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The British Astronomical Association

Variable Star Section Circular

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[Cover Picture](#)

RS Ophiuchi in outburst

August 09.557 UT 2021. iTel 0.51m CDK f4.4 - FLI PL09000 CCD 120 seconds luminance.
Martin Mobberley, Bury St. Edmunds, Suffolk UK

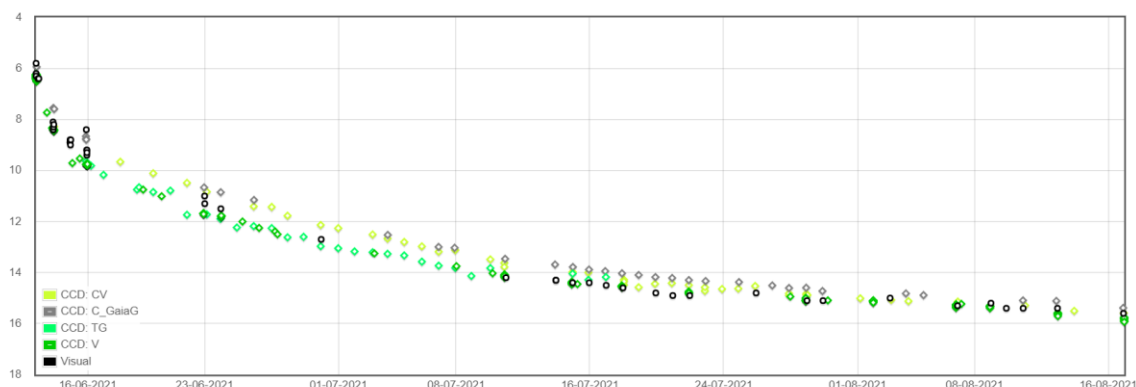
Novae galore

Since the June VSS Circular, three more novae have been discovered. N Her 2021 (**V1674 Her**) was discovered by Seiji Ueda at mag 8.4 on June 12, reaching 6th mag. Then N Vul 2021 (**V606 Vul**) was discovered by Koichi Itagaki at 12th mag on July 15. Then the Recurrent Nova, **RS Oph**, erupted on August 8, reported by Alexandre Amorim, Eddy Muylaert and Keith Geary. RS Oph last erupted in February 2006. More on this RN in Gary Poyner's CV & E notes - see also the front cover.

This brings to six the number of reasonably bright and well-placed (for northern observers) novae discovered since July of last year! Has there ever been a more exciting time for nova observers? It is gratifying to see people observing these objects who have never observed variable stars, let alone novae, before. What can we expect next, I wonder?

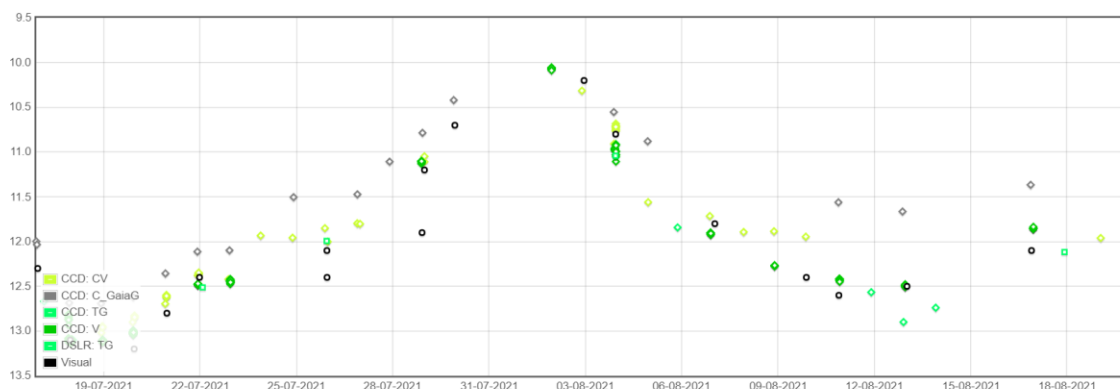
Joe Patterson, Tonny Vanmunster & Jonathan Kemp note ([ATel #14856](#)) that **V1674 Her** displayed a strong double-humped photometric signal at 0.15302(2) days, and another strong signal at 8.3586(3) minutes in CBA data from 2021 July 1 - August 10. The latter seems consistent with the 8.357 min signal detected in pre-outburst ZTF data by Mroz *et al.* ([ATel #14720](#)), and the 8.4 min X-ray signal reported in outburst by Maccarone *et al.* ([ATel #14776](#)).

Light Curve for V1674 Her



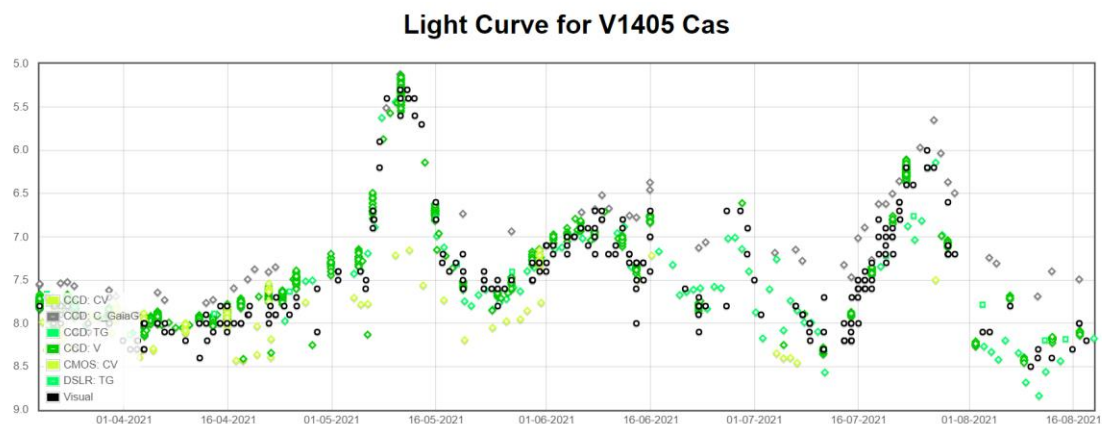
Contributors: P G Abel, S W Albrighton, D Boyd, D Dobbs, G M Hurst, N D James, M L Joslin, M Mobberley, R Pearce, G Poyner, J D Shanklin, J Shears, J Toone, T Vale

Light Curve for V606 Vul



Contributors: P G Abel, D Boyd, D Dobbs, N D James, W Parkes, R Pearce, G Poyner, J Shears

Meanwhile, N Cas 2021 (**V1405 Cas**), discovered on 2021 March 18, is keeping everyone on their toes with its various re-brightening episodes. Take a look at its beautifully intricate light curve below! Hopefully this nova will continue to delight us through the autumn.

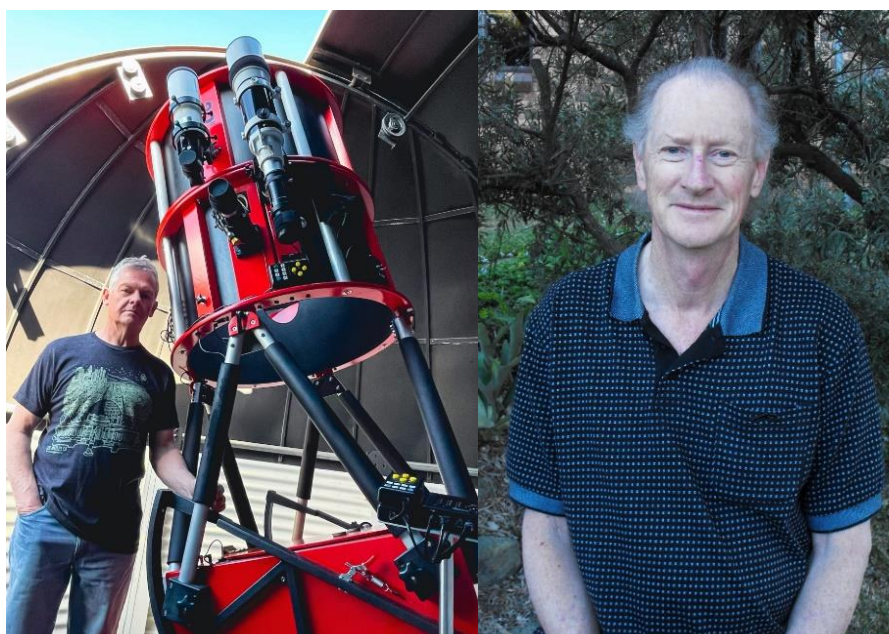


Contributors: P G Abel, S W Albrighton, D Boyd, I Bradley, D S Conner, D Dobbs, C J Evans, R B I Fraser, K Gurney, G M Hurst, N D James, M L Joslin, M Mobberley, W Parkes, R Pearce, G Poyner, J D Shanklin, I Sharp, J Shears, J Toone, T Vale

Congratulations to Rod Stubbings and Peter Williams

Rod Stubbings (Victoria, Aus.) achieved his 350,000th visual observation on 2021 June 28. Then a few days later, Peter Williams (NSW, Aus.) made his 200,000th visual observation on 2021 July 4. John Toone points out that this means Australia now has two visual observers in the 200K club, only the fourth country to achieve that feat after Japan, USA & UK.

Congratulations to both Rod and Peter on their achievements – and best wishes for your next milestones



Rod Stubbings and Peter Williams

VSS medallists

Readers will recall that two of our longstanding VSS Officers and observers were awarded medals by BAA Council last year. Roger Pickard was awarded the Merlin Medal and Gary Poyner the Walter Goodacre Medal, in recognition of their notable contributions to the advancement of variable star astronomy (see [2020 June VSS](#)).

Due to pandemic restrictions, there was a delay in engraving the medals, but I am now delighted to report both Gary and Roger have received their gongs and certificates. Once again, congratulations to both of you!

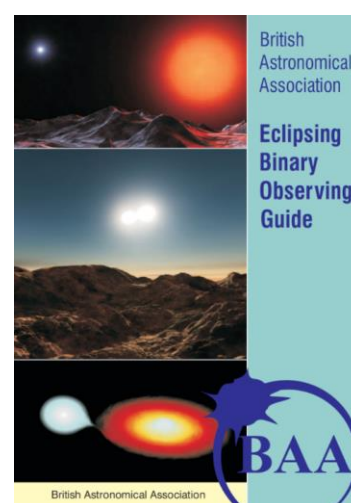


Roger Pickard and Gary Poyner with their BAA medals and certificates

Revised edition of the Eclipsing Binary Observing Guide now available

Eclipsing binaries can be studied with a range of techniques, all the way from simple naked eye observations of some of the brighter systems, through using binoculars or small telescopes, via imaging with DSLR cameras, all the way to sophisticated electronic imaging systems. This handbook provides the observer with a detailed guide to observing these objects. It covers the basic categories of eclipsing binaries, which stars the beginning observer might like to follow, how to interpret the resulting light curve and how to extract the all-important “time of minimum”, corresponding to mid eclipse.

