



L to R: Col Bembrick, Tom Richards, Margaret Streamer, and Simon O'Toole listening to a point from Bernard Heathcote (back to camera) on spectroscopy and SPADES. Photo: Bob Evans.

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From the Director – *Tom Richards*

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Mainly about research support

What a busy year so far, despite miserable weather here and there. In Brisbane over Easter, the VSS meeting kept about 30 participants on their toes all day, then for the rest of the weekend variable stars seemed to dominate NACAA. There's a report on these conferences below. And next month we have the RASNZ conference in Carterton.

SPADES observations are coming in at a pleasing rate – keeping several of us busy with analysis work. The DSLR group is furiously busy, and of course this remains an area that many of our members could move into with little expense. Alan Plummer has been upsetting applecarts on eta Carinae research. The list goes on.

Project support is of course a main objective of VSS, and to assist that, VSS has money. Have you looked at our research grant scheme? Are you involved with a VSS project and need some imaging or analysis software? Filters need replacing? Paying to use a remote telescope? If your need is directly relevant to a VSS project you should apply for a grant. And the purchases are your property, not on loan from us. Check it all out on our website at Community > Research Grant for all the details, including how to apply.

Our overheads and admin costs are chickenfeed, so virtually all of your subscription dollars are available for research grants. But it doesn't take much arithmetic to see how far 50 subs at \$20 will go in a year. So if you haven't renewed your subscription for this year (due April 30th they were!) can I ask you to do so asap? Go to About VSS > Join/Renew on our website. And if you care to add a munificent donation, you will be rewarded in heaven (because the heavens are what we study)!



Need some
imaging or
analysis software?
Filters need
replacing?
Paying to use a
remote telescope?

From the editor – *Phil Evans*

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In past issues of the newsletter I have introduced a couple of short columns entitled Software Watch and Hardware Watch, which are designed to let members know about interesting new software and hardware, as opposed to presenting a full-scale review of the items.

In this issue those of our members involved with the SPADES project may be interested in a cheap (US\$35) GPS receiver that will ensure your computer's timing accuracy to better than a second. There's also a brief item on a cataloging program for your images. It doesn't do much at present other than build a database of the contents of Fits headers and file locations but that's useful for someone who has a disorganised hard drive or who has images spread over two or more drives.

Also in this issue I'm introducing a new member of the Watch series - Publication Watch - which will present abstracts of recent publications that may of interest to VSS members. Two entries this time on CVs and T Pyx but what's in the next issue will depend to a large extent on you. If you know of interesting articles that are not behind a paywall please drop me a line. And if you'd like to share your knowledge of useful hardware or software then a couple of hundred words would be appreciated by us all.



Conference Report - *Tom Richards*

Two Conferences in One

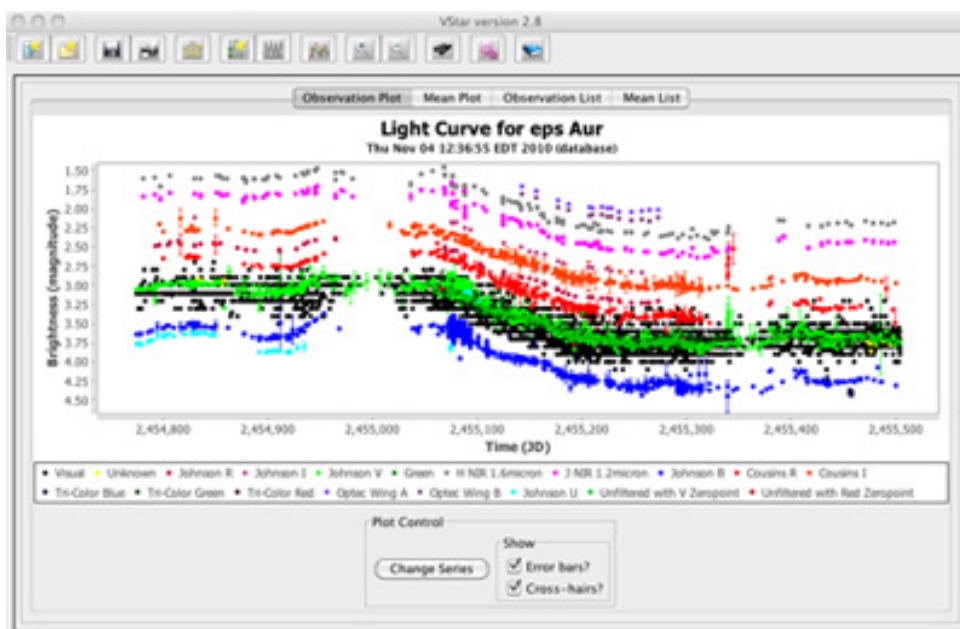
The Second Variable Stars South Colloquium and Twenty-fifth National Australian Conference on Amateur Astronomy, University of Queensland, Brisbane, Easter 2012.

The Astronomical Association of Queensland has always provided a strong showing in research, going back at least as far as the golden age of Arthur and Berenice Page, and currently under the direction of Professor David Moriarty. Combine that with the glorious campus of the University of Queensland, and the scene is set for an excellent Easter of conferences. VSS set the standard on Friday with the second VSS colloquium. Saturday and Sunday was the NACAA conference proper, and on Monday the indefatigable Graham Blow ran the sixth Trans-Tasman Symposium on Occultations.

The VSS colloquium exceeded all my expectations. We had about 30 attendees for the three-session meeting, and the excitement and enthusiasm in the sessions was palpable. A feature of all presentations was the excellent level and amount of discussion, leading into group discussions lasting all weekend. New collaborations were formed, plans laid, and I think everybody at every level gained and contributed a lot.

Vstar

The first presentation was a tutorial. **David Benn** discussed and explained the latest release, 2.13, of his **VStar**, the light curve analysis tool he wrote for the AAVSO as part of the CitizenSky initiative. I think an impressive feature of the software is its simple and intuitive user interface, and the way a wealth of functions and options can be selected and tuned to do a wide range of tasks the way you want them. Some notable features are:



- ◆ Add data directly from AAVSO's database, or from text files of various formats,
- ◆ Period search using DCDFIT and WWZ,
- ◆ Phase plot display in various modes,
- ◆ Polynomial fitting with residuals,
- ◆ Write your own Java plug-in.

Download VStar 2.13 from the AAVSO website or <http://sourceforge.net/projects/vstar/files/>. It's freeware.

A number of excellent suggestions for further development came from the floor, which David will be taking on board.

Tutorials

Tutorials were a welcome and appropriate feature of the meeting. David was followed by **Mark Blackford** on **Getting started in DSLR photometry**. Based to some extent on Newsletter contributions of

his, this took us through the basics of choices and setup of equipment, software requirements, target selection and observing preparation, and the important issues of image calibration. And of course, the VSS projects on offer for DSLR work. After this, there is no excuse for astro-imaging aficionados not to move over en masse to variable star work – even with a point-and-shoot camera.

Another tutorial later in the day was by **Tom Richards** on **Finding and using your Transformation Coefficients in differential photometry.**

This was the result of arm-twisting by several people, and the aim was to convince them that it was dead easy. A tutorial paper based on this, which was circulated in draft form, will appear on our website shortly, along with the PowerPoint file.



Mark Blackford told how to get started in photometry with a DSLR

T Pyx

The first contribution on individual stars was by **Margaret Streamer** on **The 2011 Eruption of T Pyxidis**. This recurrent nova erupted in 2011 most unexpectedly, upsetting some theories about how the accumulation of transferred mass leads to the nova eruption. Many VSS members contributed to this campaign, visual and electronic, before and after eruption. Their names were on the author list of the paper on the outburst by Brad Schaefer, which Margaret summarised in her talk.

Eta Car

Alan Plummer's presentation, **Observing the observers through the light curve of eta Carinae** provided a slightly wicked history of the observation of that notorious star. He told not just of the early observers that he's researching at the Mitchell Library (U Sydney), but some fascinating astronomical insights into early European exploration and settlement down south. The most gripping part was his detective work on the bad effects of poor research practice on our understanding of the star. Terms like "Chinese whispers" and "salami-slice research" were tacked onto the efforts of some astronomical identities; and when their work was suitably purged the result was not inconsiderable modifications of the accepted historical light curve. I will be keen to read this work when it hits a refereed journal!

SPADES

Simon O'Toole and **Tom Richards** in **SPADES: progress, problems and prognosis**, provided a brief science case for the project, describing the way that eclipse light-time variations in EAs can lead to discovery of circumbinary exoplanets in a regime that makes detection by other methods difficult. This research ties in to some very interesting issues about planet formation, partly on the basis of which SPADES is applying for time on Gemini South. Then we reported on SPADES progress, in particular cataloguing successes and failures so far in finding eclipses in 46 systems. This shows up just how bad currently available light elements are in providing useful eclipse ephemerides.

David Moriarty, who has only just started in CCD photometry but has provided voluminous high quality data to the SPADES project, brought that issue home in a personal way in two presentations (and a third to the NACAA conference). In **Updating GCVS ephemeris** elements he described the difficulties of a beginner when catalogue ephemerides fail miserably to predict eclipses, how problems arise with compari-

son stars, and how he found other catalogue data woefully wrong in many ways. To look on the bright side of this frustration, it shows how much good, publishable, research needs to be done to clear out the non-sense. In **CCD imaging issues** he went on to discuss problems he'd found in imaging and doing photometry, which led to a good discussion on the black art of getting photometry right. One of the advantages of an informal meeting like VSSC2 is you can discuss basic issues like these.

