



VARIABLE STAR SECTION CIRCULAR

No 170, December 2016

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RX ANDROMEDAE

DENIS BUCZYNSKI



Re “**Observations Requested of RX Andromedae**” for Professor Christian Knigge, in “**From the Director**”, here is an image from my time series run on the night of 16th October 2016. A light curve produced by Roger Pickard from my observations on that night can be found on page 5.

FROM THE DIRECTOR

ROGER PICKARD

Variable Star Section Meeting

The next Section Meeting will take place on the Saturday afternoon of April 8th at Sparsholt College Winchester SO21 2NF.

For some years now it has been the custom that one of the BAA Sections will host a meeting on the Saturday afternoon, and this year it will be the Variable Star Section's turn.

Speakers confirmed include Diego Altamirano (or a colleague) from the Physics and Astronomy Department at the University of Southampton, Gary Poyner, Andy Wilson David Boyd, Stan Waterman, and myself. A full programme will be announced soon.

The total cost of the full "Winchester" meeting last year was £200, but do not worry, if you just wish to attend the Section Meeting on the Saturday afternoon the cost will only be £10, and will include refreshments. However, this would not entitle you to stay for the evening lecture, which is usually one of the highlights of the weekend.

AAVSO Meeting

Discussions are currently underway for a joint meeting with the AAVSO and BAA over the weekend of the 6th-8th July 2018. This would be a similar format to that which we held in 2008 in Cambridge, but this time we are looking to hold it at Warwick University. More in the fullness of time as they say.

Observations Requested of RX Andromedae

I am sure many of you will have seen the alert notice from Professor Christian Knigge of Southampton University on October 11th requesting observations of RX And, so that they could trigger the Chandra X-ray Observatory.

It was therefore very nice to see the following alert notice posted on Wednesday, 26th October when Professor Knigge wrote:

"Hi everybody,

I just wanted to give you all a brief update on the RX And campaign in support of our Chandra observations.

First off, thanks so much to everybody who contributed! Your help was essential both for triggering in a timely fashion — which we did! — and in carefully tracking the outburst during which our Chandra observation took place. These things have been crucial for us in achieving our science goals.

We're still looking at the X-ray data we obtained, so this is all a bit preliminary still. However, briefly, it looks like there was no strong soft X-ray or extreme ultraviolet flux detected during the observation. Establishing whether or not this was there was the main goal for this observation, and a crucial factor was to make sure that we knew where in the outburst we caught the system.

As you may know, the purpose of this Chandra observations was primarily to act as a pathfinder for a much larger multi-wavelength program we are planning, which will hopefully observe an entire dwarf nova eruption across a huge range of wavelengths (X-ray to radio) and with high-ish cadence photometry and spectroscopy. This hasn't ever been done before, and the point of this pathfinder observation was to check if RX And is a good target for this. The fact that it doesn't have detectable soft X-ray flux — which we suspect is simply due to extinction along the line of sight to the system — probably means that it isn't.

Establishing this is a good thing — there are other targets we can try, and the last thing we want to do is waste a huge campaign on a sub-optimal target. In fact, we have another Chandra pathfinder observation approved to check out YZ Cnc, which is another interesting candidate system. I very much hope the BAAVSS will help us again in monitoring that system — this campaign is likely to take place early next year.

Thanks again for all your help with this. If the data we obtained turns out to be sufficiently interesting to publish in its own right, everybody who contributed data to the campaign will obviously be invited as a co-author.

*Cheers,
Christian”*

Professor Christian Knigge, School of Physics & Astronomy, University of Southampton, Southampton SO17 1BJ

Interesting Note to Council

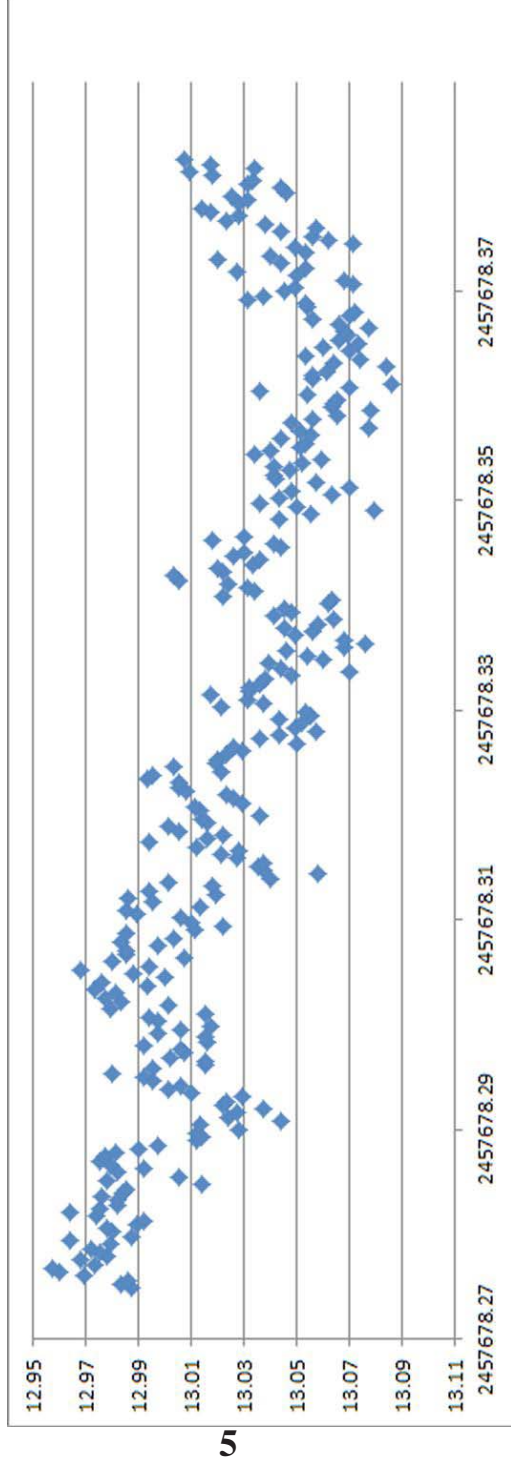
There was an interesting email to Council recently, following the Council Meeting at the end of October, from Geoffrey Johnstone, the Membership Coordinator. In that email he wrote:

“With very approximately one quarter of our new members being beginners, the question I would like to ask is if we are doing enough to retain them. I try to encourage new members to request the section newsletters, which I tell them are less technical than the Journal, yet in many cases even these are becoming more technical as the subject itself does. Can we please when writing the section publications, put in at least something to stimulate the less technically minded.”

So a plea for some more general articles leaning towards those relatively new to variable stars, please.

roger.pickard@sky.com

Light Curve produced by Roger Pickard from Denis Buczynski's Observations of RX Andromedae on 16th October 2016.



VARIABLE STAR SECTION CIRCULARS TO BE IN PDF FORMAT ONLY.

ROGER PICKARD

At a recent Meeting the VSS Officers agreed that the Circulars should be made available in PDF format only. This will not be quite immediately but certainly by the middle of 2017, depending on the replies to this note.

In addition, I can also advise that once the Circulars are issued in PDF format only, they will be free to everybody, whether they are BAA Members or not.

We realise that there are still some members who do not have access to a computer, or whose Internet connection is so poor as to preclude them receiving the Circulars this way, and therefore for a very limited number of people we will endeavour to make a paper copy available for a limited time only.

Now, for a number of people and organisations we do not have an email address, so therefore, if you are one of them and still wish to receive the Circulars, could you please send me your electronic contact details.

Roger Pickard, Director BAA VSS

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IBVS 6176 – 6185

JANET SIMPSON

- 6176** Historical light curve and the 2016 outburst of the symbiotic star StHalpa 169. (Munari, Graziani, & Jurdana-Sepic, 2016)
- 6177** On the orbital period of the exoplanet WASP-39 b. (MACIEJEWSKI, et al, 2016)
- 6178** Discovery of a new pulsating mass-accreting component in the Algol-type system VY Hya. (GUNSRIWIWAT, & MKRTICHIAN, 2016)
- 6179** Variability of the He I 6678 emission in delta Sco. (Pollmann, Ernst, 2016)
- 6180** RW Arietis, an Eclipsing RR Lyrae Star? (ODELL, & SREEDHAR, 2016)
- 6181** FO Aqr time keeping. (Bonnardeau, 2016)
- 6182** Detection of multiperiodic oscillations in the mass-accreting component of GQ Tra. (Mkrtichian, Gunsriwivat, & Komonjinda, 2016)
- 6183** GH Lib: A multi-periodic Mira, not an eclipsing binary. (Siviero, et al, 2016)
- 6184** White Dwarf Period Tables I. Pulsators with hydrogen-dominated atmospheres. (Bognar, & Sodor, 2016)
- 6185** Detection of new pulsations in the roAp star HD 177765. (Holdsworth, 2016)
- 6187** New flare stars and flares of the known ones in Orion. (Natsvlshvili, Kochiashvili, & Kochiashvili, 2016)
- 6188** An investigation of the RCB star candidate GDS J0702414-023501 (HUMMERICH & BERNHARD, 2016)

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>

RECURRENT OBJECT PROGRAMME CHANGES – SEPTEMBER 2016

GARY POYNER

The last update to the ROP occurred in January 2013, so I have taken a look at the outbursts detected over that time and have made the following changes which take place immediately.

Stars dropped from ROP:

V725 Aql: Fifteen outbursts have been detected since the star was added to the programme in 1996. The star is now an established type UGSU with a measured P_{orb} of 0.0944d (2.27h). From my records, and examining the last eleven outbursts (omitting those with a period over 1,000 days where an outburst has probably occurred but went undetected), we have an average outburst interval of 342d.

EI Psc: This is an interesting ultra-short period UGSU star with an above period minimum measured P_{orb} of 0.044567d (64.176m). Ten outbursts have been detected since 2003 with a mean outburst period from reported data to be 358d. With EI Psc residing in a zodiacal constellation, it is quite possible that some outbursts have been missed. However the largest interval between outbursts we have seen in the data is 1492d, which when averaged out to four outbursts missed due to poor seasonal timing, gives a close enough figure of 373d to our average period to be consistent.

