COMMISSION 27 OF THE I.A.U.

INFORMATION BULLETIN ON VARIABLE STARS

Nos. 901-1000

1974 June – 1975 May

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CONTENTS

0944 CG LIBRAE
Carla Cacciari
25 November 1974

0945 1974 UBV PHOTOMETRY OF THE RADIO STAR UX ARIETIS = HD 21242
C.R. Evans, D.S. Hall
26 November 1974

0946 PRELIMINARY CHART OF THE REGION OF NOVA SAGITTARII 1974
R.F. Schmidt
29 November 1974

0947 PREDISCOVERY OBSERVATIONS OF NOVA PERSEI 1974
W. Wenzel
30 November 1974

0948 HD 192913: A NEW PERIODIC MAGNETIC VARIABLE
C. Bartolini, R. Foschini, A. Piccioni
6 December 1974

0949 REQUEST TO FLARE STAR OBSERVERS
J.E. Grindlay
6 December 1974

0950 THE CHANGING PERIOD OF HQ LYRAE
Dorrit Hoffleit
7 December 1974

0951 MINIMA OF ECLIPSING VARIABLES
P. Battistini, A. Bonifazi, A. Guarnieri
11 December 1974

0952 A NEW VARIABLE STAR IN M13
F. Fuenmayor, W. Osborn
13 December 1974

0953 PHOTOELECTRIC OBSERVATIONS OF RW TAURI
R.M. Williamon
23 December 1974

0954 MINIMA OF ECLIPSING VARIABLES
B.A. Krobusek, A.D. Mallama
10 January 1975

0955 PHOTOMETRIC OBSERVATIONS OF THE SUSPECTED VV CEPHEI STAR BD +61d219
P. Tempesti
13 January 1975

0956 RZ Eri
TIMES OF MINIMA FOR V523 Sgr AND V526 Sgr
B. Gronbech
15 January 1975

0957 A NEW RR LYRAE VARIABLE IN COMA BERENICES
Dorrit Hoffleit
15 January 1975

0958 SEVENTEEN LONG PERIOD VARIABLES IN SAGITTARIUS
Dorrit Hoffleit
17 January 1975

0959 IDENTIFICATION CHART FOR NOVA PERSEI 1974
N. Sanduleak
24 January 1975

0960 BLAZHKO EFFECT IN THE RR LYRAE TYPE STAR WY DRACONIS
D. Chis, G. Chis, I. Mihoc
24 January 1975

0961 60th NAME-LIST OF VARIABLE STARS
B.V. Kukarkin, P.N. Kholopov, N.P. Kukarkina, N.B. Perova
24 January 1975