The original Handbook was written by Des Loughney, the VSS Eclipsing Binary Secretary, in 2011. I’m extremely grateful to Des for preparing this revised edition which contains much updated information. Both Des and I are also grateful to Chris Lloyd for revising the list of target stars on the VSS eclipsing binary programme.



The Eclipsing Binary Observing Guide can be [downloaded](#) from the website in PDF format for free. It is hoped that we can offer printed copies for sale in the future.

Mentors needed, please!

Several new observers have begun to observe variables this year, either visually or via digital photometry. Some have been stimulated by the recent novae, as I mentioned above. Beginners often appreciate having a mentor to help them up the learning curve from selecting target stars, making the observations, reducing them, providing reassurance that their results are “OK” and uploading the observations to the VSS database.

Might you be able to offer help to an inexperienced observer? Please do let me know if you are able.

Spectroscopic and photometric study of the Mira stars

David Boyd has recently published a paper in JAVSO on “Spectroscopic and photometric study of the Mira stars SU Camelopardalis and RY Cephei”, which is available here:

<https://arxiv.org/abs/2107.10061>

David presents results of a three-year project combining spectroscopy and photometry to analyse the behaviour of **SU Cam** and **RY Cep** and describes how their brightness, colour, spectral type, effective temperature and Balmer emission vary over four pulsation cycles.

Another great example of how powerful spectroscopy with a small telescope can be.

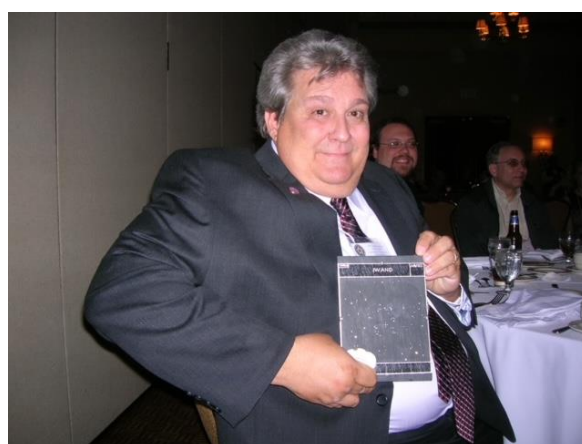
Peranso, TESS and SuperWASP/VeSPA

I have previously mentioned that Peranso version 3 was released by Tonny Vanmunster at the end of last year. The latest version (I am currently running 3.0.2.9) has the capability to import data directly from the TESS database, which makes working with TESS data straightforward and seamless.

Meanwhile, John Fairweather informs me that the SuperWASP Zooniverse project has put its results into a searchable archive called VeSPA. This makes available SuperWASP light curves of periodic variable stars that have been classified by members of the public during the SuperWASP Variable Stars Zooniverse project. It will be updated with new classification results every 6 months. The SuperWASP Variable Star Photometry Archive is available at: <https://www.superwasp.org/vespa/>

Mike Simonsen (1956-2021)

It is with great sadness that I have to report that Mike Simonsen passed away on 2021 July 11, at the age of 64. Mike was a former AAVSO staff member. He received the AAVSO Director's Award in 2005. He was of course best known as an observer of Cataclysmic Variable stars. He and Gary Poyner set up “[CVnet](#)”, the Cataclysmic Variables Network, to encourage observations of these systems. Mike received the American Astronomical Society's Chambliss Amateur Achievement Award for exemplary research by an amateur astronomer. The AAS cited Mike's multi-year “Z CamPaign” which was dedicated to the long-term study of Z Cam stars.



Mike Simonsen with his BAA VSS Butterworth award at the AAVSO Centenary meeting in 2011 (photo: Sebastian Otero)

Mike was a great friend of the BAA VSS. He was presented the BAA VSS [Butterworth](#) award at the AAVSO centennial meeting in 2011 in recognition of his outstanding contribution to the development of charts and sequences. The award is a hand-etched and painted slate plaque depicting an AAVSO f-scale chart of Mike's favourite star, IW And.

I first met Mike at the VSS/AAVSO joint meeting in Cambridge in 2008 and subsequently at a couple of AAVSO meetings in the US, including the centenary meeting. I shall never forget the bear hug he gave me on each occasion – one of his signature greetings! He was an extremely enthusiastic person, a fount of information about cataclysmic variables, and a generous encourager of variable star observers.

Mike will be greatly missed by the variable star community around the world.

VSS observing campaign on CG Dra and ER UMa systems

A reminder that these campaigns are still ongoing (see [VSSC 188](#)). This is prime CG Dra observing time, so nightly measurements or time series photometric runs are welcomed.

AUTUMN MIRAS	
M = Max, m = min.	
R And	m=Oct/Nov
V Cam	M=Nov/Dec
X Cam	m=Nov
SU Cnc	M=Oct
S Cas	m=Oct
V CrB	M=Oct
W CrB	M=Oct
chi Cyg	m=Oct
S Cyg	m=Sep/Oct
V Cyg	M=Nov
RU Her	M=Aug/Sep
SS Her	M=Sep
	m=Nov
R Hya	M=Oct/Nov
SU Lac	m=Oct/Nov
RS Leo	m=Sep
	M=Nov
X Oph	M=Oct
R Ser	m=Nov/Dec
T UMa	M=Aug/Sep
<i>Source BAA Handbook</i>	

200k Visual Observers

John Toone & Peter Williams

With Peter Williams reaching 200,000 visual observations on 4th July 2021 (see below), I thought it would be a suitable time to update the list given in [VSSC 151](#) of all observers who have reached this coveted milestone.

Milestone Achieved	Observer	Country	First Observation
1968	Albert Jones	New Zealand	1943
1994	Daniel Overbeek	South Africa	1952
1996	Hiroaki Narumi	Japan	1975
1998	Taichi Kato	Japan	1975
2003	Wayne Lowder	USA	1949
2007	Gary Poyner	UK	1975
2012	Rod Stubbings	Australia	1993
2012	John Bortle	USA	1963
2016	Paul Vedrenne	France	1978
2019	Warren Morrison	Canada	1975
2020	John Toone	UK	1975
2021	Peter Williams	Australia	1971

The first point of note is the incredible 26-year gap between Albert Jones and everyone else. Albert was also the second observer to achieve the 100,000 milestone in 1957 following Charles Butterworth in 1939.

The time taken to achieve the milestone ranges between Rod Stubbings who took less than 19 years and Wayne Lowder who took a very steady 54 years.

It is notable that out of the twelve observers who have reached the milestone five commenced observing in 1975, could it be that V1500 Cyg is responsible?

Eight of the twelve observers are still active, and they are each doing a tremendous job in extending the visual photometry era which remains very much scientifically important.

Reflections on a Personal Milestone or Two.

Peter Williams

On the evening of Feb 2, 2021, there was a small window of clear sky after the end of twilight before the clouds rolled in, as is all too typical during summer here in Heathcote on the southern outskirts of Sydney, NSW. I tried to put that short amount of time to good use and managed to observe about 20 variable stars with the 10x50 binoculars. It was a race against time as I moved from one field to the next, keeping just ahead of the clouds until the sky was eventually clouded out.

During that quick run of variable stars, I managed to record the brightness of theta Apodis, a semi regular red variable star in the somewhat obscure constellation Apus lying to the south of the box-shaped asterism of Musca, itself located at the foot on the Southern Cross. theta Aps was at that time well within its normal brightness range and shining at magnitude 6.4 – pretty unremarkable.

It dawned on me a short time later when the sky was totally clouded out that I had observed theta Aps earlier, on Feb 2, 1971, when it was at magnitude 5.5, again within its normal brightness range and also pretty unremarkable. That most recent observation of theta Aps is, however, somewhat remarkable for being exactly 50 years to the day when I made my very first variable star observation – that earlier observation of theta Apodis! Wow! 50 years of variable star observing makes me think these variable stars may be more than just a passing fad.

Yet I had been observing the night sky for several years prior to that observation of theta Aps, since about 1966 when I borrowed my grandfather's pair of binoculars, and then in more detail after receiving a small 60mm refracting telescope for Christmas 1968 from my parents. If only they knew what had started those 55 years ago! But even before all this I had a childhood fascination with the night sky and recall as a youngster noting the two naked eye double stars mu Sco and alpha Cap returning over several successive years, long before I knew any of the constellations.

My interest in variable stars had a rather unglamorous beginning and stems from having received a small soft cover book, "The Sky Observers Guide", also at Christmas in 1968. This included a rather brief section describing variable stars but, wow, the light curve shown for the star Mira Ceti made me think how fascinating it would be to see with my own eyes a star going through such a dramatic change in brightness.

Then, just a few years later I noticed theta Aps included in a list of variable stars within Norton's Star Atlas (1966 15th edition, reprinted 1969). Using a hand drawn chart traced from the Becvar's Atlas Coeli with comparison star magnitudes from the Yale Bright Star Catalogue in the library of the Sutherland Astronomical Society (formally James Cook Astronomers Club) in southern Sydney I followed theta Aps for the 8 months February through September 1971 and, despite Norton's listing it as an irregular variable, there was a clear semi regular period near 119 days.

And I still use that same copy of Norton's to this day as the convenient charts cover the whole sky in large sections to naked eye visibility and are just so convenient to quickly orient myself and identify an area of sky that contains an object of interest. Those charts have the usual assortment of deep sky and multiple stars circled to denote a successful observation and have a good many additional variable stars and novae plotted to aid in their initial location.

During those 50 years of variable star observing I have certainly clocked up a few hours under the night sky and have seen some very interesting and unusual stellar behaviour, some regular happenings, and some unexpected & unpredictable behaviour, plus a discovery or three. There have been many cooperative programs organised through the Variable Star Section of the Royal Astronomical Society of New Zealand (VSS, RASNZ) and the American Association of Variable Star Observers (AAVSO), the Variable Star Network (VSNET) of the Kyoto University in Japan and the Variable Star Section of the British Astronomical Association in the UK (BAA VSS), in support of professional astronomers using either ground based telescopes or orbiting satellite observatories.

The 60mm refractor was eventually replaced by a 15cm F8 Newtonian and that in turn was superseded by a 30cm F6 Newtonian, supplemented by 10x50 and 20x80mm binoculars.

But it has not only been variable stars that have taken my interest. During the early years there were descriptive notes of over 2,000 deep sky objects through the humble 15cm Newtonian reflector,

magnitude and central condensation estimates of comets (including Halley's Comet 1985/86), total and grazing lunar occultations, recording sunspot numbers, transit timings of structures in Jupiter's cloud belts and timing the eclipse disappearance & re-appearance of the Jovian Galilean satellites, plus the occasional eclipse and many beautiful planetary & lunar conjunctions just asking to be photographed.

