

BRITISH ASTRONOMICAL ASSOCIATION

VARIABLE STAR SECTION

CIRCULAR No. 30

1977 MAY

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ECLIPSING BINARY PROGRAMME

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NOVA SEARCH PROGRAMME

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Charts

Charts for CI Cygni and AH Herculis have been prepared and are available from the Curator.

1975 Light-Curves

The following notes are based on light-curves prepared by the Secretary (dates and magnitudes are provisional). The original plots will be on display at the Exhibition Meeting.

R And: Fell from $9^m.7$ at the beginning of the year to $13^m.3$ on Mar 16. Minimum probably took place in late May or early June, $[14^m]$. Rose from $13^m.5$ on July 26 to max, $6^m.3$, about Oct 27, falling to $8^m.5$ at the end of the year.

RX And: Maxima about Jan 10, 23, Feb 4, 15, Mar 1, 16; under-observed Apr - July, possibly in standstill through April, May and June. Maxima Jul 28^{\pm} , Aug 23, Sep 10, 26, Oct 12, 26, Nov 11, 27, Dec 12, 26. Mean period 15^d , range $10^m.8 - 14^m.1$.

DZ And: About 10^m Jan - Mar, July - Dec. Requires more obs.

R Aql: Rose from 11^m in mid-March to max, $6^m.2$, about Jun 30. Fallen to 11^m by end Dec. No obs. in Jan & Feb.

UU Aql: Maxima Aug 3, Sep 20; a few obs. at minimum, 15^m . Under-observed.

UW Aql: Possible variations $8^m.5 - 9^m.5$. Underobserved.

RW Aur: Normally between 10^m & 11^m ; drops to $12\frac{1}{2}$ about Jan 20, Sep 20, Nov 6.

SS Aur: Maxima Jan 21, Mar 24^{\pm} , May 6, Aug 22, Nov 2, Dec 13. No obs. May 22 - Aug 1; if one maximum was missed the mean period comes to 54^d .

SU Aur: Possible fade from $9^m.0$ to $9^m.4$ between Feb and Sep, rising to $9^m.0$ by Dec. (P.A. effect?)

U Boo: Double max ($10^m.4$, about Jan 10 & Mar 1, $10^m.9$ Feb 8), $13^m.1$ min about May 13, max $10^m.5$ Sep 4. Down to 12^m in Dec.

V Boo: Max, about $8^m.0$, mid-March, min ($9^m.5$) mid-June, max ($8^m.2$) mid-Oct. Down to $8^m.5$ at the end of the year.

V Cam: Fell from $10^m.0$ in early Jan to $14^m.5$ minimum in late Aug. $13^m.5$, rising, at the end of Dec. Underobserved.

X Cam: Minima Feb 9 ($12^m.1$), July 5 ($12^m.9$), Nov 22 ($12^m.9$); maxima April 10 ($7^m.4$), Sep 7 ($8^m.2$).

Z Cam: In standstill, about $11^m.5$, until Dec 5, when the star fell to minimum ($13^m.3$). 10.2 max on Dec 29.

XX Cam: At maximum throughout the year, with possible small fluctuations about $7^m.4$. The seasonal gap was closed completely, but obs. were sparse in Jun.

S Cas: Slow rise from $14^m.6$ at the start of the year to $13^m.5$ in early June; then a more rapid rise, followed by a broad maximum, $10^m.5$, about Aug 4. Fell to $13^m.1$ by the end of the year.

UV Cas: Appears to exhibit a long-term fluctuation, rising from $11^m.3$ at the beginning of the year to $10^m.8$ in Sep, then falling back to ca. $11^m.2$ (P.A. effect?).

Gamma Cas: Virtually constant at $2^m.35$

Rho Cas: Steady at $5^m.0$, with possible fluctuations of $0^m.1 - 0^m.2$ range.

