

British Astronomical Association



VARIABLE STAR SECTION CIRCULAR

No 158, December 2013

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U GEMINORUM IN OUTBURST

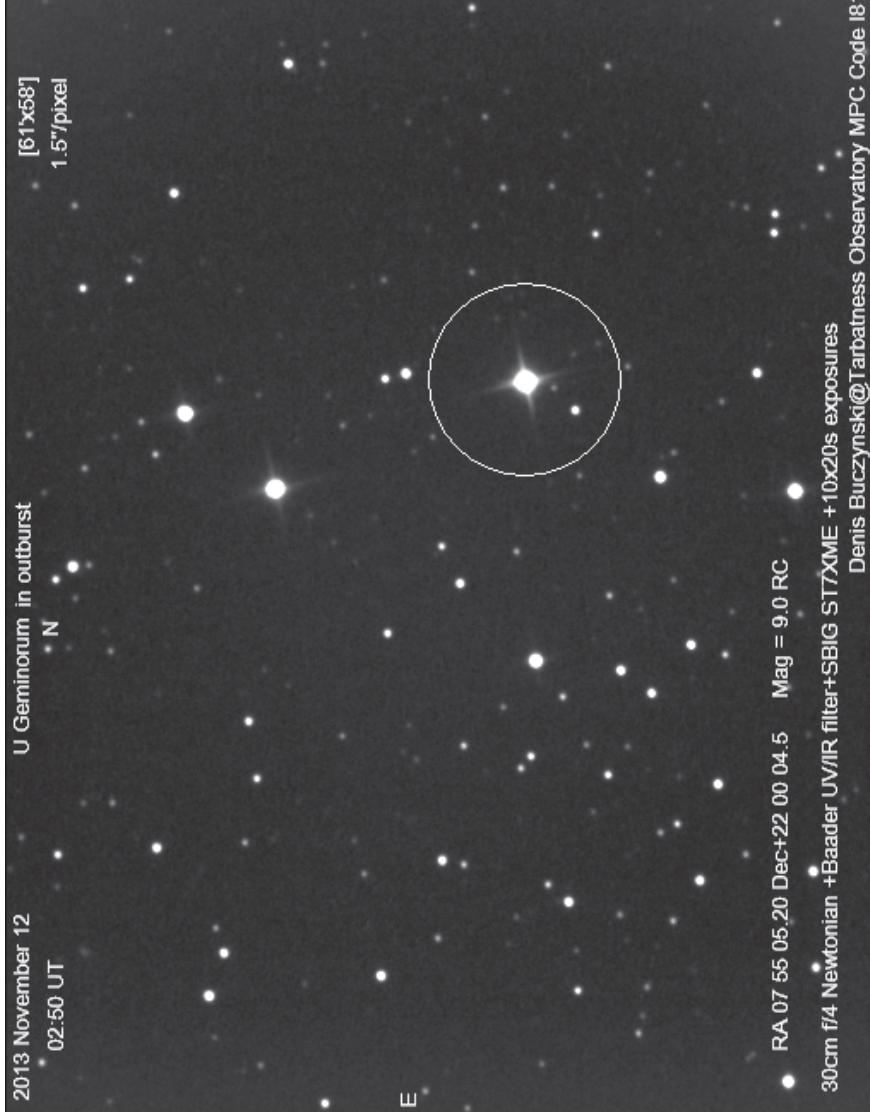
DENIS BUCZYNSKI

John Toone announced the outburst of U Geminorum on 9th November 2013. “U Gem is rising and exhibiting small scale flickering:

8 Nov 2013
00:06 GMT
W-2
149
C14

9 Nov 2013
05:12 GMT
=L (unsteady)
12.0
C8

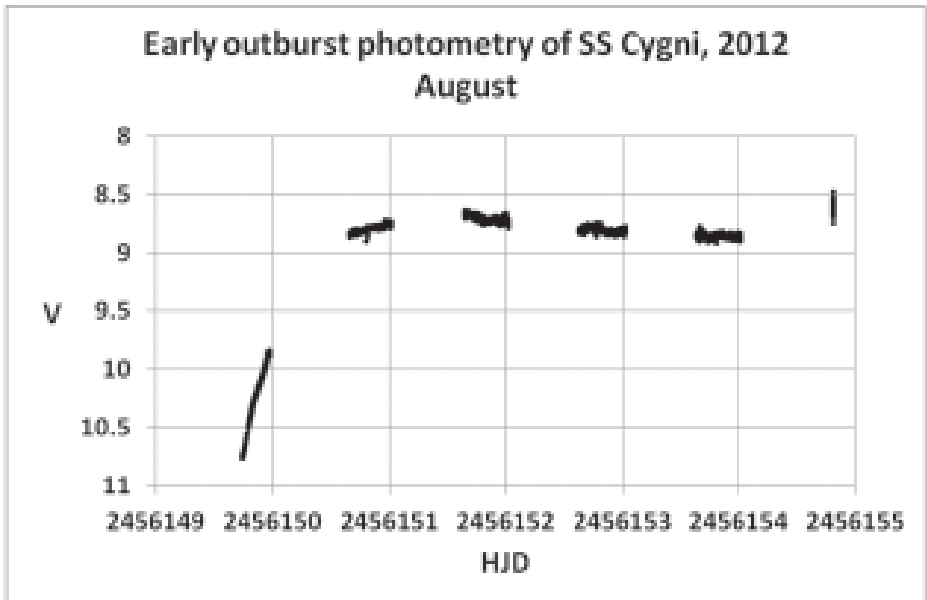
It was alternately, marginally brighter, then fainter than comparison star L, with an approximate amplitude of 0.2 magnitude.”



REQUEST FOR CCD MONITORING OF THE LONG OUTBURSTS OF SS CYGNI

ROBERT SMITH University of Sussex <R.C.Smith@sussex.ac.uk>

Dr John Cannizzo, of NASA's Goddard Space Flight Center (GSFC) in Baltimore, Maryland, is an expert on models of dwarf nova outbursts. He has a theory that all the long outbursts of SS Cygni have a short precursor outburst, which can be seen at the beginning of the long outburst as a period of time during which the brightness is not quite as high as it later becomes. This is quite a small effect, and cannot be seen in the visual light curves. However, there is some evidence of it in CCD data, as seen for example in the accompanying plot of data from August 2012, taken by colleagues of mine in Mexico, which shows an initial slight dip followed by a rise on the last night (unfortunately clouded out before many data points were obtained). Dr Cannizzo has seen this plot, and is keen to see more evidence. I would therefore like to ask readers with CCD cameras to consider monitoring the outbursts of SS Cygni, particularly the long ones (about every second one is a long one – see the AAVSO charts) and passing the processed data to Dr Cannizzo at GSFC <John.K.Cannizzo@nasa.gov>. If anyone already has such data, please also pass that on.



FROM THE DIRECTOR

ROGER PICKARD

Albert Jones

I am sure many of you will be aware that Albert Jones of New Zealand passed away on 11th September at the age of 93. Unfortunately, we were too late to include anything in the last Circular but I include a brief note here.

Albert was best known for his phenomenal skill as a variable star observer, where he made over 500,000 visual estimates. He also made a large number of consistent estimates of comet magnitudes and was the discoverer of two comets, in 1946, and 2001. His second discovery made him not only the oldest observer to discover a comet, but also it was the longest interval between consecutive discoveries by any observer.

He also received the Association's MERLIN MEDAL and GIFT in 1968.

The funeral took place on 15th September 2013, when observers were asked to mark the occasion by making an observation of the new nova in Delphinus, V339 Del, around that time, in honour of the passing of the greatest ever visual observer of variable stars.

Our Youngest Member

And so from one who was possibly our oldest member to our youngest, or at least to the only person who has replied! That person is Andy Wilson, our Database Secretary who has admitted to being 40, but surely we have somebody who is younger?

Errors in "Binocular Programme - Modifications"

Unfortunately, a couple of errors crept into the listing under "Priority level 2" of "Binocular Programme - Modifications", page 16, VSS Circular No 157.

RY Dra was omitted entirely, and a spurious "d" crept into the front of the next line making it read "dTU Gem"!

Both are corrected in the listing in this current VSS Circular No 158.

John Day

Gary Poyner forwarded the sad news at the end of October that John Day had died on Friday 25th October whilst he was on holiday in Spain. I have no further details at this time, but apparently John did have serious health problems. He was an only child, and is survived by both parents who are naturally distraught.

