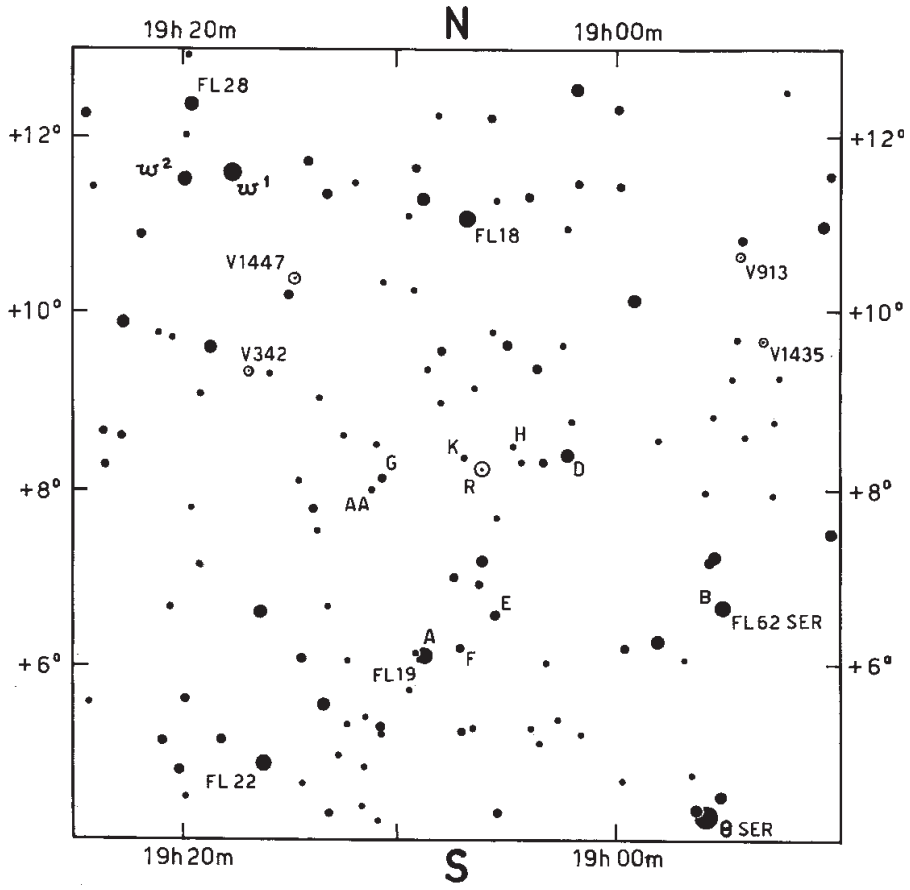


CHART: ATLAS ECLIPTICALIS

SEQUENCE: TYCHO 2 VJ

A	5·2	G	7·4
B	5·6	AA	8·0
D	6·3	H	8·5
E	6·9	K	8·8
F	7·1		

BAA VSS
EPOCH: 2000
DRAWN: JT 22-04-03
APPROVED: RDP

NEW CHART

JOHN TOONE

030·02 1° FIELD INVERTED

R AQUILAE 19h 06m 22·3s +08° 13′ 49″ (2000)