There has also been showing the night sky to thousands of visitors at the Green Point Observatory of the Sutherland Astronomical Society right from the early days of the public Star Night program, SAS Practical Astronomy Course (SASPAC) and the Public Open Nights and writing about these adventures and more in the Sutherland Astronomical Society newsletter "Southern Observer".

Following on from this, I more recently achieved another small personal astronomical milestone. On the evening of July 04, 2021 (local time) I reached and passed the 200,000 visual variable star observation mark.

To add a little background to this story, it was during a recent holiday to the UK (2019 in the pre-Covid era!) this approaching milestone was discussed over pizza and a few beers with John Toone of the British Astronomical Association Variable Star Section. Both John and I were approaching the 200K at that time.

I have known John for many years, since our first meeting during the ASNSW South Pacific Star Party at Ilford NSW in 1999, and we have since met up on several occasions both here in Oz and in London for either "Pizza on The Rocks" or "Pizza beside The Thames" depending upon which side of the globe we found ourselves.

At John's suggestion, I juggled my usual routine list of stars on that all-important night so the 200K observation was of the bright semi regular red variable theta Apodis. This was, of course, rather symbolic remembering that theta Aps was the star of which I had made my very first variable star observation 50 years and 5 months earlier. It just seemed rather fitting in some way!

By reaching the 200K mark it seems I have joined a somewhat exclusive club of just 11 other visual observers world-wide who have achieved this number, including John Toone. I am indeed therefore in good company.

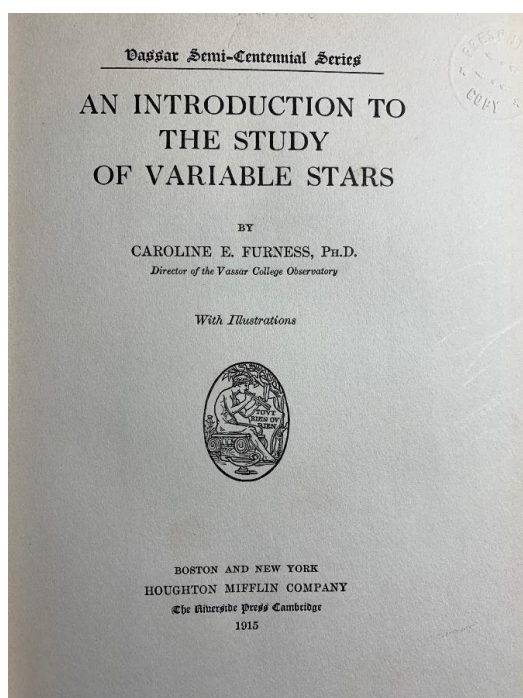
While the number of observations is certainly a great personal achievement and has involved some considerable time and a consistent effort over the long term, I would like to think the data has been accurate and therefore useful to the variable star research community, rather than just numerous. I have also witnessed a good deal of interesting and some unexpected stellar activity along the way, but it also has been a lot of fun both observing the night sky and sharing an enthusiasm for these things with others, while doing a little bit of science along the way.

Books from a bygone era with links to observers from the early years of the BAA Variable Star Section

Jeremy Shears

The purchase of a century old variable star book via eBay reveals a connexion with two variable star observers from the early days of the Variable Star Section, Dr Harold Whichello, and Charles Butterworth.

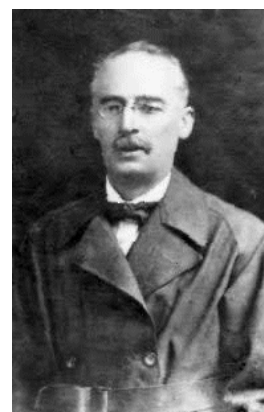
One of my secret pleasures is to collect old astronomy books, especially if they are connected with variable stars. Therefore, I was delighted to be able to purchase, via eBay, a 1915 copy of Caroline Furness' classic, *An Introduction to the Study of Variable Stars*. Furness was Director of the Vassar College Observatory, and this volume was in the "Vassar Semi-Centennial Series" to commemorate the 50th anniversary of the founding of Vassar College in New York state.



Title page of my copy of Furness' book

The book duly arrived, and I was delighted to note that the flyleaf was inscribed with the name of a former owner, "H. Whichello". This name was well known to me as I had researched his biography for a paper published in the BAA Journal along with my co-author, Theresa Hull [1]. Dr. Harold Whichello (1870-1945) was a Cheshire General Practitioner and an enthusiastic amateur astronomer. He undertook observations for our Lunar, Solar and Variable Star Sections using a 6-inch Wray refractor. He also contributed lunar occultation predictions and comet ephemerides to the Computing Section. The reason I was especially interested in him was that he lived in the village of Tattenhall, close to my home, from the 1890s until 1914. He subsequently moved to a new practice in Heswall, on the Wirral, and finally to Chester where he spent his final years. This was the first time that I had held something that had previously been owned by Dr Whichello.

Whichello joined the BAA in 1898 and for several years was most interested in observing the Moon and Sun. However, a new astronomical interest captured his imagination in 1915 when he began to observe variable stars with his Wray refractor, continuing at a steady pace for the next twenty years. The BAA Variable Star Section's database contains over two-thousands of his estimates, the first being of the long-period variable T UMa on 4 January 1915 and the last on 4 August 1935. His most frequently observed star was X Cam, another long-period variable. In 1927 he was presented with the Chester Society for Natural Science, Literature and Art's top award, the Kingsley Memorial Medal, for his work on variable stars.



Dr. Harold Whichello
(Photo. Liverpool AS)

But the connexion with variable star observers didn't end there as the full inscription reads:

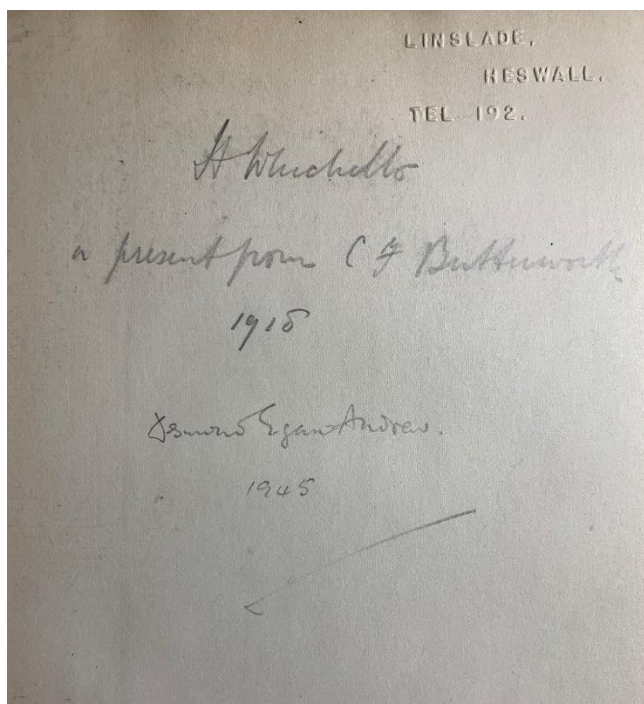
H. Whichello

A present from C F Butterworth

1915

(although it might say 1916 or 1918). Charles Frederick Butterworth (1870-1946) will be known by many members of the VSS. He was a Lancashire born amateur astronomer and the first person to complete 100,000 visual observations of Variable Stars, in 1939. He began observing Variable Stars at the age of 40 and between 1911-1941 made 105,000 observations. He was the world's leading observer from 1931 when he overtook Alexander Roberts' total of 66,000 and remained so until 1957 when NZ observer Albert Jones surpassed Butterworth's total. In 2004 the BAA Variable Star Section introduced an award for outstanding service in the field of variable star astronomy, and this was named after Charles Butterworth.

One could imagine that Whichello and Butterworth knew each other rather well given they lived in the same locality. At the time of the gift of the book, Butterworth was living in Poynton, Cheshire. They were both BAA members and Fellows of the RAS. They might well have met at meetings of the Liverpool Astronomical Society or the Manchester Astronomical Society; certainly, Whichello was a member of both.



Inscription on the flyleaf

It is interesting to speculate that it was Butterworth's gift that precipitated Whichello's taking up VS observing in 1915. Or might it have been a kind gift from an experienced VS observer who was hoping to encourage another just starting out? The gift inscription was made by Whichello as the handwriting style is the same as in other books owned by Whichello as I will discuss below. The flyleaf is also embossed with "Linslade, Heswall, Tel 192", Linslade being the name of Whichello's house in Heswall. How wonderful to have a three digit phone number – certainly easy to remember!

Whichello was not the final owner of the book, for the flyleaf is also inscribed "Desmond Egan Andrew 1945". Andrew was elected Fellow of the RAS on 1945 June 8, giving his address as 29 Liverpool Road, Chester. This address, near the centre of Chester, was also the address of Whichello's younger daughter, Ena, with who Whichello lived from the time he became a widower until his death. Whether Egan-Andrew was a lodger, guest, or merely used the address for convenience in his RAS application, we cannot say.

A number of Egan-Andrew's books were also offered for sale by the same eBay merchant, based on the Isle of Skye. These included several books, and BAA *Handbooks* and *Journals* from the 1930s and earlier, which had Whichello's name handwritten inside. Several of these were annotated with calculations in Whichello's hand. Post retirement he had become increasingly interested in

astronomical calculations and was a regular contributor to the BAA Computing Section. Volumes included *Spherical and Practical Astronomy* (Vol 1 and 2 – Chauvenet, 1885), *A Text-Book of General Astronomy* (Charles Young, 1895) and a heavily annotated BAA *Journal* from 1895.

There were also several textbooks on astronomy from the 1940s and 50s which were signed by Egan-Andrew alone. It appears that he studied astronomy at university (University College London and Cambridge University and are written in Egan-Andrew's hand on some books). Research by VSS member Dr James Dawson FRCA, revealed that Egan-Andrew was born on 1925 March 8. In 1939 records show he was living at 24 Talbot Street, Chester. He would have been 20 when Whichello died. Perhaps Whichello had encouraged Egan-Andrew's interest in astronomy and Whichello's daughter gave him some of her deceased father's books.

Egan-Andrew later lived in Chobham, Surrey, and most recently in Portree, Isle of Skye, where he died on 2019 August 22. His widow, Lorna Tolmie Egan-Andrew's, had died almost exactly a year earlier, passing away in Portree on 2018 Aug 25. Presumably Egan-Andrew's books ended up with the eBay seller as part of a house clearance, or estate management.

In conclusion, as a result of a self-indulgent eBay purchase, not only do I have a rather fine copy of a seminal book on variable stars, but also one of which has a direct link to pioneering variable star observers going back more than one hundred years to the early years of the Variable Star Section.

[1] Shears J. & Hull T., J. Br. Astron. Assoc. 124, 336-342, (2014)

Uploading Observations: Making sure that you are using recognised sequence names

Tracie Louise Heywood

A guide describing how to identify the correct sequence name to accompany your uploaded visual observations.