Gary adds: "It was the TA ROP which brought John and I together back in the late 1980's. I was displaying some ROP material on display boards at an FAS meeting when he came

over, introduced himself and told me of his interest in the programme. We became firm friends from that day. John joined my Astro club in the early 1990's, travelling from Leicester to North Warwickshire weekly. Although he observed variable stars with a 40cm from home, he enjoyed using the club's scopes in the darker skies there. I last spoke to him just over a week ago, and all seemed fine. Ann (Bonnell) had a text from him when he arrived in Spain, in good spirits and pleased that he had some good views of Venus."

Looking at the VSS Database he had contributed almost 11,000 Variable Star observations between 1991 and 2008, but whether his health problems prevented him making more observations, or whether they have just not been entered yet, is not known at this stage.

John was a member of the RAS and IOP. He gained his Master of Physics with Astrophysics with honours degree in 1999 from Leicester University, and his thesis concerned GK Persei and X-rays.

John would have been 60 next February.

His funeral is to be held on Friday November 29th at Gilroes Crematorium, Leicester, at 10.45, should you wish to join Gary and pay your last respects to John.

VSS Meeting 2014 at York

On a brighter note, I can confirm that David Boyd has also offered to give a talk, and so he has been added to the list which currently included Dr Boris Gaensicke and Martin Lunn. The meeting will follow similar lines to past ones:-

Date: Saturday 21st June 2014
Location: Priory Street
Doors Open: 10:00 - 10:30
Lunch: 12:30 - 14:00
Break: 15:30 - 15:45
Finish: 17:30
Clear: 18:00

However, in addition, members may like to visit both the Goodricke plaque and the astronomical clock in York Minster but whether they fit this in to the lunch break or after the meeting I leave it up to them to decide.

There will be more details about these, and the whole meeting, in due course.

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Figure 1: Sandy, Rodez, 2012
From a photograph by Danielle Feniou.

SANDY REID

(Dr William Alexander Reid)

JANET SIMPSON

I acknowledge help for some of the content which follows from Sam Galbraith's very fine obituary in the Scottish Herald: <http://www.heraldsotland.com/comment/obituaries/sandy-reid.20493254>

It was with shock and great sadness we heard that Sandy Reid had died suddenly and unexpectedly (after a weekend in the mountains) from heart disease at the age of 64, earlier this year on 26th February. Sandy's interest in astronomy and mathematics dated back to his school years. He had not yet had a chance to make his mark on the

Variable Star Section, but with his enthusiasm and many talents we feel sure he would have made that mark. Roger Pickard certainly had been in touch with him about CCD photometry and was "looking forward to seeing great things from him". Sandy had finished building his observatory, was keen to do some science in Variable Stars, and was considering getting involved with Stan Waterman in a project on variables. Some of you may have met him at the VSS meeting in Eccles, October 2011, where he was asking questions about what sort of equipment would be best to set up his observatory. Sandy was one of a group of five Variable Star Section members who went to the CAPAS meeting in Rodez, Sept/Oct 2012. He was a big hit at CAPAS since he was fluent in seven languages, including Russian!

In Sam Galbraith's obituary, Sandy is described as "one of the country's best loved doctors", an accomplished pathologist and teacher, and a lifelong socialist; who studied philosophy, astronomy and physics, and understood astronomical mathematics. He was widely read and an opera buff, with an outgoing happy personality that endeared him to everyone. An accomplished rock and ice climber, Sandy loved the Scottish mountains, but his interest ranged further and his many climbs included Mont Blanc, the Matterhorn and the Eiger, and also peaks in the Himalayas and the High Atlas.

He met Sally and they married in 1999. They had a happy life together, but all too short as she died of Cancer in 2008. He found solace trekking in Siberia where he sustained a broken leg and frostbite and was evacuated out on horseback.

Sandy had a full and good life, will be much missed, and is survived by his nephews, Alastair and David.

Figure 2: [page 7]

From left to right: Stan Waterman, Sandy Reid, Olga Kiyeva (Pulkova observatory, St Petersburg), Marc Serrau, Janet Simpson, Danielle Feniou, and Remi Cabanac (IRAP [Research Institute for Astrophysics and Planetary Science, France], and Hon. president of Association Andromede 4A)



Figure 2: [see page 6]

Photograph is by Laurent Corp, taken on the CAPAS meeting outing to the Musée Fenaille, Rodez 2012.

SPECTRAL EVOLUTION OF NOVA DELPHINI 2013 (V339 DEL)

DAVID BOYD

I have been taking spectra of this classical CO type nova approximately weekly as it has faded, using a LISA spectrometer with a resolution of ~ 1000 on a C11 scope. This is part of an on-going campaign to study the evolution of this nova in unprecedented detail involving amateurs contributing spectra at various resolutions to the ARAS database < http://www.astrosurf.com/aras/Aras_DataBase/Novae/Nova-Del-2013.htm >, and professional astronomers observing with ground-based instruments, the Swift X-ray satellite and the Hubble Space Telescope.

Figures 1 and 2 show two spectra of the nova, one taken on Sept 2nd 2013, when the V magnitude was 7; and one taken about seven weeks later on Oct 23rd 2013, when it had faded to magnitude 11. I have identified the most prominent lines in each spectrum. Initially the ejecta were opaque at optical wavelengths. The most prominent features in the spectrum on Sept 2nd were hydrogen Balmer emission lines from the expanding shell of hot hydrogen gas blown off the surface of the white dwarf in the nova explosion, plus lines due to a “curtain” of ionised iron. By Oct 23rd the ejecta had cooled and become sufficiently transparent that the photosphere of the white dwarf was becoming visible. The nova had recently been detected as a supersoft X-ray source indicating that nuclear burning was continuing on the surface of the white dwarf. The surface temperature was estimated to still be several 100,000K. At this stage hydrogen lines remained strong and several emission lines of helium, nitrogen and oxygen had appeared.

In these diagrams, both of which are at the same relative scale, the grey spectra are 10x magnifications of the black ones.