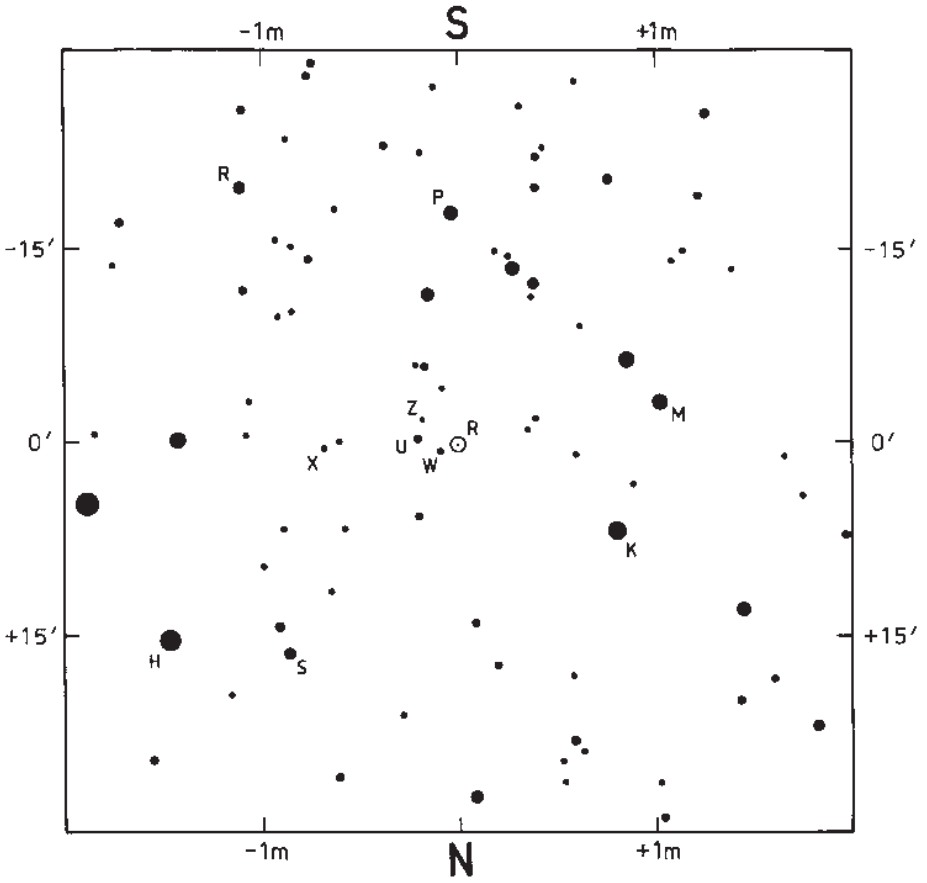


CHART: GUIDE 8

SEQUENCE: H-S TYCHO 2 VJ U-Z JEI

H	8·5	S	10·6
K	8·8	U	11·1
M	9·3	W	11·7
P	9·5	X	12·0
R	10·3	Z	12·9

BAA VSS
EPOCH: 2000
DRAWN: JT 22-04-03
APPROVED: RDP

BINOCULAR PRIORITY LIST

MELVYN TAYLOR

Variable	Range	Type	Period	Chart	Variable	Range	Type	Period	Chart
AQ And	8.0-8.9	SRC	346d	82/08/16	*AH Dra*	7.1-7.9	SRB	158d?	106.01
EG And	7.1-7.8	ZA		072.01	*NQ Gem*	7.4-8.0	SR+ZA	70d?	077.01
V Aql	6.6-8.4	SRB	353d	026.03	*X Her*	6.3-7.4	SRB	95d?	223.01
UU Aur	5.1-6.8	SRB	234d	230.01.	*SX Her*	8.0-9.2	SRD	103d	113.01
AB Aur	7.2-8.4	INA		83/10/01	*UW Her*	7.8-8.7	SRB	104d	107.01
V Boo	7-12	SRA	258d	037.01	*AC Her*	6.8-9.0	RVA	75d	048.03
RW Boo	6.4-7.9	SRB	209d	104.01	*IQ Her*	7.0-7.5	SRB	75d	048.03
RX Boo	6.9-9.1	SRB	160d	219.01	*OP Her*	5.9-6.7	SRB	120d	84/04/12
ST Cam	6.0-8.0	SRB	300d?	111.01	*R Hya*	3.5-10.9	M	389d	049.01
XX Cam	7.3-9.7?	RCB?		068.01	*RX Lep*	5.0-7.4	SRB	60d?	110.01
X Cnc	5.6-7.5	SRB	195d	231.01	*SS Lep*	4.8-5.1	ZA		075.01
RS Cnc	5.1-7.0	SRC	120d?	84/04/12	*Y Lyn*	6.9-8.0	SRC	110d	229.01
V CVn	6.5-8.6	SRA	192d	214.01	*SV Lyn*	6.6-7.5	SRB	70d?	108.01
WZ Cas	6.9-8.5	SRB	186d	82/08/16	*U Mon*	5.9-7.8	RVB	91d	029.03
V465 Cas	6.2-7.2	SRB	60d	233.01	*X Oph*	5.9-9.2	M	328d	099.01
γ Cas	1.6-3.0	GC		064.01	*BQ Ori*	6.9-8.9	SR	110d	84/04/12
rho Cas	4.1-6.2	SRD	320d	064.01	*AG Peg*	6.0-9.4	NC		094.01.
W Cep	7.0-9.2	SRC		83/10/01	*X Per*	6.0-7.0	GC+XP		84/04/08
AR Cep	7.0-7.9	SRB		85/05/06	*R Sct*	4.2-8.6	RVA	146d	026.03
mu Cep	3.4-5.1	SRC	730d	112.01	*Y Tau*	6.5-9.2	SRB	242d	84/04/12
O Cet	2.0-10.1	M	332d	039.02	*W Tri*	7.5-8.8	SRC	108d	114.01
R CrB	5.7-14.8	RCB		041.02	*Z UMa*	6.2-9.4	SRB	196d	217.01
W Cyg	5.0-7.6	SRB	131d	062.1	*ST UMa*	6.0-7.6	SRB	110d?	102.01
AF Cyg	6.4-8.4	SRB	92d	232.01	*VY UMa*	5.9-7.0	LB		226.01
CH Cyg	5.6-10.0	ZA+SR		089.02	*V UMi*	7.2-9.1	SRB	72d	101.01
U Del	5.6-7.5	SRB	110d?	228.01	*SS Vir*	6.9-9.6	SRA	364d	097.01
EU Del	5.8-6.9	SRB	60d?	228.01	*SW Vir*	6.4-7.9	SRB	150d?	098.01
TX Dra	6.8-8.3	SRB	78d?	106.01					