0962 PHOTOELECTRIC LIGHTCURVE AND MINIMA OF THE ECLIPSING BINARY CW Cas
R. Burchi, R. de Santis
31 January 1975

0963 HD 169454: A POSSIBLE ZETA Aur SYSTEM
C. Bartolini, S. Scardovi
4 February 1975

0964 PHOTOELECTRIC MINIMA OF ER Ori AND XY Leo
R. Burchi, F. Zavatti
17 February 1975

0965 THE NEXT MINIMUM OF THE LONG PERIOD ECLIPSING BINARY EE Cep
L. Meinunger
20 February 1975

0966 CSV 7917
C.B. Stephenson
25 February 1975

0967 NINE NEW VARIABLE STARS IN A FIELD AROUND Mu Cep
E.H. Geyer, F. Gieseking
27 February 1975

0968 FLARE OBSERVATIONS OF V1216 SAGITTARII
A.H. Jarrett, G. Grabner
3 March 1975

0969 Upsilon 1 PUPPIS, A PULSATING B3 Ve STAR
NOTE ON Upsilon 2 PUPPIS
A. van Hoof
5 March 1975

0970 PHOTOMETRIE PHOTOGRAPHIQUE DE 3C 120
Ch. Bertaud, B. Dumortier, C. Pollas
7 March 1975

0971 A NEW ECLIPSING VARIABLE
R. Szafraniec
10 March 1975

0972 PERIOD INCREASE IN RW PERSEI CONFIRMED
D.S. Hall, T. Stuhlinger
11 March 1975

0973 OBSERVATIONS PHOTOGRAPHIQUES DE 3C 120 (BW Tau)
L.A. Ourassine, Ida A. Ourassina
12 March 1975

0988 Theta1 Ori A - A NEW ECLIPSING BINARY IN THE TRAPEZIUM
E. Lohsen
14 April 1975

0989 A NOTE ON V CrA AND W Men
L.A. Milone
15 April 1975

0990 ON THE PERIOD VARIATION AND BLAZKO-EFFECT OF XZ CYGNI
V. Pop
16 April 1975

0991 V450 Lyr
K. Haussler
24 April 1975

0992 OBSERVATIONS OF 26, 27 AND 28 CMa
A. van Hoof
25 April 1975

0993 HD 163868, A NEW BRIGHT SOUTHERN VARIABLE
Edith J. Woodward
28 April 1975

0994 NEW FAINT SOUTHERN VARIABLE STARS
B.S. Carter
2 May 1975

0995 PROPOSED GROUND-BASE OBSERVATIONS OF UV CETI FLARE STARS IN COORDINATION WITH THE MIT/SAS-C SATELLITE
T.J. Moffett
5 May 1975

0996 FLARE-UPS IN STARS OF THE PLEIADES FIELD
G. Szecsenyi-Nagy
7 May 1975

0997 OPTICAL OBSERVATIONS OF UV CETI FLARE STARS SIMULTANEOUS WITH RADIO COVERAGE
T.J. Moffett
13 May 1975

0998 FLARE ACTIVITY OF YZ CMi
B.B. Sanwal
14 May 1975

0999 NEW VARIABLE STARS IN PERSEUS
G. Romano
19 May 1975

1000 UBV AND SPECTRAL DATA ON RV PICTORIS
R.H. Mendez
20 May 1975

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Number 901

Konkoly Observatory
Budapest
1974 June 24

FLARES ON AD LEONIS AND YZ MINORIS

Four flares on AD Leo observed during 5^h25^m of patrolling on the nights of 23 and 24 December 1973 are herein reported. Another 20^m of observing on 3 January 1974 recorded no flare. Details of the observations and the flare characteristics are given in Tables 1 and 2, respectively. The latter have been computed by procedures adopted earlier (Kapoor and Sinvhal, IBVS 750, 1972; Kapoor et al, IBVS 810, 1973). On the basis of the light curves (Figure 1) three of the flares belong to Oskanjan type I while the fourth is of type II.

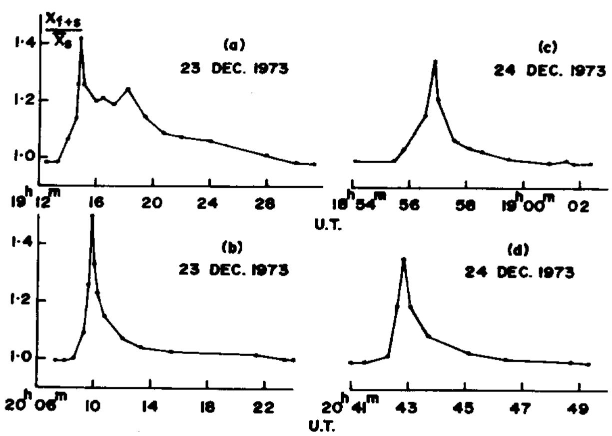

Fig. I: FLARES OF AD Leo

Also YZ CMi was observed for 3^h59^m on 21 November 1973, but no flare was detected. Table 3 gives the details of the observations.

Part of this investigation was done with financial assistance under Smithsonian Institution Project No. SFG-O-6425, which is thankfully acknowledged.

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Table 1: Coverage of AD Leo

Date	Filter	Sky conditions	Effective coverage, U.T.
23 Dec.1973	U	Moonless; seeing, good.	19^h05^m-20^h13^m; 20^h15^m-21^h31^m
24 Dec.1973	U	Moonless; seeing, good.	18^h23^m-21^h24^m
3 Jan.1974	B	Moonlit; seeing, good.	18^h52^m-19^h12^m

Notes: 1. Times have been rounded off to the nearest minute. Total coverage 5^h45^m. 2. Flare intervals are underlined. 3. Instrumentation: 104 cm. telescope; 1P21 Photomultiplier, unrefrigerated; d.c. amplifier; Honeywell - Brown Recorder; Time constant of the system, 1 sec. 4. Seeing (on a scale of 5) : Excellent (4-5); Good (3-4); Fair (2-3); Poor (1-2).