When attempting to upload visual observations to the BAA VSS database, the upload process will tell you how many *errors* it has found and how many *warnings* it has flagged.

Errors could include mismatches between Calendar Dates/Times and Julian Dates or miscalculations when converting light estimates to deduced magnitudes.

Warnings could include unrecognised sequence names (chart-id's) or unrecognised comparison star-id's

Errors will block the upload process until you correct them.

Warnings do not block the upload, as the process has to allow for variable stars with no sequence recorded in the database. In particular, the AAVSO chart plotter generates a new chart-id every time that it plots a chart, and it is not feasible to record all of these in the BAA VSS database.

It can be tempting to “save time” by just fixing the Errors and then ignoring the Warnings.

**** Please do not do this ****

For visual observations, it is especially important to use a valid sequence name in the upload to the BAA VSS database, since without a recognised sequence name the deduced magnitude cannot be checked against the light estimate. Even if the deduced magnitudes are correct, the lack of a recognised sequence name means that the deduced magnitudes cannot be recalculated at a later date to take into account revised comparison star magnitudes. Quoting the sequence name as “BAA” or “BAA VSS” is of no use, since many BAA VSS sequences have gone through multiple versions over the decades.

As has already been mentioned, for AAVSO charts all that you can do is enter “AAVSO” followed by the AAVSO chart-id (e.g. “AAVSO 12345abc”).

For other stars, including current and former BAA VSS programme variables, you should check the database to make sure that you are using recognised sequence names:

If you know the comparison star magnitudes, but aren't sure as to which sequence-id they belong, you can check as follows:

On the BAA VSS website:

- click on Database
- then on Standing Data and Summaries
- then on Sequence Data
- enter the name of the variable and click on Fetch Sequence
- check your comparison star magnitudes against the listed sequence-ids

As an example, these are the sequences listed for V465 Cas:

1 - 233.01			2 - 233.02 (Latest)		
Comp No.	Comp Alias 1	Mag	Comp Alias 1	Mag	Comp No.
1	P	5.700	P	5.800	1
2	C	6.300	C	6.400	2
3	A	6.600	A	6.900	3
4	F	7.000	F	7.200	4
5	B	7.400	B	7.600	5
6	M	7.900	M	8.400	6
7	N	8.300	N	8.600	7

If the sequence name you are using doesn't match any of those listed in the above Sequence Data, check whether it is a valid alias for one of them...

On the BAA VSS website:

- click on Database
- then on Standing Data and Summaries
- then on Sequence Versions and Alias Names
- enter the name of the variable in the Object Id field
- click on Apply Filter
- check your sequence-id against those listed in the Sequence Alias column

Sequence Id	Object Id	Sequence Version	Sequence Alias	Primary Alias
<input type="text"/>	<input type="text" value="V465 Cas"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="v"/>
		<input type="button" value="Apply Filter"/>		<input type="button" value="Reset Page"/>

Sequence Id	Object Id	Sequence Version	Sequence Alias	Primary Alias
70	V465 CAS	1	233.01	Yes
70	V465 CAS	1	961222	No
70	V465 CAS	1	BAA 233.01	No
70	V465 CAS	1	BAA VSS 233.01	No
70	V465 CAS	1	BAAVSS 233.01	No
70	V465 CAS	1	DAP740120	No
70	V465 CAS	1	JT961222	No
70	V465 CAS	1	MDT/DAP1974	No
70	V465 CAS	1	VSS 233.01	No
70	V465 CAS	2	233.02	Yes
70	V465 CAS	2	BAA 233.02	No
70	V465 CAS	2	BAA VSS 233.02	No
70	V465 CAS	2	BAAVSS 233.02	No
70	V465 CAS	2	VSS 233.02	No

Other than for AAVSO sequences, if you don't find a sequence for the variable star involved and would like one adding to the database, then please advise the VSS Secretary Bob Dryden bobdryden@ntlworld.com and the VSS Database Secretary Andy Wilson andyjwilson_uk@hotmail.com .

Investigating 'Stray' estimates in BAAVSS light curves

Tracie Louise Heywood

I describe some examples of discordant observations that have appeared in BAA VSS light curves and how they can be investigated.

BAA VSS light curves occasionally include isolated visual estimates that are very different from those reported by other observers on or around the same date.

Sometimes there may have been significant real brightness changes over short timescales, but in other cases, errors will have somehow crept in.

These could have occurred for a variety of reasons, including

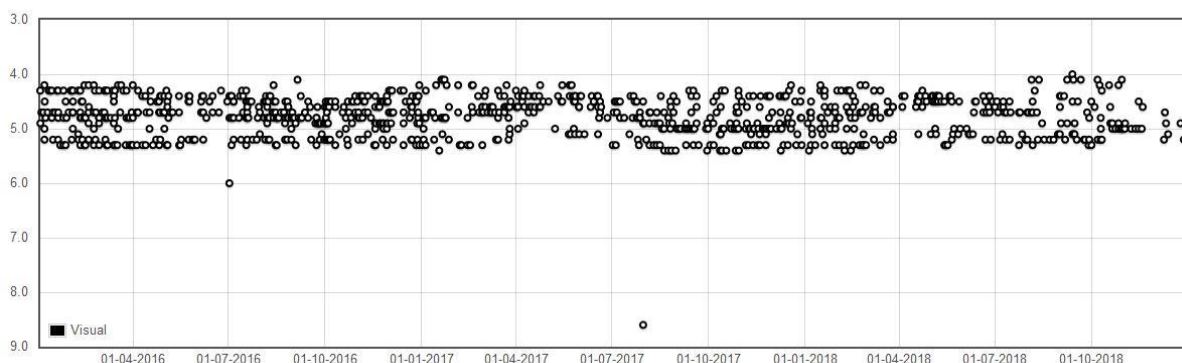
- Errors when making the observation
- Errors when recording the observation
- Errors when uploading the observation to the database

This article will focus on the third possibility.

The database upload software does its best to identify and reject observations for which the deduced magnitude does not match the reported light estimate. It can, however, only do this if a valid sequence name has been included with the observation. If the sequence name is not recognised, it can only flag a warning, and observers can still ignore the warning and complete the upload process. The upload software has to allow this option because most AAVSO and many other valid non-BAA sequences will not be listed in the database. Old BAA VSS binocular charts can be a particular problem since they often did not have their sequence names clearly labelled.

Here, as an example, is a visual light curve for rho Cassiopeiae

Light Curve for RHO CAS

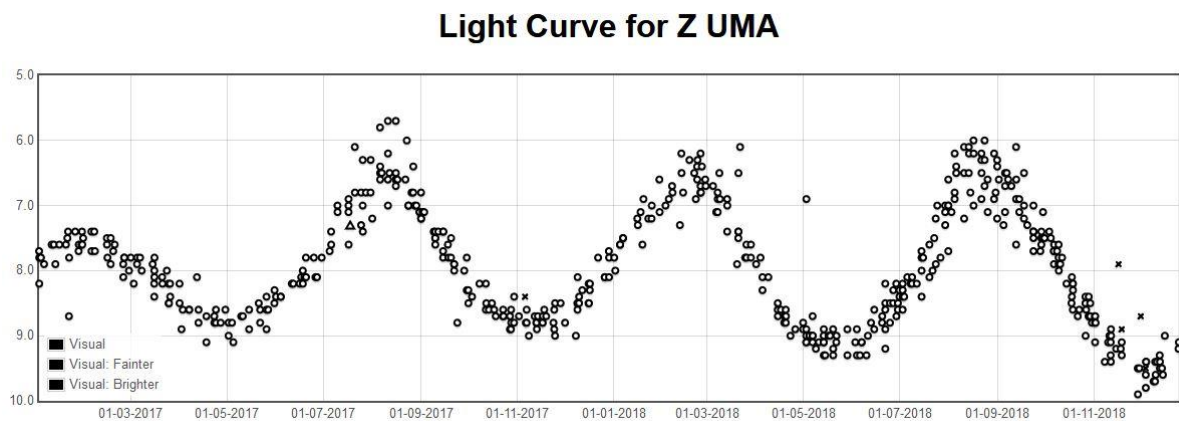


Almost all of the observations fall within the typical spread of about a magnitude. Two observations, from July 2016 and July 2017 are, however, well out of step with other estimates made on or around the same dates.

Looking first at the mag 8.6 observation from July 2017, the database record shows that the chart used was 1972Jul29. This is not one of the recognised sequences for rho Cas. Hence only a warning will have been flagged. The light estimate recorded was “8+1”. Some detective work suggested that this would fit in with an old sequence for the star RY Cam, a star sometimes monitored by the observer involved. Interestingly, the database does include an observation of RY Cam for that night using the 1972Jul29 sequence but, at mag 7.6, it is a little bright for RY Cam and the light estimate of “L+1” would better match an observation of ZZ Cam (which also shares the 1972Jul29 chart). The observer involved has now confirmed that the above was indeed the case.

For the mag 6.0 estimate from July 2016, the solution is less obvious. The sequence involved, “13108BHS” is an AAVSO sequence for rho Cas, but the light estimate of “=6.0” seems unusual for rho Cas. A case of needing to contact the observer involved to check their originally logged observation (including the variable name).

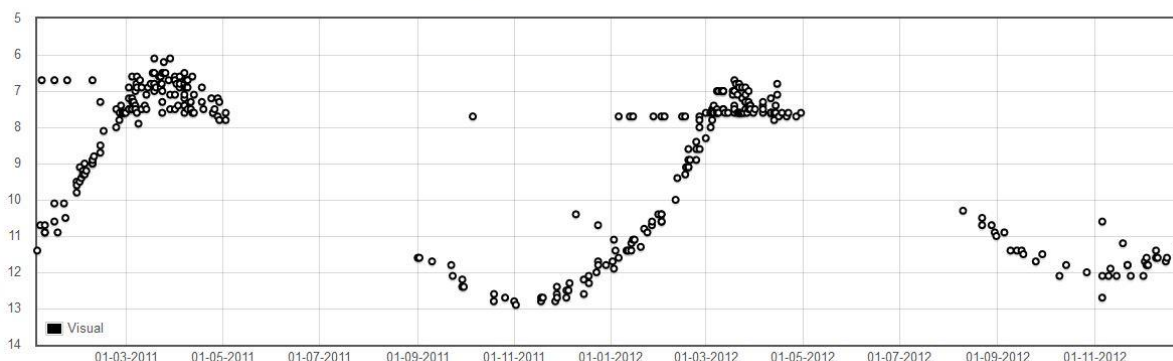
Another interesting example includes the stars Z UMa and RY UMa



The mag 6.9 estimate from May 2018 looks rather discordant. A check of the database record finds that the correct sequence name of “217.02” has been entered. Interestingly though, the recorded light estimate is “1-2” and this would make more sense if this was an observation of RY UMa, which also shares the same BAA VSS chart. Furthermore, the observer involved has also uploaded an observation of RY UMa from the same night. This has a light estimate of “H-1” and a deduced magnitude of 8.8 ... which is discordant for RY UMa, but would fit the above Z UMa light curve well. Possibly a copy & paste error when keying in the observations? The observer involved has now confirmed that the observations had inadvertently been swapped around.

