British Astronomical Association

VARIABLE STAR SECTION CIRCULAR

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Contents

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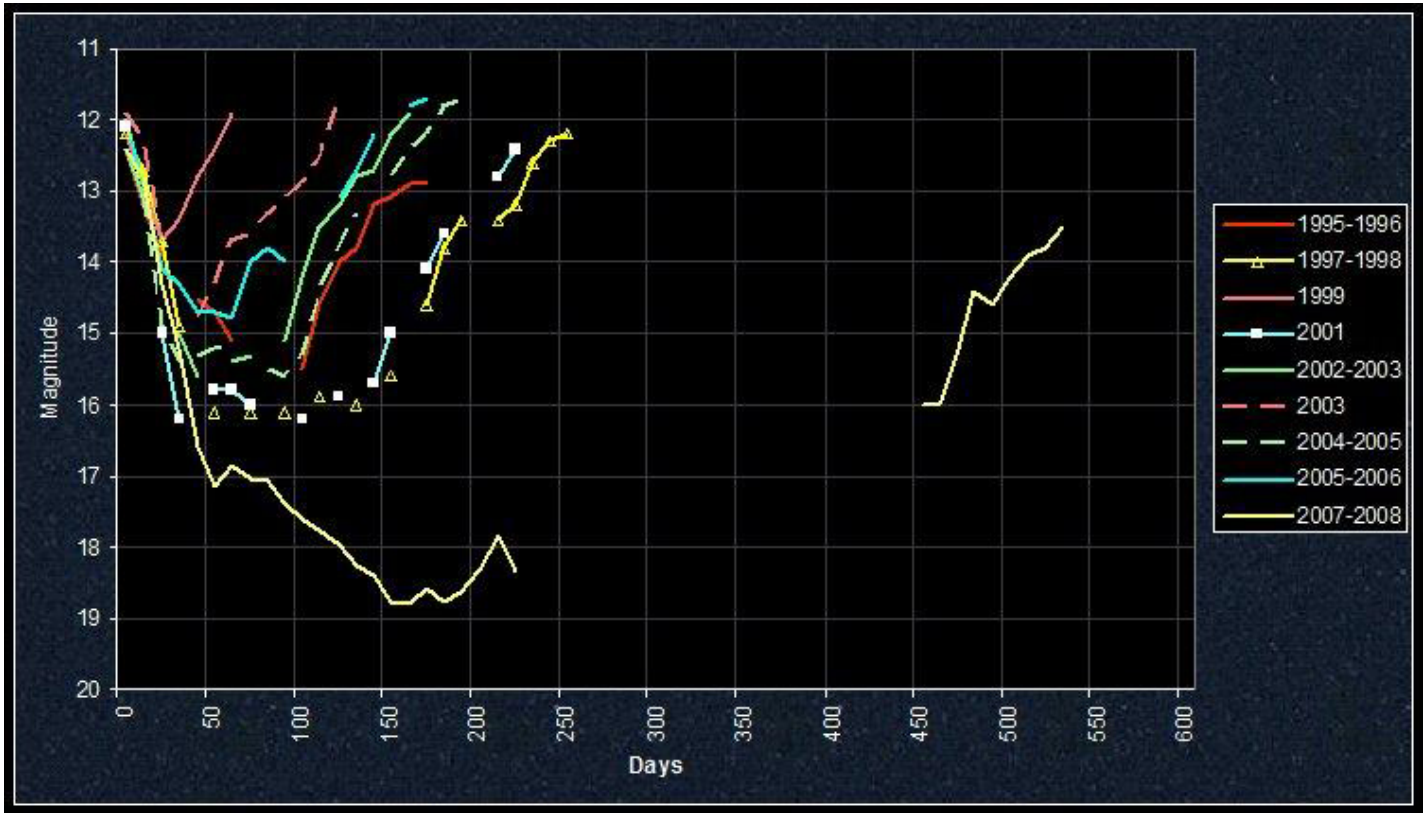
Z URSAE MINORIS

GARY POYNER

Comparison graph showing the length and depth of all previously observed minima in the RCB star Z Ursae Minoris. Data taken at 10d intervals, compiled from observations by G. Poyner.



From this simple exercise, (opposite) it's possible to deduce that for each fade, the period of time taken to lose two magnitudes from maximum is 20d. After this the regularity breaks down. The recovery period is also pretty constant, taking 40d to regain the final two magnitudes to maximum. The deeper the magnitude, the longer the time spent at minimum, as one would expect. The fade from which Z UMi is now recovering has been the longest and deepest yet observed - 533d (to Aug 1) below magnitude 12 , and a minimum magnitude of 19.1C.

G.. Poyner

FROM THE DIRECTOR

ROGER PICKARD

Charts

Thanks to Chris Jones, charts for TAV0559+06 (Ori) 0308.01 and TAV0346+38 (Per) 307.01 are available from the Chart Secretary and may also be downloaded from the web site.

International Year of Astronomy

Sadly, my request for any suggestions about next years Section Meeting with an IYA2009 theme has met with no response at all. But not to worry, you still have time!

However, that said, I have been corresponding since the Cambridge meeting with new member Carl Knight who is keen to take astronomy into the classroom (not that he is a teacher, but he does have 3 children). He, in turn, found Pamela Gay's short talk at the AAVSO/VSS meeting, on "Peer-to-Peer Astronomy Education" (see the last Circular for details) very stimulating. So, since then he has been working with Pamela with the intention to produce a pack to stimulate interest by several means: podcasts, contact with local astronomers, and via the BAA.

Central Directory to Online Astronomy Information

In addition to that, Pamela has been very busy working on, to quote, "The Portal to the Universe website, a cornerstone project that seeks to become a central directory to online astronomy information". She continues:-

"The International Year of Astronomy Cornerstone Project 'Portal to the Universe' (PTTU) seeks information on all RSS based astronomy content feeds (Blogs / Podcasts / Vodcasts / etc) and embedable widgets.

The Portal to the Universe seeks to become a one stop shop for finding online astronomy content, including news, blogs, pod/vodcasts, image feeds, and astronomy related widgets. We will not be creating content - we will be showcasing content from the

community. Details on the Portal to the Universe can be found here:

http://www.astronomy2009.org/cornerstone-projects-mainmenu-80/the-portal-to-the-universe-mainmenu-85.html

We are set to go into beta on December 1, 2008, and to make that launch a success we are working to index all blogs pod/vodcasts, image feeds and other new media content. If you are a new media content provider and would like your content included in the beta release of PTTU, can you please contact Dr. Pamela L. Gay at:

pamela@starstryder.com

with the following:

To appear on PTTU -
Site Name:
URL:
RSS Feed:
The byline is:
Tagline (1-sentence description is):
This site is [Clean] [Explicit] [Somewhere in between]

For office use only -
The correct contact person is:
The correct contact email is:

We will also be building a yellow pages of astronomy, including all astronomy community participants, from machinists building mounts to to artists creating space related jewelry and all the observatories, vendors, and science centers in between. If you would like to be notified when online forms are available to sign up to be in the directory, please also email: *pamela@starstryder.com* "

So, if any member is already involved in providing such content or knows of a member at their local astronomical society perhaps they could advise
Pamela.

TELEPHONE ALERTS

GARY POYNER

For many years now my telephone number has been available for Variable Star alerts on an all night basis. However with the increasing number of CCD observers now monitoring Variable Stars, it is time for a little clarification as to when a phone call should be made.

My telephone number is available for 'confirmation' only. It is not necessary for a CCD observer who already has an image showing the object bright/faint/outburst etc. to seek confirmation. In those cases, the alert should be e-mailed immediately to BAAVSS Alert, CVnet and/or VSnet. This of course assumes that the CCD observer has taken two (or more) images to be certain of the observation! Visual observers who spot something unusual, and who might want confirmation before an announcement is made should still

telephone if they wish. I will then endeavour to confirm it myself, or find someone else if I am clouded out. If they are confident of their observation, they should report it to one, or all of the groups mentioned above, without delay. Observers who do not have an Internet connection, are of course welcome to call reporting unusual activity. The BAAVSS chart catalogue, flags stars which have an alert status. Please report the outburst, or seek confirmation, as soon as possible after detection, on any star which is flagged as an alert object.

RECURRENT OBJECTS PROGRAMME NEWS

GARY POYNER

The most notable outburst to occur during 2008 (at time of writing) was HV Virginis, detected by Australian observer Rod Stubbings on Feb 14.601 at visual magnitude 11.5, and confirmed by A. Arai et al, KANATA team, Hiroshima observatory on Feb 14.639 at 12.4V. This is the third observed outburst reported in HV Vir since the first was detected by Schmeer in April 1992. The previous outburst occurred in January 2002. Superhump measurements were in good agreement with previous outbursts, and no post outburst brightenings were reported.

As I write these words, John Toone has reported an outburst of VY Aqrarii on Jun 30.036 at magnitude 10.2. The last outburst occurred in October 2006, but the last recorded superoutburst was detected back in April 1993. Early reports from observers reporting to both CVnet and VSNET indicate that this new outburst is a long awaited superoutburst. Hopefully further details will appear in a future VSSC.

In the December 2007 VSSC, it was announced that RXJ1831.7+6511 had been added to the programme. Since that time we have had six outbursts reported...

2008		
Feb 27.210	14.5C	I. Miller
Mar 18.128	13.8C	I. Miller
Apr 24.005	13.8 vis.	G. Poyner
May 19.072	13.7C	I. Miller
Jun 7.035	13.8 vis.	G. Poyner
Jun 29 .029	14.0 vis	G. Poyner

Clearly this object has a short outburst cycle, does not meet ROP criteria and is therefore dropped from the programme. It is however recommended that observers continue to monitor for further outbursts in order to establish a possible outburst period. The P_orb has been measured at 4.01hr (see VSSC 134), so superoutbursts are not expected.

A new addition to the ROP will be V2487 Oph (Nova Oph 1998). IAUC 8951 reports...

V2487 Ophiuchi

A. Pagnotta, B. E. Schaefer, and L. Xiao, Louisiana State University, report their discovery of a previously unknown eruption of the nova V2487 Oph (Nova Oph 1998) in the

Harvard College Observatory archival photograph collection. Plate AM505 shows V2487 Oph at B = 10.3 on 1900 June 20. This is close to its peak magnitude in 1998, which was reported to be 9.5 in the more recent outburst. They identified V2487 Oph as a strong recurrent nova candidate because of its low outburst amplitude, very fast decline rate, high expansion velocity, and the presence of high-excitation lines in its outburst spectrum. V2487 Oph was also identified as a good candidate by Hachisu et al. (2002, ASP Conf. Proc. 261, 629), based on characteristics of its light curve. With this discovery, V2487 Oph becomes the tenth known galactic recurrent nova.

