

BRITISH ASTRONOMICAL ASSOCIATION

L I G H T - C U R V E

VARIABLE STAR SECTION CIRCULAR No. 52, 1982 DEC.

SECTION OFFICERS

Director D.R.B. Saw, 12 Taylor Road, Aylesbury, Bucks.
HP21 8DR

Tel: Aylesbury (0296) 22564

Assistant Director S.R. Dunlop, 140 Stocks Lane, East Wittering,
nr Chichester, West Sussex PO20 8NT

Tel: Bracklesham Bay (0243) 670354

Programme Secretaries

Main Secretary G.A.V. Coady, 15 Cedar Close, Market Deeping,
Peterborough PE6 8BD

Tel: Market Deeping (0778) 345396

Binocular Secretary M.D. Taylor, 17 Cross Lane, Wakefield,
West Yorksshire WF2 8DA

Tel: Wakefield (0924) 37641

Eclipsing Binary Secretary J.E. Isles, c/o Department of Transport,
Room B 246, Romney House, Marsham Street,
London SW1

Tel: 01-212 0246

Nova/Supernova Search Secretary G.M. Hurst, 1 Whernside, Manor Park,
Wellingborough, Northants. NN8 3QQ

Tel: Wellingborough (0933) 676444

Chart Secretary J. Parkinson, 28 Banks Road, Golcar,
Huddersfield, West Yorkshire HD7 4LX

Tel: Huddersfield (0484) 642947

Contents: New Catalogue of Suspected Variables
X Persei
VY Aquarii
HR Delphini
Photography of variable star fields
Draughting assistance wanted
Nova/Supernova Search Programme
Recent supernova in ZWG 505.032
SU Tauri
Variable Star Section Meeting
Submission of 1982 July-December observations
1983 LPV predictions
'Missing' observations

NOTICES

Renewal of Circulars subscriptions Many subscriptions to these Circulars fall due now - this will be marked on the envelope. Please send payment (made out to the B.A.A.) to Storm Dunlop.

United Kingdom: Circulars only: £1.00; with light-curves: £2.00
Overseas: " " £1.50; " " " £3.00

Binocular Programme light-curves These are included with this issue for subscribers.

Circulars We hope to adopt a new format with the next issue. This will make no difference to the type of material which may be included, so please continue to submit any items of interest.

Index An index for Circulars 36-52 is being prepared, and will be issued in due course. In future we expect to have a yearly index.

Indian astronomical contacts wanted One of our Indian observers, S.R. Srinivasan, would like to contact other variable star workers in his country. We only have a few persons who are directly members of the VSS, but if any members have friends in India who may be interested in variables - or who could be encouraged to become interested! - please contact Mr Srinivasan at:

26, Asha Baug, First Floor, NAVSARI 396445 Gujrat, INDIA

Congratulations We should like to send our congratulations and best wishes to two of our German observers, Kerstin Reichenbacher and Manfred Rätz, upon their recent marriage. The address of Herr and Frau Rätz is:

6200 Bad Salzungen Siedlung 28 PF 43-21 DDR

Change of address

W.J. WORRAKER, now 66 Greystoke Road, Cherry Hinton, Cambridge
CB1 4DS

New Members

P. Biswell, 6 Northfield Road, Aylesbury, Bucks. HP20 1PB

C. Briden, Flat 3, 61 Heslington Lane, Fulford, York YO1 4HN

G. Chaplin, 11 Fleming Close, Farnborough, Hants. GU14 8BT

B. McInnerny, 14 Heathfield Avenue, Poole, Dorset BH12 5DJ

G. Maris, Stanwell, Parsonage Road, Takeley, Bishops Stortford
Herts.

A.K. Moore, 22 Godley Gardens, Stump Cross, Halifax, Yorks.
HX3 6XH

J. Thorpe, 51 Hall Road, Northfleet, Kent

New Catalogue of Suspected Variables

The 1951 and 1965 Catalogues of Suspected Variables (CSV) listed stars in two series: probable variables which had up to four digits (e.g. CSV 8775 Lac) and doubtful variables with seven (e.g. CSV 101849 Aql). It had been announced that a revised catalogue of suspects would be included in the fourth edition of the General Catalogue of Variable Stars.