The meeting concluded with a brief discussion of the good, bad, and future of VSS. This rapidly centred around the twin problems of recruitment and mentoring, and the particular problems these issues create for a virtual, online organisation like VSS, and of course for any nonlocal team research. Many lamented the difficulty of persuading deep-sky astro-imagers to come over to the science side. Why do they think variable star work with their equipment would be technically or scientifically any harder than what they're doing?

Personally I'm inclined to be a bit more philosophical about this – in amateur astronomy it's whatever turns you on, it's whatever niche suits your style. With about 60 members, VSS is in a healthy state; and with 30 enthusiasts at the colloquium I think the field is progressing vigorously. But we'd always like more to be involved.

The colloquium wasn't the end of variable star presentations for the weekend, let alone of deep discussions and planning in the sunshine or over wine. The NACAA Conference had quite a slew of variable star presentations.

Roy Axelsen gave a most interesting presentation on an easy-to-use **Method for differential CCD or DSLR photometry** requiring no determination of airmass or extinction coefficients, or I might add, transformation coefficients. He has tested this with DSLRs at well over two airmasses, ignoring zero-point and differential extinction factors entirely. This deserves further study and testing, though I think its main use will be for snapshots of slowly varying stars.

Tom Richards presented **Analysing a variable star from observations to physical model**. This summarised a joint paper by several of the EEB project observers, currently with the referees, about the little studied EA system, CU Hydrae. Actually it was less about CU Hya itself and more about how you take often messy time series data in and get a physical model out, with the help of Col Bembrick at the helm of BinaryMaker 3.

David Moriarty gave a step-by-step insight into **The learning curve of a beginner with a CCD camera**, piquing my interest as a beginner in CCD photometry. He deliberately chose a short-period continuously varying eclipser, TW Cru, so he would always get time-varying results – no flatline – to compare with catalogue data. This, he naively thought, would allow him to compare his work with the known reality – a good way of learning. Needless to say he found that all the known information about this system was wrong. When completed, there's a publication here.

Spectroscopy

To me, a major highlight of the weekend was paired presentations on **Variable star spectroscopy** by the Queensland team of **Keith Forbes, Anthony Dutton, Gregorie Bond** and **Julian West**. Julian, I may say, does his spectroscopy from his motor home! In The age of amateur spectroscopy Keith and Julian explained their equipment and its capabilities. Knowing nothing about the field I was amazed at the sophistication of the hardware and particularly the software now available off the shelf. Resolution to 0.8 Å with a 125 mm telescope, and a 3 Å spectrum to mag 11 with a 250 mm scope that is more than sufficient to determine spectral class and type with accuracy. And as for radial velocity determination, the only issue is down to what velocity. Visit www.keithforbes.org.

Anthony, Gregorie and Julian continued by describing their spectroscopy and near-infrared (NIR) photometry (J and H band) on R Car, an oxygen-rich Mira variable. The NIR light curve rises slower than it falls, reaching its peak 40-60 days later than in visual, and has other significant shape differences from the visual curve. NIR reaches lower into the atmosphere of a Mira, prompting questions about what lies in between to differentiate the two light curves so much. In their spectrographic work, aside from measuring temperature and spectral class changes, they are looking at the signatures of metallic oxides such as VO and TiO and their role in the phase lag and light curve shape.

It is plain now that we can and must add spectroscopy routinely to our studies of variables. My group's work on CU Hya, for instance, would have been greatly improved by the spectral data we could have obtained from this group. It is good to know there are others in the region who are doing variable star spectroscopy, such as Bernard Heathcote.

I missed the paper on **Supernova Discovery Methods** by **Peter Marples, Greg Bock and Tamara Davis** – the curse of two streams. This long presentation discussed the work of the pro-am BOSS team in Queensland plus Stuart Parker in New Zealand, their search and confirmation techniques, and again, their use of spectroscopy on the pro side. The team has made 32 confirmed discoveries since mid-2008.

Dave Herald discussed the forthcoming all-sky **UCAC4 Catalog**, with which he has been associated. Expected to be released very shortly, it will be a considerable improvement over UCAC3. It will include photometry from Tycho-2, 2MASS and APASS, making it a complete catalogue to about $R=16$ mag. It will have improved positional and in particular proper motion data compared to UCAC3.

Other fascinating papers outside of the variable star field by both professionals and amateurs made the NACAA conference a delight – but I must not stray into discussing them. I'm already thinking about how to get lots of variable star papers into the next NACAA in Melbourne in 2014 – presumably Easter again. More on spectroscopy perhaps, and certainly more on visual work which was sadly absent from this NACAA.

And when will the next VSS colloquium be? Opinion seemed to coalesce around two yearly. Obviously it must be held alongside a major conference, which in Australia means NACAA – Easter in the even years. And despite the pleasing presence of Kiwis Bob Evans, Robert Rea and Terry Butt at VSSC2, it needs to rotate back to NZ. So we'll arrange to hold it with the 2014 RASNZ conference. But save up to come to Melbourne too!

NACAA 2012: A personal summary – *David Benn*

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This article is reproduced here (with permission) from David's blog www.dbenn.wordpress.com

The National Australian Convention of Amateur Astronomers (NACAA) is held every two years over the Easter long weekend. This year, the 25th NACAA was held in Brisbane at the University of Queensland's St Lucia campus. The two main convention days are on Saturday and Sunday with Friday and Monday reserved for workshops, colloquia, symposia or other activities.

On Friday April 6th I attended the 2nd Variable Stars South (VSS) colloquium. In the first session, I gave a VStar development update. At the 2008 NACAA I'd met AAVSO Director Arne Henden where we discussed VStar as a possible volunteer project. At NACAA in 2010 I held a one day hands-on workshop covering the initial development since May 2009. VStar has matured somewhat in the last two years and the focus was on new features. I noticed a shift in emphasis from 2010. At that time, workshop attendees were interested in using VStar and looked forward to watching it evolve. This time, I spoke to people who had been making use of it for their research and our conversations over the weekend focussed upon additional features that would help them do what they needed to do.

Subsequent VSS colloquium sessions included:

- ◆ A number of presentations and discussions about the SPADES exoplanet project.
- ◆ Presentations about techniques in DSLR photometry and photometric data reduction.
- ◆ Summary of a paper concerning the eruption of the recurrent nova T Pyxidis in 2011.
- ◆ "Observing the observers" of eta Carinae through its light curve.

Simon O'Toole from the Anglo-Australian Observatory was at the colloquium, primarily for the SPADES sessions. I had some interesting conversations with him about possible VStar futures and data analysis in the morning tea break.

In parallel with the VSS colloquium on Friday was an Astronomy 101 workshop, attended by a mixture

of beginners and experts.

There were two streams on each day of the weekend, although both days had a keynote or invited speaker.

Saturday began with a keynote by Dr Tamara Davis and Professor Michael Drinkwater and although wide-ranging, the topic was focused upon the bulk of the Universe we apparently know little about: Dark Energy and Dark Matter, confirmation of Lambda Cold Dark Matter model, and some trivia about the recent Nobel Prize for Physics, such as the quality of the “paparazzi” (professional astronomers).

Sunday’s John Perdrix address was given by Martin George and was a fascinating glimpse into the life of Grote Reber, the radio astronomy pioneer who moved from Illinois to live in radio-quiet Tasmania. Martin’s historical research and personal anecdotes always make for an entertaining talk. Having lived in Launceston for a decade, I always enjoy catching up with Martin at NACAA.

Here’s a sampling of talks over the two main days:

- ◆ Building and using spectroscopes for amateur variable star spectroscopy.
- ◆ Making and submitting double star measurements to help improve catalogues, which have a surprising number of errors.
- ◆ Analysing an eclipsing binary variable star from observation through to creation of a physical model.
- ◆ Supernova discovery methods.
- ◆ A talk about Comet Lovejoy, by Terry Lovejoy.
- ◆ Talks about this year’s transit of Venus and Total solar eclipse.
- ◆ Variable star photometry and data analysis talks.
- ◆ Meteor observing systems.
- ◆ Presentations about asteroidal occultation observation and analysis.

There was also a talk about “teaching the teachers” and an interesting presentation about the likely prevalence of life elsewhere in the Universe from a presenter with qualifications in microbiology and chemistry.

For the final Sunday session, I opted for the Brisbane planetarium visit.

I flew back to Adelaide on Monday morning, but that day had two parallel streams: the Sixth Trans-Tasman Symposium on Occultations and an Eclipse Imaging Workshop.

After each day’s sessions we were kept busy with some social event or other: a welcome function on Friday, a dinner on Saturday, and a BBQ on Sunday. At the Saturday dinner, Anthony Wesley was presented with the Berenice and Arthur Page medal for his amazing planetary imaging work.

I stayed at Toowong and took the CityCat ferry to and from the University most days. This and the train made it fairly cheap to get around Brisbane during the weekend.

Overall, it was a great event. It’s my sixth NACAA and I would recommend it to anyone with an interest in communicating with other amateurs around Australia (and a few from New Zealand), finding out what’s going on beyond our borders. The next NACAA will be held in 2014 in Melbourne, hosted by the Astronomical Society of Victoria. I hope to see you there.



Some targets in the Magellanic Clouds - Alan Plummer

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This article is also published in the newsletter of the Western Sydney Amateur Astronomical Group

The Small and Large Magellanic Clouds are two satellite galaxies of the Milky Way located, depending on who you read, around 200,000 and 160,000 light years away respectively. Despite this vast distance, you will see that some of the variable star targets listed below are binocular or small telescope objects.

According to Norton's Star Atlas 19th edition and Subramanian and Subramanian (2009 A&A...496...399S) both galaxies are irregular dwarfs, the latter source describing them both to be face on. Observationally, when well placed under a dark sky, 7x50 binoculars show the LMC as a distorted barred spiral with extensive misty patches going in contrary directions off each end of the bar.