ECLIPSING BINARY PREDICTIONS

TONY MARKHAM

The autumn months are generally the best time of the year for the observation of Eclipsing Binaries. The nights are long, often allowing whole eclipses to be observed; it's not too cold yet, and the northern Milky Way constellations ranging from Cygnus through to Auriga are well-placed and well-populated with rewarding variables.

The following predictions, based on the latest Krakow elements, should be usable for observers throughout the British Isles. The times of mid-eclipse appear in parentheses, with the start and end times of visibility on either side. The times are hours UT, with a value greater than 24 indicating a time after midnight. D indicates that the eclipse starts/ends in daylight; L indicates low altitude at the start/end of the visibility; and << indicates that mid-eclipse occurred on an earlier date.

Thus, for example, on Oct 12, U CrB D18(23)22L indicates that U CrB will be in mid-

eclipse at approx 23h UT (i.e. midnight BST). The start of the eclipse occurs during Daylight, but the eclipse will be observable from approx 18h UT. Low altitude will make observation difficult after around 22h UT. Please contact the EB secretary if you require any further explanation of the format.
The variables covered by these predictions are :

RS CVn	7.9-9.1V	Z Dra	10.8-14.1p	RW Tau	7.98-11.59V
TV Cas	7.2-8.2V	TW Dra	8.0-10.5v	HU Tau	5.92-6.70V
U CrB	7.7-8.8V	S Equ	8.0-10.08V	X Tri	8.88-11.27V
SW Cyg	9.24-11.83V	Z Per	9.7-12.4p	TX UMa	7.06-8.80V
V367 Cyg	6.7-7.6V	U Sge	6.45-9.28V	Z Vul	7.25-8.90V

Note that predictions for RZ Cas, U Cep, Beta Per and Lambda Tau can be found in the BAA Handbook. The long period eclipsing variable W Crucis is due to be in mid-eclipse on Oct 25, with the eclipse lasting from Oct 10 - Nov 13. Another long period eclipsing variable with an eclipse due is AS325 (NSV24607) which will be in eclipse from Oct 31 - Jan 23, with mid-eclipse on Dec 13. This variable, at RA 18h50m03.57s, Dec -26 24 15.4 (2000) has an eclipse depth of about 0.7 magnitudes and is likely to be around magnitude 10.5, although it does also show longer term changes in brightness. Unfortunately this latest eclipse occurs only a few weeks before conjunction, and so will be fairly unfavourable. In addition, eclipses of NN Del are predicted for approximately Oct 10 00h UT (secondary), Dec 29 14h UT (primary) and Jan 17 06h UT (secondary). Outside of eclipses, NN Del is of magnitude 8.4. Both eclipses are approx 0.5 magnitudes deep, with the primary eclipse lasting approx 17 hours, compared with approx 21 hours for the secondary eclipse.