With this in mind, it's difficult not to include it on the ROP. The only down side is the declination (-19d 13' 56") – low but quite acceptable from the UK. Remote telescope users (BRT,GRAS) might like to add this to their list.

Charts are available from the AAVSO chart plotter.

U Scorpii

CBA e-mail notices and web pages mention the next imminent outburst of the Recurrent Nova U Sco, expected in Spring 2009 (+/1 1.0 year). The last outburst occurred during 1999, and is thought to have a ten year period. An observing campaign is being organised to monitor the event. See...

http://cbastro.org/communications/news/may16-b.html
http://www.aavso.org/news/usco.shtml

ECLIPSING BINARY NEWS

DES LOUGHNEY

Zeta Aurigae - March 2009

This bright eclipsing binary has a long period, 972 days, but is due to eclipse in March 2009. Mid eclipse is scheduled for the 22nd March 2009. The system consists of a relatively small blue star being eclipsed by a red supergiant. Totality lasts 37 days. As the eclipse in V is only about 0.3m (about 3.70 to 4.00), it is not a good target for visual observers, but it is a good target for DSLR photometry. On the other hand the eclipse in U light is apparently two magnitudes. The comparison star is the familiar Lambda Aurigae at 4.71V.

This system is interesting because ingress and egress lasts for 1.5 days. In other words, the small blue star, after it passes the outer boundary of the supergiant, still shines through the supergiant's atmosphere, and thus very gradually fades until totality. The light curve during ingress and egress, can provide useful information regarding the nature of the supergiant's atmosphere. The most detail will emerge with those observations using a U filter.

There is some dispute over the exact period of the system, so it is probably advisable to start observations of ingress from 2nd March, and of egress from 7th April 2009.

Auriga

The constellation Auriga, is well placed for observation during the winter months. The BAA VSS list contains a number of eclipsing systems in Auriga that are worthy of observation, (plus of course, the existing campaign to observe epsilon Aur in 2009).

WW Aurigae - EA/DM

This system is in the same binocular field of view as UU Aurigae so it should be easy to find. It is well suited to visual binocular observation, as the out of eclipse magnitude is 5.82, the depth of the primary eclipse is 0.7m, and the period is 2.525 days (according to Krakow and the GCVS). It seems that the BAA VSS period of 2.536d is no longer correct.

It is sometimes assumed that an EA system will not have a significant secondary eclipse. It is assumed, that significant secondary eclipses are associated with EB (Beta Lyrae) systems. This is not necessarily the case, if the two stars in an EA system are of similar size and brightness. The secondary eclipse in this system is of 0.5 m in depth - almost the same as the primary eclipse.

I have been searching the internet for a light curve of the system, and have yet to find it. It would be interesting to see the exact shape of an EA light curve when both eclipses are almost equal.

AR Aurigae

This is another EA/DM system which is an easy binocular object, situated in a very distinctive asterism quite near Capella, (two binocular field of views away). The out of eclipse magnitude is 6.14. The period is 4.135 days.

The stars are of similar brightness, so like WW Aurigae, the primary eclipse is 0.7 mag. in depth, and the secondary is 0.6 mag. in depth.

This system is of particular interest, because the period varies in a regular manner, due to a light time effect. The eclipsing binary pair, are actually part of a three body system. It takes AR Aurigae 24 years to revolve around the common centre of gravity (see IBVS 3871). The third star in the system has yet to be detected. It is always worth monitoring three body systems like this one - particularly when the stars are young.

IM Aurigae

This must be the easiest EB to find as it is right beside Capella. It is a binocular object, that has an out of eclipse magnitude of 7.9. It is a standard EA system, with a primary eclipse of 0.6 mag., and an insignificant secondary eclipse. The period is 1.25 days - a frequent eclipser. Its main interest lies in the fact that it is also part of a three body system, (including a third body of 0.12 solar masses), with a further period of 1382 days. The orbit of IM Aur around the common centre of gravity gives rise to a light time effect and an apparent period amplitude of 19 minutes - a difference that could be picked up visually!

BAA OUT OF TOWN MEETING, IN CONJUNCTION WITH THE AAVSO, AND BAA VARIABLE STAR, AND SOLAR SECTIONS.

CAMBRIDGE UNIVERSITY, NEW HALL COLLEGE, SATURDAY, 12TH APRIL 2008

As mentioned in the last circular, a full report of this days meeting will be published in the Journal of the British Astronomical Association, in due course.

The BAA President, Roger Pickard, officially welcomed everybody to the meeting which by the afternoon accounted for about a hundred delegates. He inviting Dr Arne Henden, the Director of the AAVSO to say a few words.

He then invited **Dr. Rene Oudmaijer**, from the University of Leeds, to give the first talk of the day which was entitled "**Star Formation**". The study of the formation of stars provides an excellent illustration of how progress in science results from the interplay of observation on the one hand, and theory on the other. Dr Oudmaije's talk was copiously illustrated with some wonderful slides using some of the world's greatest telescopes.

Dr. Arne Henden Director, AAVSO, then spoke on the "**MJUO/AAVSO Collaboration**", and recent collaborative projects he has taken part in. He emphasised in particular the Mount John University Observatory in New Zealand, and various collaborative projects that had been instigated both there and in Australia in conjunction with the AAVSO.

Guy M Hurst, the Editor of The Astronomer magazine and BAA Coordinator for the UK Nova/Supernova Patrol was the first speaker of the afternoon and entitled his talk "**Novae and Supernovae: from visual to remote robotic observations**" and gave details of the patrols and their successes.

Lee MacDonald, from the BAA Solar Section then spoke on "**Observing the Sun with Small Telescopes**" describing the work the amateur could usefully do both scientifically and for pleasure.

The next speaker was **Arto Oksanen**, from the Nyrölä Observatory, Finland who spoke about "**Observing Gamma Ray Burst Optical Afterglows**" using a state of the art observatory and instrumentation that was run by a team of dedicated amateur astronomers.

The final speaker of the afternoon was **Dr. Giulio Del Zanna**, PPARC/STFC Advanced Fellow, Department of Space and Climate Physics, Mullard Space Science Laboratory, UCL, DAMTP, CMS, University of Cambridge, who spoke on "**Changes in the solar corona during the last cycle**".

Following a break, the delegates then assembled for the banquet, after which the AAVSO Director Dr Arne Henden, presented Awards for the number of observations submitted to the AAVSO. These went to:

Martin Nicholson .....10,000 CCD observations
Jeremy Shears .....10,000 CCD observations

Arto Oksanen ..... 25,000 CCD observations
Pierre de Ponthiere ..... 25,000 CCD observations
Franz Van Loo ..... 25,000 visual observations
Gerry Samolyk .....150,000 CCD observations

Arto Oksanen also received an award for the Discovery of a Gamma Ray Burst afterglow, GRB071010B.

Our Director **Roger Pickard** received a special award of Honorary Lifetime Membership of the AAVSO. He said in 'From the Director' that he was not really sure why. It was:

Roger Pickard with his award presented by Arne Henden.
Photograph by Melvyn Taylor.

"In recognition of his contributions to, and support of, the international co-operation, and the creation, and dissemination of standardised comparison star sequences and charts; encouraging and promoting the exchange of information, data, and ideas, between the BAA Variable Star Section and the AAVSO; and his lifetime contributions to variable star research as an observer, and his distinguished service as Director of the BAA VSS."

After this Roger Pickard presented **Gary Poyner** with the Charles Butterworth award, for becoming the first European to accrue 200,000 visual observations. A full account can be found in 'From the Director' in the previous Circular, No. 136, June 2008.

Sadly, the After Dinner Guest Speaker, Professor John Brown, the Astronomer Royal for Scotland, fell ill on the eve of the meeting, and was unable to attend. Fortunately, **Mike Simonsen** of the AAVSO was able to step in, and gave a splendidly exhilarating and extremely amusing talk entitled "**Astronomy, Hobby or Obsession**."

I would like to thank Melvyn Taylor who collected all the details in this report, and for the photograph; and Roger Pickard who helped to put some of it together, (although not the part about his award). JS

The final event, on Sunday, was a coach trip to Stonehenge and Avebury Stone Circles.

LONG TERM POLAR MONITORING PROGRAMME

GARY POYNER

More observers are needed to monitor this list of interesting magnetic systems. Visual observers have a role to play with the brighter ones on the list, where observations should be made to register a change from high to low state or vice versa. CCD observations prove to be the more valuable when monitoring P_orbs, and of course when the object is in a faint state.

Figure 1 shows a nice orbital curve of QQ Vulpeculae observed by Roger Pickard on June 15/16 2008. The P_orb is 3.7h. QQ Vul is also a visual target, although it will be seen that over the course of three hours, the star can get faint during it's orbital cycle.
Figure 2 shows a visual plot of QQ Vul from observations by Poyner from 2006-present. Discounting the orbital variations, QQ Vul is seen to be in high state during this period. Low states can take the star to below magnitude 17.5V.