Tables 1 and 2 shows the LMC and SMC observing programme from Linden. I have included U Dor and U Tuc even though they are most likely foreground objects because they are in direct line of sight with the Clouds. U Tuc especially acts as finder object star hopping into the depths of the SMC. Here's one or two highlights.

As you run a finder scope over the SMC, the brightest fuzzy patch you see is NGC 346. And what a fuzzy patch it is! See figure 1. There are two (at least) distinct cluster populations here; the young blue-white stars in the nebulous starbirth region, NGC 346, and the more distant older and redder cluster, visible to the side

of the nebulosity. Our target is HD 5980 (arrowed) is a member of the hot young cluster, and is a system reminiscent of η Car. It's a binary star with an erupting Luminous Blue Variable / Wolf Rayet (LBV/WR) type object of 58-79 solar masses paired with another WR-like companion of 51-67 solar masses (Foellmi et al 2008RMxAA...44...3F). This system is normally around 11.6 mag but has been observed by Albert Jones to erupt to 8th mag in 1994.

I started estimating HD 5980 in 2002 with a 20cm Newtonian and I recall that no stars were resolvable in the central cluster itself, only a bright patch

within the nebulosity, while HD 5980 and another bright star (of 12th mag) just to the side of it were

Name	Location (J2000)	Type	Range
S Dor	05 18 13.5 -69 15.0	S Dor	8.6 – 11.5B
U Dor	05 10 08.85 -64 19 04.3	Mira	8.2-14.2v
YY Dor	05 56 42.38 -68 54 34.3	Recurrent Nova	10.8 – 18.0p
V1341 LMC	05 09 58.3 -71 39 52	Recurrent Nova	10.9 – 15.7p
N LMC 1992	05 19 19.82 -68 54 35.0	Nova	10.7 – 15.3p (?)
N LMC 2005	05 10 32.68 -69 12 35.7	Nova	13.0 - ?
RY Dor	05 14 56.5 -66 48.2	Nova?	12.4 - <18.0
HD 269006	05 02 07.392 -71 20 13.12	LBV? WR? (OB)	9.3v -
HD 269227	05 13 54.271 -69 31 46.72	WR (Bep D)	12.2v -
HD 269582	05 27 52.61 -68 59 07.3	WR (WN10D)	9.8v -
HV 12671	05 48 44.2 -67 36 13	Z And	14.5 – 16p

Table 1. Observing programme for the Large Magellanic Cloud

Name	Location (J2000)	Type	Range
HD 5980	00 59 26.72 -72 09 55.4	WR + S Dor + E	7.9 - 11.6v
RY Tuc	01 01 00 -72 21.9	?	?
SMC 3	00 48 20.9 -73 31 53	Z And	14.0? – 15.5?
SMC Ln358	00 59 12.2 -75 05 19	Z And	14.0 – 15.5 ?
N LMC 2005	01 14 59.92 -73 25.38	Nova	13.0 - ?
U Tuc	00 57 13.14 -75 00 0.4	LPV	8.0 – 14.8v

Table 2. Observing programme for the Small Magellanic Cloud

visible. Today, with the 40 cm the central cluster is resolvable and the older background cluster is visible as a hazy patch. The eyepiece field abounds with clusters and nebulas.

Move now to the LMC, and 2 years ago the brightest patch in my 50mm finder was the massive star S Doradus and its small patch of surrounding clusters and nebulas, pictured in figure 2. Not any more! S Dor has faded past the limiting magnitude of my finder leaving a difficult patch of light to find in the midst of this galaxy. It has dipped from 9th to 10th magnitude, and may go fainter. S Doradus type stars—also called LBVs, as HD 5980 and η Car are labeled—is the name given to the most massive stars of all when at a certain evolutionary stage (see below). Enormous mass-loss is evident, but more significant for categorizing the S Dor stars is spectroscopic variability. In particular, so called ‘S Dor phases’, which are changes in visual magnitude and colour while maintaining constant bolometric luminosity. The dip that S Dor is exhibiting now is characteristic of the class—of which it is after all the prototype—and may last for many years. To my eye S Dor does not look red at all, but one other star—V432 Car—certainly does look red since it entered a similar ‘S Dor phase’.

Rare and mysterious catastrophic mass loss and brightening events are also seen in these stars, and only two have been observed in the Milky Way; P Cygni in 1600 and η Car during 1838-1858. The mass alone lost from η Car in those 20 years dwarfs the Sun and all the stars out to several light years. If S Dor were located the same distance as α Cen, we would not know ‘night’ as we do now.

The three LMC stars in the table, HD 269006, HD 269227, and HD 269582, are all WR stars (and also favorites of Albert Jones), two of which are doing unexpected things today. HD 269006 was happily varying around 10.5-11th mag until 2007, when it took a year or two to brighten to 9th mag – now a clear binocular object. Very unusual. HD 269582 has done the same, and jumped from 13th to 10th mag. This behavior is more like LBVs, although admittedly these two types of stars, LBVs and WRs, are similar

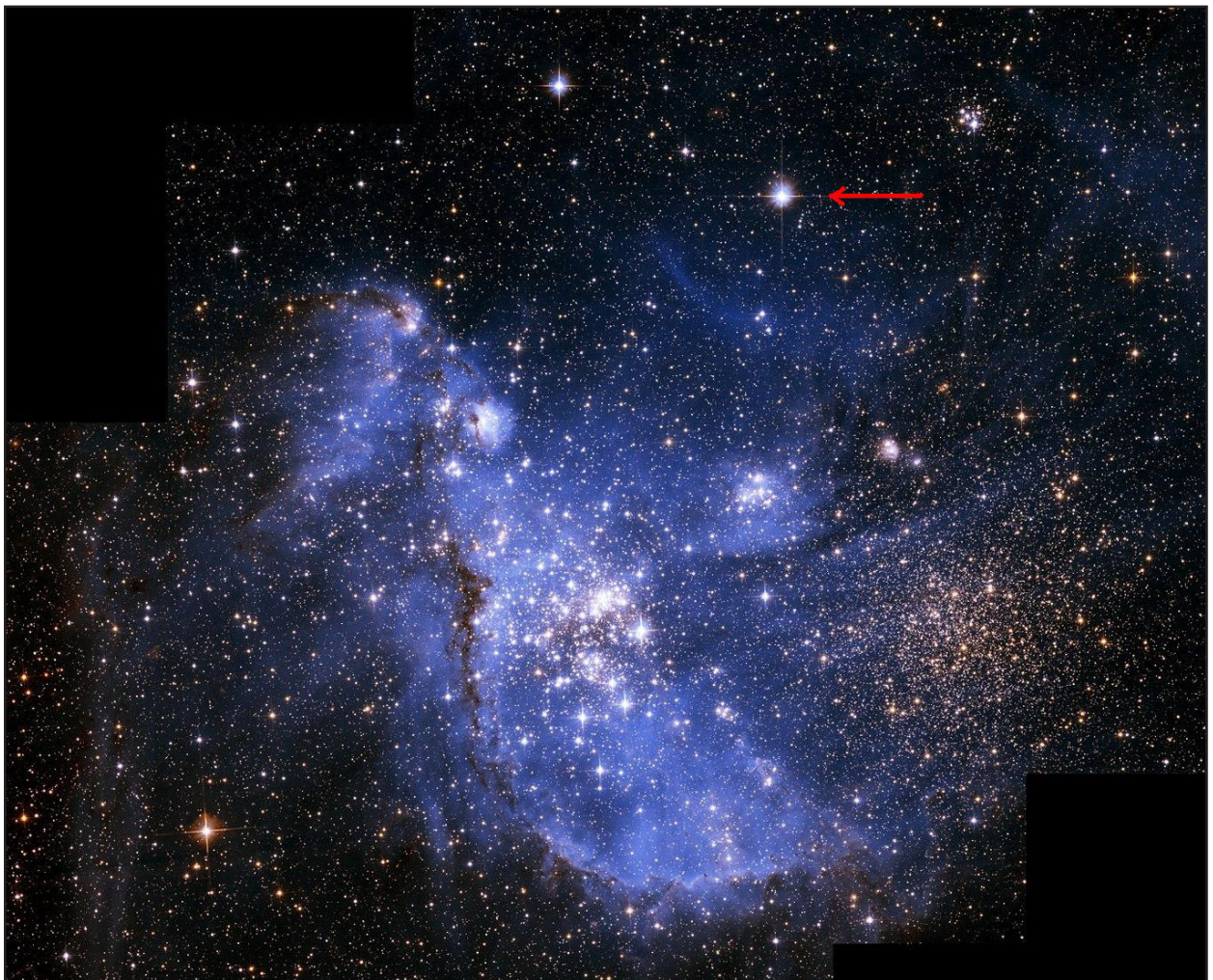


Figure 1. NGC 346 and HD 5980 (arrowed) Credit: NASA/ESA/STScI/SCIENCE PHOTO LIBRARY