Figure 1. Nova Del 2013 2013 Sep 2.874 C11 + LISA + SXV-H9 D. Boyd

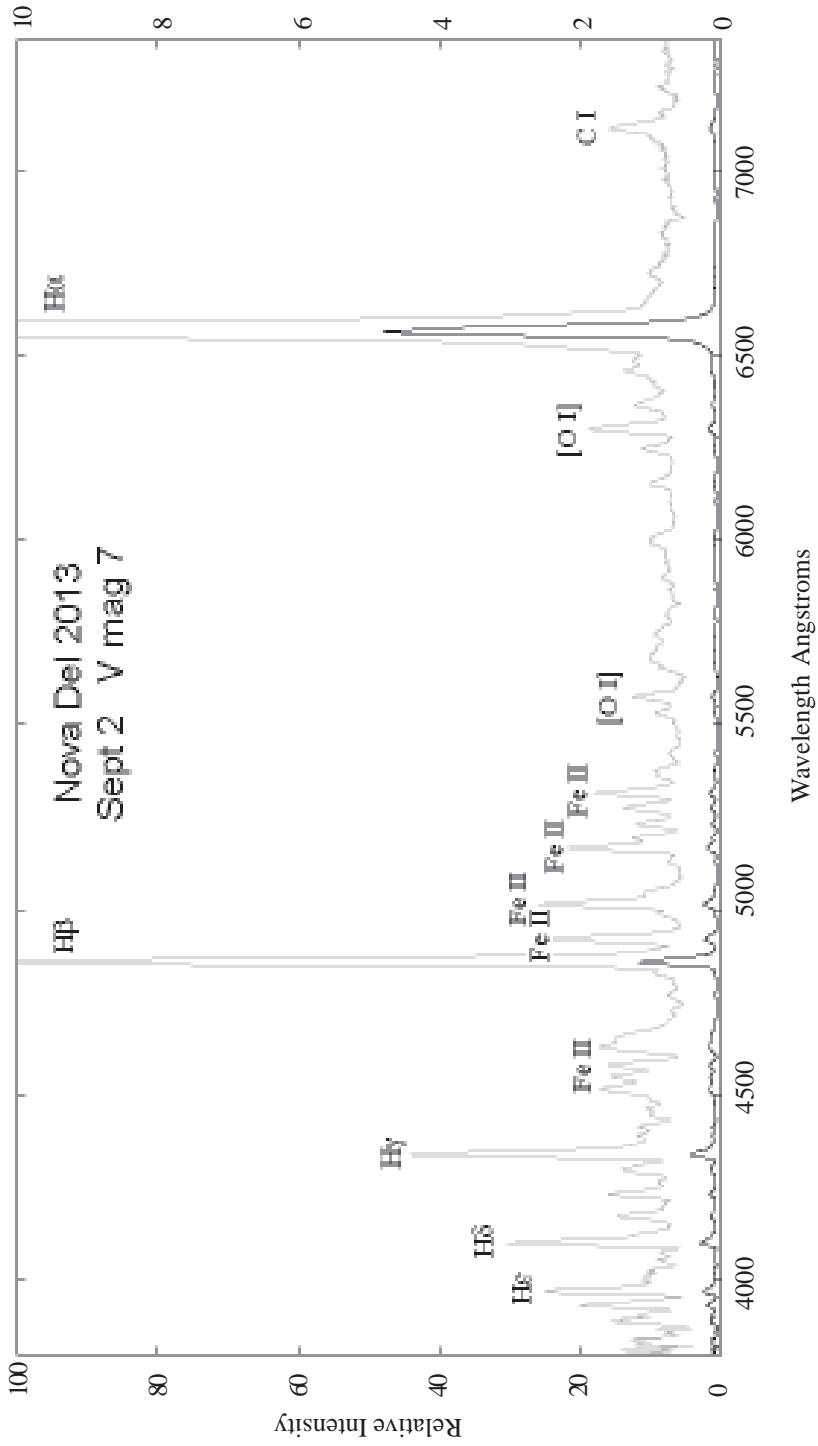
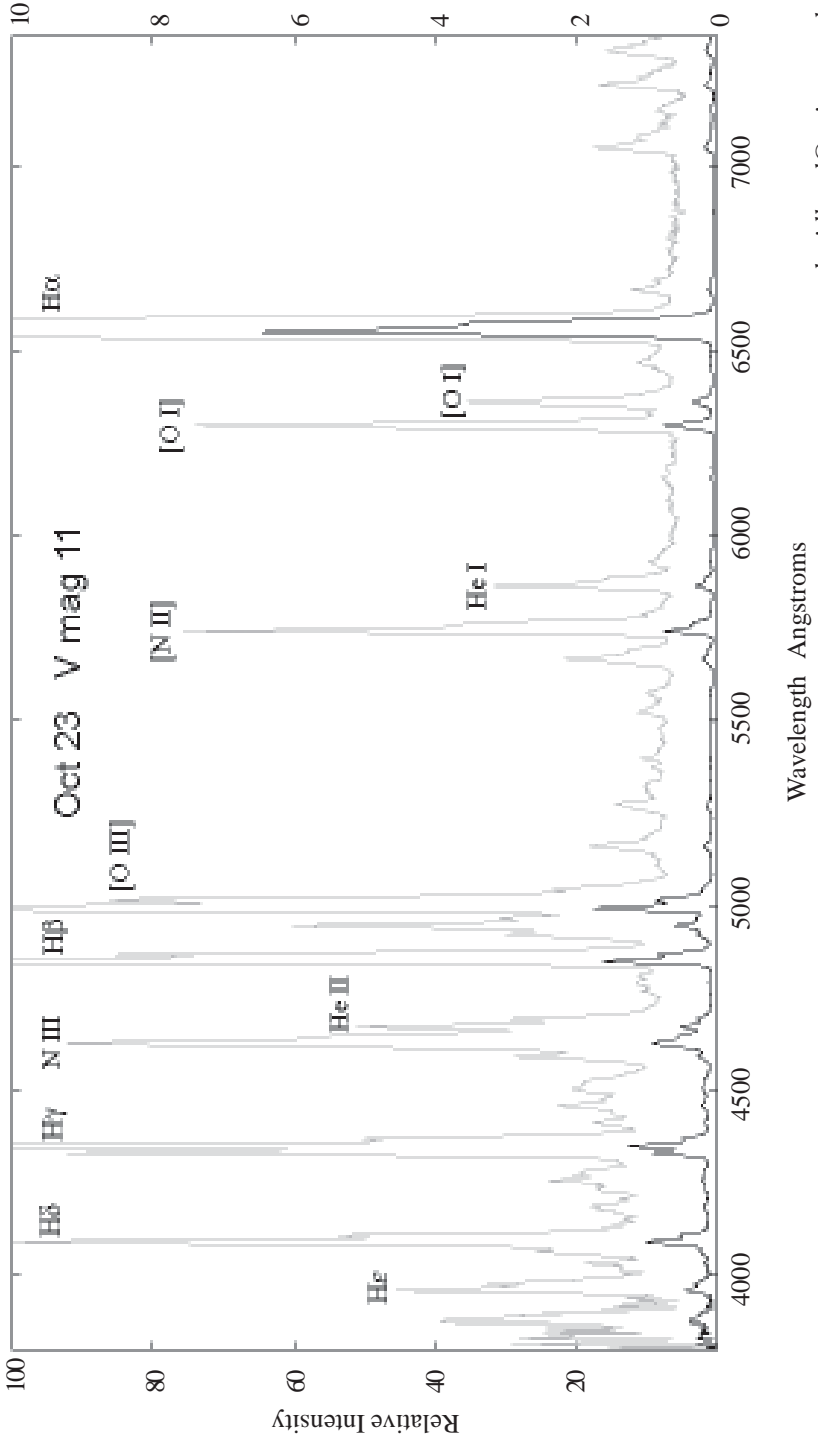


Figure 2. Nova Del 2013 2013 Oct 23.781 C11 + LISA + SXV-H9 D. Boyd



ECLIPSING BINARY NEWS - NOVEMBER 2013

DES LOUGHNEY

IU Aurigae

In the last EB News there was a description of the IU Aurigae system, and a call for observations to determine the current amplitude of the primary and secondary eclipses. Some observations have been made including a profile of a secondary eclipse. The weather has not yet permitted a profile of the primary eclipse.

The secondary eclipse had a depth of 0.38V in 1964, 0.56V in 1983-1985, and 0.48V in 1990. The recent measurements indicate a depth of 0.31V. Our latest results show that there is real variation of the eclipse amplitude over a period of many years. It seems that around 1983 - 1985 the two main stars in the system, and Earth, were lined up precisely. Since then the orbit of the secondary star has become more tilted with respect to ourselves.

The next step will be to profile the primary eclipse to confirm the orbital changes.

UV Piscium

We have been asked by our colleagues in the southern hemisphere to observe this system. It is classified as an EA/D/RS system which means that it has an Algol type light curve but one star can have spots which may be large enough to produce variations in the light curve. With a period as short as 0.8610468 days it must be doubtful whether it can really be considered as a detached system. However, a determination of its actual complete light curve may answer that question.

UV Psc, although not very high up - at least from Edinburgh - is fairly easy to find. One can star hop from Epsilon Psc (4.25V) to nearby Zeta Psc (5.18V).

Out of eclipse the magnitude of the system is 8.91. The secondary minimum has only a depth of 0.1. The primary minimum has a depth of over a magnitude at 10.05V.

I am in the process of drawing up a chart for UV Psc with nearby comparisons. At the moment apt comparisons seem to be HIP 6038 at 9.40V, TYC 27-913-1 at 9.10V, and TYC 26-471-1 at 9.41V. All the stars including UV Psc have a similar colour (B-V).

UV Psc is a frequent eclipser so it should be easy to profile a primary eclipse.

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PETER WILLIAMS ACHIEVES THE 150K MILESTONE.

JOHN TOONE

On 4th November 2013 Peter Williams observed the Blazar PKS2155-304 at magnitude 14.0. This was his 150,000th visual observation and comes less than nine years since his 100,000th observation made on 26th November 2004 (see VSSC No 123 page17). This is a fine effort for an observing career spanning some 42 years.