2006 Oct 1 Sun
Y Psc D18(19)24
Z Dra D18(20)23
TX UMa D18(21)21L
X Tri 22(24)27
TX UMa L23(21)26

2006 Oct 2 Mon
TW Dra 03(08)05D
U CrB D18(15)21
S Equ 20(25)25L
X Tri 21(23)26
TV Cas 23(27)29D

2006 Oct 3 Tue
Z Dra 02(05)05D
RS CVn L04(06)05D
X Tri 20(23)25
RW Tau 23(27)29D

2006 Oct 4 Wed
TX UMa D18(23)20L
TV Cas 19(23)27
X Tri 20(22)25
TW Dra 22(27)29D
TX UMa L23(23)27

2006 Oct 5 Thu
SW Cyg 01(07)05D
Z Vul D18(19)25
X Tri 19(21)24
Z Dra 20(22)24
U CrB 20(26)22L

2006 Oct 6 Fri
TV Cas D18(18)22
X Tri D18(21)23
V367 Cyg D18(57)29L
RW Tau L19(22)27

2006 Oct 7 Sat
Z Dra 04(07)05D
X Tri D18(20)22
U Sge D18(20)25L
TW Dra D18(22)27
V367 Cyg D18(33)29L
TX UMa L23(24)29

2006 Oct 8 Sun
RS CVn L03(02)05D
V367 Cyg D18(09)29L
X Tri D18(19)22

2006 Oct 9 Mon
V367 Cyg D18(<<)28L
X Tri D18(19)21
SW Cyg D18(21)27
S Equ D18(22)25L
RW Tau L19(16)21
Z Dra 21(24)26

2006 Oct 10 Tue
Z Vul D18(17)23
TW Dra D18(18)23
X Tri D18(18)20
TX UMa L23(26)29D
U Sge 23(29)25L

2006 Oct 11 Wed
X Tri D18(17)20
HU Tau L20(19)23

2006 Oct 12 Thu
TV Cas 01(05)05D
Z Per D18(15)20
X Tri D18(17)19
Z Dra D18(17)19
RS CVn D18(21)20L
U CrB D18(23)22L
Y Psc 22(26)28L
Z Vul 23(28)25L