The 'New Catalogue of Suspected Variable Stars' (NSV) has in fact recently been published separately, perhaps indicating that the main catalogue will be delayed. The editors are the late B.V. Kukarkin, P.N. Kholopov, and 14 other members of the Sternberg State Astronomical Institute, Moscow.

Suspects are now numbered in a single series of five digit numbers, from NSV 00001 to 14811. This renumbering will cause temporary inconvenience but it avoids the difficulty of allowing for the strengthening and weakening of evidence of variability under the old system, since many of the objects in the 'doubtful' series turned out to be genuinely variable.

The new catalogue contains nearly 9 000 objects from the earlier catalogues which had still not received final variable star designation by 1980, plus 6 000 new objects suspected to be variable since 1965. However, many objects reported since 1973 are not included although some of the references cited are as late as 1974. A cursory examination reveals numerous references to the BAA Journal, BSS reports, 'Light Curve', and other amateur publications.

The following table gives NSV details for the suspects on the Binocular Programme.

NSV	Former designation	Range	Type	Spectrum	Remarks
00021	+49°4329 Cas	7.0-8.0		K0	
00436	Wr 162 Cas	8.4-9.1p	Lb	M0	
00650	CSV 171 Cas	6.9-7.7p	Ia	B8	
01280	CSV 6048 Tau	6.5-7.3p	Is?	A0	
01702	+22°0743 Tau	6.6-8.0		B9	
02537	+31°1048 Aur	4.0-6.07		B7	Flares 1-2 ^m
02917	+14°1247 Ori	5.68-5.81	Lc?	K3Ib	
03597	CSV 100869 Lyn	6.69		M4	doubtful
12088	CSV 101849 Lyn	6.08		K5	doubtful
12247	CSV 8232 Cyg	8.6-9.1p	Lb	M4	
12439	CSV 8307 Cyg	7.3-8.2	SR	K5	
13150	+19°4450 Del	7.0-8.2		M7	
13656	+60°2217 Cep	6.8		M3	
13729	+59°2383 Cep	6.09-6.5		M2	
13857	CSV 8683 Cyg	6.3-7.08B	Lb	M2	
14213	CSV 8775 Lac	5.6-6.8	L	G8	
14260	CSV 102195 Lac	5.09		M4	amplitude 0. ^m 09
14680	+84°536 Cep	8.9p		K0	doubtful

It is encouraging that some of the discoveries of our own members are now 'official' suspects and so will not be forgotten.

NSV 13729 has apparently been confirmed by photoelectric observations by Necker (*As. Ap. Suppl.* 18, 169, 1974).

NSV 13150 was comparison star 20 for Nova HR Del 1967 in a chart published in 'The Astronomer', and has thus been referred to as TA 20 Del. The NSV literature reference for this object is the

second BSS report. A star of similar magnitude in Triangulum at 01h 55.2m, +28° 17' (1950), not known to the writer, is listed as NSV 00681; the Designation column calls this TA 20 Del, the literature reference is to the first BSS report, and the remarks say this is 'Comp. * for N Del 1967'. This is hard to fathom.

Another puzzle is the apparent absence from the NSV of CSV 927 Cep, at 7h 18.5m, +87° 8' (1950). Also unlisted are +61° 0668 Cam, +47° 2801 Cyg and 69 Dra, which have not been publicised.

I am compiling a short-list of NSV stars brighter than 9m, which will be useful to binocular observers, at least as a list of stars to avoid using as comparisons. Anyone who would like a copy may send me an SAE, but should not expect an immediate reply.