Table 2

Characteristics of the Flares on AD Leonis (dM4e; V=$9^m.43$; U-V=$2^m.61$)

Date 1973	UT_{max}	Flare duration (min.) t_b	t_a	$\frac{X_{fm+s}}{\overline{X_s}}$	Δm_U	$\frac{3\sigma}{\overline{X_s}}$	P (min.)	F (z)	Energy released at flare max. (10^{29} erg sec^{-1})	Total em. during the flare-up (10^{30} ergs)
Dec. 23										
	$19^h14^m54^s$	1.75	15.20	1.42	.38	.091	1.805	1.526	1.77	13.54
	20 09 45	1.80	13.65	1.45	.40	.067	0.914	1.287	1.85	6.86
Dec. 24	18 56 16	1.25	5.10	1.34	.32	.044	0.349	1.622	1.68	2.62
	20 42 02	1.37	7.00	1.36	.33	.055	0.398	1.141	1.69	2.99

Note: $\overline{X_s}$ is the mean steady state intensity deflection above sky, X_{f+s} that due to flare plus $\overline{X_s}$, and X_{fm+s} the same corresponding to flare maximum.

Table 3

Date, 1973	Filter	Sky condition	Effective coverage, U.T.
21 November	B	Moonless; seeing, good.	19^h16^m-20^h26^m; 20^h29^m-21^h51^m; 21 56 -22 49 ; 23 05 -23 39. Total coverage: 3^h59

Notes: s. Table 1

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
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Konkoly Observatory
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1974 June 28

NEW PERIODS FOR ST Pic AND XZ Cet

In many variable stars the period may be incorrectly determined if observations are only obtained once a night. This occurs since several integral periods may elapse during a 24 hour period.The true period P_n will be one of the family $1/P_n = 1/P_{obs}-n$, where P_{obs} is the apparent period in an integer. ST Pic, one of about twenty cepheids observed at SAAO in 1973 is described in the General Catalogue of Variable Stars, GCVS, as a 9th Magnitude C_δ of 18.75 day period. One spectrum was taken each night during several observing sessions using a grating spectrograph on the 40-inch reflector, and simultaneous V, B and I photometry was obtained on the 20-inch.

Since the spectra appeared rather too early in type, and the colour indices appeared too blue for a classical cepheid, it was decided to observe the star several times during one night. A change of 0.25 magnitudes was obtained in V over an interval of 3 hours, indicating that ST Pic is a short period variable. The available photometry suggests 0.486 days as the most likely period. We hope to complete the visual light curve, and confirm the period next summer.

XZ Cet, described in GCVS as a 9th magnitude RR Lyrae variable of 0.451 day period was observed spectroscopically and also in V,B, I on 14 nights between August and December 1973. On plotting the light curve it was found that the portions of curve derived from runs taken on certain nights disagreed in phase with the light curve derived on other nights. On investigations, one of the "reciprocal" periods of 0.45 days, 0.823 days, was found to give a smooth light curve with no discrepancies. The radial velocity curve appears to fit both periods equally well. It is possible that the discrepancies in the 0.451 day light curve are due to arbitrary phase shifts rather than an incorrect period. To check this photometric observations will be taken 12 hours apart when XZ Ceti is suitably placed.

I would like to thank L.A. Balona, B.D. Kelly and the photometric department for help with the observations.

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Konkoly Observatory
Budapest
1974 June 29

THE SECONDARY PERIOD OF AE UMa

The variability of AE UMa = BV 92 was discovered on Bamberg plates some twenty years ago (E.Geyer, R.Kippenhahn and W.Strohmeier, Kleine Veröff. Bamberg No 11, 1955). According to E.K. Kharadze (Abastumani Bull. 10.125, 1949) the star's spectral type is A2, while W. Götz and W.Wenzel (MVS No 571, 1961) classify it as A9.

V.P. Tsesevich (Astr.Circ.No 170,1956) and G.S.Filatov (Astr. Circ. No 215, 1960) observed the star visually, but the type of variability could not be determined with certainty. Recent investigations by Tsesevich (Astr.Circ. No 775, 1973) have, however, shown that the star belongs to the class of dwarf cepheids and has a period of $0^d.086017055$. Tsesevich also called the attention to the light curve variation of the variable.

In order to determine the secondary period of AE UMa more than one thousand photoelectric blue and yellow observations were collected with the 20 in. Cassegrain and 24 in. Newton telescopes of the Konkoly Observatory from January 15, 1974 till April 23, 1974. BD+44°1882 was used as comparison star whose constancy was checked by BD+44°1881.