V701 Tau: Eight outbursts have been recorded in this UGSU star since 2005, all below magnitude 15. Analysis was carried out and published on the Psh by Shears and Boyd in 2006 (JBAA 116, 2006). As with EI Psc, some outbursts are certain to have been missed due to Sun and Moon location. The longest period between outbursts is 1,341d and the shortest 273d.

New stars added to ROP:

ASASSN-15po	UGWZ	(And)	00h 36m 35.83 +21 51 25.8	13.7 - 21.5V
ASASSN-15ax	UGWZ	(Her)	17h 30m 25.97 +45 16 46.0	13.5 - 21.3V
ASASSN-14jv	UGWZ	(Lyr)	18h 53m 28.81 +42 03 43.3	8.8 - 16.3V
V529 Dra	UGWZ		18h 42m 28.03 +48 37 41.5	12.0 - 20.0V
SDSS J172929.47+005404.3	(Oph)		17h 29m 29.48 +00 54 04.3	12.4 - 21.4V

Each of these five objects has a maximum magnitude bright enough to be detected in a moderate sized instrument, and each one has a chart and sequence available from the AAVSO chart plotter.

Please do continue to monitor those stars which have been dropped from the programme.

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GSC 02873-03309: A NEW EW-TYPE IN PERSEUS

IAN MILLER

This new variable star is located about 40 arcsec SW of SDSS J032015.29+441059.3 and was identified as GSC 02873-03309 (= UCAC4 671-018057) and as 139 in the archived AAVSO sequence X16680AAS.

An accurate position, 03 20 11.86 +44 10 37.7 (J2000), is given in the Guide Star Catalogue and its (B-V) Colour Index is listed as 0.590 in the UCAC4 star catalogue, and 0.589 in X16680AAS. A clear-filtered image of the field is shown in Figure 1.

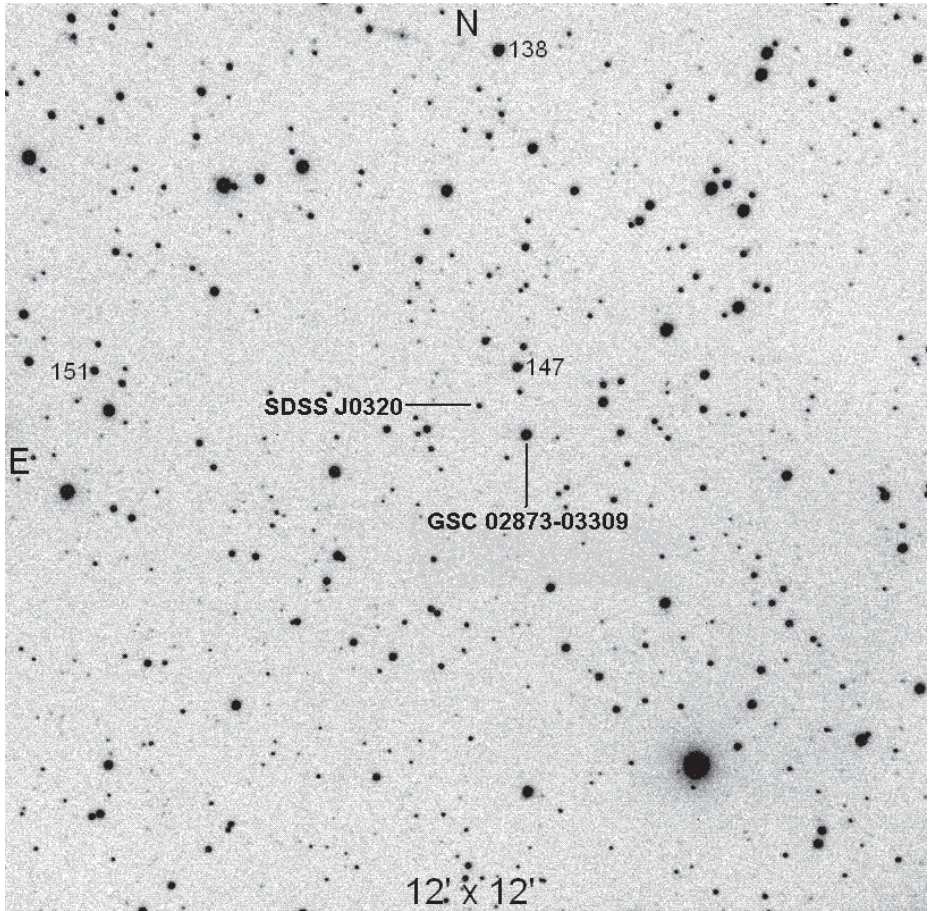


Figure 1. The field of SDSS J032015.29+441059.3 (labelled here as SDSS J0320), GSC 02873-03309 and the comparison stars used for these observations.

Ensemble photometry of GSC 02873-03309 was carried out with a 35cm SCT + SXVR-H16 CCD camera at Furzehill Observatory on six nights during October 2016, when it displayed continuous variability with amplitude about 0.1 magnitudes relative to three V magnitude stars in the sequence X16680AAS. The observations log is summarised in Table 1.