John Isles

X Persei (034930, 03^h 52^m.2, +30° 54' (1950), 6.0-7.0V, GC, 09V) Interest in this hot, massive variable centres around its identity with the x-ray source 3U 0352+30 and its association with the Zeta Persei complex. The Catalogue (GCVS 1976) classification gives the type as 'Gamma Cassiopeiae', yet more recent work suggest it to be of the sympiotic/slow nova category. VSS observations over the last 3½ years show the star has been through a bright phase at JD 2 444 460 (1980 August) when visually it was magnitude 6.2, probably the brightest it has been since the maximum of 1977/78, when a photoelectric V magnitude of 6.33 was recorded (see VSSC 40). In 1979 April magnitudes of 6.77 (V) and 6.55 (v) are known. During 1979, 1980 and 1981 VSS observations indicate variations between about magnitudes 6.2 and 6.5, (415 estimates - see the frequency distribution). The trend of the light curve during those years suggests minima at JD 2 444 050 ± (6.5) and JD 2 444 750 (6.5). During 1982 January to June the star has been brightening. (When the star is near the Sun, i.e. May - July an average of 80 days is lost in the light-curve, so it is fairly well covered.)

The astrophysical importance of X Persei ensures its continuance on the observational programme, and future work on searching for long-term and orbital periods will take place.

[Observers whose work has been used for this summary were: Bell, Billington, Blair, Collinson, Fraser, Gardner, Hapgood, Hufton, Hurst, Middlemist and Taylor. Assistance with the logging/checking of estimates and with computing was given by Forno, Collinson and Saville.]

A chart for this object is available from the Chart Secretary, John Parkinson; its date is 1972 May 27.

X Persei, VSS observations, 1979-81 inclusive, frequency distribution

Magnitude	No. of estimates	
5.8	2	
5.9	3	
6.0	7	
6.1	27	
6.2	54	Mean mag. = 6.36
6.3	67	s = 0.15 mag
6.4	128	n = 415
6.5	93	
6.6	30	
6.7	2	
6.8	1	
6.9	1	

M.D. Taylor

VY Aquarii In preparing charts for the Nova Search Programme, Robert McNaught noticed an image of VY Agr, apparently in outburst, on chart 225 of the Papadopoulos True Visual Magnitude Star Atlas. The image is similar in form to neighbouring star images and appears to be authentic, but the original plate has not yet been checked. It was taken on 1973 July 31 at 21.34 UT.

Members are asked to check to see if they have any photographs of the area of this object at position (1950):

$21^{\text{h}} 09^{\text{m}} 28^{\text{s}}.33 \quad -09^{\circ} 01' 56''.3$

This position has been measured by A.S.-Czerny (RGO) from a glass copy of the Palomar Sky Survey. Any photographs around 1973 July-August will be of interest, particularly if they reach beyond 9.5 magnitude, the apparent magnitude being 9.7.

This object is classed as a recurrent nova (1907, 1962) the interval being 55 years. If the 1973 outburst is confirmed, a recurrence period of 11 years is suggested, so that the next outburst could be expected in 1984. However, recent work suggests that the object has a very short orbital period, and consequent small orbit. Such a small orbit would not allow one component to be the red giant thought to exist in all recurrent novae, so the classification is in some doubt. It is distinctly possible that photographs taken at other times may reveal other outbursts.

Further details may be obtained from Robert McNaught at:

Earth Satellite Research Unit
Royal Greenwich Observatory
Herstmonceux Castle
Herstmonceux
nr Hailsham
East Sussex
BN27 1RP

HR Delphini A somewhat similar position exists with regard to this famous slow nova. John Hosty - again in connection with Nova Search work - notes that it appears bright on a plate in Dr Vehrenberg's Atlas Falkauer. Again the original plate, taken in mid-1960 has not been checked, but information is awaited. In this case the recovery of an image 7 years before outburst is most unusual, and we must reserve judgement for the time being.

Again please check to see if you have any photographs of this area, the position being:

$20^{\text{h}} 40^{\text{m}} 04^{\text{s}} \quad +18^{\circ} 58' 18'' \quad (1950)$

Any information should be sent to Guy Hurst at the address given on the cover, who will pass it on to John Hosty. Two photographs already submitted by M.J. Hendrie, Director of the Comet Section, do appear to show a faint image at the correct position, but the exact magnitude has yet to be established.

Photography of variable star fields The two objects just mentioned show how valuable photographs can be in the case of suspect objects and activity, but we should like to ask for members' assistance in the more prosaic task of revising charts and sequences. Photographs at various scales would greatly help

in this task, both in ensuring that stars are correctly positioned, and that none are omitted.