2006 Oct 13 Fri
TV Cas 20(24)28
HU Tau L20(20)24
TX UMa 22(27)29D
Z Dra 23(25)28

2006 Oct 14 Sat
U Sge D18(14)20

2006 Oct 15 Sun
RW Tau 01(05)05D
Z Vul D18(15)20
Z Per D18(16)21
TV Cas D18(20)24
HU Tau L20(21)25

2006 Oct 16 Mon
TW Dra 03(08)05D
Z Dra D18(19)21
S Equ D18(19)24
Y Psc D18(21)25
TX UMa 24(29)29D

2006 Oct 17 Tue
RS CVn D18(16)20L
U Sge D18(23)24L
RW Tau 19(24)28
HU Tau L20(23)27
Z Vul 21(26)25L

2006 Oct 18 Wed
Z Dra 01(03)05D
Z Per D18(18)23
SW Cyg 19(25)29L
TW Dra 23(28)29D

2006 Oct 19 Thu
U CrB D18(21)21L
HU Tau 20(24)28

2006 Oct 20 Fri
TX UMa 02(06)05D
Y Psc D18(15)20
Z Dra 18(20)23
RW Tau L18(18)23

2006 Oct 21 Sat
TV Cas 02(06)05D
Z Per D18(19)24
TW Dra 18(23)28
HU Tau 22(25)29
2006 Oct 22 Sun
Z Dra 02(05)05D
Z Vul 19(24)24L
TV Cas 22(26)30D
2006 Oct 23 Mon
TX UMa 03(08)06D
U CrB L05(08)06D
SW Cyg D18(14)21
S Equ D18(16)21
HU Tau 23(27)30D
2006 Oct 24 Tue
U Sge D18(18)23
TW Dra D18(19)24
Z Per D18(20)25
TV Cas D18(21)25
Z Dra 20(22)24
2006 Oct 25 Wed
V367 Cyg D18(47)27L
2006 Oct 26 Thu
HU Tau 00(04)06D
RW Tau 02(07)06D
Z Dra 04(07)06D
X Tri 04(07)06D
TV Cas D18(17)21
U CrB D18(19)21L
V367 Cyg D18(23)27L
S Equ 21(26)24L
2006 Oct 27 Fri
RS CVn L02(06)06D
X Tri 04(06)06D
V367 Cyg D18(<<)27L
Z Vul D18(22)24L
Z Per D18(22)27
U Sge 21(27)23L
SW Cyg 22(28)29L
Y Psc 23(28)27L
2006 Oct 28 Sat
HU Tau 02(06)06D
X Tri 03(06)06D
V367 Cyg D17(<<)20
RW Tau 21(26)30D
Z Dra 21(24)26
2006 Oct 29 Sun
X Tri 02(05)06D
2006 Oct 30 Mon
X Tri 02(04)06D
HU Tau 03(07)06D
TV Cas 04(08)06D
TW Dra 04(09)06D
U CrB L05(06)06D
Z Per 18(23)28
2006 Oct 31 Tue
X Tri 01(04)06D
Z Dra D17(17)19
Y Psc 18(22)26L
RW Tau L18(20)25
TV Cas 23(27)30D
2006 Nov 1 Wed
X Tri 00(03)05
RS CVn L02(01)06D
HU Tau 04(08)06D
SW Cyg D17(18)24
Z Vul D17(20)24L
Z Dra 23(26)28
TW Dra 24(29)30D
X Tri 24(26)29
2006 Nov 2 Thu
U CrB D17(17)20L
S Equ 18(23)23L
TV Cas 19(23)27
Z Per 20(24)29
X Tri 23(26)28
2006 Nov 3 Fri
U Sge D17(21)23L
X Tri 22(25)27
2006 Nov 4 Sat
Y Psc D17(17)21
TV Cas D17(18)22
Z Dra D17(19)21
TW Dra 19(24)29
X Tri 22(24)27
2006 Nov 5 Sun