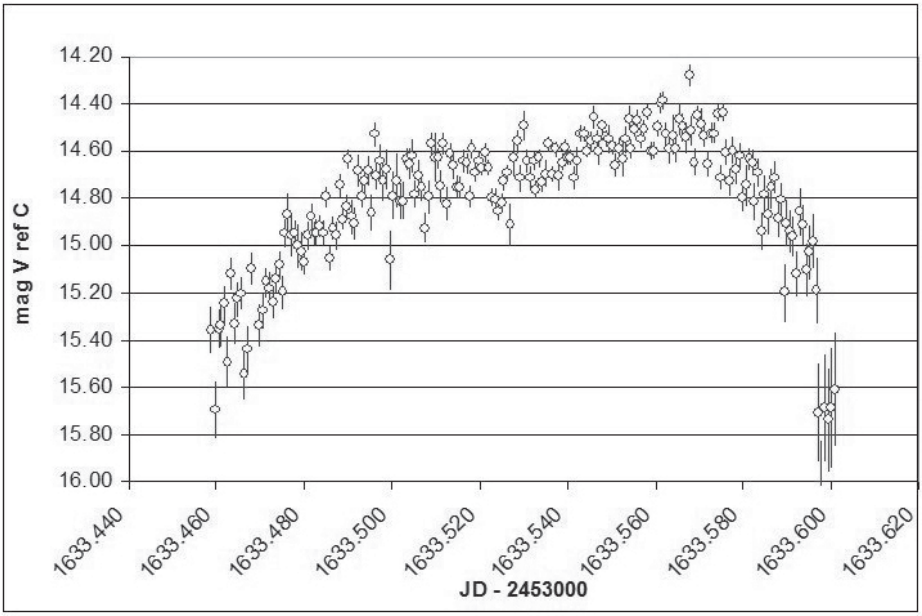
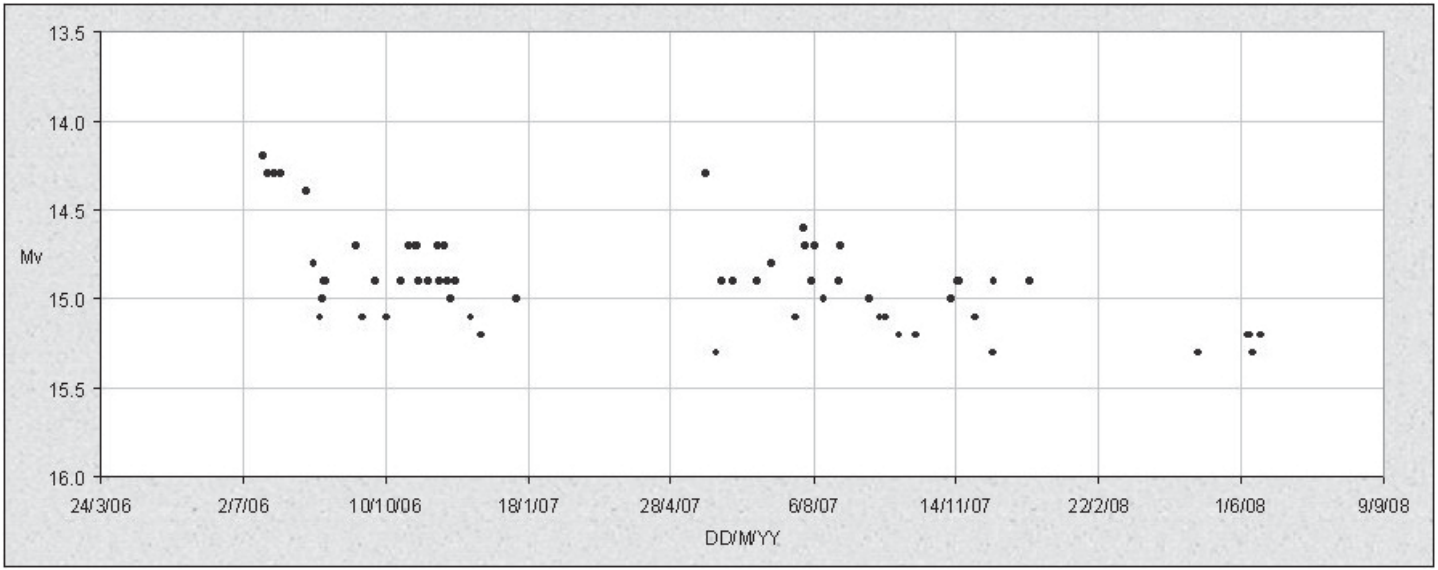


Figure 1: Orbital plot of QQ Vulpeculae. R. Pickard. June 15/16 2008, 30 cm SCT+CCD

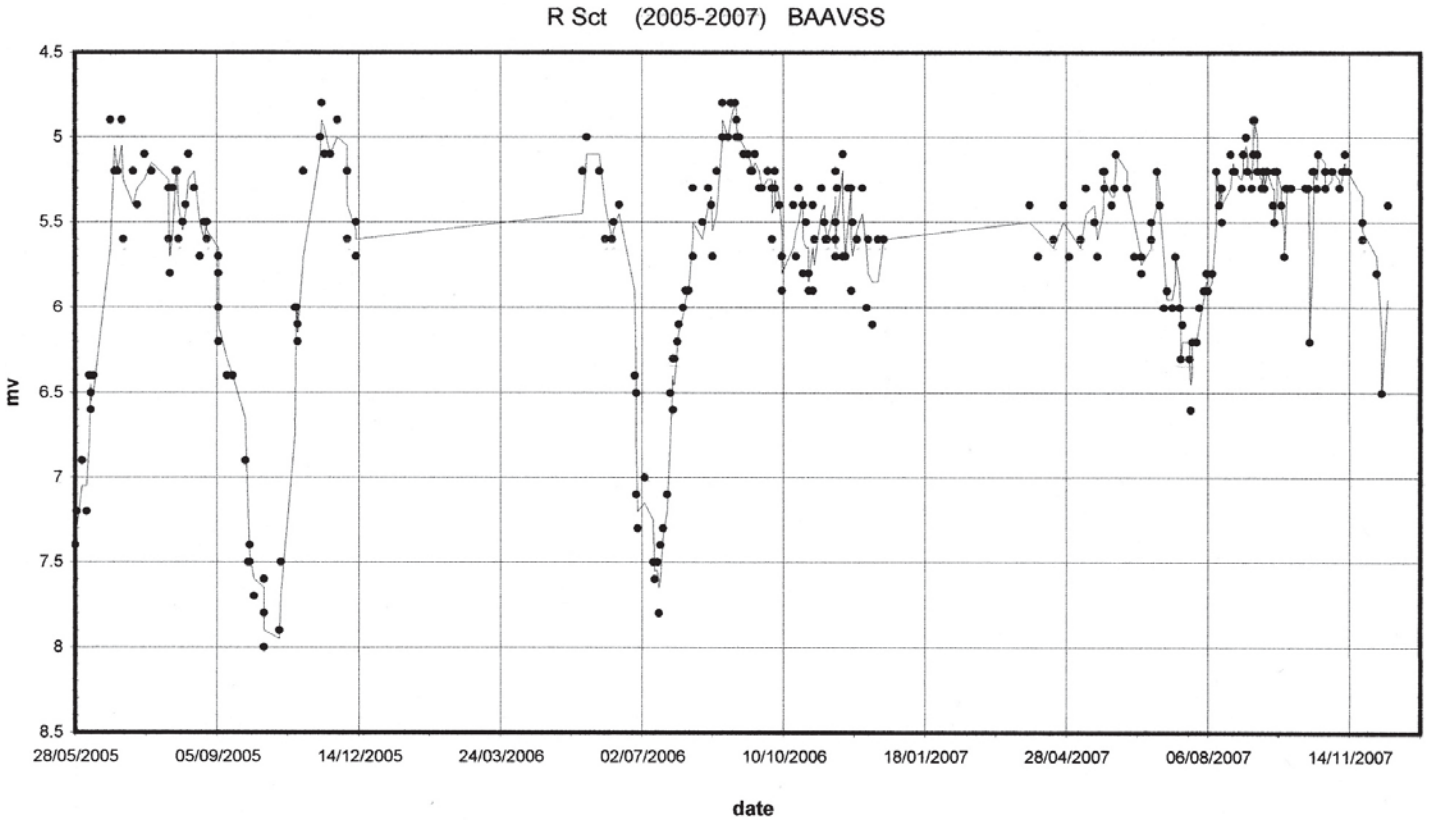
Figure 2: Visual plot of QQ Vulpeculae. G. Poyner, 35cmSCT

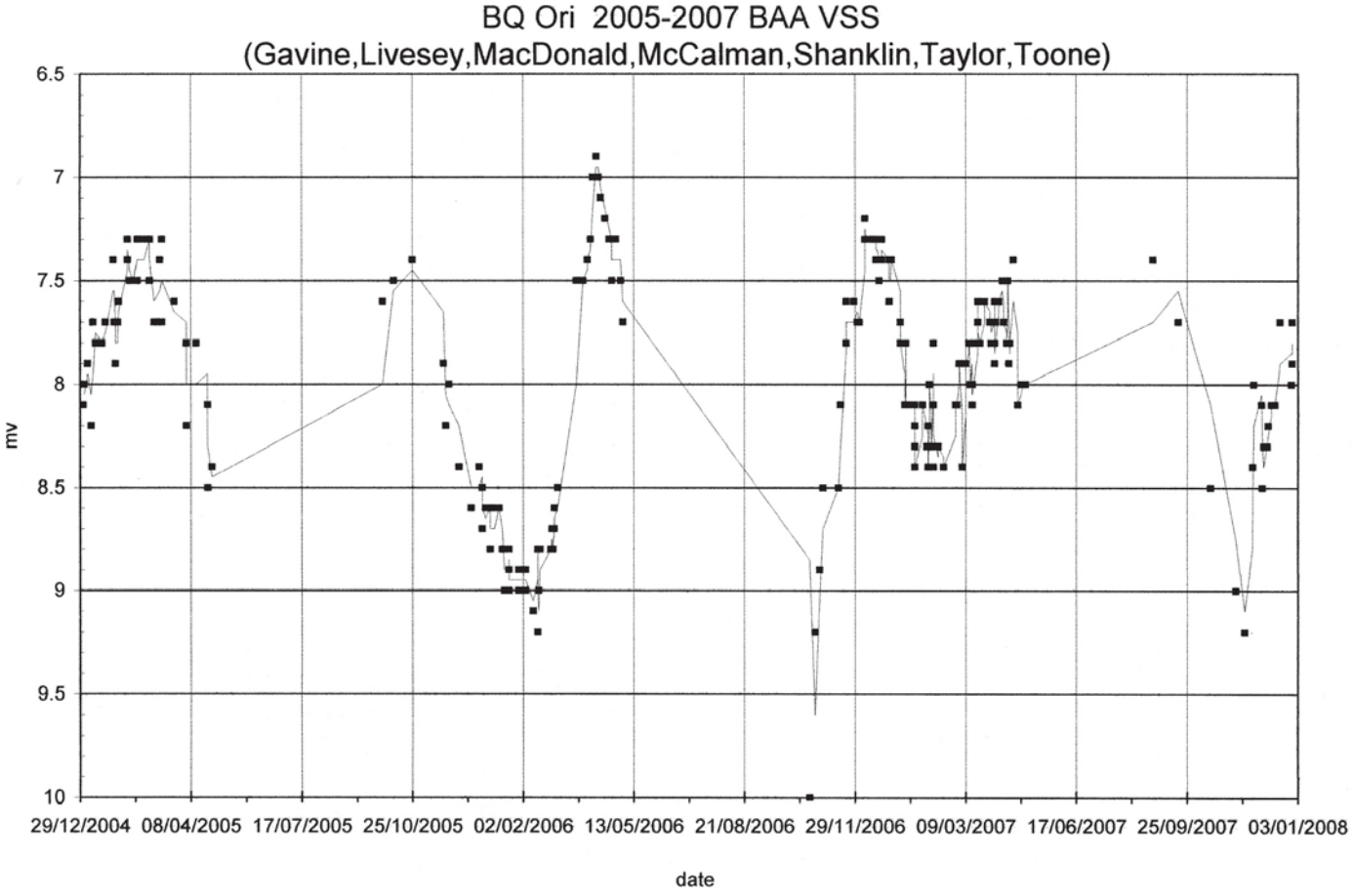


See *http://www.garypoyner.pwp.blueyonder.co.uk/vsspolar.html*

R SCUTI AND BQ ORIONIS LIGHT CURVES

MELVYN TAYLOR




BQ Ori 2005-2007 BAA VSS
(Gavine,Livesey,MacDonald,McCalman,Shanklin,Taylor,Toone)
6.5
7
7.5
8
8.5
9
9.5
10
mv
29/12/2004
08/04/2005
17/07/2005
25/10/2005
02/02/2006
13/05/2006
21/08/2006
29/11/2006
09/03/2007
17/06/2007
25/09/2007
03/01/2008
date