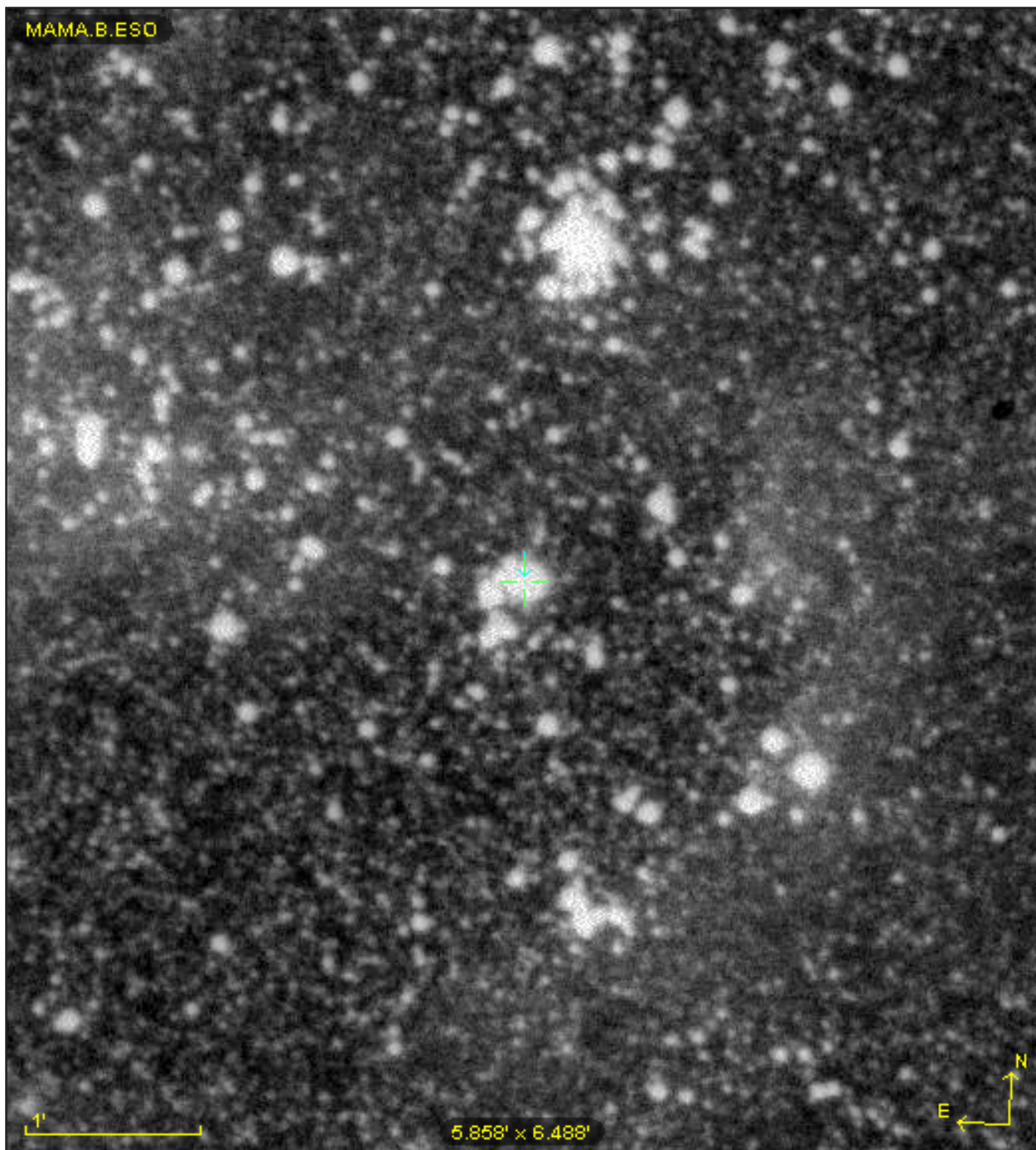


Figure 2 S Doradus, center. Credit: Aladdin Sky Atlas

objects at different times in their life cycle. Current thinking is that WRs are the exposed cores of LBVs, after the envelope is gone. But WRs are not supposed to do this! Observers 1 – Theorists Nil; they have some work to do.

Anyone who wants to participate in this work can contact myself, Variable Star South, or the AAVSO, and jump in!

Alan Plummer

VSS <http://www.variablestarssouth.org/>

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SPADES – 57 binaries under observation – *Tom Richards*

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Thanks to voluminous and assiduous observations by Margaret Streamer and David Moriarty, the number of SPADES binaries on which we now have data has grown to over one third of the listed targets. The resulting data is mixed, however. As was dissected at length at the VSSC2/NACAA meetings this Easter, the unreliability of currently available light elements is a big stumbling block. (I came across one last week, so old that the standard error on its current prediction was about two days!) You need them to predict when an eclipse will occur so you can observe it; but then you find nothing, or at best an ascent or descent, with the eclipse occurring outside of your observing period.

The table below, which is not up to date, shows what success we've had catching eclipses.

System	Ecl Obs?	Ecl Pred?	(O-C) Days	Source
Car AS	no	no		GCVS
Car DO	no	no		Dvorak
Cen V762	no	no		GCVS
Cen V775	yes	yes	0.002	Dvorak
CMa AR	yes	yes	-0.0296	BRNO
CMa TU	yes	yes	-0.0011	Krakow
	yes	yes	0.0007	Krakow
CrA V471	no	yes		GCVS
Cru AA	yes	yes	0.00123	SPADES
	yes	yes	-0.0011	SPADES
	yes	yes	-0.0003	SPADES
	yes	yes	0.00011	SPADES
Cru AF	yes	yes	0.2264	GCVS
	yes	yes	0.2254	GCVS
Cru BE	no	yes		GCVS
	no	no		GCVS
	no	no		GCVS
Cru SZ	no	no		GCVS
	no	yes		GCVS
	yes	yes	0.020	Dvorak
	yes	yes	0.013	Dvorak
	yes	yes	0.008	Dvorak
Eri CW	yes	yes	-0.018	GCVS
For AT	no	no		SuperWASP
Gru RU	yes	yes	0.002	SuperWASP
	yes	yes	0.004	SuperWASP
Gru W	yes	yes	-0.034	SuperWASP
Her LT	yes	yes	-0.001	Dvorak
	yes	yes	0.004	Dvorak
Hor TT	no	no		SuperWASP
Lup FV	yes	yes	-0.03	Dvorak
Lup FZ	no	no		GCVS
Mic RZ	yes	yes	-0.024	SuperWASP
	yes	yes	0.009	SuperWASP
Mon AQ	no	no		Krakow
Mon AS	yes	yes	0.02883	BRNO

System	Ecl Obs?	Ecl Pred?	(O-C) Days	Source
	yes	yes	0.02948	BRNO
Mus BX	yes	yes	0.01	GCVS
Nor GM	no	yes		GCVS
Nor V384	no	yes		GCVS
Nor VX	no	yes		Dvorak
	no	yes		Dvorak
	no	yes		Dvorak
	no	yes		Dvorak
Oph V456	no	no		Dvorak
	no	yes		Dvorak
Phe CT	yes	yes	0.0205	SuperWASP
Pic RV	yes	yes	0.04557	GCVS
Pup AH	no	yes		BRNO
	no	yes		BRNO
	no	no		BRNO
Pup CU	no	yes		BRNO
	no	yes		BRNO
	no	yes		Schrader
Pup HM	no	yes		GCVS
Scl CE	no	no		SuperWASP
	yes	yes	0.002	SuperWASP
Sco V457	no	no		GCVS
Sco V491	no	yes		GCVS
	no	yes		GCVS
Sco V569	yes	yes	0.002	Zasche
Sco V634	yes	yes	0.04	GCVS
Sco V638	no	yes		GCVS
Sco V640	yes	yes	-0.01	GCVS
Sct V536	yes	yes	-0.022	Dvorak
Sgr V526	no	no		SuperWASP
Sgr V849	yes	yes	-0.019	SuperWASP
Sgr V2351	yes	yes	-0.002	SuperWASP
Tel IZ	yes	yes	0.046	GCVS
Tel LU	yes	yes	0.018	GCVS
TrA EQ	no	no		GCVS
Vel AO	yes	yes	-0.036	Krakow

Of 72 nightly time-series, we have observed a measurable eclipse in 35. The table shows the Observed – Calculated time difference in days and the source of the light elements from which the eclipse was calculated. For the 19 of these observation sets marked in red, an eclipse was predicted but none observed. Those particular targets simply need observing at any time, not just when an eclipse is predicted, in the hope of catching an eclipse. Then at least we can start measuring, and obtaining reliable light elements.

We have now gained enough experience in this project to start streamlining the workflow. If you want to join in, as analyst or observer, read on!

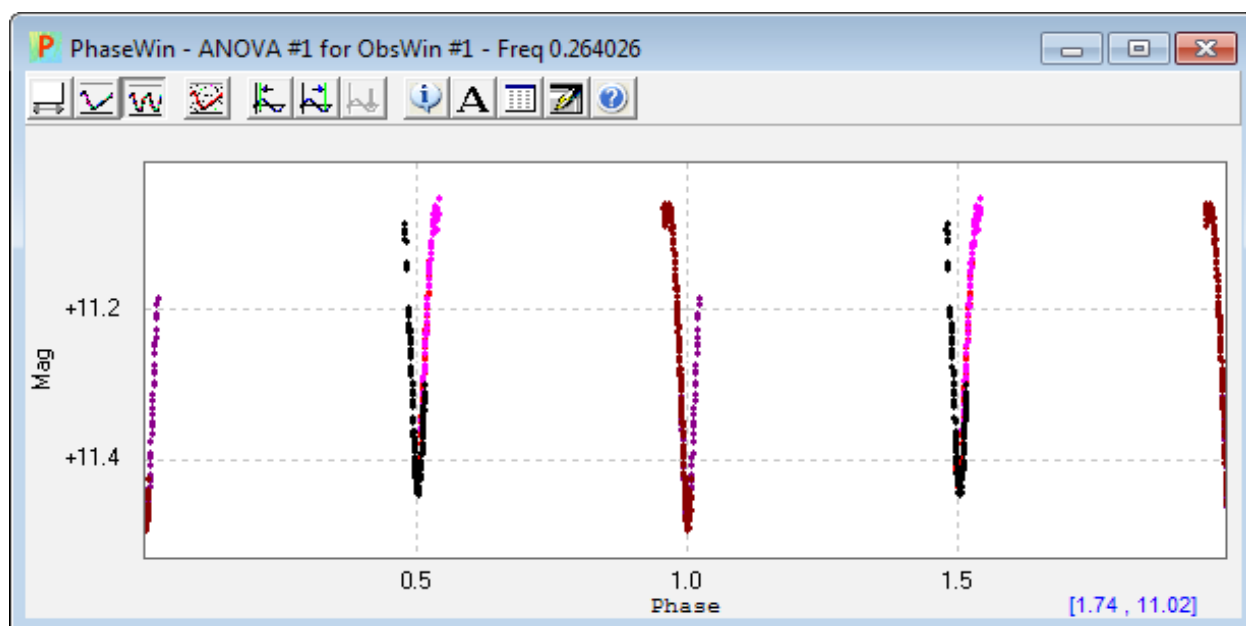
As an observer, start by downloading David Motl's Ephemerides program (<http://www.motl.cz/dmotl/predpovedi/>) and use with it the SPADES light elements database on our website (<http://bit.ly/JmREO6>). This has the best light elements to our knowledge, but some may be very poor, so be warned! Margaret Streamer looks after this database, and will update it frequently, and put a message on the SPADES forum (see Margaret's article on page 13).