The time of the 18 maxima observed arc listed in the Table. The brightnesses of the maxima in blue (b) and yellow (y) light relative to the comparison star are also given.

First the period of modulation P_m was derived from the heights of the observed blue maxima (see upper part of the Figure) as $P_m = 0^d.29364$. Utilizing the maxima at nearly the same phase of modulation the main period P_o was redetermined: $P_o = 0^d.086017$. This value agrees remarkably well with Tsesevich's period.
The O - C values were calculated by the new elements:

C_o(mean max.) = 2442062.5820 + $0^d.086017 \cdot E$ and

C_m(min.ampl.) = 2442062.5960 + $0^d.29364 \cdot N$

In the Figure Δb_{max} and $O-C_o$ are plotted against the phase of modulation $\psi = (O-C_m)/P_m$.

Table

J.D. max	Δy_{max}	Δb_{max}	O - C	O - C_m	E	N
2442062.5835	+0.90	+0.77	+0.0015	+0.2811	0	- 1
095.5293	.85	.69	+0.0028	+0.0456	+383	+112
.6118	.69	.51	-0.0007	+0.1281	384	112
106.4520	.73	.54	+0.0013	+0.1036	510	149
119.5258:	.83:	.69:	+0.0003:	+0.2573	662	193
121.5017:	.70:	.52:	-0.0019:	+0.1777	685	200
128.2968	.81	.63	-0.0022	+0.2191	764	223
.3872	.91	.76	+0.0022	+0.0158	765	224
.4727	.77	.58	+0.0017	+0.1013	766	224
.5550:	.74:	.57:	-0.0020:	+0.1836	767	224
133.4622	.73	.58	+0.0022	+0.0990	824	241
.5440	.69	.54	-0.0020	+0.1808	825	241
134.4055:	.70:	.53:	-0.0007:	+0.1613	835	244
147.3935:	.79:	.66:	-0.0013:	+0.2292	986	288
148.4295	.73	.60	+0.0025	+0.0906	998	292
.5096	.69	.54	-0.0034	+0.1707	999	292
159.4365	.78	.67	-0.0006	+0.2329	1126	329
161.4145	+0.67	+0.50	-0.0010	+0.1555	1149	336

From P_o and P_m we easily obtain the secondary period P_1 and the period ratio P_1/P_o:

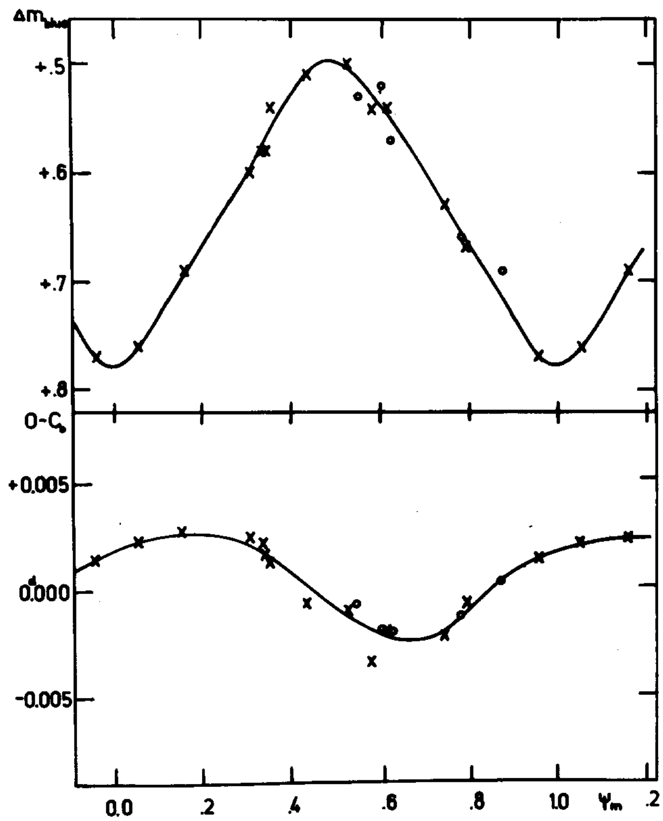
$$P_1 = 0\overset{d}{.}066529 \text{ and } P_1/P_o = 0.773$$

It is worthy of note that exactly the same P_1/P_o ratio was obtained by Julia Balázs and L. Detre (Budapest Mitt. No 40,1956) for RV Ari which has only a slightly longer main period ($0\overset{d}{.}0931$) than AE UMa. It is also interesting that the phase relation between the $\Delta b_{max}-\psi$ and $(O-C_o)-\psi$ curves is nearly the same for both dwarf cepheids.