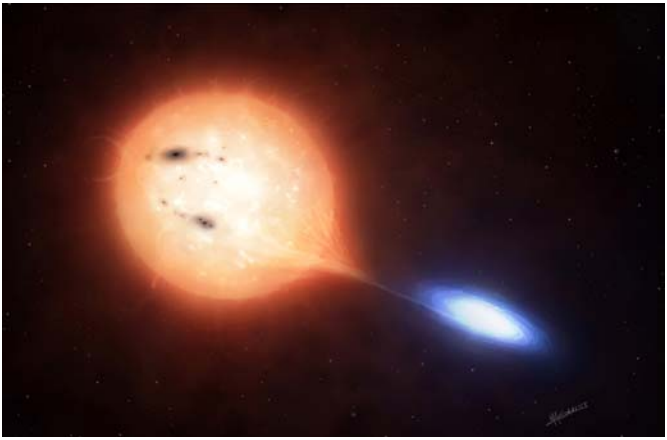
DUSTY TOADS

Mike Simonsen

In cataclysmic variable star circles, TOAD is the term used for a special class of dwarf novae, Tremendous Outburst Amplitude Dwarf novae.

Dwarf novae, are in fact binary systems made of a white dwarf primary and a less evolved (normal) star, orbiting around each other in such close proximity that the white dwarf's gravitational attraction is actually stripping away the outer layers of its companion's atmosphere.

This cannibalized material cannot fall directly down to the surface of the white dwarf, but instead goes into orbit around it, creating a disk called an accretion disk. This disk material is so hot and releases so much energy and light, that it can be thought of almost as if it were a flat star!



This image is copyright Mark A. Garlick and has been used with permission. Please do not use this image in any way without first contacting the artist.

Now and then, something happens, we aren't quite sure what, that tips the balancing act, and this material suddenly falls down to the surface of the white dwarf and ignites an outburst that makes the system hundreds of times brighter than it is in quiescence.

Normal, garden variety dwarf novae undergo outbursts irregularly in time scales of weeks to months, to a couple of years in between outbursts. Other systems may take several years or decades in between eruptions. Generally speaking, the longer it takes between outbursts, the bigger the bang.

TOADs belong to this class of rarely outbursting stars that have brighter than normal outbursts. Because they don't happen very often, and we never know when the next one will occur, astronomers are interested in studying these objects and their unusual nature.

The light from the accretion disk and the light from the white dwarf make it very difficult to study or 'see' the secondary star. Only before or after an outburst, when the system is relatively quiet, do astronomers have a chance at studying the light from the secondary.

One way to get a look at this cooler secondary star is to study the infrared light coming

from it. The white dwarf and accretion disk are too hot to emit much infrared radiation (IR), so its a pretty safe bet that the IR light that gets to the telescope came from the secondary.

And what better cataclysmic variable target to try and catch this portion of the spectrum in, than a system that rarely goes into outburst? So, when given the opportunity to get 'discretionary time' on the Spitzer Space Telescope, which studies the universe in the infrared portion of the electromagnetic spectrum, Steve Howell suggested they point it at one of these TOADs, WZ Sagittae, to see what they could see about the secondary of the system.

Once the data were analyzed, Steve and his team were astonished to find they couldn't see the secondary at all! What they found instead was a large, asymmetric disk of dusty material surrounding the accretion disk. Because this disk contains so little mass, it is completely invisible in optical and near-IR wavelengths. In a way, it is 'dark matter'. The pre-print paper can be read at arXiv:0805.4818v1 (astro-ph).

This discovery has implications for accretion disks in general, other interacting binaries, even the accreting black holes in active galaxies. It also raises a lot of interesting questions. Where is this dust coming from? What exactly is it made of? Do all dwarf novae have dusty rings around them?

To follow up on this discovery, Steve and his team have acquired another set of target of opportunity observations with Spitzer. AAVSO observers around the world are monitoring a list of TOADs. Once an outburst of one of the stars on the list is detected, observations with the space telescope will commence a couple weeks after the outburst, and then again several times as the system falls back to quiescence, to see if dust formation can be detected and what, if any, changes take place over time.

References

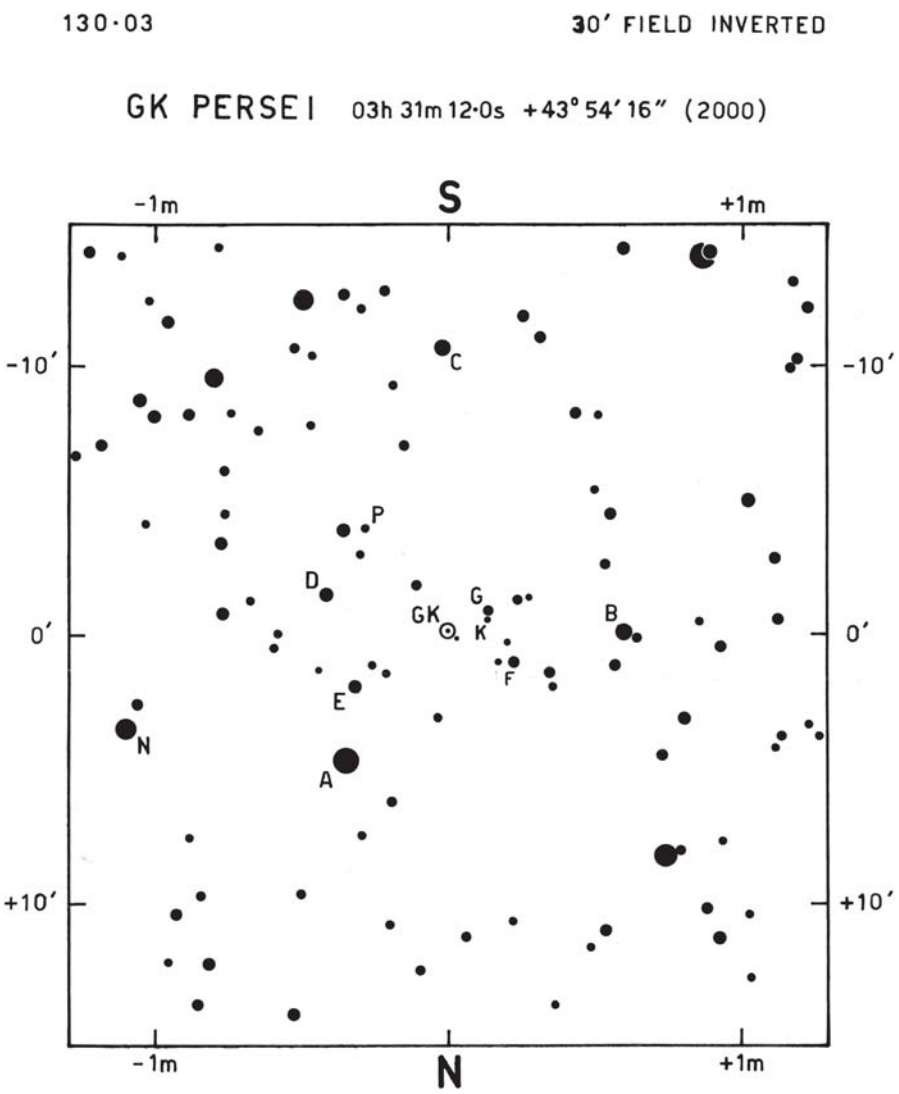
http://simostronomy.blogspot.com/
http://simostronomy.blogspot.com/2008/07/dusty-toads.html
http://arxiv.org/abs/0805.4818v1
http://www.aavso.org/news/toads_campaign.shtml

Images

Dwarf Novae depiction "Cataclysm III", copyright Mark Garlick.
www.space-art.co.uk
www.markgarlick.com
Spitzer Space Telescope image, copyright NASA.