RS CVn D17(20)19L
X Tri 21(23)26
Z Per 21(26)30D
2006 Nov 6 Mon
Z Dra 01(03)06
SW Cyg 02(08)04L
RW Tau 04(09)06D
U CrB L04(03)06D
Z Vul D17(17)23
X Tri 20(23)25
2006 Nov 7 Tue
TW Dra D17(19)24
X Tri 20(22)25
2006 Nov 8 Wed
Z Dra 18(20)23
X Tri 19(21)24
Z Per 22(27)30D
RW Tau 23(27)30D
Z Vul 23(28)23L
2006 Nov 9 Thu
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S Equ D17(20)23L
X Tri 18(21)23
2006 Nov 10 Fri
TV Cas 01(05)06D
Z Dra 03(05)06D
TW Dra D17(15)20
U Sge D17(15)21
SW Cyg D17(21)28
X Tri 18(20)23
TX UMa L21(17)22
2006 Nov 11 Sat
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X Tri D17(19)22
RW Tau D17(22)26
TV Cas 20(24)28
Z Per 24(29)30D
2006 Nov 12 Sun
X Tri D17(19)21
V367 Cyg D17(61)26L
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2006 Nov 13 Mon
U CrB L04(01)06D
X Tri D17(18)20
TX UMa D17(18)18L
TV Cas D17(20)24
V367 Cyg D17(37)26L
HU Tau L18(16)20
U Sge 19(25)22L
TX UMa L20(18)23
Z Vul 21(26)23L
2006 Nov 14 Tue
Z Dra 04(07)06D
V367 Cyg D17(13)26L
X Tri D17(17)20
2006 Nov 15 Wed
Z Per 01(06)06D
RS CVn 04(11)06D
V367 Cyg D17(<<)26L
TV Cas D17(15)19
X Tri D17(17)19
HU Tau L18(18)22
Y Psc 19(24)25L
2006 Nov 16 Thu
TW Dra 00(05)06D
X Tri D17(16)18
S Equ D17(17)22L
TX UMa L20(20)25
Z Dra 21(24)26
2006 Nov 17 Fri
HU Tau L18(19)23
2006 Nov 18 Sat
Z Per 02(07)06D
Z Vul 19(24)23L
TW Dra 20(25)30
2006 Nov 19 Sun
TV Cas 02(06)06D
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Y Psc D17(18)23
U CrB 17(23)19L
HU Tau L18(20)24
SW Cyg 19(25)27L
TX UMa L20(21)26
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U CrB L03(<<)05
U Sge D17(19)22L
TV Cas 22(26)30
Z Dra 23(26)28
2006 Nov 21 Tue
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TW Dra D17(20)25
HU Tau 18(22)26
2006 Nov 22 Wed
TV Cas 17(21)25
RW Tau 19(24)28
TX UMa L20(23)28
2006 Nov 23 Thu
U CrB 04(10)06D
Z Dra D17(19)21
Z Vul D17(22)22L
HU Tau 19(23)27
2006 Nov 24 Fri
SW Cyg D17(15)21
TW Dra D17(16)21
TV Cas D17(17)21
2006 Nov 25 Sat
RS CVn L00(01)06D
Z Dra 01(03)06
RW Tau D17(18)23
TX UMa 20(24)29
HU Tau 21(24)28
2006 Nov 26 Sun
U CrB D17(20)19L