Peter would have completed the milestone about a month earlier had he not undertaken a tour of the UK and France in August and September 2013. The trip itinerary and weather had prevented any observational astronomy and Peter remarked that the only star he had seen since leaving Australia was from an altitude of 35,000 feet. Fortunately I had the chance to meet up with Peter together with our respective wives Linda and Irene, in central London on the 26th August 2013. Since the sky was clear I thought this was a good opportunity to show Peter the northern constellations so we headed out onto the Hungerford Footbridge. Unfortunately even from the mid-point of the River Thames the sky glow was such that I could only pick out Arcturus and the Summer Triangle (there were plenty of aircraft lights around though). Conversely the late summer warmth made for a pleasant outdoor meal on the south bank of the river which returned the compliment dished out to Irene and myself by Peter and Linda at Sydney Harbour back in December 2004.

Peter is the nineteenth observer to have reached the 150,000 visual observations milestone. He is the second Australian (Australia is the least populous country to have two or more observers achieve this milestone) and only the fifth observer from the southern hemisphere. The full list of observers who have achieved the 150,000 milestone is given below:

Marvin Baldwin	USA
John Bortle	USA
Georg Comello	Netherlands
Tom Cragg	USA
Gerald Dyck	USA
Alain Figer	France
Albert Jones	New Zealand
Taichi Kato	Japan
Reginald de Kock	South Africa
Wayne Lowder	USA
Warren Morrison	Canada
Hiroaki Narumi	Japan
Edward Oravec	USA
Dannie Overbeek	South Africa
Gary Poyner	UK
Rod Stubbings	Australia
John Toone	UK
Paul Vedrenne	France
Peter Williams	Australia

Peter initially worked within, and submitted his observations to the RASNZ VSS but since the 1990's he has also been sending the observations to the AAVSO. Janet Mattei told me in 2002 that she very much appreciated the high quality and promptness of Peter's monthly reports. Frank Bateson and Albert Jones of the RASNZ VSS made similar complementary comments to me in 2004.

I first met Peter at the South Pacific Star Party at Wiruna, NSW, Australia in March 1999. This was sandwiched between his discoveries of Comet C/1998P1 found (whilst locating EK Trianguli Australis) on 10th August 1998, and V382 Velorum (brightest nova since V1500 Cygni in 1975) on 21st May 1999. Peter also found V2576 Ophiuchi (another nova and at magnitude 10 possibly one of the faintest detected visually) in the field of V517 Ophiuchi on 6th April 2006. It is very rare for a single observer to discover two galactic novae by visual means whilst undertaking routine variable star work.

Peter has been the recipient of the following prestigious awards:

1. Berenice Page Medal in 1996 by the Astronomical Society of Australia
2. AAVSO Nova/Supernova Award in both 1999 and 2006
3. Amateur Achievement Award of the Astronomical Society of the Pacific in 2007

Peter told me that he intends to keep observing the stars that he has monitored over many years except for some of the CV's that are adequately monitored by his energetic compatriot Rod Stubbings. At a time when the number of systematic visual observers is dwindling, it is reassuring to know that Australia is doing its bit to buck the trend.

John Toone and Peter Williams, London, August 2013

Photograph by Irene Toone



V CANUM VENATICORUM

(RA 13h 19.5m Dec +45° 31.6", SRA, 6.52 to 8.56, M4e-M6III, period 191.5d [GCVS])

MELVYN TAYLOR

The chart ref. 214.02 at one time incorporated Y Canum Venaticorum (La Superba) and TU Canum Venaticorum, and these now have a separate chart (seq. no. 215.02). Both are semi-regulars on the binocular programme.

The overall light-curve from JD 2448500 to 2455500 covers activity from the 31st August 1991 to the 30th October 2010. Periods occur from 141days to 204days. Mean periods tend to decrease with increasing time, from averages of 191.3days, to 184.0days, if the data is split in two equal time slots. At the extremes the maxima reach magnitude 6.7, and the minima reach 8.7. The variable amplitude is obvious, and may be 2.3 magnitude to 0.6 magnitude. Irregular activity appears to have 0.5 magnitude changes, among the inevitable observer scatter. The two point moving trend lines (used in the MS excel programme) offer guidance to the phase where small periodic changes have a period about 91days.

A well defined maximum at 2450092.7 with a magnitude of 7.2 offers a simple calculation for a value of $M-m/p$ the fraction of the period rising from minimum (8.3 magnitude) at 0.43. This was based on a period of 199d. Not far from the famous Whirlpool Galaxy (M.51) this strongly periodic semi-regular is very popular as 68 observers contributing to the light-curve verify. The Sunflower Galaxy (Messier 63) is 3.5° to its south.

Figure 1: Covers activity from the 31st August 1991 to the 22nd July 2000.

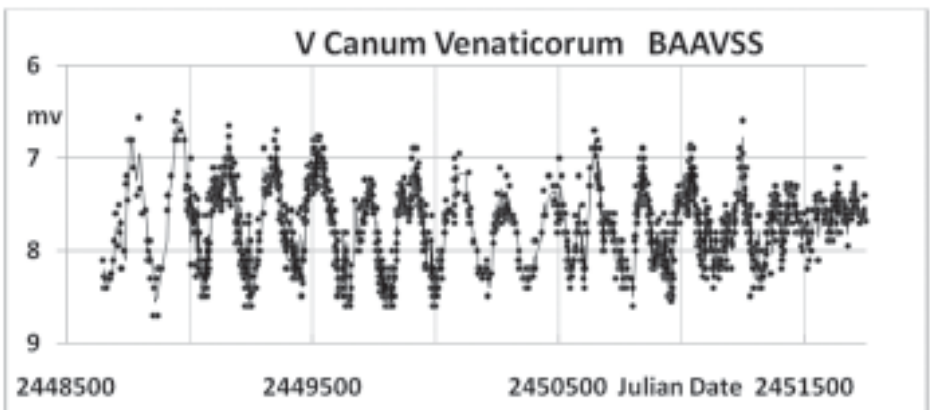
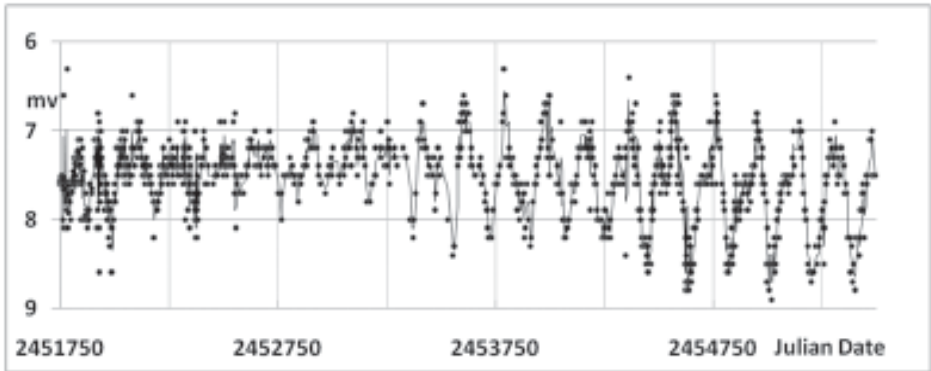


Figure 2: Covers activity from the 22nd July 2000 to the 30th August 2010.

V Canum Venaticorum BAAVSS



Observers:

Albrighton	Forno	Horsley	Mormyl	Simpson
Allen	Fraser	Hoste	Nartowicz	Smith
Baransky	Gavine	Hunt	Nicholls	Steele
Barrett	Gill	Isles	Northwood	Stefan
Beesley	Godden	Jackman	O'Halloran	Stefanopoulos
Bingham	Gough	J. Johnston	Pickard	Stott
Bone	Granslo	S. Johnston	Pickup	Swain
Charleton	Griffin	Kellaway	Pointer	Taylor
Collinson	Hapgood	MacDonald	Quadt	Toone
Currie	Hather	Markham	Ramsey	Voss
Day	Henshaw	Marriott	Roper	Worraker
Dryden	Hern	McCalman	Saville	Yusuf
Farrer	Hoare	Middlemist	Saw	
Fleet	Hornby	Minty	Shanklin	

THE FIRST DWARF NOVAE

JOHN TOONE

Upon examination of 20th Century English language literature the general impression given is that SS Cyg and SS Aur were the second and third U Gem type stars to be discovered. Whilst these stars were instantly recognised as clearly belonging to the U Gem class, other variable stars were known or being discovered at a similar time that eventually became classified as UGSS, UGZ or UGSU (the principle GCVS classifications for dwarf novae). Here is a sequential list of the current members of the dwarf novae family that were known as variable stars prior to 1913 (100 years ago) given in order of their identification together with their discovery announcement references:

U Gem - 1856MNRAS, 16, 56

U Gem's position almost on the northern limit of the ecliptic certainly contributed to its early detection 41 years ahead of any other dwarf nova being identified and before plate photography was introduced. J. R. Hind in London was visually surveying Gemini for minor planets and had previously discovered the first three variable stars designated within this constellation. On 15th December 1855 he detected U Gem in outburst. N. R. Pogson at Oxford on 26th March 1856 observed a second outburst and confirmed the recurrent nature of the star.