- Mira Cet: Maximum, $3^m.1$ on Mar 7, was caught just before the seasonal gap. No obs. Mar 23 - Jul 30, fell from $8^m.0$ in early Aug to faint min, $9^m.6$, Nov 8. Up to $8^m.3$ at the end of Dec.
- R CrB: Maximum, $6^m.0/6^m.1$, until early Oct. $7^m.0$ on Oct 20, $8^m.0$ on Oct 26, $9^m.0$ on 28, $10^m.0$ on 30, after which very few obs. were made. Min, $11^m.2$, about Nov 25. Underobserved in Jan & Dec.
- T CrB: Small fluctuations about $10^m.0$; orbital variations seen to be 'on schedule' as far as can be judged.
- W CrB: Minima early Feb ($12^m.8$), Aug 30 ($13^m.7$). Maxima May 2 ($8^m.8$), late Dec ($8^m.5^+$).
- R Cyg: $6^m.4$ max on Jan 27, steady fall to 14^m min on Nov 10. Up to $12^m.5^+$ at the end of Dec.
- S Cyg: Underobserved. Rose from 14^m in early Jan, to max, $11^m.2$, Apr 9. Minimum ($15^m.2$?) late August, rising to $12^m.3$ at the end of the year.
- W Cyg: Rose from $6^m.8$ to $6^m.2$ during Jan, apparently steady to mid-May, then fell to $7^m.3$ by early Aug. Max, $5^m.8$, in late Oct; min, $6^m.7$, late Dec?
- SS Cyg: No outbursts were completely missed, but more observations are badly needed from the end of Feb to late Apr. Maxima Jan 24 ($8^m.8$); Mar 3 (9?); Apr 13 ($8^m.6^+$); May 29 ($8^m.4$); Jun 23 ($8^m.6$); Jul 22 ($8^m.4$); Sep 11 ($8^m.5$); Oct 9 ($8^m.4$); Nov 14 ($8^m.4$); Dec 20 ($8^m.4^+$). An active year, mean period 37^d . Minima appear to have been quiescent, about $11^m.8$.
- BC Cyg: A steady fall from $10^m.0$ to $10^m.5$ through the year.
- BI Cyg: Fluctuations about $9^m.5$.
- CI Cyg: Underobserved Feb - May inclusive. Rose from $11^m.3$ at the end of Apr to $9^m.2$ in early Jun, remaining bright until Aug 10. Eclipse minimum, about $11^m.2$, Aug 25 - Nov 23, rising to $9^m.2$ by Dec 5, at which mag it stayed for the rest of the year.
- V1500 Cyg (Nova 1975): Maximum, $1^m.7$, on Aug 30.9. Took $4^d.0$ to fall 3^m ; $9^m.6$ by the end of the year.
- Chi Cyg: Rose from $13^m.0$ to maximum, $4^m.3$, on May 19. This maximum was a magnitude brighter than average. The rise was badly underobserved, with no obs. in Feb, but a hump may have occurred. Steady fall to 14^m at the end of the year.

(To be continued)

The Programme Ian Middlemist writes:

"Have you any ideas for tinkering with the main programme? If so, I think you would do well to include [the red stars] TZ Cas, PZ Cas, SW Cep, RW Cyg, AZ Cyg and V441 Cyg as originally proposed. V358 Cas and UY Sct could perhaps be dispensed with, but three other SRC stars could be added, i.e. SS And, ST Cep & U Lac. This lot should more than satisfy small telescope users such as myself. ... [This] is a serious proposal which should not be dismissed lightly, and if it is usual rejected then there ought to be very good reasons for it, and not the excuses about overload and underobserved (mainly nebular!) medium brightness stars."

Now that the main programme has gelled, I am loath to make sweeping changes, particularly in the way of additions. The 'usual excuses' are in fact painful truths; the Secretary reports that 1976 totals are only $\frac{2}{3}$ of those for 1975, and there is scarcely a star on the programme that does not cry out for more attention. As to the specific

proposals in the above extract, my feelings are that there are plenty of (underobserved!) stars in the 8 - 12^m range (Miras & miscellaneous other types) to keep the small telescope user busy, and lots of SR's on the BG programme to keep the 'reds' men occupied. Perhaps other observers would care to comment?