Standard camera lenses may be used for many of the fields which we require, so the task of obtaining suitable photographs should not be too difficult. Standard field sizes and focal lengths required for adequate coverage on 35 mm format are:

9°	135 mm	5°	200 mm
3°	300 mm	1°	1000 mm

These focal lengths will include more than the stated angle across the film. If possible please orientate the camera so that the even greater dimension (i.e. along the length of the film) is North-South as we are able to make use of the additional field included in many of our charts. For 1° and 20' fields most persons will be using telescopes, and if possible the same field orientation would be helpful.

Any exposures will be of interest, but we would particularly like to encourage members to try the use of Wratten W8 filters. The late Walter Pennell established many very satisfactory sequences using the combination of a W8 with Tri-X film for many fields, and this gave essentially accurate photovisual magnitudes. W8 filters should give somewhat similar results with other black-and-white films, but we shall be interested to establish the response of the W8/S0 115 combination, since the latter film is frequently used nowadays. A series of exposures with, and without, the filter on S0 115 would be valuable. (A series using both Tri-X and S0 115 on the same fields would be even more valuable.)

[If anyone has problems in obtaining W8 filters, they may be obtained from Mike Maunder at: Speedibrews, 54 Lovelace Drive, Pyrford, Woking, Surrey GU22 8QY. Standard gelatines are approx. £2.60 for 50 mm square, £3.90 for 75 mm square.]

Photographs of the following objects are required:

Star	Position (1950)	Field sizes
CO Aur	05 ^h 57 ^m .1 +35° 19'	5°
RY Cam	04 ^h 26 ^m .1 +64° 20'	5°
RY Dra	12 ^h 54 ^m .5 +66° 16'	9°
AB Dra	19 ^h 51 ^m .1 +77° 37'	1° 20'
DW Gem	06 ^h 27 ^m .9 +27° 29'	3°
DK Lac	22 ^h 47 ^m .7 +53° 01'	3° 1° 20'
TT Tau	04 ^h 48 ^m .4 +28° 27'	3°
Z UMa	11 ^h 53 ^m .9 +58° 09'	9°

The above are required for the revision of existing charts, whilst the following object is new:

V603 Aql	18 ^h 46 ^m .4 +00° 31'	9° 3° 1°
----------	---	----------

For the Z UMa photograph we would like an exposure sufficiently long to shown down to at least 9.5 magnitude, please - that is about 10 minutes on medium-speed film.

The famous nova, V603 Aql, Nova Aquilae 1918, is definitely variable around 11-12 magnitude. Sequences do already exist, but

we should like to have our own material to hand.

Any photographs of the above fields (negatives or positives) should be sent, in the first instance, to Storm Dunlop, who will pass them on to the appropriate persons preparing the particular charts. Please remember to take two exposures of a field on each occasion to eliminate flaws.

Assistance of draughtsmen wanted

Although John Toone is doing sterling service in providing newly drawn charts for many stars, we have several projects in the offing for which we would be grateful for draughting assistance. Anyone who has some experience of this sort of work, and who would be prepared to help is asked to contact the Director.

Nova/Supernova Search Programme

Contrary to any rumours which may be in circulation, we do not intend to make any major changes in the operation of the Nova/Supernova Programme. A very considerable amount of work has been done on the Supernova Search Programme, following the lines of development which were originally envisaged, and we expect to make some announcements about the project shortly. Light-curves of some recent supernovae will be available soon, and a definitive report on the supernova in NGC 6946 is in an advanced stage of preparation for the Journal by Guy Hurst and Melvyn Taylor.

Recent supernova discovered by Wild

Following the discovery of a supernova in an apparently anonymous galaxy by Wild on 1982 Nov. 22, at a B magnitude of 15.2, Alan Young photographed this on November 26.00764 UT at an approximate photovisual magnitude of 14.5. Alan has secured further photographs, which by mid-December showed a decline by approximately 0.5 mag. The galaxy appears to be ZWG 505.032 (also known as UGC 02156).