NEW CHART

JOHN TOONE



IBVS 5780 - 5820

Gary Poyner

5780 CL Aurigae: A triple system with mass transfer. (Wolf et al, 2007)
5781 166. List of timings of minima eclipsing binaries by BBSAG observers. (Diethelm, 2007)
5782 Orbital effects on the light curves of eta Car, BP Cru, and other eccentric binaries. (Van Genderen & Sterken, 2007)
5783 Quiescent photometry of V5115 Sgr. (Henden & Di Scala, 2007)
5784 CCD times of minima of some eclipsing binaries from the SAVS sky survey. (Lewandowski et al, 2007)
5785 ASAS 122801-2328.4 – A new galactic field RRd star. (Pilecki & Szczygiei, 2007)
5786 V963 Cygni is an active detached binary with a 33.5 hour period. (Samec et al, 2007)
5787 Discovery of 6 minute oscillations in HD 151878. (Tiwari et al, 2007)
5788 Evidence for a third body in the eclipsing binary DI Her. (Khodykin, 2007)
5789 An increase in stellar activity in the eclipsing binary CM Dra. (Nelson & Caton, 2007)
5790 The GEOS RR Lyr survey. (Le Borgne et al, 2007)
5791 Minima times of some eclipsing binary stars. (Gurol et al, 2007)
5792 UBVRI photometry of DX And: The 2006 outburst. (Spogli et al, 2007)
5793 Multicolour CCD Photometry of three RRab stars. (Sodor et al, 2007)
5794 Discovery of rapid oscillations in HD218994. (Gonzalez et al, 2007)
5795 New times of minima of some eclipsing binary stars. (Dogru et al, 2007)
5796 Minima times for selected close binary stars. (Kruspe et al, 2007)
5797 Physical parameters of the components of the visual binary CCDM 11289-6256. (Khaliullin et al, 2007)
5798 delta Scuti component discovered in eclipsing binary system BO Her. (Sumter & Beaky, 2007)
5799 Observations of variables. (The Editors, 2007)
5800 NSVS 14256825: A new HW Vir type system. (Wils et al, 2007)
5801 Photoelectric minima of some eclipsing binary stars. (Kilicoglu et al, 2007)
5802 Photoelectric minima of selected eclipsing binaries and maxima of pulsating stars. (Hubscher, 2007)
5803 Photometric sequences and astrometric positions of Nova Sgr 2007 and Nova Vul 2007. (Henden & Munari 2007)
5804 Analysis of the light curve of the RV Tauri star LV Del. (Maderak & Honeycutt, 2007)
5805 A study of the bright RR Lyrae star CN Cam. (Kinman et al, 2007)
5806 Photoelectric minima of some eclipsing binary stars. (Krajci, 2007)
5807 Early spectral evolution of Nova Vul 2007 = V458 Vul. (Tarasova, 2007)
5808 The first BVRI light curves and analysis of the short period Algol type binary DI Hya. (Manimanis & Niarchos, 2007)
5809 236 minima timings of eclipsing binaries observed by INTEGRAL OMC. (Sobotka, 2007)
5810 New variable star in the field of the Seyfert galaxy Mrk 290. (Doroshenko et al, 2008)
5811 Elements for 10 RR Lyrae stars. (Haussler et al, 2008)

5812 The first light curve analysis of two overcontact binaries: EY Cas and NO Vul. (Zasche et al, 2008)
5813 Ha observations of zeta Tauri. (Pollman & Rivinius, 2008)
5814 Times of minima for neglected eclipsing binaries 2006-2007. (Dvorak, 2008)
5815 Outburst of the WZ Sge type dwarf nova, AL Com in 2007. (Uemara et al, 2008)
5816 Does the period of BE Lyncis really vary? (Szakats et al, 2008)
5817 Variable star designations for extreme helium stars. (Simon, 2008)
5818 Identification of two ROTSE transients as Cataclysmic Variables in outburst. (Southworth & Rebassa-Mansergas, 2008)
5819 The extreme outburst of EX Lup in 2008: Optical spectra and light curve. (Kospal et al, 2008)
5820 CCD minima for selected eclipsing binaries in 2007. (Nelson, 2008)

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*

U DELPHINI AND EU DELPHINI

MELVYN TAYLOR

BAAVSS cd database has provided the basis of light curves over the interval of late 1987 to 2002 (JD 2447100 to 2453100) with all observers listed below. The light estimates were made mainly with binoculars of apertures from 25mm to 80mm the most common being a B10x50 but small reflectors and refractors in a similar size range were also used. The two SRB type stars are within 2° of the other. The current chart for the two stars has the sequence number 228.01.

Observers:

Adamson, Albrighton, Allen, Anderson, Baker, Barrett, Beekman, Beesley, Bell, Bibbings, Billington, Bilt, Bingham, Blackett, Blair, Bone, Brelstaff, Briden, Britton, Brown, Bullivant, Burch, Butler, Chambers, Chapman, Clayton, Coady, Collinson, Conner, Cook, Currie, Day, Dryden, Dunlop, England, Evans, Fadda, Fleet, Forno, Fraser, Freeman, Gardner, Gavine, Gill, Good, Gough, Granslo, Green, Hapgood, Harpur, Harris, Heathcote, Henshaw, Heppenstall, Hoenig, Hollis, Hornby, Horsley, Hoste, Howarth, Hufton, Hurst, Isles, Jackson, Jobson, Johnson, Johnston, Kelly, Kennedy, Kiernan, Kirby, Knox, Koushiappas, Lashley, Livesey, Livingstone, Long, Lubek, Macvey, Markham, Marshall, Mason, Matthews, Maudsley, McInnery, McNaught, Middlemist, Miles, Miller, Moore, Morell, Munden, Nartowicz, Nicholls, O'Halloran, Pezzarossa, Pickard, Pickup, Pointer, Poxon, Pratt, Privett, Quadt, Ramsey, Reid, Ridley, Ring, Robinson, Rothery, Saunders, Saville, Saw, Shorten, Smeaton, A Smith, B Smith, Spooner, Srinivasan, Stanley, Steer, Stephanopoulos, Stott, Swain, Swift, Tanti, Taylor, Thomson, Toone, Tyacke, van der Bilt, Wanstall, West, Winstanley, Wise, Worraker, Xylaris, Yates, Young, Yusuf.

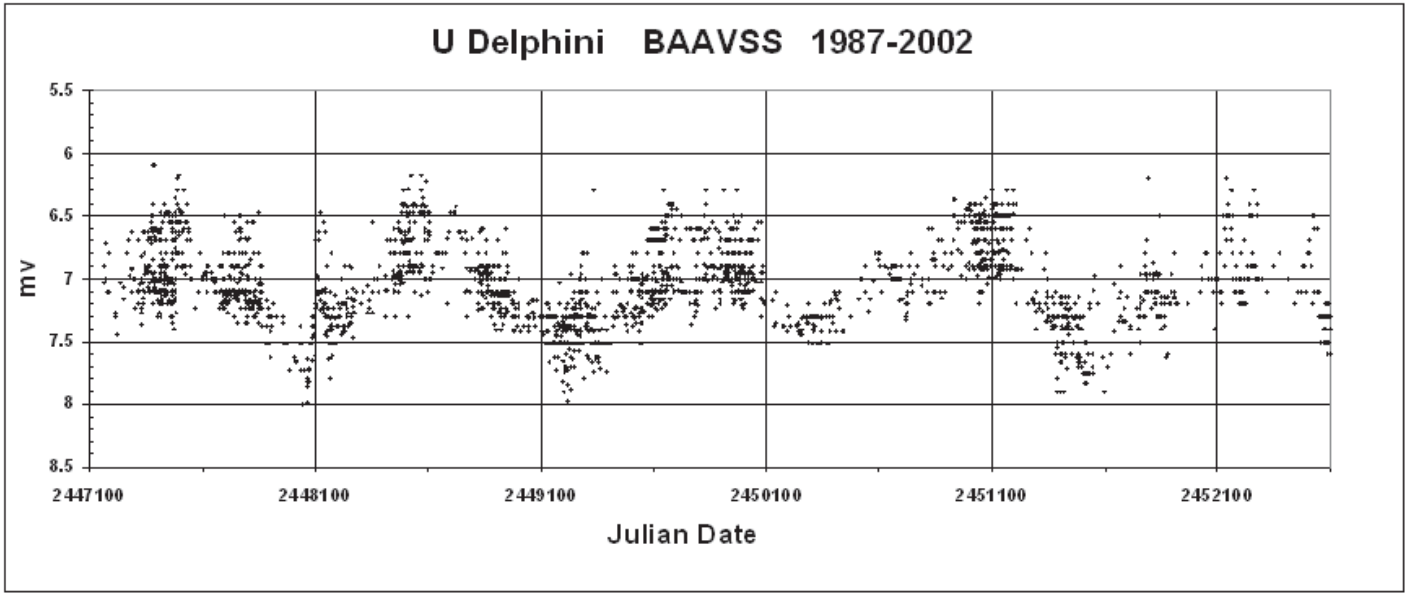


Figure 1: U Delphini is slower than EU Del with its main variations 6.3 to 7.8, mean magnitude 7.0 and its long period of about 1160 days has smaller scale changes of roughly 0.5 magnitude amplitude on the rising and fading phases. It is probably wise to use the established frequency of estimation around 10 days.

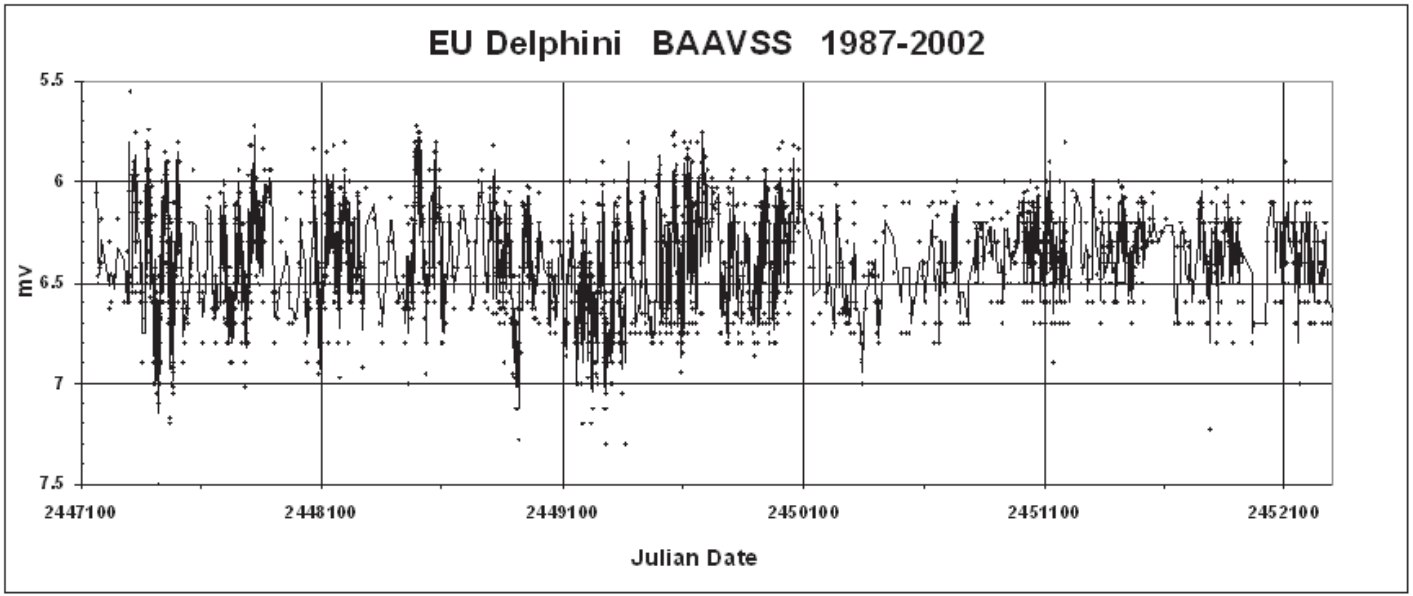


Figure 2: EU Delphini shows changes from 5.8 to 7.1 in extreme magnitude with variations having periods from 50 to 70 days and usual semi-regular phases with more rapid changes obvious in the plot; the mean magnitude is 6.4. Frequency of observations is best about every 6 to 10 days. The plot is from MS excel with a 2-point moving average.