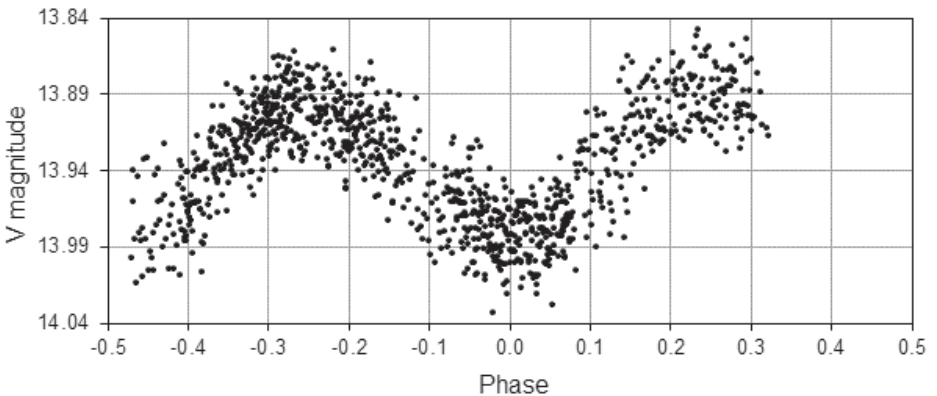
Date (UT)	Start (JD)	End (JD)	Duration (h)	Number of Images
2016, Oct 1	2457663.38855	2457663.63512	5.92	263
2016, Oct 3	2457665.38735	2457665.39256	0.13	6
2016, Oct 3	2457665.42781	2457665.45759	0.71	40
2016, Oct 4	2457666.41653	2457666.52007	2.48	126
2016, Oct 5	2457667.35008	2457667.62421	6.58	299
2016, Oct 11	2457672.53788	2457672.72456	4.48	234
2016, Oct 14	2457675.61105	2457675.72424	2.72	81

Table 1. The observations Log

The observation times were converted to Heliocentric Julian Dates (HJD) prior to carrying out a period search. Assuming the dips in this light curve are due to eclipses, the orbital period of GSC 02873-03309 was estimated to be 0.4989 (+/- 0.0017) days using the ANOVA, PDM and Lomb-Scargle Methods in Peranso⁽¹⁾. However, the eclipse depths are similar and their half-period also gave a strong result, so GSC 02873-03309 could also be an intrinsically variable star. Spectral data may therefore be needed to confirm the binary nature of this object.

A plot based on the longer period is displayed in Figure 2.

Figure 2. A plot of the observations, folded on P = 0.4989 days



This orbital coverage is not enough to indicate which eclipse is the primary one, so the minimum of the best-observed eclipse (shown here centred on phase 0.0 in Figure 2) was measured instead. The time of minimum of that eclipse was estimated to be HJD 2457672.577769 (+/- 0.000184) using the Linear Interpolation Method in Peranso.

After applying a (B-V) colour correction, provided by the Galactic Dust Reddening and Extinction tool in the NASA/IPAC Infrared Science Archive⁽²⁾, GSC 02873-03309's spectral type was estimated to be F3. Consequently, considering the amplitude and period of its oscillations, and its spectral type, I think GSC 02873-03309 is likely to be a new variable star of W Ursae Majoris (EW) type.

The General Catalogue of Variable Stars⁽³⁾ says that EW types *“are eclipsers with periods shorter than 1 day [sic], consisting of ellipsoidal components almost in contact and having light curves for which it is impossible to specify the exact times of onset and end of eclipses. The depths of the primary and secondary minima are almost equal or differ insignificantly. Light amplitudes are usually <0.8 mag in V. The components generally belong to spectral types F-G and later.”*

Clearly more observations (preferably multi-longitudinal) are needed to fully establish the characteristics of this new variable star.

Acknowledgements:

This research used the SIMBAD database, operated by the CDS at Strasbourg, France, the VSX database operated by the AAVSO and the General Catalogue of Variable Stars.

This research also made use of the NASA/IPAC Infrared Science Archive, which is operated by the Jet Propulsion Laboratory, California Institute of Technology, under contract with the National Aeronautics and Space Administration.

References:

1. Vanmunster T., Peranso (2011)
<http://www.peranso.com/>
2. NASA/IPAC Infrared Science Archive, Galactic Dust Reddening and Extinction (2013)
<http://irsa.ipac.caltech.edu/applications/DUST/>
3. Samus N.N., Durlевич O.V., Goranskij V.P., Kazarovets E. V., Kireeva N.N., Pastukhova E.N., Zharova A.V., General Catalogue of Variable Stars (Samus+ 2007-2015), VizieR On-line Data Catalog: B/gcvs, GCVS Variability Types
<http://www.sai.msu.su/gcvs/gcvs/iii/vartype.htm>

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* * *

ECLIPSING BINARY NEWS - NOVEMBER 2016

DES LOUGHNEY

RW Tauri

In the last News we called for observations of RW Tau in order to make an up to date determination of the time of mid primary minimum. So far it seems that no one in the UK has been able to make the necessary measurements. The weather in Edinburgh has not cooperated for the past two months. David Conner has drawn my attention to the measurements that were made by Gerry Samolyk on the 25/10/16 and which were submitted to the AAVSO. They are displayed in Figure 1.