Look for SPADES targets with an eclipse around local midnight near your meridian, and take a time series on it all night. Remember these targets are best suited to 30 cm aperture or more, and you must use a V filter and an NTP protocol time server client to keep your computer clock well synchronized. We recommend Dimension4, www.thinkman.com.

Do not make your exposures too short; in fact the longer the better if your mount is good enough. Take an image, find on it the target and the required comparison star (see <http://bit.ly/JDUi1J>, click through to your target's information, and note you can also view a field showing V, C and K.) Then adjust your exposure time until the brighter of V and C have a maximum ADU comfortably below your limit of linearity. I use 20-30,000 ADU. When you have completed your observations for the night and done your photometry, you need to copy your JD (not HJD any more – current observers please note!), target magnitude and its magnitude error columns (if your photometry tool records that) to the special SPADES observing form. Fill in the header data and email it to me. The new form will be on the website, in the SPADES area, by the time you read this. If not, contact me.

Incidentally our aim is to get at least three well-measured eclipses of a system during its observing season. And don't forget to send all your data to the AAVSO too: that gives researchers the best way of accessing JD data.

Analysts will now have a different approach to before. When you receive an observing form, you copy the JD/mag/error data into Peranso, in which you can then measure the eclipse minimum in Heliocentric



Our light curve so far for AA Cru, based on three eclipses observed by David Moriarty and one by Margaret Streamer. $HJD_{min} = 2455732.9289(7) + 3.787895(24)$. Now we need to fill in the rest of the curve, and get more eclipses. PERANSO diagram.

Julian Date. When more observation sets accumulate on the target, you can use Peranso to find light elements, which can be further improved by doing a linear regression on the minima in Excel; and then to O-C analysis. Peranso will also enable you to produce phased light curves. When enough such data accumulates, you can go on to derive an astrophysical model using BinaryMaker 3, Wilson-Devinney, or similar. All these data and results, from observation files to models, will be put on our website, and important results will be published in refereed journals.

This new analysis pipeline can be a very exciting piece of deskwork as more and more is revealed about the binary. Some analysts may not wish to proceed to the later parts of the pipeline however; but that's OK – others can take over.

Branching off from this analysis pipeline, the professionals under Simon O'Toole will take the data and convert eclipse times to Barycentric Julian Date to eliminate the swings of the Sun in orbital partnership with Jupiter and Saturn. Their own O-C analyses will be tuned primarily to find third bodies in the system – hopefully planets.

We will provide close help to analysts to develop skills and confidence in this exciting work. So if your Excel skills are reasonably good, and you understand basic statistics – very basic – why not give analysis a go? Contact me. And if you haven't got PERANSO, apply for a VSS research grant (see under Community on our website.)

Updates to SPADES data for Ephemerides – *Margaret Streamer*

m.stream@bigpond.com

The SPADES project has now collected data on about 50 stars out of the 150 in the target list.

Most observers have relied on the Ephemerides program published by David Motl (<http://www.motl.cz/dmotl/predpovedi/>) to generate a list of targets predicted to eclipse on any given night. The SPADES data set to use with this program was supplied on the VSS website and was a subset from the BRNO data set published by Brno Regional Network of Observers, Czech Republic.

It soon became apparent that the light elements used in the SPADES data set were not always accurate and the night's observing plan was thrown into disarray as the predicted eclipse was either early, late or didn't occur at all during the scheduled interval.

For each target giving a 'failed' or inconclusive result, SPADES project analysts have carried out thorough literature searches to find better light elements. More up-to-date light elements are available from sources such as the O-C Gateway, SuperWasp and ASAS. An updated ephemeris was then posted for the particular target on the SPADES website.

So the observer now had access to a better ephemeris for a particular star but this didn't make the task of planning a night's observing any easier as it is tedious trawling through individual ephemerides looking for a star that might eclipse that night.

Our data set used in Motl's program was in desperate need of updating and, as important, needs to be updated regularly as new information becomes available. I put my hand up to be the keeper of the SPADES data set of light elements and with the help of my husband, Dave Herald, we have managed a few improvements to the way the data is presented with Motl's program (see Fig1 overleaf).

A minor formatting error was corrected and also a misalignment in one column of numbers which meant that the first number for the eclipse duration was being skipped, ie '1.1hr' was reported as '.1hr'.

The most important addition is the 'Remarks' column (see the screen shot of a typical night's predictions). The reliability of the Light Elements is noted here, ie whether confirmed, probable, or different from Motl's predicted ToM if there are no updated LEs to work with.

A 'confirmed' entry means that a VSS observer has observed the target and found the observed ToM was very close to predictions. 'Probable' means that the predictions are probably correct but we haven't tested them yet. Some are SuperWasp elements and some are Glen Schrader's ASAS predictions – so these 'probable' are pretty reliable and should become 'confirmed' once somebody has looked at them. An entry like '+1hr Motl ToM' means that you need to add 1hr to Motl's predicted ToM to get the eclipse – the

eclipse is running one hour later than predicted. This type of statement arises from a VSS observation of the target but we have as yet insufficient data to update the light elements and that no other star data is available in the literature. A blank entry means nobody in the Spades project has yet looked at the star.

Variable star	Date	UT	Az	Alt	R.A.	DEC.	Type	Mag	Catalogue	Pts.	Remarks
ET Vel	2012-05-01	9.0	SSW	77	9:09	-46.6	EA D=8.9 h	11.2-11.8	SPADES ...	3	probable
V0521 Mon	2012-05-01	9.0	WNW	39	6:56	-0.2	EA D=12.8 h	10.0-10.5	SPADES ...	8	
SV Fyx	2012-05-01	9.5	W	84	9:25	-33.6		10.0-11.0	SPADES ...	10	probable
VWV Sex	2012-05-01	9.5	N	61	9:51	-5.5		10.0-10.5	SPADES ...	8	
V0692 Cen	2012-05-01	10.0	SSE	59	11:54	-63.3	EA D=3.7 h	11.1-11.8	SPADES ...	8	
V0598 Car	2012-05-01	10.5	S	52	10:43	-73.0		10.8-11.4	SPADES ...	10	
AW Vel	2012-05-01	11.0	WSW	50	8:08	-44.3	EA D=5.3 h	11.5-12.2	SPADES ...	8	
LT Pup	2012-05-01	11.0	W	42	8:00	-23.7	EA D=2.4 h	12.5-13.0	SPADES ...	9	confirmed
LU Tel	2012-05-01	11.5	SE	24	18:21	-46.5	EA D=5.7 h	12.4-13.5	SPADES ...	10	confirmed
KZ Lib	2012-05-01	12.0	E	42	15:56	-17.2		11.1-13.1	SPADES ...	9	
ST Cen	2012-05-01	12.0	SW	66	11:10	-52.5	EA D=6.5 h	10.6-11.3	SPADES ...	9	
V0634 Sco	2012-05-01	12.0	ESE	36	17:22	-36.8	EA D=2.4 h	11.7-12.3	SPADES ...	10	+40min Motl ToM
SZ Cru	2012-05-01	12.5	SSW	65	12:15	-58.5	EA D=8.1 h	10.9-11.6	SPADES ...	7	confirmed
GP Car	2012-05-01	12.5	SW	54	10:30	-59.1	EA D=12.5 h	12.4-12.8	SPADES ...	10	
DQ Car	2012-05-01	13.5	SW	49	10:22	-57.2	EA D=4 h	11.1-11.5	SPADES ...	7	confirmed
V0752 Sgr	2012-05-01	13.5	E	43	17:48	-26.4	EA D=6 h	12.2-12.8	SPADES ...	10	
RR Men	2012-05-01	14.0	S	29	3:44	-84.0	EA D=11.9 h	11.4-12.7	SPADES ...	10	
EQ TrA	2012-05-01	15.0	S	58	16:10	-66.2	EA D=13 h	8.9-9.5	SPADES ...	10	
V0640 Sco	2012-05-01	15.0	ESE	65	17:24	-39.7	EA D=7.8 h	12.8-13.5	SPADES ...	10	
V0775 Cen	2012-05-01	15.0	SW	65	13:58	-51.7		9.9-10.6	SPADES ...	9	confirmed
V0849 Sgr	2012-05-01	15.0	E	48	19:03	-31.1	EA D=10.6 h	12.5-14.2	SPADES ...	10	confirmed
V1721 Sgr	2012-05-01	15.5	ESE	35	20:55	-39.8	EA D=3.1 h	12.9-13.5	SPADES ...	10	probable
CR Scl	2012-05-01	16.0	E	75	17:59	-33.3	EA D=4.3 h	9.2-10.6	SPADES ...	10	
V1702 Aql	2012-05-01	17.0	NE	58	18:50	-9.5	EA D=6 h	10.9-12.1	SPADES ...	10	
BN Sgr	2012-05-01	17.0	ENE	44	20:02	-4.8	EA D=4.4 h	12.1-13.2	SPADES ...	10	
RZ Cha	2012-05-01	18.5	WNW	69	17:47	-28.1	EA D=13.9 h	9.3-10.1	SPADES ...	10	
V0606 Sco	2012-05-01	19.5	S	28	10:42	-82.0	EA D=7.5 h	8.2-9.1	SPADES ...	8	
RU Gru	2012-05-01	19.5	WSW	52	17:06	-37.7	EA D=2.6 h	11.9-12.2	SPADES ...	10	
	2012-05-01	20.0	ESE	64	22:27	-37.2	EA D=5.5 h	11.0-11.4	SPADES ...	9	confirmed

Figure 1. Sample screen showing Daily Ephemerides

Either by selecting the Details tab for each star or by simply clicking on the star, the source of any new light elements is given as shown in Figure 2. For example, the source of light elements for CZ Mic is SuperWasp.