BINOCULAR PRIORITY LIST

MELVYN TAYLOR

(Includes *XX Cam*, *Mira*, *R CrB*, and *R Hya* which are also on the telescopic programme)

Variable		RA (2000) Dec	Range	Type	Period	Chart	Prog
AQ	***And***	00 28 +35 35	8.0-8.9	SR	346d	303.01	
EG	***And***	00 45 +40 41	7.1-7.8	ZAnd		072.01	
V	***Aql***	19 04 -05 41	6.6-8.4	SRb	353d	026.04	
UU	***Aur***	06 37 +38 27	5.1-6.8	SRb	234d	230.01	
AB	***Aur***	04 56 +30 33	6.7-8.4	Ina		301.01	
V	***Boo***	14 30 +38 52	7-12	Sra	258d	037.01	
RW	***Boo***	14 41 +31 34	7.4-8.9	SRb	209d	104.01	
RX	***Boo***	14 24 +25 42	6.9-9.1	SRb	160d	219.01	
ST	***Cam***	04 51 +68 10	6.0-8.0	SRb	300d?	111.01	
XX	***Cam***	04 09 +53 22	7.3-9.7	RCB		068.01	T/B
X	***Cnc***	08 55 +17 04	5.6-7.5	SRb	195d	231.01	
RS	***Cnc***	09 11 +30 58	5.1-7.0	SRc	120d?	269.01	
V	***CVn***	13 20 +45 32	6.5-8.6	SRa	192d	214.02	
WZ	***Cas***	00 01 +60 21	6.9-8.5	SRb	186d	1982Aug16	
V465	***Cas***	01 18 +57 48	6.2-7.8	SRb	60d	233.01	
γ	***Cas***	00 57 +60 43	1.6-3.0	GCAS		064.01	
Rho	***Cas***	23 54 +57 29	4.1-6.2	SRd	320d	064.01	
W	***Cep***	22 37 +58 26	7.0-9.2	SRc		312.01	
AR	***Cep***	22 52 +85 03	7.0-7.9	SRb		1985May06	
Mu	***Cep***	21 44 +58 47	3.4-5.1	SRc	730d	112.01	
O	***Cet***	02 19 -02 59	2.0-10.1	M	332d	039.02	T/B
R	***CrB***	15 48 +28 09	5.7-14.8	RCB		041.03	T/B
W	***Cyg***	21 36 +45 22	5.0-7.6	SRb	131d	062.03	
AF	***Cyg***	19 30 +46 09	6.4-8.4	SRb	92d	232.01	
CH	***Cyg***	19 25 +50 15	5.6-10.5	ZAnd+SR	97	089.02	
U	***Del***	20 46 +18 06	5.6-7.9	SRb	110d?	228.01	
EU	***Del***	20 38 +18 16	5.8-6.9	SRb	60d	228.01	
TX	***Dra***	16 35 +60 28	6.6-8.4	SRb	78d?	106.02	
AH	***Dra***	16 48 +57 49	7.0-8.7	SRb	158d	106.02	
NQ	***Gem***	07 32 +24 30	7.4-8.0	SR+ZAnd	70d?	077.01	
X	***Her***	16 03 +47 14	6.1-7.5	SRb	95d	223.01	
SX	***Her***	16 08 +24 55	8.0-9.2	SRd	103d	113.01	
UW	***Her***	17 14 +36 22	7.0-8.8	SRb	104d	107.01	
AC	***Her***	18 30 +21 52	6.8-9.0	RVA	75d	048.03	
IQ	***Her***	18 18 +17 59	7.0-7.5	SRb	75d	048.03	
OP	***Her***	17 57 +45 21	5.9-7.2	SRb	120d	1984Apr12	
R	***Hya***	13 30 -23 17	3.5-10.9	M	389d	049.02	T/B
RX	***Lep***	05 11 -11 51	5.0-7.4	SRb	60d?	110.01	
Y	***Lyn***	07 28 +45 59	6.5-8.4	SRc	110d	229.01	
SV	***Lyn***	08 84 +36 21	6.6-7.9	SRb	70d?	108.03	
U	***Mon***	07 31 -09 47	5.9-7.9	RVB	91d	029.03	
X	***Oph***	18 38 +08 50	5.9-9.2	M	328d	099.01	
BQ	***Ori***	05 57 +22 50	6.9-8.9	SR	110d	295.01	

Variable		RA (2000) Dec	Range	Type	Period	Chart	Prog
AG	***Peg***	21 51 +12 38	6.0-9.4	Nc		094.02	
X	***Per***	03 55 +31 03	6.0-7.0	GCas+Xp		277.01	
R	***Sct***	18 48 -05 42	4.2-8.6	RVA	146d	026.04	
Y	***Tau***	05 46 +20 42	6.5-9.2	SRb	242d	295.01	
W	***Tri***	02 42 +34 31	7.5-8.8	SRc	108d	114.01	
Z	***UMa***	11 57 +57 52	6.2-9.4	SRb	196d	217.02	
ST	***UMa***	11 28 +45 11	6.0-7.6	SRb	110d?	102.02	
VY	***UMa***	10 45 +67 25	5.9-7.0	Lb		226.01	
V	***UMi***	13 39 +74 19	7.2-9.1	SRb	72d	101.01	
SS	***Vir***	12 25 +00 48	6.9-9.6	SRa	364d	097.01	
SW	***Vir***	13 14 -02 48	6.4-8.5	SRb	150d?	098.01	

* *

ECLIPSING BINARY PREDICTIONS

DES LOUGHNEY

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.

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	AI Dra	7.2 - 8.2	U Sge	6.45 - 9.28V
TV Cas	7.2 - 8.2V	Z Vul	7.25 - 8.90V	RW Tau	7.98 - 11.59V
U Cep	6.8 - 9.4	Z Dra	10.8 - 14.1p	HU Tau	5.92 - 6.70V
U CrB	7.7 - 8.8V	TW Dra	8.0 - 10.5v	X Tri	8.88 - 11.27V
SW Cyg	9.24 - 11.83V	S Equ	8.0 - 10.08V	TX Uma	7.06 - 8.80V
V367 Cyg	6.7 - 7.6V	Z Per	9.7 - 12.4p		

Note that predictions for RZ Cas, Beta Per and Lambda Tau can be found in the BAA Handbook.

For information on other eclipsing binaries see the website:
http://www.as.ap.krakow.pl/o-c/index.php3
Again please contact the EB secretary if you have any queries about the information on this site and how it should be interpreted.

October

2008 Oct 1 Wed
Z Dra.....01(03)05D
RW Tau.....03(08)05D
U Cep.....03(08)05D
SW Cyg.....04(10)05D
Y Psc.....04(09)04L
RS CVn.....D18(13)19
V367Cyg.D18(40)29D
AI Dra.....23(25)26

2008 Oct 2 Thu
TV Cas.....D18(15)19
V367Cyg.D18(16)29L
Z Per.....D18(22)26
TX UMa....19(24)21L
TX UMa....L23(24)29

2008 Oct 3 Fri
SS Cet.....02(07)05D
AI Dra.....04(06)05D
V367Cyg.D18(<<)29L
U Sge.....D18(16)22
U Cep.....D18(20)25
Z Dra.....D18(20)23
TW Dra.....D18(22)27
Z Vul.....D18(22)26L
S Equ.....D18(23)25L
RW Tau.....22(26)29D

2008 Oct 4 Sat
Y Psc.....23(27)28L

2008 Oct 5 Sun
Z Dra.....03(05)05D
Z Per.....D18(23)28
SW Cyg..D18(24)29D
TX UMa.L23(26)29D

2008 Oct 6 Mon
SS Cet.....01(06)05D
TV Cas.....01(06)05D
U Cep.....03(08)05D
RS CVn...L04(08)05D
TW Dra.....D18(17)22
U CrB.....D18(23)22L
AI Dra.....19(20)21
RW Tau.....L19(21)25
U Sge.....19(25)25L

2008 Oct 7 Tue
Z Dra.....20(22)25
TV Cas.....21(25)29D
AI Dra.....23(25)26

2008 Oct 8 Wed
U Cep.....D18(20)25
Z Vul.....D18(20)25L
Y Psc.....D18(21)26
Z Per.....20(24)29
HU Tau.....L21(17)21
TX UMa.L23(27)29D

2008 Oct 9 Thu
SS Cet.....01(05)05D
AI Dra.....04(05)05D
Z Dra.....04(07)05D
TV Cas.....D18(21)25
RW Tau.....L19(15)20

2008 Oct 10 Fri
SW Cyg.....D18(14)20
S Equ.....D18(20)25L
HU Tau.....L20(18)22

2008 Oct 11 Sat
U Cep.....03(08)05D
RS CVn...L03(03)05D
X Tri.....05(07)05D
TV Cas.....D18(16)20
Z Per.....21(26)29D
Z Dra.....22(24)26
TX UMa...24(29)29D

2008 Oct 12 Sun
SS Cet.....00(05)05D
TW Dra.....03(08)05D
X Tri.....04(07)05D
RW Tau.....05(10)05D
Y Psc.....D18(16)20
AI Dra.....18(20)21
HU Tau.....L20(20)24

2008 Oct 13 Mon
X Tri.....04(06)05D
Z Vul.....D18(18)23
U Cep.....D18(19)24
U Sge.....D18(19)24L
U CrB.....D18(20)22L
AI Dra.....23(24)26

2008 Oct 14 Tue
X Tri.....03(05)05D
Z Dra.....D18(17)20
HU Tau.....L20(21)25
SW Cyg.....21(27)29D
TW Dra.....22(27)29D
Z Per.....22(27)29D
SS Cet.....23(28)29D
RW Tau.....23(28)29D