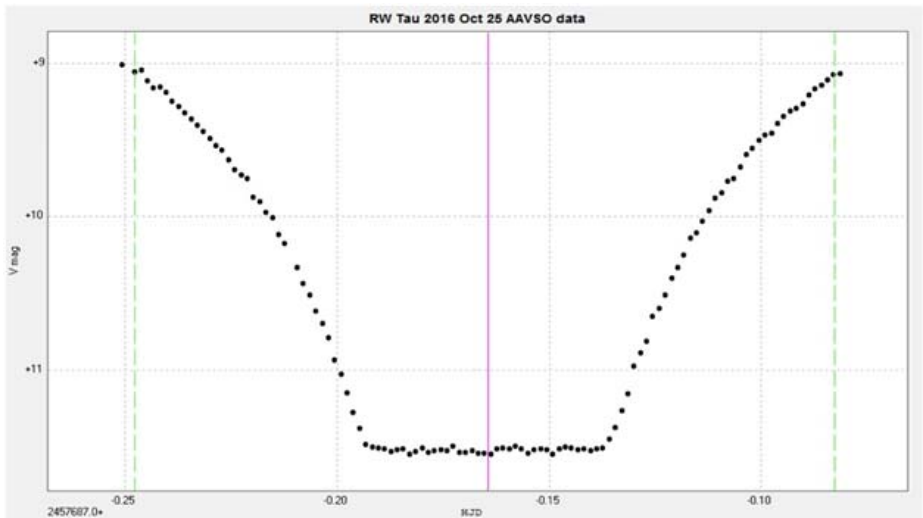


Figure 1: Light Curve of RW Tau 2016 Oct 25 Gerry Samolyk

This is an excellent set of measurements allowing an accurate determination of mid eclipse. The time of mid eclipse was found to be HJD 2457686.835463. The time predicted by the Krakow website was HJD 2457686.825556. The eclipse was therefore late by about 14 minutes.

The Krakow prediction is based on a period determined in 2004, 12 years ago. The time obtained on 25/10/16 implies that the period is lengthening.

The Krakow website presents an O/C diagram that is based on different elements determined 32 years ago, in 1986. If the time on 25/10/16 is compared with a prediction from these earlier elements then the eclipse is early by 0.206526 days (or about 5 hours). This fits in with the recent measurements presented on the O/C diagram which suggests the period is decreasing.

The excellent measurements on 25/10/16 do not clear up whether or not the period is getting bigger or smaller. More measurements are needed.

Checking the magnitudes of Comparison Stars for RW Tauri

In the last News (VSSC Issue 169, September 2016) there were doubts expressed about the quoted magnitudes of comparisons used in the BAAVSS chart (T.Brelstaff 1984). I have checked out the magnitudes of the comparisons D,E,F,H. This has been done relative to C which is assumed not to have significantly changed. This is because the chart quotes a magnitude of 7.91 for C and Hipparcos states a magnitude of 7.94 for C.

Using the chart, the difference between C and D is predicted to be 0.29 magnitude. My finding was that the difference was 0.21 magnitude. The chart predicts that the difference between C and E is 0.99 magnitude. I found it to be 0.50 magnitude. The chart predicts the difference between C and F is 1.39. I found it to be 0.92 magnitude. The chart predicts the difference between C and H is 1.79. I found it to be 1.76 magnitudes.

It seems that the magnitudes of D, E and F quoted in the 1984 chart are erroneous. The Hipparcos/Tycho values are reliable. I would assume that the other, fainter, comparisons (J,M,N,P,Q) need their magnitudes updated in line with Tycho values.

About Algol Predictions

A short time ago we received the following query about Algol from Jean Meeus:

The “Observer’s Handbook 2016” of the Royal Astronomical Society of Canada, page 300, gives a new formula for the times of the minima of Algol. The starting minimum is 2016 January 1.41 = JD 2457388.91, and the period is 2.8673075 days. I assume that the formula gives the times of the heliocentric minima.

For the first minimum of 2017, the formula gives January 2 at 10.1 hours UT. This is 2 hours earlier than the instant given on page 101 of the BAA Handbook 2017.

Do you have some comments?

*Thanks and best regards.
Jean Meeus (Belgium)”*

In our reply we said:

“The BAAVSS uses the period quoted by the Krakow website as the current period , namely 2.867339 days:
<<http://www.as.up.krakow.pl/o-c/data/getdata.php3?BETA%20per>>

This is sufficiently different from the RASC period to account for the two hour difference.”

We explained that some organisations quote older periods because the difference between their predictions and the observed minima are used to construct their O/C diagrams. These diagrams illustrate the changes in period over time and thus the evolution of the eclipsing binary system.

However, we think that using old periods for this purpose is confusing. If you are in the business of providing predictions then they should be as accurate as possible.

Did you know....