Sometimes, we see a string of discordant estimates all at the same magnitude, as in this light curve for U Orionis:

Light Curve for U ORI

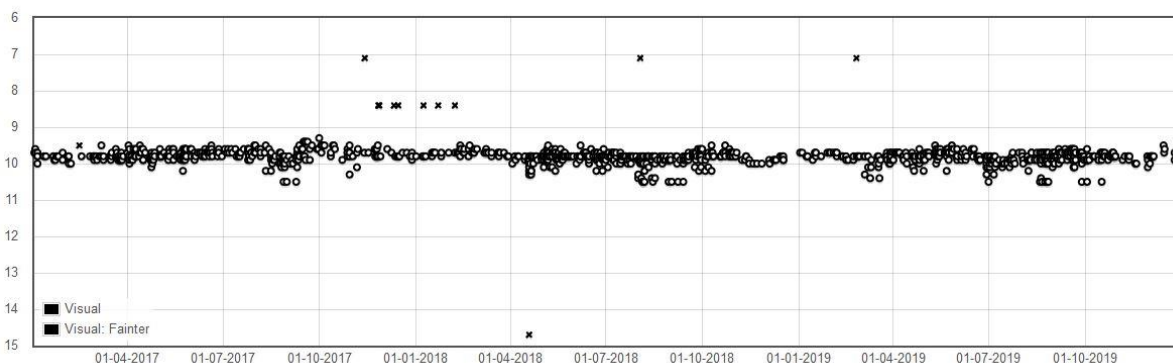


There is a run of discordant estimates at mag 6.7 in early 2011 and another run, this time at mag 7.7, in early 2012.

A closer look at the database records shows that the expected sequence 059.02 was indeed used. Interestingly, all of these estimates were reported by the same observer. Sadly, the observer involved is no longer with us, so we can't ask them to check their original logs. However, the light estimates for the mag 6.7 observations were all “=F” and those for the mag 7.7 observations were all “=H”, so a distinct possibility is that these observations were all meant to be “fainter than” estimates.

Sometimes, though, it can be a “fainter than” estimate that is discordant, as can be seen in this light curve for T CrB:

Light Curve for T CRB

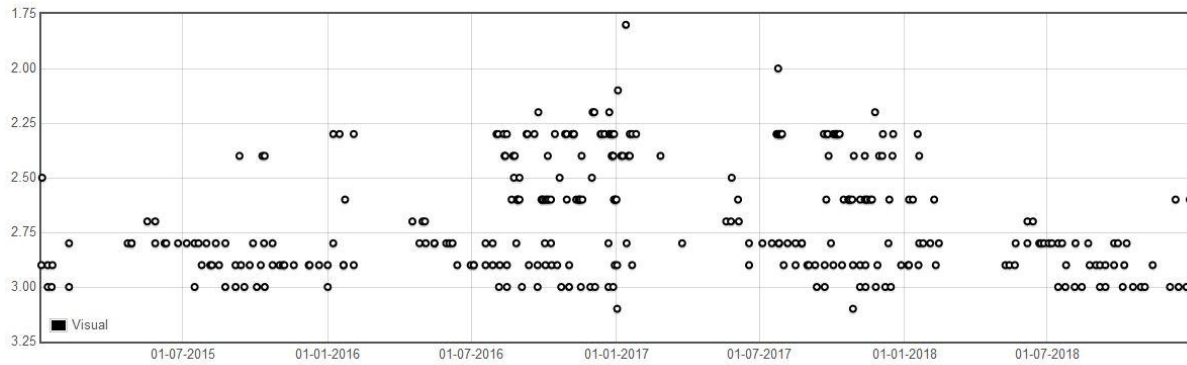


Most of the “fainter than” estimates look sensible, but there is one from May 2018 that clearly appears to be discordant. Inspection of the database record shows that the sequence name recorded was “1432hit”. This is not a recognised BAA VSS sequence for T CrB, but it is a valid AAVSO sequence name for DV UMa ... and the recorded light estimate of “<147” would match DV UMa well. The observer involved has now confirmed this.

There are times, however, that so many observations of a star have been uploaded with unrecognised sequence names in the database, that it becomes difficult to tell whether the observations are all of one star or whether some belong to another star.

This is particularly true in this light curve for beta Pegasi:

Light Curve for BETA PEG



Most estimates are in the range 2.7-3.0, but a significant number are brighter ... and many of these are close to what would be expected for beta Persei (Algol) when it is outside of eclipse.

“SPA” is the only valid sequence name recognised by the database software. Many observations have, however, been uploaded using sequence names such as “BAA”, “PER0708” or “None” and so their deduced magnitudes will not have been checked against their light estimates. More significantly, there is no “BAA” sequence for beta Pegasi – could these really be observations of beta Persei? Similarly, “PER0708” is similar to an old chart naming convention used by the SPA VSS - but this would make more sense if the star being observed was in Perseus.

In conclusion, please make sure that you do investigate any warnings flagged by the upload software and, whenever possible, make sure that you specify recognised sequence names.

NSV 1178 is likely a “Dipper” variable and a good target for Visual, Photometric and Spectroscopic monitoring.

John Greaves

A combination of data from online epoch photometry and spectroscopic resources reveal that NSV 1178 is a “dipping” Young Stellar Object.

During a cross match using the CDS Xmatch service (CDS, Strasbourg) of a catalogue of variable Radial Velocity LAMOST (LAMOST, NAO China) objects against the AAVSO-VSX it was serendipitously discovered that amongst the unclassified classic NSV candidate variable stars (NSV, SAI Russia) was a K3 spectral class T Tauri star with variable lightcurve.

Namely NSV 1178 (RA 52.87033° Dec +30.51473° Equinox 2000 Epoch 2016 from GAIA EDR3).

Examination of the SIMBAD entry (CDS, Strasbourg) revealed several papers noting it in candidate lists of Young Stellar Objects (YSOs), although with many of these kinds of statistically derived lists from space observatory data there is often no confirmation of the targeted spectroscopic ilk.

Fuller examination of the object revealed that it is spatially a close outlier to the area of PER OB2 (an OB Stellar Association lying towards Perseus) and candidate member thereof (NSV 1178 itself lies just within Taurus with the star being quite close to the point where Perseus, Taurus and Aries all meet), with no extra data to speak of appearing in AAVSO-VSX beyond the data it initially imported from the NSV and the discovery paper referenced therein merely noting it as a “blue” variable discovered in a survey of PER OB2 looking for said.

Basic astrophysical data include a 2MASS J-K_s of 1.1, which fits well with the LAMOST K3 spectral type (SDSS APOGEE DR2 data also state it is a K type star from near infrared spectra), whilst UKIDSS DR10 (which has a slightly different K passband and not necessarily contemporaneous measures) has J-K 0.0 which is contradictorily white. Also strange is the fact that the UKIDSS DR10 H₂ bandpass (molecular hydrogen, around 2.12 microns wavelength) is two magnitudes brighter than the K band despite the molecular line being within the K passband and near its peak effective wavelength. On the other hand, the molecular hydrogen survey was certainly at a totally different later epoch.

In the WISE survey the object gets progressively brighter from the mid to far infrared and the Herschel Point Source Catalogue lists several objects in and around the immediate vicinity of the star from the far to the very farthest infrared suggesting circumstellar dust in the area. The GAIA EDR3 raw parallax gives a rough distance of 285 parsecs whilst the core of PER OB2 is around 400 parsecs distant with its included R Association PER R1 purportedly around 330 parsecs distant.

The aperiodic variability is shown clearly in several surveys from ROTSE1 Northern Sky Variability Survey ([NSVS](#)), the [Catalina Real Time Survey Data Release 2](#) (the data for CSS, NOT for MLS, click on the 0 button) and the [ASAS-SN Survey](#) (scroll to bottom of page and select one of the links under the column heading ID).

Epoch photometry also exist within the SuperWASP data and the TESS data, however interpretation of the former and of preliminary data for the latter is nontrivial for aperiodic variables as it is difficult to

discern between true signal and vagaries and glitches from uncleaned and not fully processed data (especially in the case of the latter where the data for this particular object is still preliminary).

In the terms of spectroscopic variation, the two LAMOST spectra of different epoch present interesting information. Both when viewed in full are lightcurves characteristic of K type stars but both also show H α apparently in emission. However, using the computer mouse 'rubber banding' selection can be achieved to zoom in on the emission line at around 6560 Ångströms showing that the H α emission has a strong absorption core and evolves in shape and size over time as shown by the following LAMOST spectral plots taken roughly 22 months apart :-

<http://dr5.lamost.org/spectrum/view?obsid=115805220>

<http://dr5.lamost.org/spectrum/view?obsid=260506209>

In summary, increasing infrared excess for increasingly longer infrared wavelengths suggestive of circumstellar matter, aperiodic optical epoch photometry and spectral type including variable absorption cored emission for H α suggests that this is a "red" "late" relatively low mass YSO of the K or M T Tauri sort commonly referred to nowadays as "Dippers" (in order to distinguish them from the "blue" "early" medium to high mass YSO Herbig/Haro Ae/Be stars that show similar variations due to their circumstellar matter which are referred to as UXORs). Other indirect evidence suggests it is part of a low mass population of YSOs associated with PER OB2, which is also known for its reflection, emission and dark cloud nebulosity, all of these being characteristic of a current and/or recent star formation region.

It is certainly no longer a suspected variable even if this current interpretation should eventually show itself to be in error.

It presents itself at an apparently magnitude and amplitude amenable to visual and CCD photometry and although slightly faint its greater brightness towards the red end of the spectrum may permit monitoring of the evolution of the H α emission/absorption profile to the more experienced and/or better equipped spectroscopic observers, albeit somewhat near to the brightness limit even in this instance.