SU Tauri

The current minimum of this RCB star began in mid-October, when it dropped from its usual magnitude of 9.8 to 10.0. It is now (late December) at minimum of 15 magnitude approximately. Members are urged to forward their observations as soon as possible to Greg Coady so that a light-curve may be prepared when the star returns to normal brightness. (The last minimum of this star was 1980 August/September; its nominal range is 9.3 - 16 and the spectrum is G0.)

Variable Star Section Meeting

We expect to hold a Section Meeting in the Midlands - most probably on one Saturday in July. Further details will be announced as soon as possible. Anyone with any items of interest is invited to contact the Director. In view of the increasing interest in photoelectric photometry, we are particularly hopeful that some item or items on this subject can be included. Looking further ahead we hope that we shall be able to sponsor an IAPPP meeting in the UK for 1984.

Submission of observations

Observers are reminded that all observations for 1982 July-December should be submitted as soon as possible - certainly before the end of February. Reports should be sent to the appropriate Secretaries, from whom report forms may be obtained. Please try to submit observations early; we most certainly wish to use all observations, but late submissions cause a lot of problems - especially if analysis has already begun - so we cannot guarantee to use late results.

1983 Predictions for Maxima and Minima of Long Period Variables

D.R.B. Saw

<u>Star</u>	<u>Desig.</u>	<u>Maximum</u>	<u>Minimum</u>	<u>Star</u>	<u>Desig.</u>	<u>Maximum</u>	<u>Minimum</u>
R And	0018+38	--- Oct 20	May 23	R Cyg	1934+49	May 16	(Feb 21)
W And	0211+43a	--- Jun 24	Jan 7 (Feb 8)	S Cyg	2003+57	Feb 16 (Jan 4)	Jly 28
RW And	0041+32	--- Dec 2	Jun 29	V Cyg	2038+47	--- Dec 22	Jun 10
R Aql	1901+08	May 31	Sep 9	Chi Cyg	1946+32	Mar 30	Nov 25
U Boo	1449+18	--- May 5 Nov 21	Feb 4 Aug 23	T Dra	1754+58a	--- Oct 14	Apr 30
V Boo	1425+39	--- Aug 2	Apr 12 Dec 27	RU Her	1606+25	Feb 19	Nov 23
V Cam	0549+74	May 25	---	SS Her	1628+07a	--- Apr 2 Jly 18 Nov 2	Feb 11 May 29 Sep 14 Dec 30
X Cam	0432+74	Feb 28 Jly 22 Dec 13	May 14 Oct 5	R Hya	1324-22	--- Sep 14	Feb 28
S Cas	0112+72	--- (Jan 6)	Apr 19	SU Lac	2219+55b	Mar 1 Dec 21	Aug 18
T Cas	0017+55	Jun 4	Dec 31	U Ori	0549+20a	--- Oct 25	Jun 7
o Cet	0214-03	--- Jun 10	Feb 12 (Jan 9)	R Ser	1546+15	--- Jly 6	Feb 11
S CrB	1517+31	--- Dec 25	Aug 20	T UMa	1231+60	Feb 6 Oct 22	Jly 11
V CrB	1546+39	--- Aug 6	Mar 16	*V CVn	1315+46	Feb 10 Aug 23	May 12 Nov 22
W CrB	1611+38	Feb 9 Oct 2	Jun 24	*X Oph	1833+08	Mar 14	Aug 23
				*SS Vir	1220+01	Feb 5 (Jan 27)	Jly 18

* Stars on the VSS Binocular programme.

All the other stars are on the VSS Main programme.

'Missing' observations

Certain of the Section's records are incomplete and we are having difficulty in tracing or gaining access to some files. This particularly applies to some southern stars, and we should be most grateful for duplicate copies of reports for 1978 on the following:

UW Aql, Omicron Cet (Mira), R Hya, U Mon and R Sct
Information should be sent to the Director, as soon as possible please.