Joel Stebbins, in 1910, at the University of Illinois Observatory, used an early selenium cell photometer to produce the first-ever photoelectric study of a variable star. The star was Algol. The paper, which can be downloaded from the internet, is:

“The Measurement of the Light of Stars with a Selenium Photometer with an application to the variations of Algol” ApJ, 32, 185-214 (1910)

Here (Figure 2) is the light curve that Joel Stebbins constructed from his revolutionary measurements:

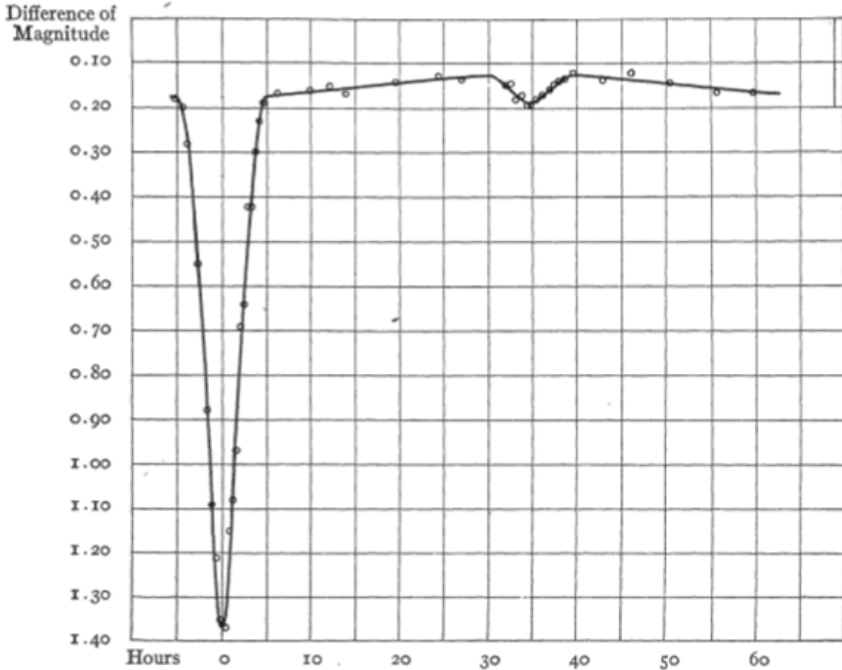


FIG. 3.—The Light-Curve of Algol

Figure 2: The light curve obtained by Joel Stebbins in 1910

Joel Stebbins' work represented a leap in our understanding of eclipsing binary systems. He discovered the secondary minimum and also reflection effects. Light from the system is slowly increasing as the secondary eclipse approaches, due to the primary star shining on the secondary star.

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CHART NEWS

JOHN TOONE

The Chart Secretary is pleased to welcome back Rod Lyon who had been responsible for completely overhauling the telescopic programme charts during the years 1979-1981. Rod has recently commissioned his new observatory, housing a 20cm Newtonian, in Helston, Cornwall. At a latitude of almost exactly 50 degrees north Rod is (most likely) our southernmost observer on the mainland UK. Rod has kindly volunteered to help with chart production and has prepared his first batch, which are for T Cep, R Tri, R UMa and S UMa, and details are given below. Whilst these Mira stars were dropped from the telescopic programme in 1974 they continue to be observed; and by preparing sequences

with modern photometry we can transform the substantial legacy data, some of which dates from 1901.



Rod Lyon with his new observatory.

Photograph courtesy of Margaret Lyon.

The following new charts are now posted to the Variable Star Section web-site and are available in paper form from the Chart Secretary:

Telescopic Stars

338.01 T Cep

New 8 degree and 2 degree field charts have been drawn. The sequence consists of Tycho 2 Vj and SRO measurements. Previous VSS charts for T Cep range from EEM 1906 May 29 (lower case HCO letters adopting ASV photometry) to RGA 1961 Mar (mix of HCO letters and ASV numbers adopting HCO photometry).

339.01 R Tri

New 9 degree and 1 degree field charts have been drawn. The sequence consists of Tycho 2 Vj, Hipparcos Vj, APASS, Skiff and SRO measurements. The previous VSS charts used for R Tri were referenced RGA 1963 Mar.

340.01 RUMa

New 10 degree and 30 minute field charts have been drawn. The sequence consists of Tycho 2 Vj, BSM and SRO measurements. Previous VSS charts for R UMa range from EEM 1906 Oct 11 (lower case HCO letters adopting ASV photometry) to RGA 1961 Jan (mix of HCO letters & ASV numbers adopting HCO photometry).

341.01 SUMa

New 6 degree and 1 degree field charts have been drawn. The sequence consists of Hipparcos Vj, BSM and SRO measurements. Previous VSS charts for S UMa range from EEM 1906 Oct 16 (lower case HCO letters adopting ASV photometry) to RGA 1961 Jan (ASV numbers adopting HCO photometry).

250.02 ZUMi

Formerly 250.01, the existing 1 degree and 10 minute charts have been retained. The sequence has been extended, at both the bright and faint ends, with the addition of comparison stars N and M. Comparison stars G and H have been replaced by new comparison stars K and L. The sequence now consists of V measurements from Henden and SRO.

Binocular Stars

334.01 RS and TZAnd

A new 6 degree field chart replaces chart MDT 1977 Sep 10.