CV & E News

Gary Poyner

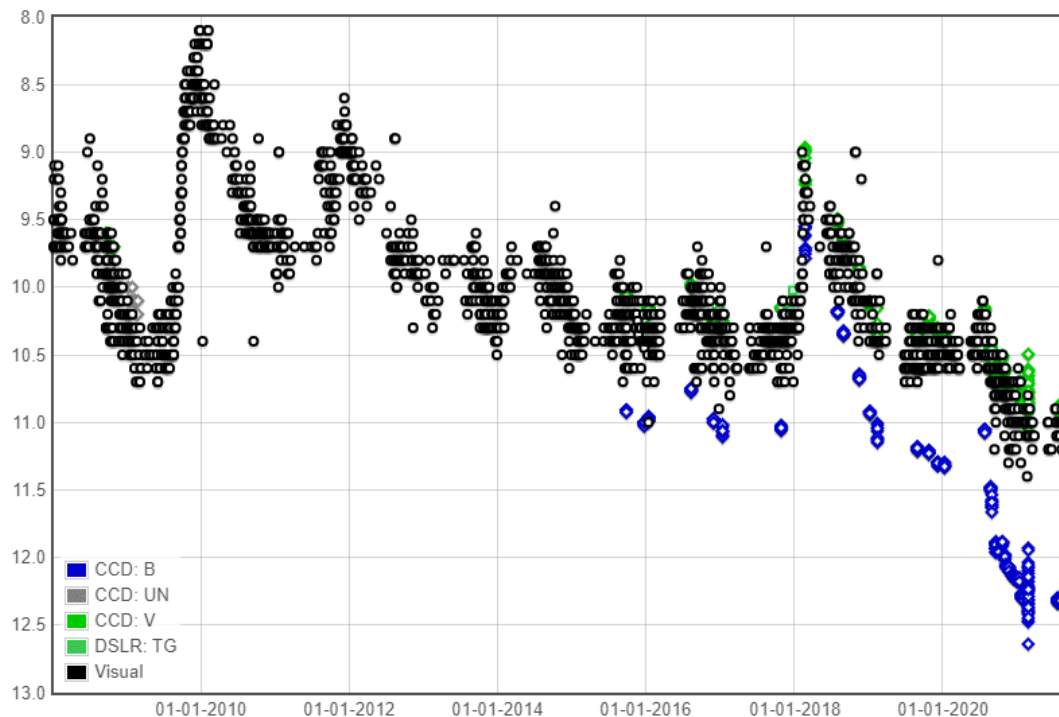
Activity updates on a number of objects on the VSS CV&E programme are discussed

Z And

The prototype symbiotic variable Z And has, over the past couple of months, dipped to a mean minimum magnitude of 11.3 after spending more than two decades above minimum. After a gradual rise from minimum starting in late 1996, Z And has undergone numerous brightenings between magnitudes 8 and 9, including a fairly bright 'outburst' to magnitude 8 in early 2010. Following this outburst, the lower level of brightness has been declining steadily, interspersed with smaller amplitude brightenings, until the present minimum. B magnitude has also dropped significantly since August 2020, to reach a new record minimum level approaching B=12.5.

Without wanting to get observers too excited, the last time Z And experienced a similar extended drop in visual brightness to its current levels was in the late 1930's, which resulted in the brightest outburst yet seen when a maximum of $m_v=7.2$ was reached in November 1939 (AAVSO IDB). The BAAVSS makes no such predictions for any future activity in Z And, but it's a good enough reason to add this bright star to your observing programme. [VSX](#) has a range of 7.7-11.3V, which seems to be in error to me because of the aforementioned outburst in the 1930's.

Further details for Z And can be seen in our BAAVSS [VSOTY](#) 2016 article. A chart can be downloaded from [here](#).



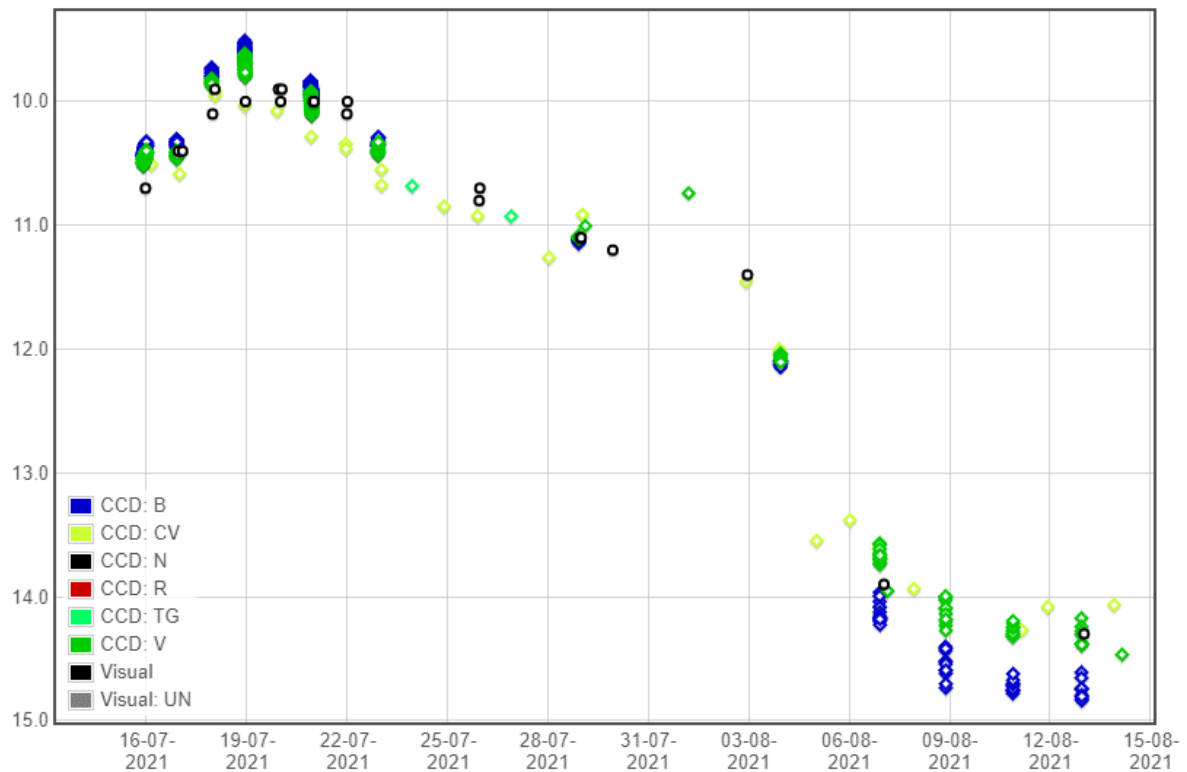
Z And 2008-2021. BAAVSS database.

V627 Peg

The UGWZ star V627 Peg was detected in outburst by Yutaka Maeda, Nagasaki Japan on July 15.727UT at magnitude 10.6C. The outburst was also detected by the ASAS-SN sky patrol and ZTF (Zwicky Transient Facility). This was the first outburst detected in this system since October 2014, and the third in total since the initial outburst detection in May 2010. [VSX](#) has the range as 8.8-16.3V.

The current outburst was detected three days before maximum brightness of 9.7V on July 18, after which a typical UGWZ type slow decline followed, reaching 11.1V by July 28. This level was maintained for six days (again classical UGWZ behaviour) before a sharp decline to 13.5V was reached by Aug 4 after which V627 Peg has been slowly fading to its present brightness (Aug 19) of 14.6V. Both visual and CCD observations approaching magnitude 15 need to be obtained with care, as the presence of a magnitude 15.1 field star just 2.5" NW of the variable will naturally affect the resulting magnitude if the correct identification isn't obtained.

Observers able to obtain spectra have been busy with V627 Peg during this current outburst, and a number of comments and spectra have been posted to the BAA forum, which can be seen [here](#).

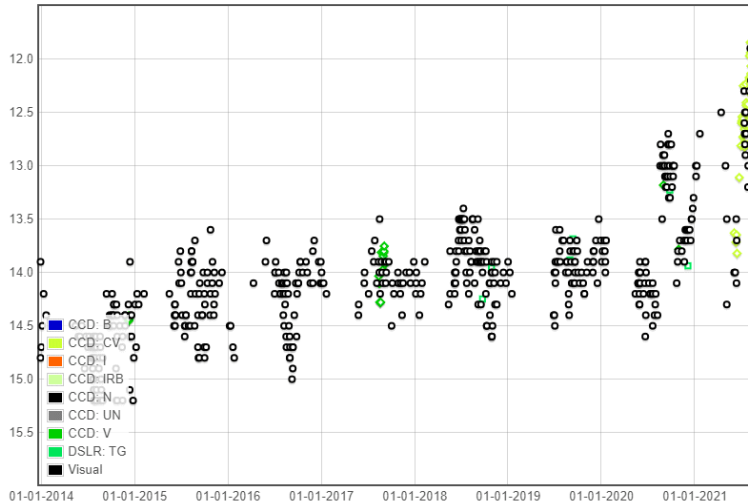


V627 Peg. July 15-Aug 18, 2021. BAAVSS database

BL Lac

In [VSSC 187](#) (March 2021), I wrote about the AGN BL Lac, and how on January 21.7 UT 2021, an historical high state was reached with a visual magnitude of 12.7. Well, this has now been surpassed. For the first time since discovery, BL Lac reached above magnitude 12.0 on August 7th with a visual

and V magnitude of 11.9. The AAVSO IDB has BL Lac above magnitude 12.0 for a total of nine days in all, peaking on August 7. By August 18 (time of writing) BL Lac had faded to 13.2V. The start of the optical 'outburst' was first announced on [Atel 14751](#).



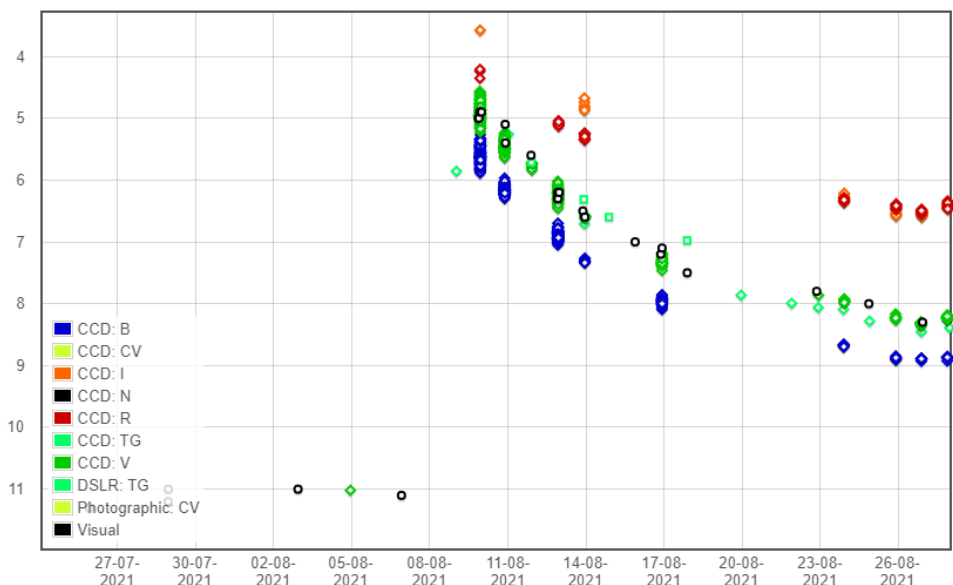
Left. BL Lac and its gradual seven year rise to a new historical high state.