Updates to the data file are now easy to achieve. I maintain an Excel spreadsheet with all the data needed for the program, and any other relevant information for each target. Dave H has written a script that easily extracts the necessary information from the Excel file and generates the data file for use with the program. Each new update is automatically numbered so I don't have to think about that.

The updates will be regularly posted to the website once David O'Driscoll has finished with his major overhaul of the entire site. In the meantime, if you would like the current update, please send me an email (m.stream@bigpond.com) and I shall forward it to you. Remember to place the file in the same folder as the Ephemerides program.

Variable star	Ephemeris
N	
N10	
RA2000	205443.9
DEC2000	-394811
MO	54363.41763
PER	1.0094218741
Max.	12.87
Prim.	13.53
Sec.	
Branch	V
LD	3.1
SD	
Source	SuperWasp
Chart	
Attr.	EA
Remarks	probable
GSC	
Change	

Figure 2. Clicking on a star from the Daily Ephemerides screen produces detail on that star.

I have only a brief report this month. Weather conditions have not been favorable over summer, but with winter approaching conditions should improve. Never-the-less 11 eclipses of 8 targets stars have been observed so far in 2012.

The DSLR extinction correction procedure I described in the February 2012 Newsletter has been incorporated into an Excel spreadsheet. The method breaks down when atmospheric transparency changes significantly throughout a time series. Therefore it is necessary to assess each dataset closely to determine if full extinction correction and transformation is appropriate. Reanalysis of all my eclipse time series is in progress.

Also included in the new spreadsheet is an improved method of applying transformation corrections which results in less noisy B and R light curves (Figure 1), thus allowing better ToM estimates and reasonable Colour Index curves as illustrated in Figure 2.

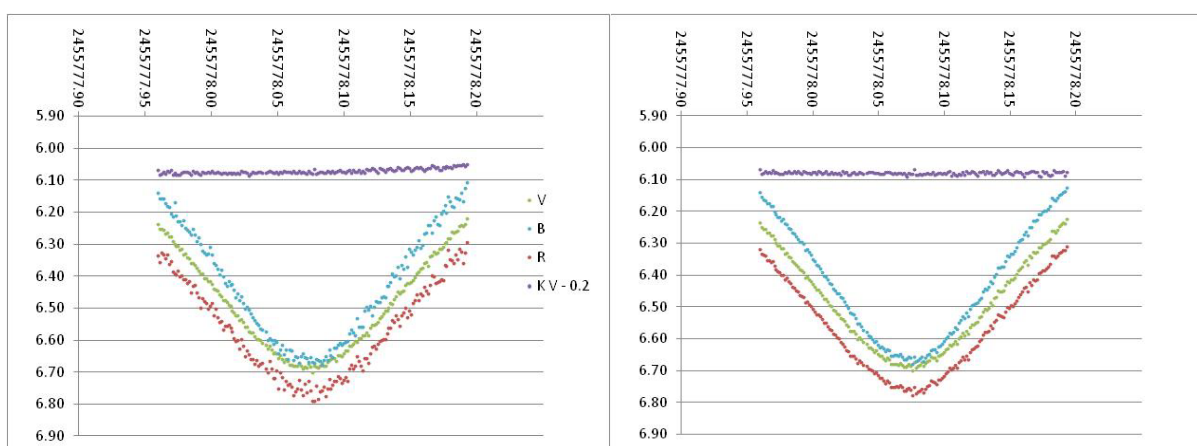


Figure 1. Transformed BVR light curves of a primary eclipse of RS Sgr. The left plot using the original transformation method and without extinction correction. The right plot has been corrected for extinction and an improved method of applying transformation coefficients was used.

Target	Cons.	Type
V0486	Car	Secondary
V0716	Cen	Primary
V0716	Cen	Secondary
V0831	Cen	Secondary
V0831	Cen	Primary
GG	Lup	Primary
eta	Mus	Secondary
eta	Mus	Secondary
V0906	Sco	Secondary
V0356	Vel	Primary
DL	Vir	Primary

Table 1. SBDSLRL project targets observed in so far 2012.

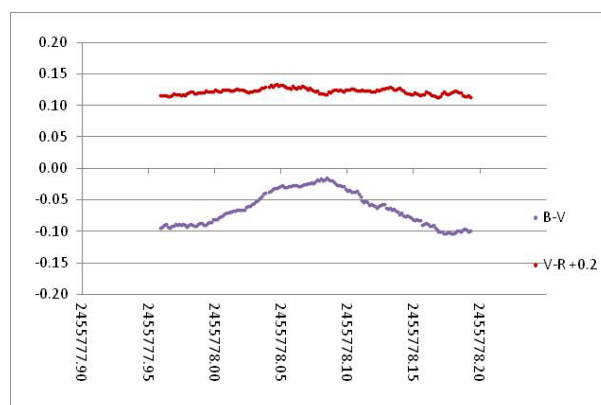


Figure 2. Colour index curves constructed from the light curves shown in Figure 1 (right).

The VSS website includes a feature called a discussion forum. This allows you to read (and write) about subjects of interest to you.

How is this different from the [VSS-members] Google Group, I hear you ask! Quite a bit actually. This article is designed to explain the differences and the options available to you.

The Google Groups

The Google Group is basically an email-exploder (an actual IT term). Any message sent to it or posted on the Google Groups site is automatically sent to all members of the group as an email. This is a great way of staying in touch with a large group with diverse interests.

However, it has one downside – it isn't very discriminating! If you are interested in Cepheids, but wouldn't give a pulsation about a Nova, there is no way to stop getting those annoying messages about things that go bang!

That's where a discussion forum comes in.

Discussion forums

The discussion forums group the conversation into related topics. This allows people to focus their attention on those discussions that are of interest to them, ignoring anything else.

However there is another difference: the forums are web-based (rather than email-based), and you therefore need to go to the website to interact with them. This is fine for some people, but others find it inconvenient to have to visit the site in order to see if there are any new messages.

For this reason, there are two ways of being alerted to new messages.

RSS feeds

One method is using an RSS feed, which allows a compatible reader to highlight any new posts to the forums. I use Microsoft Outlook (because I am also using this as my email client). Most other email clients also support RSS feed, and there are other options as well.

To use the RSS feed, locate the icon at the bottom of the forum in question – it's an orange logo (see the circled icon in Figure 1).

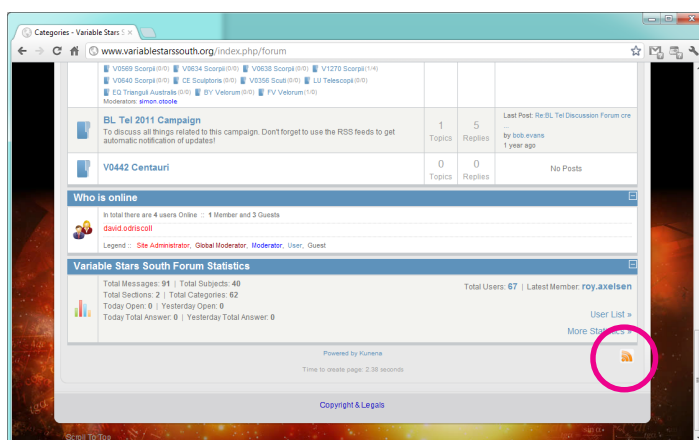


Figure 1: Locating the RSS feed icon.

If you right-click on it, there is usually an option to save the link, which you can then paste into an RSS

feed reader. Your reader will then periodically check the site for new posts, and most commonly allow you to click through directly to the new posts on the site.

Subscribing to forums

The second option allows you to subscribe to one or more forums and receive email notifications – in that regard it is a little like the Google Groups.

To subscribe to a forum (or even an individual topic), locate the Subscribe button (see Figure 2).