T Leo – 1865AN, 65, 55

Towards the end of April 1862 C. H. F. Peters at Hamilton College Observatory, New York was observing the minor planet Clytia on the ecliptic near the boundary of Leo and Virgo and noted a 10th magnitude star not shown on Chacornac's charts. The star faded from view in early May but was seen again at magnitude 10 on 24th April 1865. Despite Peters publishing a detailed report T Leo was neglected and not seen again until 1962 although several outbursts had been recorded photographically at Sonneberg Observatory.

SS Cyg – 1896ApJ, 4, 369

SS Cyg was the second dwarf nova to be recognised shortly after Miss L. D. Wells at Harvard identified its variations from plates taken between 1883 and 1896. On 2nd November 1896 E. C. Pickering announced that it had a period of about 40 days and a magnitude range of 7.2 to below 11.2. Visual observations by Z. Daniel, J. A. Parkhurst, W. E. Sperra, and P. S. Yendell, between 20th December 1896 and 28th February 1898, established that it was a variable of the U Gem class.

Z Cam – 1904MNRAS, 64, 837

The Astronomer Royal announced the discovery of Z Cam in 1904 during the work on the Astrographic Catalogue at the Royal Observatory, Greenwich. From examination of eight plates taken between 20th December 1897 and 27th March 1902, a photographic range of magnitudes 10.0 to 13.1 had been deduced. Van Biesbroeck then observed the new variable visually throughout the summer of 1905 and calculated that it had a short period of about 30 days.

RU Peg – 1904AN, 166, 59

In winter 1901/1902 K. Graff at Urania Observatory, Berlin commenced a visual survey of the Bonner Durchmusterung catalogue and charts, and by Autumn 1902 he had found that the star BD +11 4760 (catalogued as magnitude 9.5) was missing. Graff tentatively matched it to GSC 1145 825 (current AAVSO comparison star 127 for RU Peg) and checked it out on 25th May 1903, 25th June 1903 and 7th June 1904 from Hamburg Observatory. Upon checking the field for a fourth time on 10th July 1904 he noted a new star nearby which proved to be RU Peg in outburst. Further outbursts were seen on 12th May 1905 and 16th August 1905 leading Graff to announce in 1905 that it belonged to the U Gem class.

RXAnd – 1905AN, 167, 341

On 18th February 1905 A Stanley Williams at Hove, Sussex announced his discovery of RX And which he had been observing visually since 1904 and had photographic plates recording variation going back to 1899. Stanley Williams initially thought it was a Cepheid with a period of 46 days but by 1906 he revised his opinion and considered it as belonging to the U Gem class but with irregularities. Stanley Williams' visual observations in 1905 also seemed to indicate a standstill throughout the months of November and De-

SVari – 1905AN, 169, 415

star was initially recorded at magnitude 12 by M. and G. Wolf on a plate exposed on 6th November 1905 and had faded to magnitude 13.5 by 21st November 1905. A check of 17 earlier plates taken between 21st October 1895 and 1st November 1905 showed no trace of the star. It was considered for many years to be a nova but confirmation that it is in fact a dwarf nova finally came on 2nd August 2011 when R. Stubbins visually detected it in outburst at magnitude 15.0 and superhumps (identifying it as UGSU class) were recorded shortly afterwards by G. Masi.

CNOri – 1906AN, 171, 77

In February 1906 M. and G. Wolf at Heidelberg examined seven six inch plates taken between 3rd February 1896 and 22nd January 1906 and identified CN Ori for the first time having a photographic range of 10.5 to 14.5 magnitude. It would not be until 1928 that the star got its official variable star designation and began to be monitored on a regular basis.

UUAql – 1907AN, 174, 101

On 26th January 1907 E. C. Pickering announced that Mrs Fleming at Harvard College Observatory had found this star whilst searching for Iris on Henry Draper Memorial plates. On nine plates taken between 16th November 1894 and 18th September 1906 the variable showed a magnitude range of 9.6 to <11.5. Although given its official variable star designation in 1912 it remained poorly observed. Finally in 1932 D. J. K. O'Connell verified UU Aql as U Gem class with a photographic range of nearly 6 magnitudes and rather long cycles.

SSAur – 1907AN, 174, 361

Detected by E. Silbernagel at Munich whilst examining plates taken on 13th October 1901 (recorded at magnitude 9.0) and 15th January 1903 (not visible and fainter than magnitude 14.5). By March 1908 it was known to be U Gem class and a search of Harvard plates revealed 33 outbursts in the period 1891 to 1908.

XLeo – 1907AN, 175, 259

The Rev. J. H. Metcalf of Taunton, Massachusetts detected a rise from magnitude 13.5 to 11.5 on plates taken on the 21st and 25th April 1906. Metcalf reported this to E. C. Pickering at Harvard who confirmed the variability from checking their plate archive but the period and nature of the star could not be established. From observations made in 1914 K. Graff concluded that X Leo was a member of the U Gem class with a period of 16 days and a

minimum magnitude of about 16.

SUUMa – 1908AN, 177, 173

Light variations were first detected by L. Ceraski from plates exposed by M. S. Blazko at Moscow Observatory in February 1908. From 13 plates taken in 1907 and 1908 Blazko found a range of magnitude between 11.5 and <12.5 and concluded that the period was long. W. M. Lindley recorded a long maximum in February 1928 but it would not be until 1952 that the term supermaxima was used and SU UMa itself was recognised as a separate dwarf nova sub-group.

SWUMa – 1909AN, 183, 109

This object was identified by L. Ceraski at magnitude 10 from a plate exposed on 23rd March 1909 at Moscow Observatory. The star was absent on 24 similar plates taken between 1906 and 1909 that had a limiting magnitude of 12.5. M. S. Blazko carefully examined the plate and dismissed possibilities of a minor planet or head-on meteor and concluded that it was a new variable star or a nova. Confirmation that it was not a nova did not come before 7th April 1937 when P. Parenago caught it in outburst.

UV Per – 1912AN, 190, 163

This star was identified at magnitude 11.1 by C. R. d'Esterre from four plates taken on 13th and 21st November 1911 with a 15 inch reflector at Tatsfield, Surrey. There was no sign of the star on five plates taken between 5th August 1911 and 18th October 1911. Initially thought to be a nova, a search of the Harvard plates by A. J. Cannon revealed earlier outbursts on 30th October 1896, 17th September 1899 and 28th January 1902 and E. C. Pickering concluded it was a member of the U Gem class. During a second outburst in June 1914 D'Esterre noted that it appeared fainter visually than photographically before fading back to a constant minimum of magnitude 16.9.

TZ Per – 1912AN, 192, 131

C. R. d'Esterre found variation between 12.0 and 14.0 magnitude on 15 plates (including the same plates used to earlier detect UV Per) exposed between 5th August 1911 and 10th June 1912. From a combination of visual and photographic observations made in the following year d'Esterre concluded a short period, blue white colour and appearing to be slightly brighter photographically than visually.

The above list might require revision in the future if it is finally established that any of W Ari, T Boo, U Leo or UW Per are indeed dwarf novae.

It will be noted that with the exception of CN Ori (positioned 5 degrees south of the equator) all of the above stars have a northerly declination. It was not until 1932 that the celebrated southern hemisphere dwarf nova VW Hyi was discovered. This was identified by W. J. Luyten applying a blink microscope on photographic plates.

Some variable stars discovered post 1913 and identified as dwarf novae have outbursts recorded photographically pre 1913. Two such examples are:

1. VY Aqr was identified in 1925 from a plate taken at Yerkes Observatory on 12th August.

2. WZ Sge was identified in 1919 from a series of plates taken at Harvard College Observatory in November 1913.

The first discovery of a dwarf nova (U Gem) was by visual means but this proved to be exceptional and we had to await the advent of the photographic plate before other stars of this class could be positively identified. To my knowledge the only other visual discoveries of dwarf nova were of T Leo, RU Peg (see above) and TT Crt (by R W Fleet in 1986).