BAAVSS database

RS Oph

The Recurrent Nova RS Oph surprised many of us in August with a rather unexpected outburst detected on Aug 08.913 at visual magnitude 5.0 by Brazilian observer Alexandre Amorim. An independent detection was also made shortly after by Eddy Muylaert of Belgium on Aug 08.920 at 5.1 visual. RS Oph was seen visually 24 hours earlier at minimum brightness of 11.2 visual. This is the first outburst since February 2006. Previous outbursts have been recorded in 1898, 1933, 1958, 1967 and 1985. A possible outburst also occurred in 1945, but the data is scant as the activity occurred during a seasonal gap. See AAVSO [VSOTS](#) for further details.

Although outburst intervals are irregular, the outburst profile is similar from one outburst to the next, and the current outburst is following a similar fading trend to previous ones. Following a rise of six magnitudes in 24 hours, RS Oph begun fading within a day of peaking at magnitude 5.0 and is currently 8.3V, some 20 days after maximum brightness (see light curve from BAAVSS DB right).



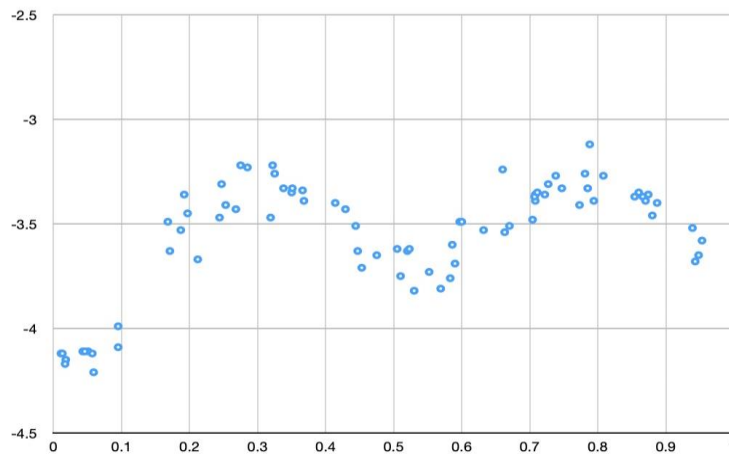
Eclipsing Binary News

Des Loughney

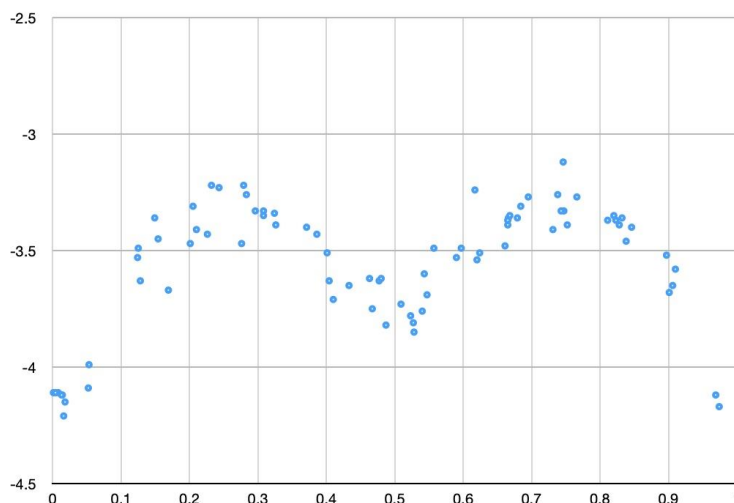
beta Lyrae - New Period

In [VSSC 187](#) Chris Lloyd announced a new period for beta Lyrae - 12.945272 days. This compares with the current period on the Krakow site of 12.913834 days and on [VSX](#) of 12.944 days.

Earlier in the year the following phase diagram was plotted using measurements made by myself and Bill Parkes using DSLR photometry. The measurements were made between 22/3/20 and 16/5/21. The period used for compiling the phase diagram was 12.9408 days. The vertical axis is magnitude, and the horizontal axis is phase. It can be seen that the period is wrong because the time of mid primary eclipse and mid secondary eclipse is displaced by over 15 hours.



A new phase diagram using the same measurements has been calculated using Chris Lloyd's elements (below). It can be seen that this new period is consistent with our measurements. It should be used for predictions for the foreseeable future though the period probably will continue to increase.



AR Lacertae

AR Lacertae is a system that is part of our observing programme. It is well worth monitoring because its period can vary, and professionals are unsure of the reasons for the variation. Amateurs can contribute to the ongoing debate by making determinations of the time of primary and secondary minimum. AR Lac is an EA/AR/RS system. Although the period is very short (1.9831924 days) the stars are detached. As the stars are of similar size there is a significant secondary minimum which is certainly measurable using DSLR photometry. The primary minimum is of about 0.7 magnitude in depth and the secondary of 0.4 magnitude.

The variation in the system is specified as between 6.08 and 6.77 by GCVS. Hipparcos, however, states it is between 6.11V and 6.85V. The fact that it is an RS system means that the light curve can vary due to large star spots. It will be noted that the current period is very nearly two days. This means that time between adjacent primary eclipses changes by only 24 minutes. For an extended period of one or two months, eclipses will take place during daylight/ twilight.

As a bright system AR Lac is fairly easy to find and is circumpolar, although for a while it can be too low for useful observing.

A 2012 paper (1), "A Study on the Orbital Variation of AT Lacertae" by Ye Lu, Fu-Yuan Xiang, Xiao-Min Shi, looks at the possible reasons for the orbital variation. It cannot be due to mass transfer as the stars are apparently too far apart. It may be due to the presence of a nearby third, unseen, star. They think it is due to magnetic effects. As they put it:

"Our study suggests that the orbital period cyclic variation can be explained by the magnetic activity, and that the long- term secular period decrease may be caused by enhanced magnetic wind braking in the cooler component."

There is not a BAAVSS online chart available, but I can send people a copy of the 1972 chart prepared by JEI which is in my files. I am going to check the stated magnitudes of comparisons with the Hipparcos values.

Eclipsing Binary Observing Guide - Second Edition

As mentioned by Jeremy in his 'From the Director' section above, there is a new edition of the EB observing guide available for download.

The main changes in the Guide are thanks to Chris Lloyd who amended the presentation of our Observing Programme. The programme has information added in the form of links to SIMBAD, our online charts and the AAVSO's VSX database. I hope members will find the extra information useful.

The Guide is meant to be a 'living' document so I am sure it will undergo further amendments if only to update periods. I had hoped the Guide would contain information about the revision of the Krakow website. However, that has not been completed yet. I would welcome suggestions for amendments bearing in mind the Guide is meant for beginners to EB observing. It makes no attempt to describe the use of CCD and DSLR methodologies in EB work or the nature of pro-am/international EB observing campaigns.

1. Publications of the Astronomical Society of Japan, Volume 64, Issue 4, 25 August 2012, 84, <https://doi.org/10.1093/pasj/64.4.84>

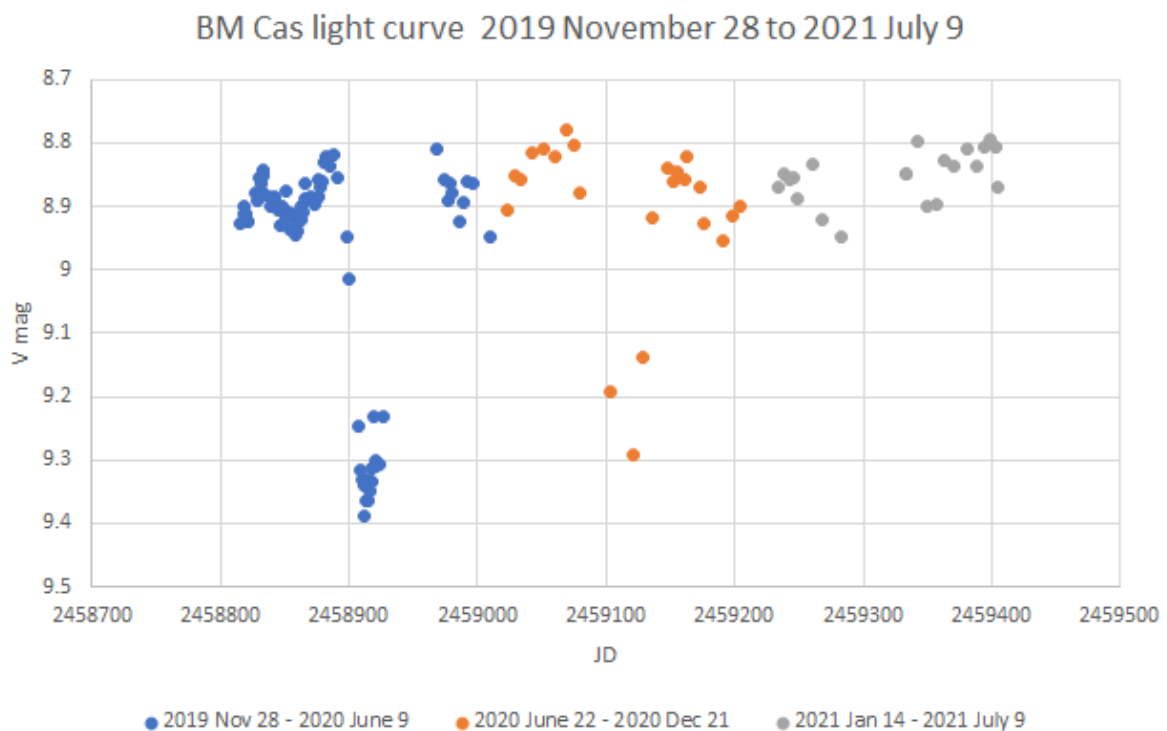
Observations of the eclipsing binaries BM Cas and V413 Aql suggesting ongoing changes to their light curves.