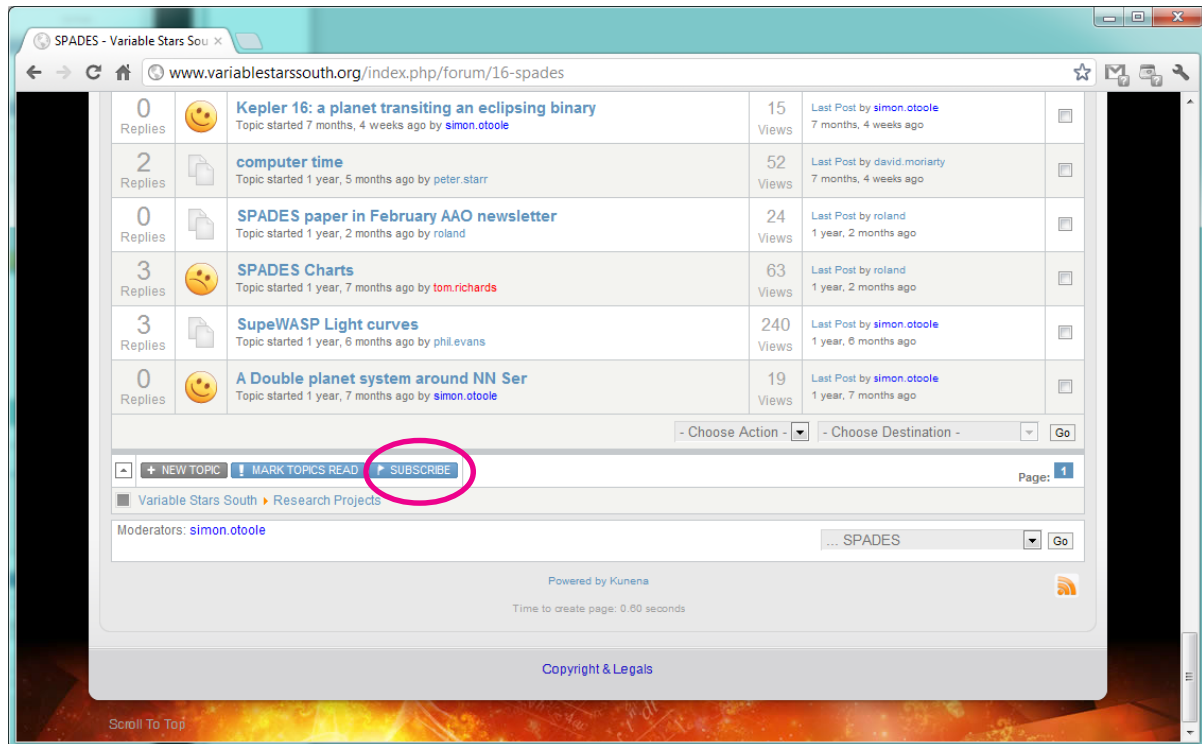


Figure 2: Using the subscribe option.

You will now get emails whenever a new message is created. To unsubscribe, just repeat the process.

Hopefully this information will help you to understand how to use the forums to your advantage – they are a great way to gather related conversations and save them for later reading. If anybody wants a forum created to discuss specific topics, contact your project leader or myself to arrange it.

SS Nor and QR Nor : A riddle resolved – *Mati Morel*

mmorel7@bigpond.com

Basic Data, from VSX.

SS Nor:	(J2000) 16 13 21.87 -59 46 57.2	M.	9.9 - <14.9 V 464d Sp. Me
QR Nor:	(J2000) 16 13 20.76 -59 47 29.5	M.	12.1 - <14.5V 210.2d

SS Nor

This variable was first discovered by Cannon in 1926, by having an unusual spectrum. It was also noted as being variable, but the available material could not yield a reliable period, only that “the period may be about 291 days”. This rough period entered the literature (including the GCVS) and no improvement was made right up till 2011. Only a rough position was ever published.

Another variable, close to SS Nor was announced by Luyten in 1935. The magnitude range he gave was 15.8 -17p, and he emphatically stated it was not SS Nor. Again, a poor position was given for this new variable, and no finder chart. Because of this poor documentation, and resulting doubts, no proper name was assigned. It dwelt in limbo until it was finally designated QR Nor in 1978, but this still did not make

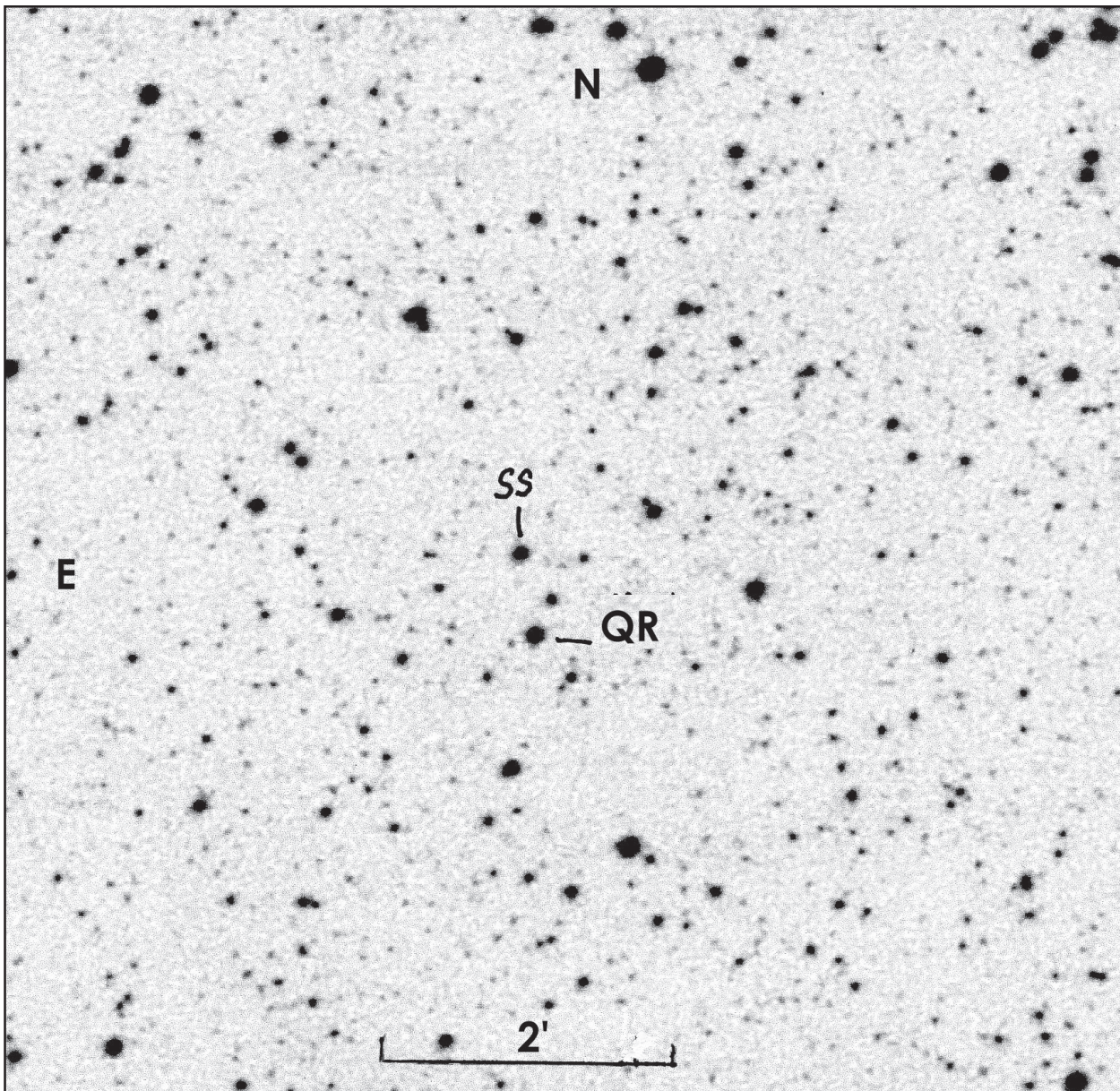


Fig. 1. Chart for SS and QR Nor. Adapted from Digitized Sky Survey red plate.

precise identification certain. In about 1986 I requested help from Rob McNaught (Anglo Australian Observatory) to track down QR Nor. From examination of UK Schmidt plates he found a red variable, close to but distinct from SS Nor. Naturally this was assumed to be QR Nor, and a preliminary position was published in 1994 (IBVS 4037) at (2000) 16 13 20.0 -59 47 30. In the same paper the position of SS Nor is quoted as 16 13 21.89 -59 46 56.6, from the Guide Star Catalogue. There matters lay till 2003, when the GCVS team decided to withdraw the name QR Nor for Rob McNaught's variable, in spite of the evidence. Rather, the GCVS team considered that SS and QR Nor were really the same star.

QR Nor reinstated

In 2011 January I was contacted by Sebastian Otero seeking background information on the discovery of the McNaught variable. I advised him that Rob provided no finder chart, but he did give me a semi-precise position which established its position relative to SS Nor. In due course this piece of data appeared in IBVS 4037. Positions of both stars are shown accordingly on RASNZ chart 934. Further work, using ASAS-3 lightcurves, has resulted in the rediscovery of McNaught's variable as an undesignated variable, and given the name VSX J161320.7-594729. Finally this star was restored the name QR Nor as it was found the original investigations had included data for both stars.

Remarks

The separation of SS and QR Nor is about 15", which is at the very limit at which ASAS-3 can resolve two stars reliably. Fortunately both variables are of large amplitude, so that when one star is "up", the other is likely to be "down" and unlikely to cause contamination of the lightcurve. This is the ideal circumstance, of course, and doesn't always transpire. SS Nor is very well recorded, QR Nor not so well, but there is sufficient data in ASAS-3 to enable the two stars to be disentangled.

In 2004 I stumbled on a pair of red variables, NX and NY Sgr, which is very analogous. This pair is even closer at only $d=10''$. One, and perhaps both are Mira variables. They reach about 11.5V at maximum, and disentangling the ASAS-3 lightcurves is even more daunting, but not impossible. Arne Henden observed the field and obtained BV data for the surrounding stars.