A hundred years ago photographic plates were being used extensively to discover variable stars and 12 stars that ended up classified as dwarf novae had been identified by plate examination leading up to 1913. Dwarf novae were particularly easy to detect on plates because of their wide range (3-5 magnitudes) and rapid variation. Occasionally a few dwarf nova are still being detected through CCD imaging today that can get as bright as magnitude 11. When this happens consultation of the old photographic plate archives such as Harvard and Sonneberg can be a fruitful exercise.

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CHART NEWS

JOHN TOONE

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

095.02 ZAndromedae

A new 1 degree field chart replaces chart 095.01. Comparison stars B, J, L, M and N have been dropped, Tycho 2 Vj and SRO V measurements are adopted for the sequence.

061.02 UV Cassiopeiae

A new 20 minute field chart replaces chart 061.01. The position of comparison star B has been corrected and the sequence has been amended to align with AAVSO and TASS V measurements. Comparison star C has been dropped and comparison stars N, R, S and T have been added.

333.01 HR Delphini

A new 1 degree field chart replaces chart JEI 1972 Oct. Comparison stars 1, 2, 6, 8, 9, 11, 13, 19 and 20 are dropped. The new sequence adopts Tycho 2 Vj plus V measurements by Pickard and CMC14. In the unlikely event of HR Del undergoing a further outburst then observers may use chart 228.02 (U and EU Del) that provides a suitable sequence in the range 5.3 to 8.4.

049.03 RHydrae

New 30 degree, 9 degree and 3 degree field charts replace chart 049.02. Comparison stars C, E, J, L, N, Q (red variable), S, Y, Z and AA are dropped, and comparison stars 5

(designation used on chart RGA 1961 Mar) and 8 are added. The sequence now adopts both Tycho2 Vj and Hipparcos Vj measurements.

222.02 RY Leonis

New 6 degree and 1 degree field charts replace chart 222.01. Comparison stars A, B, D, F, H, L, N, Q and R are dropped, and comparison stars T and W are added. The new sequence consists of V measurements from Tycho and APASS.

218.02 U Leonis Minoris

New 6 degree and 1 degree field charts replace chart 218.01. Comparison star N is added. The new sequence consists of V measurements from Tycho, TASS and CMC14.

Binocular Stars

304.01 BZ Andromedae

A new 6 degree field chart replaces chart MDT 1982 Aug 16. A lettered sequence replaces the numbered sequence. Comparison stars 1 and 4 (both red stars) are dropped, and comparison stars A, C and E are added. The new sequence adopts Tycho 2 Vj measurements.

337.01 V391 and V393 Cassiopeiae

A new 5 degree field chart replaces chart MDT 1978 May 15. CSV171 is no longer considered variable and has been dropped from the chart. Comparison stars 2, 4, M, D, F and N have been dropped. The new sequence adopts Tycho 2 Vj measurements.

062.04 W Cygni

A new 9 degree field chart replaces chart 062.03. Comparison stars FL63 (red), E (red), 1, 5 and L (V2162 Cyg) are dropped, and comparison star N added. The new sequence adopts Tycho2 Vj measurements and has a much reduced colour range.

335.01 RV Cygni

A new 3 degree field chart replaces chart MDT 1983 Sep 18 that was previously a combined chart for RV Cyg and V460 Cyg. Comparison stars M and Q are dropped, and the positions of comparison stars N, P and R have been corrected. The new sequence adopts Tycho 2 Vj measurements.

227.02 TT Cyg

A new 6 degree field chart replaces chart 227.01. The previous sequence has been retained but with the values adjusted to adopt Tycho 2 Vj measurements.

336.01 V460 Cygni

A new 9 degree field chart replaces chart MDT 1983 Sep 18 that was previously a combined chart for RV Cyg and V460 Cyg. Comparison stars C, B, E, G and K are dropped, and comparison star A from previously superceded chart MDT 1974 Jul 28 has been reintroduced. The new sequence adopts Tycho 2 Vj measurements.

109.02 U Hydrae

A new 18 degree field chart replaces chart 109.01. Comparison stars A (red variable), F (red variable) and H are dropped, and comparison stars N and P are added. The new sequence adopts Tycho 2 Vj measurements and has a much reduced colour range.

235.02 SX Lacertae

A new 6 degree field chart replaces chart 235.01. Comparison star B has been dropped and the new sequence adopts Tycho 2 Vj measurements.

110.02 RX Leporis

A new 9 degree field chart replaces chart 110.01. Comparison stars A, F and G are dropped, and comparison stars H and N are added. The new sequence adopts Tycho 2 Vj measurements and has a much reduced colour range.

211.02 BL Orionis

A new 9 degree field chart replaces chart 211.01. Comparison stars B and C (both blue stars) are dropped. The new sequence adopts Hipparcos Vj measurements and has a much reduced colour range.

103.02 GO Pegasi

A new 9 degree field chart replaces chart 103.01. Comparison stars D and F (red variable) are dropped. The new sequence adopts Tycho 2 Vj measurements.

226.02 VW and VY Ursae Majoris

A new 9 degree field chart replaces chart 226.01. Comparison stars F, G and L are dropped. The new sequence adopts Tycho 2 Vj measurements.

058.02 V Vulpeculae

A new 3 degree field chart replaces chart 058.01. Comparison stars B, D, E, J, K and M are dropped, and comparison stars N, P, R and S are added. The new sequence adopts Tycho 2 Vj, Hipparcos Vj and TASS V measurements.

The chart for Z Andromedae is the first to be prepared using the AAVSO chart plotter and the intention is to make extensive use of this facility to speed up chart production in the future. Thanks are due to AAVSO for granting the use of this facility and also to Gary Poyner for adapting it for the VSS chart format.

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IBVS 6046 - 6073

JANET SIMPSON

- 6046** New Times of Minima of Some Eclipsing Variables. (Lacy, 2013)
- 6047** Variability type of BD +46 2731. (Serebryanskiy et al, 2013)
- 6048** BAV-Results of observations - Photoelectric Minima of Selected Eclipsing Binaries and Maxima of Pulsating Stars. (HUBSCHER, Braune, and Lehmann, 2013)
- 6049** Photometry of High-Amplitude Delta Scuti Stars in 2012. (Wils, Ayiomamitis, et al, 2013)

- 6050** CCD Minima for Selected Eclipsing Binaries in 2012. (Nelson, 2013)
- 6051** First result of the Czech RR Lyrae Stars Observation Project - a new Blazhko star CN Cam. (Skarka, Honkova, and Jurysek, 2013)
- 6052** The 80th Name - List of Variable Stars. Part III - RA 16h to 24h. (Kazarovets, et al, 2013)
- 6053** Confirming the delta Scuti nature of GSC 02696-02622. (Zhang, Pi, and Zhang, 2013)
- 6054** Photometric Analysis of Variable Stars in NGC 299. (Sanders, et al, 2013)
- 6055** Bipolar ejection from the symbiotic binary Hen 3-1341 during its 2012 outburst. (TOMOV, and TOMOVA, 2013)
- 6056** New outburst of AX Persei in 2012. (Kondratyeva, and Rspaev, 2013)
- 6057** GSC 02996-00858: A new Algol-type eclipsing binary in Leo. (Ayiomamitis, 2013)
- 6058** Search for rapid oscillations among seven northern CP stars. (Paunzen, et al, 2013)
- 6059** The 2013 flare of ASASSN-13ae. (Nesci, et al, 2013)
- 6060** Photometric and spectroscopic variations of the Be star HD 112999. (Corti, et al, 2013)
- 6061** Discovery of irregular variability of five stars in the vicinity of the young stellar object V645 Cygni. (Sobolev, Gorda, and Davydova, 2013)
- 6062** New light elements for 63 long period variable stars from ASAS-3 database. (Mina, 2013)
- 6063** Timings of Minima of Eclipsing Binaries. (Diethelm, 2013)
- 6064** Variables from SDSS Stripe 82 region. (Sesar, Becker, and Ivezić, 2013)
- 6065** Variable stars from the LINEAR survey. (Palaversa, Sesar, and Ivezić, 2013)
- 6066** Period changes in the eclipsing binary DX Vel. (Volkov, et al, 2013)
- 6067** VSX J075328.9+722424: a new sdB+M dwarf variable? (Pribulla, et al, 2013)
- 6068** CzeV283 and CzeV397 - new RR Lyrae stars showing Blazhko effect. (Skarka, and Cagas, 2013)
- 6069** High and low resolution absolute spectrophotometry of the symbiotic nova. VVV-NOV-003 = OGLE-2011-BLG-1444. (Munari, et al, 2013)
- 6070** BAV-Results of observations - Photoelectric Minima of Selected Eclipsing Binaries and Maxima of Pulsating Stars. Hubscher, and Lehmann, 2013
- 6071** Time-Series Photometry of the Symbiotic Nova NSV 11749 and New Variable Stars in Aquila. Wehrung, et al, 2013
- 6072** A new W UMa-type variable star near R CMa. Mkrtichian, et al, 2013
- 6073** Follow-up of MASTER OTJ204200.48+041839.9 Nesci, et al, 2013
- 6074** Variable Stars in the SMC Star Cluster Bruck 50. (Schmidtke, and Udalski, 2013)
- 6075** New times of minima for some eclipsing binary stars. GURSOYTRAK, et al, 2013)
- 6076** Simultaneous multicolour photometry of late-type giant stars. (KURATOV, et al, 2013)
- 6077** Discovery of a new periodic variable star CzeV 503. (Liska, and Skarka, 2013)
- 6078** A misidentified RR Lyrae variable star in omega Centauri. (Navarrete, et al, 2013)
- 6079** AW UMa observed with MOST satellite. (Rucinski, et al, 2013)