The following stars are being DROPPED FROM THE PROGRAMME:

T Ori	MX Ori	V566 Ori
GW Ori	NU Ori	CSV 100567 Ori
IU Ori	NV Ori	'Var No.2' Ori
KS Ori	V359 Ori	RY Tau
KX Ori	V361 Ori	BW Tau
LP Ori	V372 Ori	

Observations of BW, which is considered too faint for co-operative observation, have never got off the ground. To judge from the totals of VSSC 27, the other stars are not particularly popular with observers, but the main reason they are being dropped is that virtually no conclusions can be drawn from the results. Enthusiastic nebulars observers (are there any?) may be consoled by the fact that a number of other examples of this class are being retained. Observers should submit their results on the above stars for the apparition now ending to the Secretary in the usual way at the end of the year.

I have also asked the BG co-ordinator to look into the desirability of revising the binocular programme. This is an 'open-ended' investigation, and may result in the expansion of the programme to include all binocular variables suited to visual observation, or (more likely) a pruning to the size where all the programme stars could be satisfactorily followed. In the latter case the stars dropped would be those unpopular with observers, of small range, or with poor sequences. Comments on all pertinent aspects of the BG programme in general, or specific stars, should be sent to Alan Smith in order that he can supply me with a report later this year.

Credit where it is due

The notes about T CrB and PSR 0833-45 in VSSC 29 were prepared by Jeremy Bailey, not the Director.

3rd Supplement to the GCVS

This has now been in circulation for some time (see VSSC 27). Revisions in data (or first time entries) for SS Aur, RX Boo, V465 Cas, U Del, IR Gem, S Per, FO Per and SN NGC 4414 have been made on the basis of observations by VSS members; the usefulness of our work, in the light of these results, can hardly be doubted.

Collaboration with Professionals

The last observations of the 'Canterbury H₂O' stars (R Aql, RX Boo, S CrB, U Her, R LMi, S Per, RS Vir, RT Vir) supplied to Dr. Parker covered the period up to the end of August 1976. I would be grateful if observers following any of these stars could send me a note of subsequent results (dates & mags only required), for forwarding. It will be of interest to observers that, in a recent telephone conversation with the Director, Dr Parker emphasized how helpful VSS results have been to him in the interpretation of his data.

The Canterbury programme will be coming to an end this summer (we hope for further details in time for the next VSSC). However, as one door shuts another opens, and we have been asked by Alan McCall (Hatfield Observatory) to supply visual data on a number of stars which he is observing polarimetrically with the 60" I.R. telescope at Tenerife. The stars concerned are:

R And	(Mira type, mean range 6 ^m 9 - 14 ^m 3, 409 ^d)
+ W And	(Mira, 7 ^m 4 - 13 ^m 7, 396 ^d)
+ RW And	(Mira, 8 ^m 7 - 14 ^m 8, 430 ^d)
R Aql	(Mira, 6 ^m 1 - 11 ^m 5, 291 ^d)
V CVn	(SRa, extremes 6 ^m 7 - 8 ^m 8, 192 ^d)
+ T Cas	(Mira, 7 ^m 9 - 11 ^m 9, 445 ^d)
Mira Cet	(Mira, 3 ^m 4 - 9 ^m 1, 332 ^d)
R CrB	(RCB)
+ V Cyg	(Mira, 9 ^m 1 - 12 ^m 8, 421 ^d)
+ T Dra	(Mira, 9 ^m 6 - 12 ^m 3, 421 ^d)
+ RU Her	(Mira, 8 ^m 0 - 13 ^m 7, 485 ^d)
S Per	(SRc, extremes 7 ^m 9 - 11 ^m 5, 825 ^d)

Those stars marked with a '+' are being temporarily added to the programme with immediate effect; we already have the other stars under observation; arrangements for reporting observations will be given later. Charts for all the above stars are available from the Curator. The Hatfield programme will continue until at least 1979.

Limiting Magnitudes

Andrew Son is investigating the effect of magnification on limiting magnitude. In case any Section members would like to correspond with Mr. Son on this topic, or supply him with data, his address is:

Nijenheim 3247, 3709 AW Feist, Holland.

Novae

A Section Report on the 1970 & 1971 novae (V1229 Aql, V368 Sct, FH Ser & IV Cep) will be prepared in due course. Since at that time, shortly before John Isles' Directorship, the VSS programme was not well defined, it may be that there are unsubmitted observations of these stars tucked away in log books; if you have, or know of, any such observations, the Director would be grateful for them.

CHANGE OF ADDRESS

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