David Conner

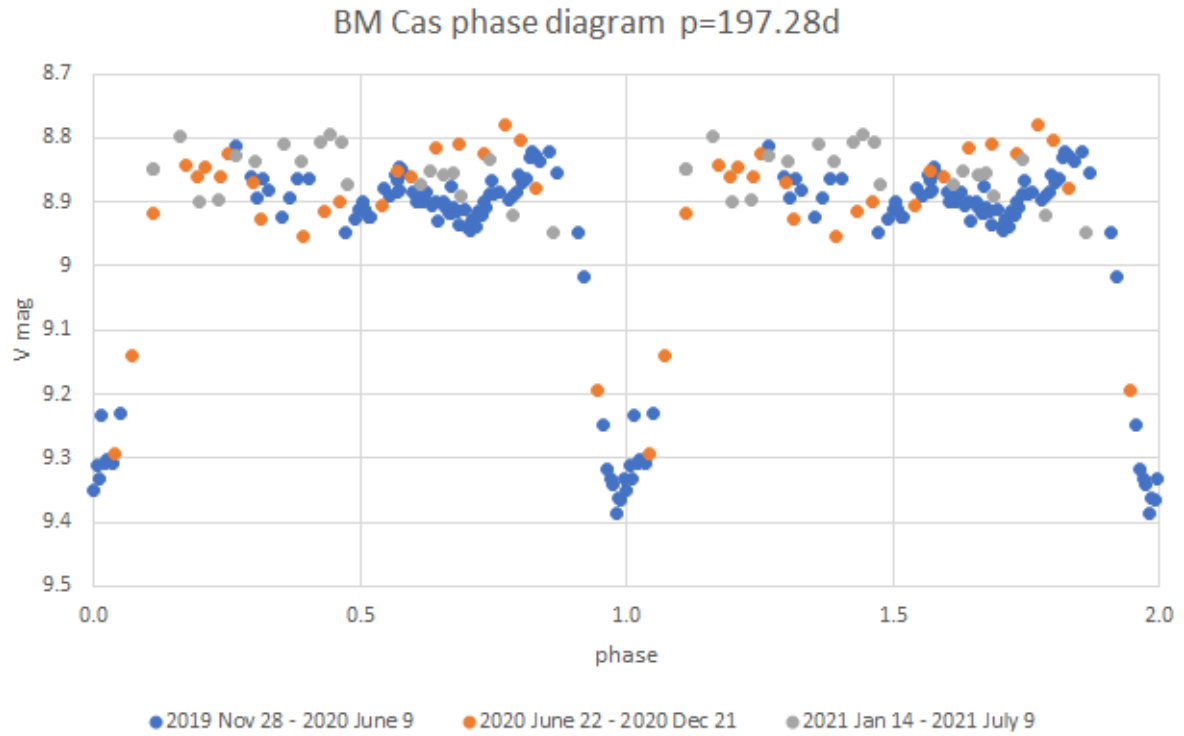
Follow up observations of two eclipsing binaries discussed in recent VSSC articles, from an ongoing project to observe variable stars with the Open University [COAST](#) telescope located on Mt Teide in Tenerife. These recent observations suggest there are ongoing changes to the light curves of BM Cas and V413 Aql. All observations have been submitted to the VSS database. Details of the system types and periods are from the AAVSO VSX.

BM Cas (EB/GS p=197.28d)

Follow up to article in [VSSC 184](#) June 2020, which included most of the first cycle in the following light curve (2019 November 28 up to 2020 March 17, shown in blue). Since then, two more cycles have been observed and included in the following light curve and phase diagram; cycle 2 (24 observations, 2020 June 9 to 2020 Dec 21, shown in orange) and cycle 3 (21 observations, 2021 January 14 to 2021 July 9, shown in grey), again from images taken with the COAST telescope using a V filter.

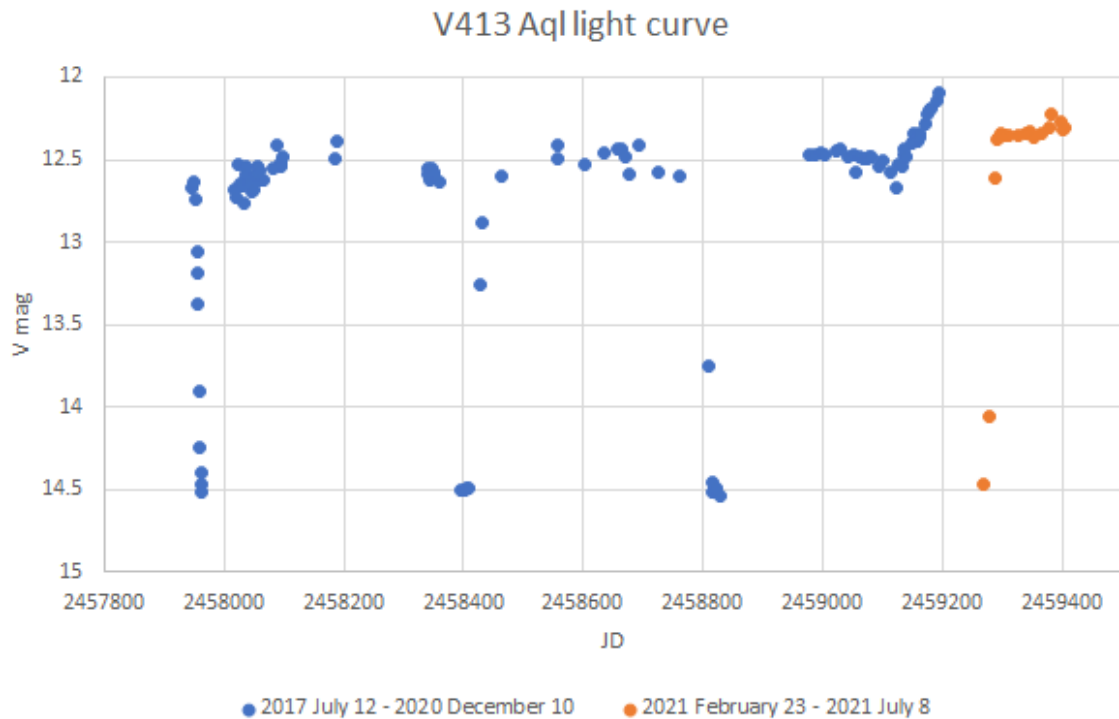


There are more evident changes to the light curve between the primary minima (the third such minimum was itself missed due to poor weather at the site). The magnitude of the section between phase 0 and phase 0.5 has increased slightly during the third cycle, while the section between phase 0.5 and phase 1 increased during the second cycle before fading again during the third cycle. Overall, the depth of the 'secondary minimum' had been reduced. The cause of the variations might be due to some as yet undetermined type of variations in the hotter component ([Ferne 1997](#)), or a 'hot region' located between the two components ([Kalv et al 2005](#), [Pustynnik et al 2007](#)).

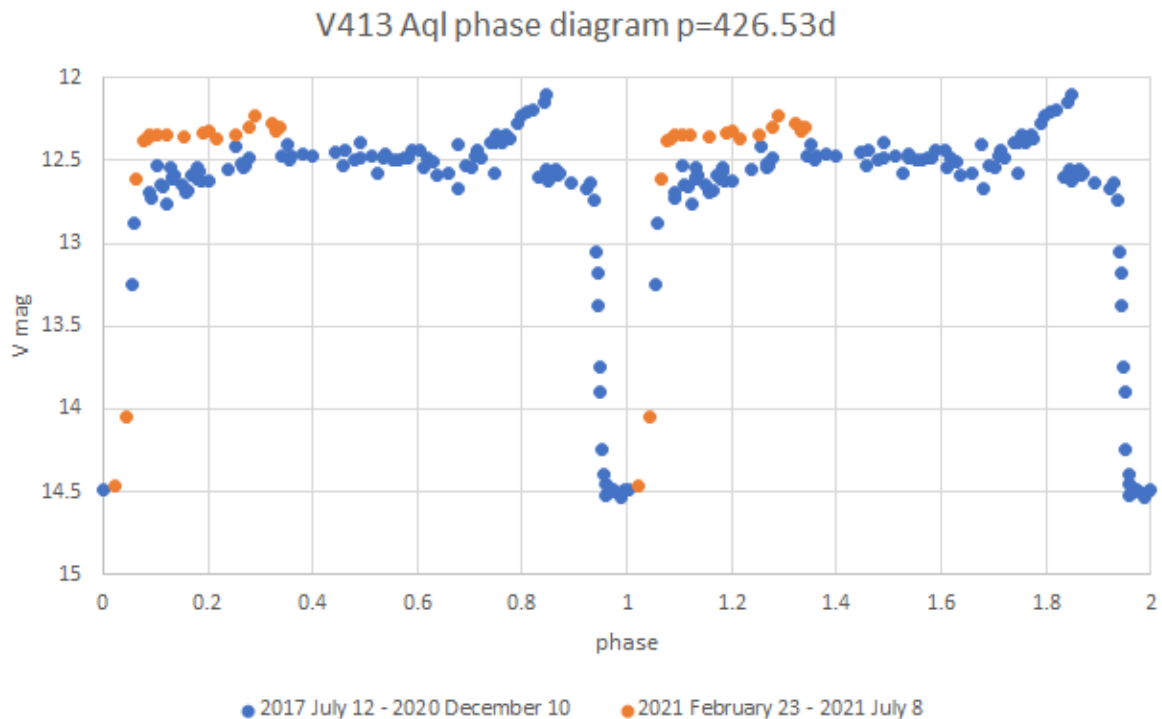


V413 Aql (EA+ZAND $p=426.53d$)

Follow up to article in [VSSC 187 March 2021](#), which described observations made between 2017 July 12 and 2020 December 10. These are shown as blue in the following light curve and phase diagram. Since then, 18 observations have been obtained with the COAST telescope using a V filter between 2021 February 23 and 2021 July 8, which are shown as orange in the diagrams.



It is evident that the maximum after the latest primary minimum is slightly brighter than the previously observed ones. It's a shame there is a gap in the data just after JD2459200, but the weather on Mt Teide was again not favourable. However, the phase diagram (below) is misleading in suggesting that the light curve returned to 'normal' immediately after the upwards spike in brightness from JD 2459127 (2020 October 4). These spurious events do not occur regularly in each cycle, and they are more realistically depicted in the light curve in this respect.



This spike and increased light out of eclipse might be attributed to Z AND type activity within the system, a previous outburst having been observed in 2006 ([vsnet-alert 10534](#)). In addition, [ASAS data](#) shows that the light curve between primary minima is not necessarily the same from one cycle to the next, nor always symmetrical around phase 0.5.

Note: The COAST telescope used in the above, COAST MkII, is a C14. This has now been replaced by the old 'PIRATE' telescope, a CDK17 corrected Dall-Kirkham, which has just recently started returning images (not used in the above). It retains the camera and filters from the 'old' COAST. It's hoped to continue this project using the replacement COAST MkIII telescope.

Section Publications

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Charts for all stars on the BAAVSS observing programmes are freely available to download from the VSS Website www.britastro.org/vss

Contributing to the VSSC

Written articles on any aspect of variable star research or observing are welcomed for publication in these circulars. The article must be your own work and should not have appeared in any other publication. Acknowledgement for light curves, images and extracts of text must be included in your submission if they are not your own work! References should be applied where necessary. Authors are asked to include a short abstract of their work when submitting to these circulars.

Please make sure of your spelling before submitting to the editor. English (not American English) is used throughout this publication.

Articles can be submitted to the editor as text, RTF or MS Word formats. Light curves, images etc. may be submitted in any of the popular formats. Please make the font size for X & Y axes on light curves large enough to be easily read.

Deadlines for contributions are the 15th of the month preceding the month of publication. Contributions received after this date may be held over for future circulars. Circulars will be available for download from the BAA and BAAVSS web pages on the 1st day of March, June, September and December.

Notes for readers: All text bookmarks, www and e-mail links are active. Clicking on an image with a blue border will take you to a relevant image or text elsewhere in this Circular or the web.

Deadline for the next VSSC is November 15th, 2021

BAA www.britastro.org

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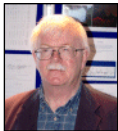
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