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>

BINOCULAR PROGRAMME - MODIFICATIONS

MELVYN TAYLOR

Do I

The binocular programme of mainly pulsating variables together with a few other types (M, RV, Ina, Z And, G Cas, S Dor and NC) is being modified very slightly to assist both new and existing observers. The programme is changed little except that NQ Gem and CK Ori are dropped as only very minor variations not dissimilar to observer's scatter are seen. It is likely that a set of 'red irregulars' (see level 4 below) may ultimately be dropped and that some more suitable 'binocular' variables may be added.

The VSS database has been consulted for assessing the priority scenarios. The distribution and continuity of the observational set in terms of the light-curve and determination of a star's basic variation was seen as being more relevant than grand totals. One of the initial criteria in prioritising stars was not only about an object being 'popular' (i.e. easily found, or considered to be important astrophysically) but that it may be seen to have definite brightness changes, which is not always the case in terms of the characteristics of the pulsating classes. Data given is generally from the General Catalogue of Variable Stars.

This does not mean that if a star is dropped an observer should stop observing it if they still wish to, if they have been following it for years, for example. Their observations will still be accepted by the VSS.

Priority level 1:

This list is as existing and as previously published, but it should be noted that V Boo, XX Cam, gamma Cas, R CrB, omicron Cet and R Hya are not shown as they are on the telescopic programme.

Star	RA (2000)	Dec	Type	Range	Period	Chart
<i>AQ And</i>	00 28	+35 35	SR	8.0 - 8.9	346d	303.01
<i>EG And</i>	00 45	+40 41	ZAnd	7.1 - 7.8		72.02
<i>VAql</i>	19 04	-05 41	SRb	6.6 - 8.4	353d	26.04
<i>UU Aur</i>	06 37	+38 27	SRb	5.1 - 6.8	234d	230.02
<i>AB Aur</i>	04 56	+30 33	Ina	6.7 - 8.4		301.01
<i>RW Boo</i>	14 41	+31 34	SRb	7.4 - 8.9	209d	104.02
<i>RX Boo</i>	14 24	+25 42	SRb	6.9 - 9.1	160d	219.02
<i>ST Cam</i>	04 51	+68 10	SRb	6.0 - 8.0	300d?	111.02
<i>XCnc</i>	08 55	+17 04	SRb	5.6 - 7.5	195d	231.02
<i>RS Cnc</i>	09 11	+30 58	SRc	5.1 - 7.0	120d?	269.01
<i>VCVn</i>	13 20	+45 32	SRa	6.5 - 8.6	192d	214.02
<i>WZ Cas</i>	00 01	+60 21	SRb	6.9 - 8.5	186d	323.01
<i>V465 Cas</i>	01 18	+57 48	SRb	6.2 - 7.8	60d	233.02
<i>Rho Cas</i>	23 54	+57 29	SRd	4.1 - 6.2	320d	64.01
<i>WCep</i>	22 37	+58 26	SRc	7.0 - 9.2		312.02
<i>AR Cep</i>	22 52	+85 03	SRb	7.0 - 7.9		332.02
<i>Mu Cep</i>	21 44	+58 47	SRc	3.4 - 5.1	730d	112.02
<i>RS CrB</i>	15 59	+36 01	SRa	7.0 - 10.2	332d	220.02
<i>WCyg</i>	21 36	+45 22	SRb	5.0 - 7.6	131d	62.03

<i>AF Cyg</i>	1930	+4609	SRb	6.4-8.4	92d	232.02
<i>CH Cyg</i>	1925	+5015	ZAnd+SR	5.6-11.0	97d	089.03
<i>P Cyg</i>	2018	+3802	SDor	3.0-6.0	6d	1972Jul29
<i>U Del</i>	2046	+1806	SRb	5.6-7.9	110d?	228.02
<i>EU Del</i>	2038	+1816	SRb	5.8-6.9	60d	228.02
<i>TX Dra</i>	1635	+6028	SRb	6.6-8.4	78d?	106.03
<i>AH Dra</i>	1648	+5749	SRb	7.0-8.7	158d	106.03
<i>X Her</i>	1603	+4714	SRb	6.1-7.5	95d	223.02
<i>SX Her</i>	1608	+2455	SRd	8.0-9.2	103d	113.02
<i>UW Her</i>	1714	3622	SRb	7.0-8.8	104d	107.02
<i>AC Her</i>	1830	+2152	RVA	6.8-9.0	75d	048.04
<i>IQ Her</i>	1818	+1759	SRb	7.0-7.5	75d	048.04
<i>OP Her</i>	1757	+4521	SRb	5.9-7.2	120d	324.01
<i>RX Lep</i>	0511	-1151	SRb	5.0-7.4	60d?	110.01
<i>SV Lyn</i>	0804	+3621	SRb	6.6-7.9	70d?	108.03
<i>Y Lyn</i>	0728	+4559	SRc	6.5-8.4	110d	229.02
<i>U Mon</i>	0731	-0947	RVB	5.9-7.9	91d	029.04
<i>X Oph</i>	1838	+0850	M	5.9-9.2	328d	099.02
<i>BQ Ori</i>	0557	+2250	SR	6.9-8.9	110d	295.01
<i>AG Peg</i>	2151	+1238	Nc	6.0-9.4		094.02
<i>X Per</i>	0355	+3103	GCas+Xp	6.0-7.0		277.01
<i>R Sct</i>	1848	-0542	RVA	4.2-8.6	146d	026.04
<i>Y Tau</i>	0546	+2042	SRb	6.5-9.2	242d	295.01
<i>W Tri</i>	0242	+3431	SRc	7.5-8.8	108d	114.02
<i>Z UMa</i>	1157	+5752	SRb	6.2-9.4	196d	217.02
<i>ST UMa</i>	1128	+4511	SRb	6.0-7.6	110d?	102.02
<i>VUMi</i>	1339	+7419	SRb	7.2-9.1	72d	101.02
<i>SS Vir</i>	1225	+0048	SRa	6.0-9.6	364d	097.02
<i>SW Vir</i>	1314	-0248	SRb	6.4-8.5	150d?	098.02

Priority level 2:

The following are regarded (in the main) as under-observed or having poor continuity, and several objects come to conjunction with the Sun so the light-curve is broken.