2008 Oct 15 Wed
TX UMa...02(06)05D
X Tri.....02(05)05D
TV Cas.....03(07)05D
AI Dra.....04(05)05D
RS CVn..D18(22)20L
Z Dra.....23(26)28
Z Vul.....23(29)25L

2008 Oct 16 Thu
X Tri.....01(04)05D
U Cep.....02(07)05D
RS CVn.....L03(<<)04
HU Tau.....L20(22)26
TV Cas.....22(27)29D
U Sge.....23(29)24L

2008 Oct 17 Fri
X Tri.....01(03)05D
S Equ.....D18(16)22
TW Dra.....D18(23)28
RW Tau.....L19(23)27
SS Cet.....23(27)29D
Z Per.....24(28)29D

2008 Oct 18 Sat
X Tri.....00(03)05
TX UMa.03(08)05D
Z Vul.....D18(16)21
Z Dra.....D18(19)21
U Cep.....D18(19)24
TV Cas.....18(22)26
AI Dra.....18(20)21
HU Tau.....20(24)28
X Tri.....23(26)28

2008 Oct 19 Sun
SW Cyg.....D18(17)23
V367Cyg.D18(54)28L
X Tri.....23(25)28
AI Dra.....23(24)26

2008 Oct 20 Mon
Y Psc.....00(05)03L
Z Dra.....01(03)05D
U Sge.....D18(14)19
RS CVn...D18(17)20L
TV Cas.....D18(18)22
TW Dra.....D18(18)23
U CrB.....D18(18)21L
V367Cyg.D18(30)28L
RW Tau.....L18(17)22
Z Vul.....21(27)24L
HU Tau.....21(25)29
S Equ.....22(27)24L
X Tri.....22(25)27
SS Cet.....22(27)29D

2008 Oct 21 Tue
Z Per.....01(06)05D
U Cep.....02(07)05D
AI Dra.....04(05)05D
TX UMa....05(09)05D
V367Cyg.D18(06)28L
X Tri.....21(24)26

2008 Oct 22 Wed
V367Cyg...D18(<<)26
Z Dra.....18(21)23
X Tri.....21(23)26
HU Tau.....23(27)30D

2008 Oct 23 Thu
TW Dra.....D18(13)18
Z Vul.....D18(14)19
U Cep.....D18(19)24
U Sge.....D18(23)24L
Y Psc.....18(23)27L
X Tri.....20(23)25
SS Cet.....22(26)30L

2008 Oct 24 Fri
SW Cyg.....01(07)05L
Z Per.....02(07)06D
Z Dra.....03(05)06D
TV Cas.....04(09)06D
U CrB.....L05(05)06D
S Equ.....D18(13)19
AI Dra.....18(19)21
X Tri.....19(22)24

2008 Oct 25 Sat
HU Tau...00(04)06D
RS CVn...D18(12)19
X Tri.....19(21)24
Z Vul.....19(24)24L
AI Dra.....23(24)25
TV Cas....24(28)30D

2008 Oct 26 Sun
RW Tau...01(06)06D
U Cep.....02(07)06D
TW Dra...04(09)06D
X Tri.....18(20)23
Z Dra.....20(22)25
SS Cet.....21(26)29L

2008 Oct 27 Mon
HU Tau...01(05)06D
Z Per.....04(08)06D
AI Dra.....04(05)06D
U CrB...D18(16)21L
Y Psc.....D18(17)22
X Tri.....D18(20)22
S Equ.....19(24)24L
TV Cas.....19(24)28

2008 Oct 28 Tue
Z Dra.....04(07)06D
U Cep.....D18(18)23
X Tri.....D18(19)22
SW Cyg...D18(21)27
RW Tau.....20(24)29
TW Dra...23(28)30D

2008 Oct 29 Wed
HU Tau...03(07)06D
Z Dra.....D17(15)18
X Tri.....D17(18)21
TV Cas....D17(19)23
SS Cet.....20(25)29L

2008 Oct 30 Thu
RS CVn.L02(08)06D
Z Per.....05(10)06D
TX UMa.D17(14)19
U Sge.....D17(17)23
X Tri.....D17(18)20
Z Vul.....D17(22)24L
AI Dra.....18(19)21
Z Dra.....22(24)26

2008 Oct 31 Fri
U Cep.....01(06)06D
HU Tau.....04(08)06D
U CrB.....L05(03)06D
TV Cas.....D17(15)19
X Tri.....D17(17)20
RW Tau.....L18(19)23
TW Dra.....18(23)28
AI Dra.....23(24)25

November

2008 Nov 1 Sat
X Tri.....D17(16)19
SS Cet.....20(24)29

2008 Nov 2 Sun
AI Dra.....04(05)06D
HU Tau.....05(09)06D
TX UMa.D17(15)19L
X Tri.....D17(16)18
Z Dra.....D17(17)20
U Cep.....D17(18)23
U Sge.....21(26)23L

2008 Nov 3 Mon
U CrB.....D17(13)19
X Tri.....D17(15)17
TW Dra.....D17(19)24
S Equ.....D17(21)23L
RW Tau.....L18(13)18
Z Dra.....23(26)28

2008 Nov 4 Tue
TV Cas.....01(06)06D
Y Psc.....02(06)02L
RS CVn....L02(03)06D
Z Vul.....D17(20)23L
SS Cet.....19(24)28

2008 Nov 5 Wed
U Cep.....01(06)06D
TX UMa.D17(17)18L
AI Dra.....18(19)20
TX UMa....L21(17)22
TV Cas.....21(25)29

2008 Nov 6 Thu
RW Tau.....03(08)06D
TW Dra.....D17(14)19
Z Dra.....D17(19)21
SW Cyg.....18(24)28L
U CrB.....19(24)20L
AI Dra.....23(24)25
V367 Cyg...24(68)27L

2008 Nov 7 Fri
U CrB.....L04(00)06D
SW Cyg....L06(00)06D
U Cep.....D17(18)23
TV Cas.....D17(21)25
V367Cyg..D17(44)27L
SS Cet.....L19(23)28
Y Psc.....20(24)26L

2008 Nov 8 Sat
Z Dra.....01(04)06
AI Dra.....03(05)06
Z Per.....D17(14)19
TX UMa..D17(18)18L
V367Cyg..D17(20)26L
RS CVn....D17(22)18L
TX UMa.....L21(18)23
RW Tau.....21(26)30D

2008 Nov 9 Sun
RS CVn.....L01(<<)04
TW Dra.....04(09)06D
V367Cyg.D17(<<)26L
TV Cas.....D17(16)20
Z Vul.....D17(18)23L
U Sge.....D17(21)23L

2008 Nov 10 Mon
U Cep.....01(06)06D
U CrB.....05(11)06D
S Equ.....D17(18)23L
Z Dra.....18(21)23
SS Cet.....L18(22)27
HU Tau.....L18(15)19

2008 Nov 11 Tue
SW Cyg.....D17(14)20
Z Per.....D17(15)20
Y Psc.....D17(19)23
TX UMa..D17(20)18L
RW Tau.....D17(21)25
AI Dra.....18(19)20
TX UMa.....L21(20)25
TW Dra.....24(29)30D

2008 Nov 12 Wed
Z Dra.....03(05)06D
U Cep.....D17(17)22
HU Tau.....L18(16)20
AI Dra.....22(24)25

2008 Nov 13 Thu
TV Cas.....03(07)06D
X Tri.....06(08)06L
RS CVn...D17(17)18L
U CrB.....D17(22)20L
SS Cet.....L18(22)26

2008 Nov 14 Fri
AI Dra.....03(05)06
U CrB.....L04(<<)04
X Tri.....05(07)06L
RW Tau.....D17(15)20
Z Vul.....D17(16)21
Z Per.....D17(17)21
TX UMa.D17(21)18L
HU Tau.....L18(17)21
TW Dra.....19(24)29
Z Dra.....20(22)25
TX UMa.....L20(21)26
TV Cas.....22(27)30D

2008 Nov 15 Sat
U Cep.....00(05)06D
X Tri.....04(07)06L
Y Psc.....D17(13)18
SW Cyg.....22(28)27L

2008 Nov 16 Sun
X Tri.....04(06)06L
Z Dra.....05(07)06D
SW Cyg....L05(04)06D
U Sge.....D17(15)21
SS Cet.....L18(21)26
TV Cas.....18(22)26
HU Tau.....L18(19)23
Z Vul.....21(27)23L

2008 Nov 17 Mon
X Tri.....03(05)06L
U CrB.....L04(09)06D
RW Tau.....05(09)06D
S Equ.....D17(15)20
Z Dra.....D17(16)18
U Cep.....D17(17)22
Z Per.....D17(18)23
TW Dra.....D17(20)25
AI Dra.....18(19)20
TX UMa....L20(23)28

2008 Nov 18 Tue
X Tri.....02(05)06L
RS CVn....06(12)06D
RS CVn..D17(12)18L
TV Cas.....D17(18)22
HU Tau.....L18(20)24
Z Dra.....22(24)27
AI Dra.....22(24)25

2008 Nov 19 Wed
X Tri.....02(04)05L
Z Vul.....D17(14)19
SS Cet.....L18(21)25
U Sge.....18(24)22L
RW Tau....23(28)30D

2008 Nov 20 Thu
U Cep.....00(05)06D
X Tri.....01(03)05L
AI Dra.....03(04)06
Z Dra.....06(09)06D
TV Cas.....D17(13)17
TW Dra....D17(15)20
SW Cyg....D17(17)23
Z Per.....D17(19)24
U CrB....D17(20)19L
HU Tau.....L18(21)25
S Equ.....20(25)22L
TX UMa...L20(24)29

2008 Nov 21 Fri
X Tri.....00(03)05
Z Dra.....D17(17)20
Z Vul.....19(25)22L
X Tri.....24(26)29

2008 Nov 22 Sat
TV Cas.....04(09)06D
U Cep.....D17(17)22
SS Cet.....L18(20)25
RW Tau.....18(22)27
HU Tau.....19(23)27
Y Psc.....21(26)25L
X Tri.....23(25)28
Z Dra.....23(26)28

2008 Nov 23 Sun
RS CVn....01(07)06D
TW Dra....05(10)06D
Z Per.....D17(21)25
AI Dra.....17(19)20
TX UMa..21(26)30D
X Tri.....22(25)27