SU And, which was on the superceded chart, now shares a new chart with VX And (see below). The existing sequence is retained, but with Tycho 2 Vj measurements for all comparison stars, with the exception of A that retains an HD value due to its high B-V colour index. The previous sequence was non-linear and too bright at the faint end.

345.01 VX and SU And

A new 5 degree field chart replaces charts JEI 1988 Oct, for VX And (see VSS Circular 68, page 5) and MDT 1977 Sep10, for SU And, with both sequences amended. The VX And sequence is trimmed more closely to the range of the variable and consists of Tycho 2 Vj measurements, with the exception of F, which adopts the SAO value due to its high

BV colour index. Comparison stars 1 and 4 are dropped from the SU And sequence and replaced by new comparison stars 5 and 6. The sequence is Tycho 2 Vj measurements, with the exception of 2, which is a double star and Hipparcos Vj is adopted.

343.01 RY, ZZ and UV Cam

A new 6 degree field chart replaces chart MDT 1972 Jul 29. Comparison stars 2, 3, 7, 9, F, K, N and Q have been dropped and comparison stars S and T are added. The sequence now consists of Tycho 2 Vj measurements with the exception of 6, that retains the SAO value on account of its low B-V colour index. The updated sequence has a reduced colour range and is now linear at the faint end.

089.04 CH Cyg

The 9 degree and 1 degree charts plus the existing sequence are retained. The only changes to the charts are of a cosmetic nature at the suggestion of Tracie Heywood and Roger Pickard.

346.01 UX Dra

A new 6 degree field chart replaces chart MDT 1982 Nov 7. Comparison star 3 is dropped and comparison star E is added. The sequence is drawn from Tycho 2 Vj measurements but with HD adopted for 2 (high B-V colour index), Hipparcos Vj adopted for 7 (double star), and WDS adopted for D (high B-V colour index).

342.01 SU Lyn*

No previous BAA VSS chart existed for this newly identified symbiotic variable star (see VSS Circular 168, page 7). A 3 degree field chart has been drawn with a sequence derived from Tycho 2 Vj measurements.

344.01 PR, AD, SU and KK Per

A new 3 degree field chart replaces chart DAP 1972 Feb 4. Major changes have been made to the previous sequence which had a wide colour range and contained several small-range variable and double stars. The existing comparison stars retained are B, C, D, N and P with new comparison stars R, S, T, U, W, X, Y and Z added. The new sequence is drawn from Tycho 2 Vj measurements, but with HD adopted for D (high B-V colour index,) and Hipparcos Vj adopted for W (double star) and Y.

209.02 tau 4 Ser

A new 9 degree field chart replaces chart 209.01. The previous numbered sequence has been replaced by a lettered sequence adopting Hipparcos Vj measurements. Comparison stars 2, 4 and 5 from the old sequence have been dropped, and the new sequence introduces comparison star D.

Thanks are due to Shaun Albrighton, Dave Gavine, Tracie Heywood and Melvyn Taylor for providing helpful input to the binocular sequences. I am grateful to David Boyd for highlighting the interesting classification of SU Lyn that created an urgent need for a chart. Roger Pickard has provided important comments on the charts at the approval stage.

Finally, I repeat my initial statement that it is great to have Rod Lyon back to help with the production of telescopic charts.

enootnhøj@btinternet.com

CHART OF SU LYNCIS* see page 16

DRAWN BY JOHN TOONE

342-01

3° FIELD DIRECT

SU LYNCIS 06h 42m 55.1s +55° 28' 27" (2000)