References

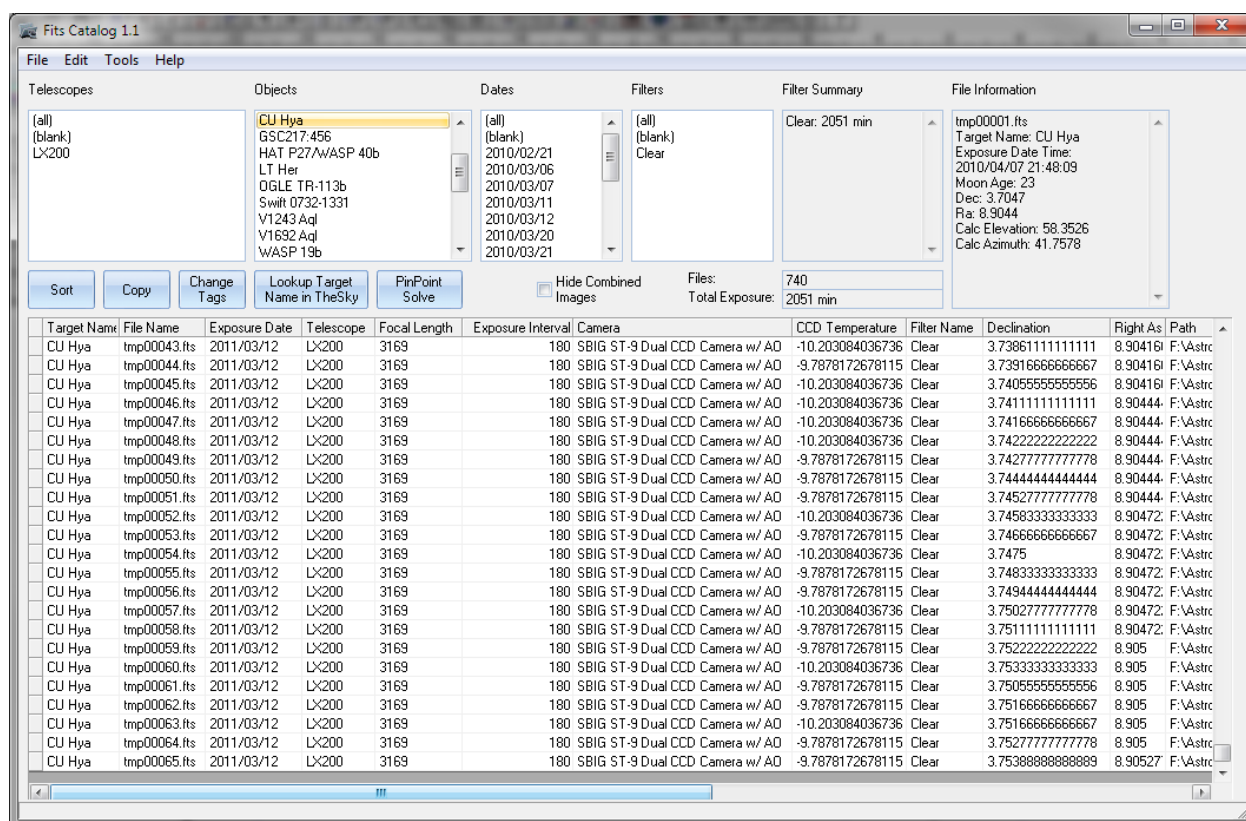
- Cannon, A.J. 1926. Harvard Bulletin 837.
- Luyten, W.J. 1935. AN 258, 121-126; Minn. Publ. 2,N6, 1938
- McNaught, R.H. 1986. Private communication.
- Morel, M. 1994. IBVS 4037.

Software Watch

Fits Catalog

<http://sites.google.com/site/astrosoftint/home/fits-catalog>

If you have lots of Fits files on your computer I'd recommend a small cheap (US\$35) program by Maurice de Castro to help you organize them. Fits Catalog will find Fits files on your computer and build a catalogue of them allowing you to easily find all your observations of any particular star or object. It will also easily allow you to batch rename or change certain Fits tags, so if you forgot to tell Maxim that you're imaging CU Hya and it tags all your evening's files as 'Autosave image' then Fits Catalog will let you change the whole lot at once.



The program will pick up values from a large number of Fits header keywords and you can hide or show any particular column.

It will interface with Pinpoint (full version only) to plate solve any image and it will interface with a large number of viewers to let you visualize any particular image. I use FV (http://heasarc.gsfc.nasa.gov/tools/fv/fv_download.html) for this.

It is still in version 1 and at present it doesn't do a lot else.

Hardware Watch

GPS Receiver

I had been using a small Star GPS unit I bought along with my MI-250 mount several years ago but last year it began to give erratic readings and more than once messed up a whole night's observations and since then I've been on the lookout for a cheap replacement. Now I have found one.

It's the GlobalSat BR-355 Serial GPS Receiver (\$36.29 from Amazon).

My old Star unit was not particularly sensitive and quite often couldn't pick up any satellites from inside my observatory, but this new unit is much more sensitive, never taking more than 30seconds for an initial fix. It uses the latest SiRF Star III High Performance GPS chipset, has an RS232 connection port (but you'll probably want to get the USB cable set (\$14.95 from Amazon) for it as serial ports are hard to come by on modern computers), supports NMEA 0183 data protocol and has a built-in magnet for attaching to metal surfaces. A single red LED lets you know its status.



To synchronise my computer clock with GPS time I use a small program called GPS Time and Test available as a free trial download from CNET (http://download.cnet.com/GPS-Time-and-Test/3000-2350_4-10446293.html). With this you can synchronise your clock every few minutes (I use 2 minute intervals).

To continue to use it after the trial period costs \$10.

It does not have pulse-per-second output so won't give you microsecond accuracy but if you've measured your CCD's shutter delay and synchronise your PC clock to this device you can be very confident of much better than 1 second accuracy in your photometry.

Publication Watch

Here are abstracts of two recent papers that I think may be of interest to VSS members. The first one on CVs was brought to my attention by Steven Hovell who writes that the "... article gives a very readable and up-to-date summary of where we are with CVs today. The paper covers

1. What we know about CVs
2. Open questions
3. The importance of the AAVSO for CVs"

The second publication is from the arXiv and may well be of interest to those who monitored T Pyx throughout its latest outburst.

Cataclysmic Variables

Szkody, P. & Gaesicke, B.T. (2012) Cataclysmic Variables. JAAVSO Vol 40, 2012.

Accessible at <http://www.aavso.org/sites/default/files/jaavso/ej160.pdf>

Abstract This paper presents a concise summary of our current knowledge of cataclysmic variables, including definitions of types and the observational basis for classification, what we have been able to piece together about evolution, and discoveries from recent surveys. We provide a list of unanswered problems and questions and references for seeking additional information. The importance of AAVSO observations in the past and for the future is highlighted.

T Pyx

Infrared observations of the recurrent nova T Pyxidis: ancient dust basks in the warm glow of the 2011 outburst. A Evans et al., <http://arxiv.org/abs/1205.4430>

We present Spitzer Space Telescope and Herschel Space Observatory infrared observations of the recurrent nova T Pyx during its 2011 eruption, complemented by ground-based optical-infrared photometry. We find that the eruption has heated dust in the pre-existing nebulosity associated with T Pyx. This is most likely interstellar dust swept up by T Pyx - either during previous eruptions or by a wind - rather than the accumulation of dust produced during eruptions.

About

Variable Stars South is an international association of astronomers, mainly amateur, interested in researching the rich and under-explored myriad of southern variable stars.

Renamed from the Variable Star Section of the Royal Astronomical Society of New Zealand, it was founded in 1927 by the late Dr Frank Bateson, OBE, and became the recognised centre for Southern Hemisphere variable star research.

VSS covers many areas and techniques of variable star research, organised into “Projects” such as Beginners’ Visual Observations and Dual-Maxima Miras. The goal of each project is to obtain scientifically useful data and results. These may be published in recognised journals, or supplied to international specialist data collection organisations.

VSS is entirely an Internet based organisation, working through our website <http://www.VariableStarsSouth.org> and its e-group <http://groups.google.com/group/vss-members>. It also encourages members to work in with major international organisations such as the British Astronomical Association, the Center for Backyard Astrophysics and the American Association for Variable Star Observers.

To find out more, please visit our website, where, incidentally, you will find PDF copies of all our newsletters. Our website has a great deal of information for VSS members, and for anyone interested in southern hemisphere variable star research. All VSS project information and data is kept here too.

WHO’S WHO

Director Dr Tom Richards, FRAS.

Treasurer/Membership Bob Evans

Newsletter Editor Phil Evans

Webmaster David O’Driscoll

Visit our website to see a list of our area advisers, and to find out about our projects and how to contact their leaders

MEMBERSHIP

New members are welcome. The annual subscription is NZ\$20, and the membership year expires on April 30th. Find out how to join by visiting the VSS website. There you will find out how to join by post, email, or directly online. If you join by email or online you will get a link to pay by PayPal’s secure online payment system, from your credit card or bank account.

After you’ve joined and received your membership certificate, you will be signed up to the VSS-members egroup (see above), and you will also receive a password to access the members’ areas of our website.

NEWSLETTER ITEMS

These are welcomed and should be sent to the Editor. I’d prefer Microsoft Word (or compatible) files with graphics sent separately. Don’t use elaborate formatting or fancy fonts and please do not send your contribution as a fully formatted PDF file.

Publication dates are February, May, August and November, nominally on the twentieth day of these months and the copy deadline is the thirteenth of the month though earlier would always be appreciated.

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