2008 Nov 24 Mon
TV Cas.....00(04)06D
U CrB.....L03(07)06D
S Equ.....D17(12)17
HU Tau.....20(24)28
X Tri.....21(24)26
AI Dra.....22(23)25
U Cep.....24(29)30D

2008 Nov 25 Tue
SW Cyg.....01(07)03L
SW Cyg.....L05(07)06D
RW Tau.....D17(17)22
Z Dra.....D17(19)21
V367Cyg..D17(59)25L
SS Cet.....L17(19)24
TV Cas.....19(24)28
X Tri.....21(23)26

2008 Nov 26 Wed
TW Dra.....01(06)06D
AI Dra.....03(04)06
U Sge.....D17(18)21L
Y Psc.....D17(20)25L
V367Cyg..D17(35)25L
Z Vul.....17(22)22L
Z Per.....17(22)27
X Tri.....20(23)25
HU Tau.....22(26)29
TX UMa.....23(27)30D

2008 Nov 27 Thu
Z Dra.....01(04)06
V367Cyg..D17(11)25L
U Cep.....D17(16)21
U CrB.....D17(17)19L
TV Cas.....D17(19)23
S Equ.....D17(22)22L
X Tri.....19(22)24

2008 Nov 28 Fri
RS CVn.....L00(02)07D
V367Cyg..D17(<<)25L
SS Cet.....L17(19)23
X Tri.....19(21)24
TW Dra.....20(25)30
HU Tau.....23(27)31D

2008 Nov 29 Sat
del Lib....L06(02)07D
TV Cas.....D17(15)19
SW Cyg.D17(21)26L
AI Dra.....17(19)20
X Tri.....18(21)23
Z Dra.....18(21)23
Z Per.....18(23)28
U Cep.....23(28)31D

2008 Nov 30 Sun
TX UMa..00(05)07D
Y Psc.....D17(15)19
X Tri.....17(20)22
AI Dra.....22(23)25

DECEMBER

2008 Dec 1 Mon
HU Tau.....00(04)07D
RW Tau.....01(06)07D
U CrB.....L03(04)07D
Z Dra.....03(05)07D
TV Cas.....06(10)07D
del Lib.....L06(10)07D
X Tri.....D17(19)22
Z Vul.....D17(20)22L
TW Dra....D17(20)25
SS Cet.....L17(18)23

2008 Dec 2 Tue
AI Dra.....03(04)05
U Cep.....D17(16)21
X Tri.....D17(19)21
Z Per.....20(25)29
RS CVn.....L24(22)28

2008 Dec 3 Wed
TV Cas.....02(06)07D
HU Tau.....02(06)06L
TX UMa...02(07)07D
U Sge.....D17(12)18
X Tri.....D17(18)20
RW Tau.....19(24)29
Z Dra.....20(23)25

2008 Dec 4 Thu
SW Cyg.....05(11)07D
U CrB....D17(15)18L
TW Dra.....D17(16)21
X Tri.....D17(17)20
SS Cet.....D17(17)22
S Equ.....D17(19)21L
TV Cas.....21(25)29
U Cep.....23(28)31D

2008 Dec 5 Fri
HU Tau.....03(07)06L
Z Dra.....05(07)07D
X Tri.....D17(16)19
AI Dra.....17(18)20
Z Per.....21(26)31D

2008 Dec 6 Sat
TX UMa...03(08)07D
del Lib.....L06(01)07D
Z Dra.....D17(16)18
X Tri.....D17(16)18
Z Vul.....D17(18)21L
RW Tau.....D17(19)23
TV Cas.....D17(21)25
U Sge.....D17(22)21L
AI Dra..... 22(23)24

2008 Dec 7 Sun
HU Tau.....04(08)06L
TW Dra....06(11)07D
X Tri.....D17(15)18
U Cep.....D17(16)21
SS Cet.....D17(17)21
Z Dra.....22(24)27
Y Psc.....23(27)24L

2008 Dec 8 Mon
U CrB.....L02(02)07D
AI Dra.....03(04)05
del Lib.....L06(09)07D
X Tri.....D17(14)17
TV Cas.....D17(16)20
SW Cyg.....18(24)26L
Z Per.....23(27)31D

2008 Dec 9 Tue
SW Cyg.....L04(00)06
TX UMa..05(10)07D
HU Tau.....06(10)06L
Z Dra.....06(09)07D
RW Tau....D17(13)18
U Cep.....23(28)31D

2008 Dec 10 Wed
TW Dra....01(06)07D
SS Cet.....D17(16)21
Z Dra.....D17(17)20

2008 Dec 11 Thu
U CrBD.....17(13)18L
Z Vul.....D17(16)21L
S Equ.....D17(16)21L
AI Dra.....17(18)20
Y Psc.....17(22)24L
Z Dra.....24(26)28
Z Per.....24(29)31L

2008 Dec 12 Fri
RW Tau.....03(08)06L
TV Cas.....03(07)07D
RS CVn.....06(12)07D
TX UMa...06(11)07D
U Cep.....D17(15)20
TW Dra.....21(26)31D
AI Dra.....22(23)24

2008 Dec 13 Sat
del Lib.....L05(01)07D
SW Cyg.....D17(14)20
SS Cet.....D17(16)20
U Sge.....D17(16)20L
TV Cas.....23(27)31

2008 Dec 14 Sun
AI Dra.....03(04)05
V367Cyg.L06(49)07D
Z Vul.....L06(03)07D
Z Dra.....D17(19)22
V367Cyg.D17(49)24L
RW Tau.....21(26)30L
U Cep.....22(27)31D

2008 Dec 15 Mon
Z Per.....01(06)07L
U CrB.....L02(00)05
del Lib.....L05(09)07D
V367Cyg.L06(25)07D
HU Tau.....D17(14)18
Y Psc.....D17(16)21
TW Dra.....D17(21)26
V367Cyg.D17(25)24L
TV Cas.....18(22)26

2008 Dec 16 Tue
Z Dra.....01(04)06
V367Cyg.L06(01)07D
V367Cyg.D17(01)24L
Z Vul.....D17(14)19
SS Cet.....D17(15)20
U Sge.....19(25)20L

2008 Dec 17 Wed
RS CVn.....01(07)07D
V367Cyg.L06(<<)07D
V367Cyg...D17(<<)22
HU Tau.....D17(15)19
U Cep.....D17(15)20
TV Cas.....D17(18)22
AI Dra.....D17(18)19
RW Tau.....D17(20)25
SW Cyg.....22(28)25L

2008 Dec 18 Thu
Z Per.....03(07)06L
SW Cyg...L03(04)07D
U CrB.....05(11)07D
S Equ.....D17(13)18
TW Dra.....D17(17)22
TX UMa....L18(14)19
Z Dra.....18(21)23
Z Vul.....19(25)21L
AI Dra.....22(23)24

2008 Dec 19 Fri
TV Cas.....D17(13)17
SS Cet.....D17(14)19
HU Tau.....D17(16)20
U Cep.....22(27)31D

2008 Dec 20 Sat
AI Dra.....02(04)05
Z Dra.....03(05)07D
del Lib.....L05(00)07
U Sge.....L07(10)07D
RW Tau.....D17(15)20

2008 Dec 21 Sun
X Tri.....03(06)03L
Z Per.....04(09)06L
TV Cas.....05(09)07D
Z Vul.....06(12)07D
Z Vul.....D17(12)17
TW Dra.....D17(12)17
HU Tau.....D17(18)22
U CrB.....D17(21)17L
TX UMa....L18(16)20
S Equ.....18(23)20L
RS CVn....L23(26)31D

2008 Dec 22 Mon
U CrB.....L01(<<)03
X Tri.....02(05)03L
del Lib.....L05(08)07D
SS Cet.....D17(14)18
U Cep.....D17(15)20
SW Cyg.....D17(18)24
Z Dra.....20(23)25

2008 Dec 23 Tue
TV Cas.....00(04)07D
X Tri.....02(04)03L
RW Tau.....05(09)05L
AI Dra.....D17(18)19
HU Tau.....D17(19)23
U Sge.....D17(19)20L
Z Vul.....17(22)20L

2008 Dec 24 Wed
X Tri.....01(03)03L
TW Dra.....02(07)07D
Z Dra.....05(07)07D
Z Per.....05(10)06L
TX UMa....L18(17)22
TV Cas.....20(24)28
AI Dra.....21(23)24
U Cep.....22(27)31D

2008 Dec 25 Thu
X Tri.....00(03)03L
U CrB.....02(08)07D
SS Cet.....D17(13)18
Z Dra.....D17(16)18
HU Tau.....D17(20)24
RW Tau.....23(28)29L
X Tri.....24(26)27L

2008 Dec 26 Fri
AI Dra.....02(04)05
Z Vul.....L06(09)07D
TV Cas.....D17(19)23
Y Psc.....19(23)23L
TW Dra.....22(27)31D
Z Dra.....22(24)27
RS CVn.....L22(21)28
X Tri.....23(25)27L

2008 Dec 27 Sat
SW Cyg...L03(07)07D
del Lib.....L04(00)06
U Sge.....L06(04)07D
U Cep.....D17(14)19
TX UMa....L17(19)23
HU Tau.....18(22)26
X Tri.....22(25)27L

2008 Dec 28 Sun
Z Dra.....07(09)07D
SS Cet.....D17(12)17
TV Cas.....D17(15)19
S Equ.....D17(20)20L
Z Vul.....D17(20)20L
RW Tau.....18(22)27
X Tri.....22(24)27

2008 Dec 29 Mon
U CrB.....L01(<<)01
del Lib....L04(08)07D
Z Dra.....D17(17)20
AI Dra.....D17(18)19
TW Dra.....17(22)27
HU Tau.....19(23)27
X Tri.....21(23)26
U Cep 21(26)31D

2008 Dec 30 Tue
TV Cas.....06(10)07D
Z Per.....D17(13)18
U Sge.....D17(14)19L
Y Psc.....D17(18)22
TX UMa..L17(20)25
X Tri.....20(23)25
AI Dra.....21(23)24
Z Dra.....24(26)28

2008 Dec 31 Wed
Z Vul.....L05(07)07D
RW Tau.....D17(17)21
RS CVn.....L22(16)23

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The **deadline for contributions** to the next issue of VSSC (number 136) will be 7th November, 2008. All articles should be sent to the editor (details are given on the back of this issue).

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