Star	RA(2000)	Dec	Type	Range	Period	Chart
<i>RS And</i>	23 55	+48 38	SRa	7.0-9.1	136d	1977Sep10
<i>TZ And</i>	23 51	+47 31	SRb	7.6-9.0		1977Sep10
<i>V450 Aql</i>	19 34	+05 28	SRb	6.3-6.7	64d	70.02
<i>RV Boo</i>	14 39	+32 32	SRb	7.5-8.8	137d	104.02
<i>U Cam</i>	03 42	+62 39	SRb	7.7-8.8		100.02
<i>RY Cam</i>	04 31	+64 26	SRb	7.3-9.4	136d	1972Jul29
<i>Y CVn</i>	12 45	+45 26	SRb	5.2-6.6	157d	215.02
<i>TU CVn</i>	12 55	+47 12	SRb	5.6-6.6	50d	215.02
<i>V393 Cas</i>	02 03	+71 18	SRa	7.0-8.0	393d	1978May15
<i>RU Cep</i>	01 21	+85 08	SRd	8.2-9.8	109d	332.02
<i>RW Cep</i>	22 23	+55 58	SRd	6.2-7.6	346d?	312.02
<i>SS Cep</i>	03 50	+80 19	SRb	6.7-7.8	90d	315.01
<i>FZ Cep</i>	21 20	+55 27	SR	7.0-7.6		302.01
<i>RR CrB</i>	15 41	+38 33	SRb	7.1-8.6	61d	220.02

<i>RU Cyg</i>	21 41	+54 19	SRa	8.0-9.4	233d	302.01
<i>RV Cyg</i>	21 43	+38 01	SRb	7.1-9.3	263d	1983Sep18
<i>TT Cyg</i>	19 41	+32 37	SRb	7.4-8.7	118d	227.01
<i>RY Dra</i>	12 56	+66 00	SRb?	6.0-8.2	200?	225.02
<i>TU Gem</i>	06 11	+26 01	SRb	7.4-8.3	230d	294.01
<i>TV Gem</i>	06 12	+21 52	SRc	6.6-8.0	42d	294.01
<i>WY Gem</i>	06 12	+23 12	Lc+E?	7.2-7.9		294.01
<i>ST Her</i>	15 51	+48 29	SRb	7.0-8.7	148d	223.02
<i>V566 Her</i>	18 08	+41 43	SRb	7.1-7.8	137	324.01
<i>g(30) Her</i>	16 29	+41 53	SRb	4.3-6.3	89	224.02
<i>SX Lac</i>	22 56	+35 12	SRd	7.7-8.7	190	235.01
<i>CE Lyn</i>	07 44	+38 50	SR	7.8-8.7	?	108.03
<i>RLyr</i>	18 55	+43 57	SRb	3.9-5.0	46?	330.01
<i>RV Mon</i>	06 58	+06 10	SRb	6.8-8.6	132	292.01
<i>SX Mon</i>	06 52	+04 46	SR	7.3-8.5	100	292.01
<i>W Ori</i>	05 05	+01 11	SRb	5.9-7.7	212	105.02
<i>GO Peg</i>	22 55	+19 34	Lb	7.1-8.3		103.01
<i>SU Per</i>	02 22	+56 36	SRc	7.0-8.5	533	1974Jan13
<i>AD Per</i>	02 21	+57 00	SRc	7.7-8.4	362	1974Jan13
<i>Z Psc</i>	01 16	+25 46	SRb	7.0-7.9	144	278.01
<i>TV Psc</i>	00 28	+17 54	SR	4.7-5.6	49	1972Sep09
<i>S Sct</i>	18 50	-07 54	SRb	7.0-8.2	148	26.04
<i>t4 Ser</i>	15 36	+15 05	SRb	5.9-7.4	100	209.01
<i>TT Tau</i>	04 52	+28 32	SRb	8.1-8.8	166	301.01
<i>BU Tau</i>	03 49	+24 08	GCas	4.8-5.5		1983Oct03
<i>RY UMa</i>	12 21	+61 19	SRb	6.7-8.3	310?	217.02
<i>TV UMa</i>	11 46	+35 54	SRb	6.8-7.3	42	271.01
<i>VW UMa</i>	10 59	+69 59	SR	6.9-7.7	610	226.01
<i>BK Vir</i>	12 30	+04 25	SRb	7.3-8.8	150?	270.01

Priority level 3:

Stars that have been queried by period and/or type.

Star	RA(2000)	Dec	Type	Range	Period	Chart
<i>V Ari</i>	02 15	+12 14	SRb	7.8-8.8	77?	1984Oct26
<i>W Boo</i>	14 43	+26 32	SRb?	4.7-5.4	450?	Undated
<i>UV Cam</i>	04 06	+61 48	SRb	7.5-8.1	294?	1972Jul29
<i>RT Cnc</i>	08 58	+10 51	SRb	7.1-8.6	60?	311.01
<i>V460 Cyg</i>	21 42	+35 31	SRb	5.6-7.0	180?	1983Sep18
<i>V973 Cyg</i>	19 45	+40 43	SRb	6.2-7.0	40?	232.02
<i>UX Dra</i>	19 22	+76 34	SRa?	5.9-7.1	168	1982Nov07
<i>U Hya</i>	10 38	-13 23	SRb	4.3-6.5	450?	109.01
<i>RX Vir</i>	12 05	-05 46	SRd?	8.0-8.6	200?	317.01

Priority level4:

Not all the 'red-irregulars' are included here. These are considered unlikely to reveal further relevant data other than a trend of the variation and the overall mean range.

Many of these stars would make a suitable longer term project for observers with a DSLR camera.

Possibly, if there is sufficient interest, a DSLR/instrumental observer may be keen to take on a few of these (?).

Star	RA(2000)	Dec	Type	Range	Chart
<i>SU And</i>	00 05	+43 33	Lc	8.0-8.5	1977Sep10
<i>BZ And</i>	00 38	+45 36	Lb	7.5-8.4	1982Aug16
<i>Psi I Aur</i>	06 25	+49 17	Lc	4.8-5.7	1973Jul14
<i>ZZ Cam</i>	04 18	+62 21	Lb	7.1-7.9	1972Jul29
<i>WC Ma</i>	07 08	-11 55	Lb	6.4-7.9	213.02
<i>V391 Cas</i>	01 57	+70 12	Lb	7.6-8.4	1978May15
<i>DM Cep</i>	22 08	+72 46	Lb	6.9-8.6	Undated
<i>UW Dra</i>	17 58	+54 40	Lb	7.0-8.2	1974Jul27
<i>BU Gem</i>	06 12	+22 55	Lc	5.7-8.1	294.01
<i>XY Lyr</i>	18 38	+39 40	Lc	5.8-6.4	331.01
<i>BL Ori</i>	06 26	+14 43	Lb	6.3-7.2	211.01
<i>KK Per</i>	02 10	+56 34	Lc	6.6-7.9	1974Jan13
<i>PR Per</i>	02 22	+57 52	Lc	7.6-8.3	1974Jan13
<i>TX Psc</i>	23 46	+03 29	Lb	4.8-5.8	276.01
<i>VY UMa</i>	10 45	+67 25	Lb	5.9-7.0	226.01
<i>RW Vir</i>	12 07	-06 46	Lb	6.7-7.6	317.01

BRIEF NOTE

For visual observers just starting observing and wishing to make their own set of stars from the VSS programmes the following advice is given.

As a simple selection theme the following constellations have a number of Binocular Programme stars: 9 in Cygnus and Hercules; 8 in Cepheus; 6 in Andromeda and Ursa Major, and 5 in each of Cassiopeia, Camelopardalis, Draconis and Virgo. Another obvious aspect of making a personal selection apart from the instrumental, local topographical, and seasonal considerations, is that the database may be checked to appreciate the observed magnitudes. This may not coincide with the catalogued values or even with current estimates of other observers which could 'put-off' an observer's confidence in their results. The Binocular Secretary is always willing to assist in the choice of stars to follow. In addition he would like to hear from the Variable Star Section's observers of any possible new additions which could be added to the programme.

The lists above cater for 116 objects. In general new observers may first wish to select, say 10 or 15 stars and thereafter consider another 15 stars. One aspect of over observing just a few stars has to be considered, where bias comes into play. Even experienced observers may wish to re-develop their existing set of variables and this was another intention of creating the priorities as listed above.

* * *

ECLIPSING BINARY PREDICTIONS – WHERE TO FIND THEM

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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:

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

The **deadline for contributions** to the next issue of VSSC (number 159) will be 7th February, 2013. All articles should be sent to the editor (details are given on the back of this issue).

Whilst every effort is made to ensure that information in this circular is correct, the Editor and Officers of the BAA cannot be held responsible for errors that may occur; nor will they necessarily always agree with opinions expressed by contributors.

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If only answering machine response, leave a mess-age 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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