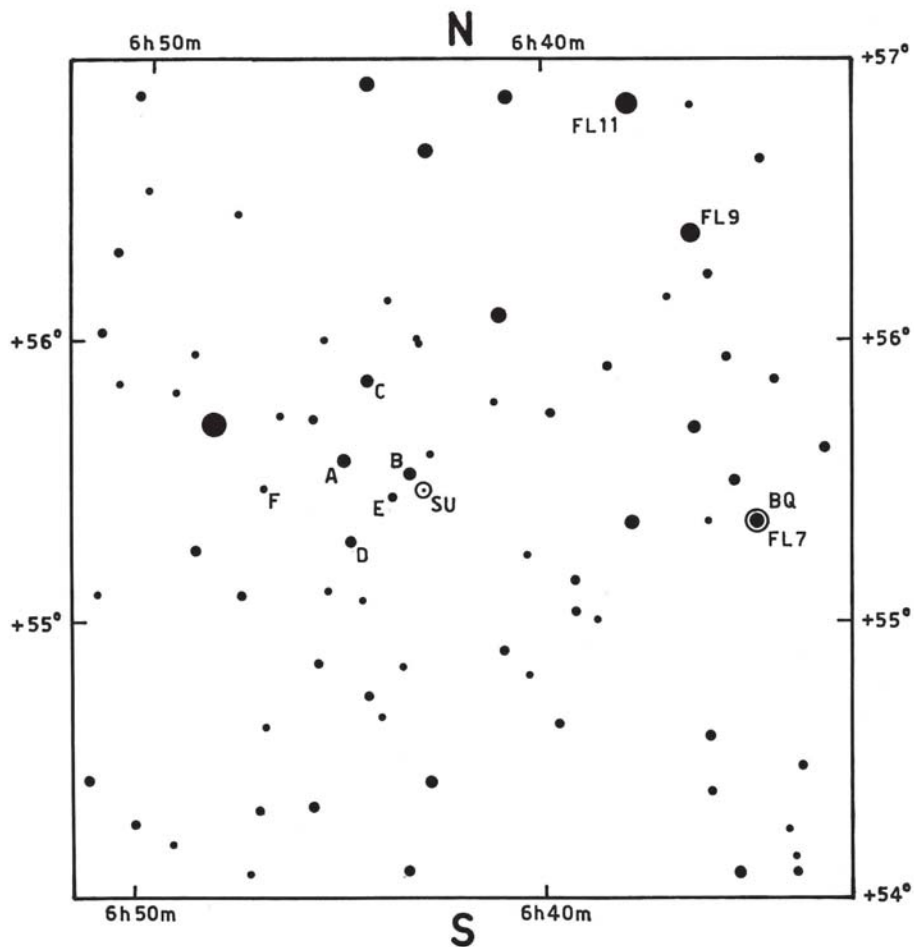


CHART:
MILLENNIUM SA
SEQUENCE:
TYCHO 2 VJ

A 7.4 D 8.7
B 7.7 E 9.2
C 8.4 F 9.6

BAA VSS
EPOCH: 2000
DRAWN: JT 14-8-16
APPROVED: RDP

BINOCULAR PROGRAMME

SHAUN ALBRIGHTON

The various priority levels of the Binocular Programme can now be found on the VSS web site at: http://www.britastro.org/vss/bin_prog_priority_191013.htm or for a full listing in constellation order at: http://www.britastro.org/vss/chartcat_binoc.htm

These listings can be viewed in Circulars 157 - 160, and can be obtained in paper format from Shaun Albrighton and Roger Pickard (Contact details under Director and Binocular Secretary on back page of the Circular).

ECLIPSING BINARY PREDICTIONS – WHERE TO FIND THEM

DES LOUGHNEY - desloughney@blueyonder.co.uk

The publication of Eclipsing Binary Predictions is now discontinued in the VSS Circular. Predictions for RZ Cas, Beta Per and Lambda Tau can still be found in the BAA Handbook. Predictions, completed on a monthly basis, are available on the BAA VSS website at: <http://www.britastro.org/vss/dpredict.html>

If readers require paper copies of the predictions please contact me.

The best source for predictions for Eclipsing Binaries is the Mt. Suhora Astronomical Observatory, Cracow Pedagogical University website (known as the Krakow website) at: <http://www.as.up.krakow.pl/o-c/index.php3>

Click on 'Constellation List', choose your constellation and then choose your system.

A webpage will then appear with lots of useful information regarding the system. In the section entitled 'Light Elements' there is a link entitled 'current minima and phase'. When you click on this link, in the example of Beta Lyrae, you get predictions of primary and secondary eclipses for a period of three months. For systems with very short periods such as RZ Cas the predictions are for one week. For a system such as SW Cyg, with a period of around 4.57 days, the predictions are for a month.

The Krakow website does not tell you how much of an eclipse will be observable at a particular time of the year at your latitude and longitude. However, it has some useful literature references for each system, although they may not necessarily be up to date. Nor are references to the 'Information Bulletin on Variable Stars' included, but these can be found at: <http://www.konkoly.hu/IBVS/IBVS.html>

Although the Krakow website lists the depth of eclipses it does not list the actual V magnitudes at maximum and minimum. For an indication of these magnitudes you will need to visit the 'General Catalogue of Variable Stars' website at: <http://www.sai.msu.su/groups/cluster/gcvs/gcvs/>

Click on 'GCVS Query Form', type in a designation such as SW Cyg, and click on 'Search'. The resulting information displayed shows that maximum is 9.24V, primary minimum 11.83V, and secondary minimum 9.30V. These magnitudes, however, may have been determined some time ago.

The GCVS website gives SW Cyg a period of 4.57313411 days but the Krakow website lists the period of SW Cyg as 4.572986 days. The latter is more likely to list the most up to date period. It must always be borne in mind that small changes in a period can result in significant changes in the times of minima if the period was determined a few years ago.

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* * *

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CONTRIBUTING TO THE CIRCULAR

If you would like to prepare an article for consideration for publication in a Variable Star Section Circular, please read the *Notes for Authors*, published on the web pages at:

<http://www.britastro.org/vss/circons.htm>; reproduced in full in VSSC132 p 22, or contact the editor (details on back cover) for a pdf copy of the guidelines.

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 171) will be 7th Feb 2017. 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 VSS cannot be held responsible for errors that may occur; nor will they necessarily always agree with opinions expressed by contributors.

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Nova and Supernova discoveries

First telephone the Nova/Supernova Secretary, Guy Hurst: 01256 471074
If only answering machine response, leave a message and then try the following:
Denis Buczynski 01862 871187,
Glyn Marsh 01624 880933, or
Martin Mobberley 01284 828431.

Variable Star Alerts

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