S Equ 19(25)22L
2006 Nov 27 Mon
U Sge D17(13)19
Z Dra 18(20)23
HU Tau 22(26)30
2006 Nov 28 Tue
TV Cas 04(08)06D
Z Vul D17(20)22L
TX UMa 21(26)30D
SW Cyg 22(28)27L
2006 Nov 29 Wed
Z Dra 03(05)06D
SW Cyg L04(04)06D
TV Cas 23(27)31D
HU Tau 23(27)31D
RS CVn L24(20)27
2006 Nov 30 Thu
TW Dra 01(06)07D
U CrB L03(07)07D
X Tri 04(06)05L
U Sge D17(22)21L
Y Psc 21(25)24L
2006 Dec 1 Fri
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X Tri 03(06)05L
V367 Cyg D17(52)25L
TV Cas 19(23)27
Z Dra 20(22)25
TX UMa 23(27)31D
2006 Dec 2 Sat
HU Tau 01(05)07L
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TW Dra 21(26)31D
2006 Dec 3 Sun
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Z Dra 04(07)07D
V367 Cyg D17(04)25L
Z Per D17(14)19
Z Vul D17(17)22L
TV Cas D17(18)22
U CrB D17(18)18L
SW Cyg D17(18)24
S Equ D17(22)21L
RW Tau 21(25)30
2006 Dec 4 Mon
X Tri 01(04)04L
HU Tau 02(06)06L
V367 Cyg D17(<<)24
Y Psc D17(20)24L
2006 Dec 5 Tue
TX UMa 00(05)07D
X Tri 00(03)04L
TW Dra D17(21)26
Z Dra 22(24)26
X Tri 24(26)28L
2006 Dec 6 Wed
HU Tau 03(07)06L
Z Per D17(15)20
RW Tau D17(20)25
X Tri 23(26)28
2006 Dec 7 Thu
U CrB L02(05)07D
TV Cas 05(09)07D
U Sge D17(16)21L
X Tri 22(25)27
2006 Dec 8 Fri
TX UMa 02(07)07D
SW Cyg L04(08)07D
Y Psc D17(14)19
Z Vul D17(15)21
TW Dra D17(16)21
Z Dra D17(17)20
X Tri 22(24)27
2006 Dec 9 Sat
TV Cas 01(05)07D
RS CVn 04(10)07D
RW Tau D17(14)19
Z Per D17(17)21
X Tri 21(24)26
Z Dra 23(26)28
2006 Dec 10 Sun
U CrB D17(16)18L
S Equ D17(18)21L
U Sge 20(26)21L
TV Cas 20(24)28
X Tri 20(23)25
Z Vul 21(26)21L
2006 Dec 11 Mon
TX UMa 03(08)07D
X Tri 20(22)25
2006 Dec 12 Tue
RW Tau 04(09)06L
Z Per D17(18)23
Z Dra D17(19)21
TV Cas D17(20)24
SW Cyg D17(22)26L
X Tri 19(22)24
2006 Dec 13 Wed
X Tri 18(21)23
RS CVn 23(30)31D
2006 Dec 14 Thu
Z Dra 01(03)06
U CrB L02(03)07D
TW Dra 02(07)07D
TX UMa 05(10)07D
TV Cas D17(15)19
X Tri 18(20)23
RW Tau 22(27)30L
2006 Dec 15 Fri
Z Per D17(19)24
X Tri 17(19)22
Z Vul 19(24)21L
Y Psc 22(27)23L
2006 Dec 16 Sat
X Tri D17(19)21
Z Dra 18(21)23
TW Dra 21(26)31D
2006 Dec 17 Sun
SW Cyg 05(11)07D
S Equ D17(15)20L
X Tri D17(18)21
U Sge D17(20)20L
RW Tau 17(22)26
2006 Dec 18 Mon
TV Cas 02(06)07D
Z Dra 03(05)07D
HU Tau D17(15)19
X Tri D17(17)20
Z Per D17(21)26
RS CVn L23(25)31D
2006 Dec 19 Tue
X Tri D17(17)19
Y Psc D17(21)23L
TW Dra D17(22)27
V367 Cyg 21(66)24L
TV Cas 22(26)30
2006 Dec 20 Wed
X Tri D17(16)19
RW Tau D17(16)21
HU Tau D17(17)21
Z Vul D17(22)20L
V367 Cyg D17(42)24L
Z Dra 20(22)25
2006 Dec 21 Thu
U CrB L01(00)06
V367 Cyg D17(18)24L
TV Cas 17(21)25
Z Per 17(22)27
SW Cyg 19(25)25L
2006 Dec 22 Fri
SW Cyg L03(01)07D
Z Dra 05(07)07D
V367 Cyg D17(<<)24L
TW Dra D17(17)22
HU Tau D17(18)22
2006 Dec 23 Sat
Z Dra D17(15)18
Y Psc D17(16)20
TV Cas D17(17)21
RS CVn L22(20)26
2006 Dec 24 Sun
U Sge D17(14)20L
HU Tau D17(19)23
Z Per 19(23)28
Z Dra 22(24)26
2006 Dec 25 Mon
Z Vul D17(20)20L
2006 Dec 26 Tue
RW Tau 00(05)05L
SW Cyg D17(15)21
HU Tau 17(21)25
TX UMa L18(16)20
2006 Dec 27 Wed
Z Dra D17(17)20
S Equ 17(23)20L
Z Per 20(25)30
2006 Dec 28 Thu
U CrB L01(<<)04
TW Dra 03(08)07D
HU Tau 18(22)26
RW Tau 19(23)28
TV Cas 23(27)31D
Z Dra 23(26)28
2006 Dec 29 Fri
TX UMa L17(17)22
2006 Dec 30 Sat
Z Vul D17(18)20L
TV Cas 19(23)27
HU Tau 20(23)27
Z Per 21(26)30L
TW Dra 22(27)31D
SW Cyg 23(29)24L
2006 Dec 31 Sun
SW Cyg L02(05)07D
U CrB 03(09)07D
U Sge L06(08)07D
RW Tau D17(18)23
Z Dra D17(19)21

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If you are unsure if the material is of a suitable level or content, then please contact the editor for advice.

The **deadline for contributions** to the next issue of VSSC (number 130) will be 17th November, 2006. All articles should be sent to the editor (details are given on the back of this issue)

Whilst every effort is made to ensure that information in this circular is correct, the Editor and Officers of the BAA cannot be held responsible for errors that may occur.

Printed by RAMPrint 01604 233677

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Nova and Supernova discoveries
First telephone the Nova/Supernova Secretary. If only answering machine response, leave a message and then try the following: Denis Buczynski 01524 68530, Glyn Marsh 01772 690502, or Martin Mobberley 01284 828431.

Variable Star Alerts Telephone Gary Poyner (see above for number)