PLEASE SEE NOTICES ON INSIDE FRONT COVER

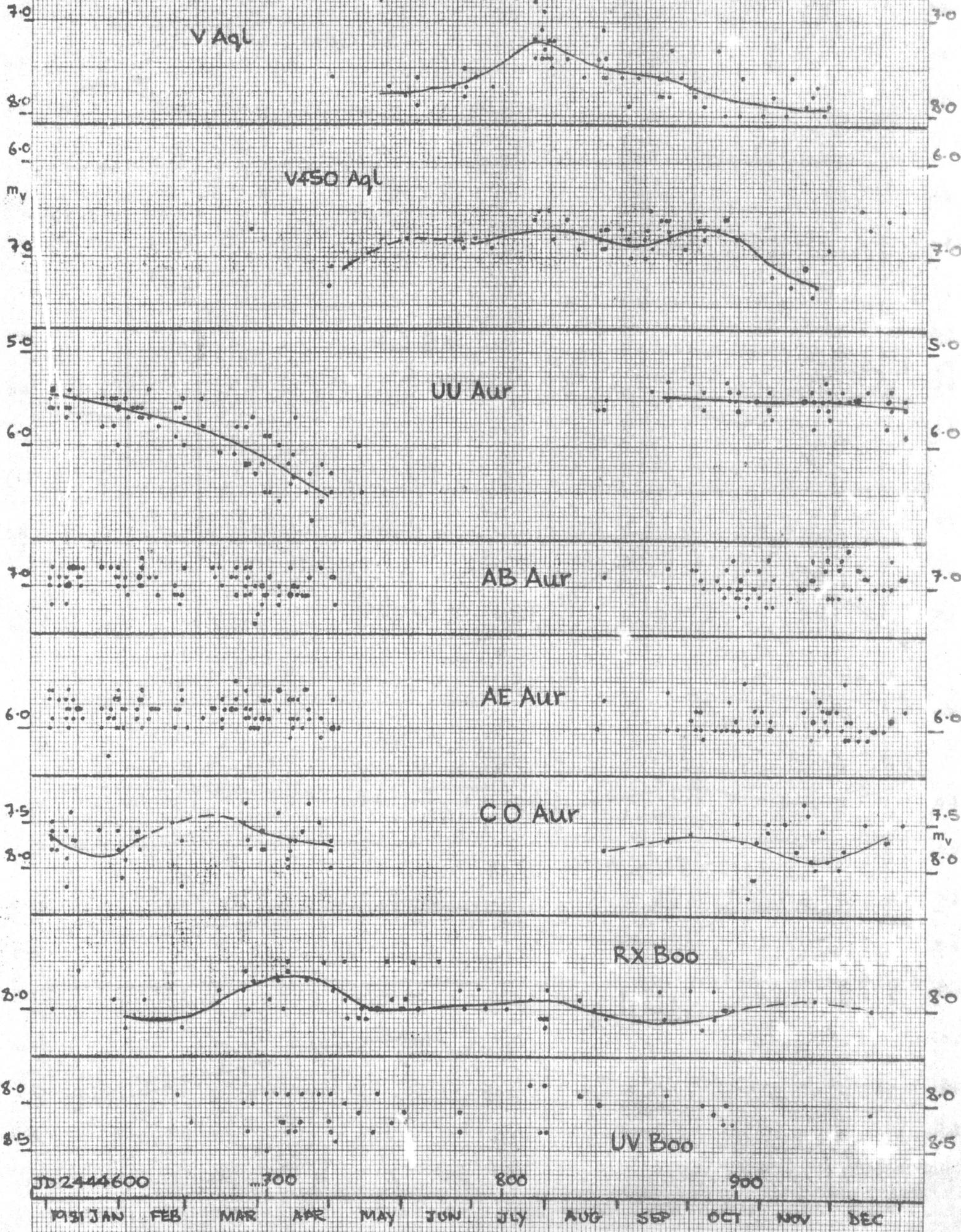
JD 2444600

...700

...800

...900

1981 JAN FEB MAR APR MAY JUN JULY AUG SEP OCT NOV DEC



JD 2444600

...700

800

900

1981 JAN FEB MAR APR MAY JUN JULY AUG SEP OCT NOV DEC