In the next observational season the investigation of AE UMa will be continued to determine its periods more accurately.

Konkoly Observatory,
Budapest

B. SZEIDL



Δm blue
+.5
+.6
+.7
+.8
O-C
+0.005
0.000
-0.005
0.0
.2
.4
.6
.8
1.0
ψm
.2

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Number 904

Konkoly Observatory
Budapest
1974 June 30

PHOTOELECTRIC MINIMA OF ECLIPSING BINARIES

In the Table we give twelve photoelectric minima of three eclipsing binaries. The observations in V light were performed photoelectrically at the 40 cm refractor of the Teramo Observatory. We have computed the times of minimum light by the Kwee-vanWoerden method. (O-C)'s were computed with the elements from the "Rocznic Astronomiczny 1974" for RT And and AC Boo while for RT Per we used the elements of Frieboes-Conde and Heczeg (1973).

J.D.	E	O-C	σ	Observer
RT And				
2441598.4912	2371	-0.0087	±0.0010	Mancuso
41627.4227	2417	-0.0081	0.0012	Di Paolantonio
AC Boo				
2441457.4215	10494.5	+0.0012	±0.0007	Milano
41458.4785	10497.5	0.0008	0.0014	Milano
41503.4147	10625	0.0024	0.0005	Mancuso
41506.4096	10633.5	0.0017	0.0006	Mancuso
41513.4567	10653.5	0.0002	0.0017	Mancuso
41515.3975	10659	+0.0027	0.0018	Mancuso
RT Per				
2441298.4128	25604	-0.0294	±0.0009	Milano
41300.5397	25605.5	0.0260	0.0007	Milano
41304.3595	25611	0.0286	0.0016	Milano
41627.5588	25991.5	-0.0283	0.0010	Di Paolantonio

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Reference:

Frieboes-Conde H.,Herczeg T. 1973, Astron. and Astroph.Suppl.12.19.

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Number 905

Konkoly Observatory
Budapest
1974 July 2

NEW PERIODS OF THREE RR LYR VARIABLES

The variables 10 in NGC 6333, 23 in NGC 5466 and 12 in NGC 6426 are three c-type RR Lyrae variables with the shortest periods ($<0^d.25$) in Oosterhoff type II globular clusters. Figure 1a shows the cumulative distribution for Oosterhoff II c-type variables (without ω Cen). The distribution clearly shows a gap at $P=0^d.024$ at the shortest periods between these three variables and all the others. As the wings of the cumulative distributions may be of great importance in the interpretation of the Oosterhoff effect, these three variables have been carefully studied.

NGC 6333(M9) Var.10- This star has been studied only by H.B.Sawyer (Toronto Publ.1,No.24,1951) who classified it as a c-type RR Lyr with the period $P=0^d.242322$. Using the same data the alternative period $P=0^d.319822$ has been found, whose reciprocal differs by a unity from the previous one. The light curve (Fig.2) has the same dispersion as the curve constructed with Sawyer's period.

NGC 6426 Var. 12- This variable has been discovered and studied by C. Grubissich (Asiago Contr. 94,1958) who found $P=0^d.23679$ and the extremely short alternative period $P=0^d.19145$. Using the same data a new possible period has been found, $P=0^d.310255$, which differs from the previous one by a unity in its reciprocal. The light curve Fig.2 constructed with this period however shows a larger dispersion, and new observations are needed to decide about the right period.

NGC 5466 Var.23- This star (Hop 235) has been discovered and studied by T.I. Gryzunova (AC 526,8,1969; VS.Suppl.1,253,1972). She found $P=0^d.2321607$, but $P=0^d.302353$ gives a perfectly equivalent light curve (Fig.2).

This study, which cannot be considered conclusive in absence of new observations, reconfirms however the suspicion that the published periods of these three variables might be wrong. On the basis of this hypothesis and using the new periods found, the cumulative distribution for Oosterhoff II c-type variables has been plotted (Fig.1b): the behaviour is now more regular and continuous.

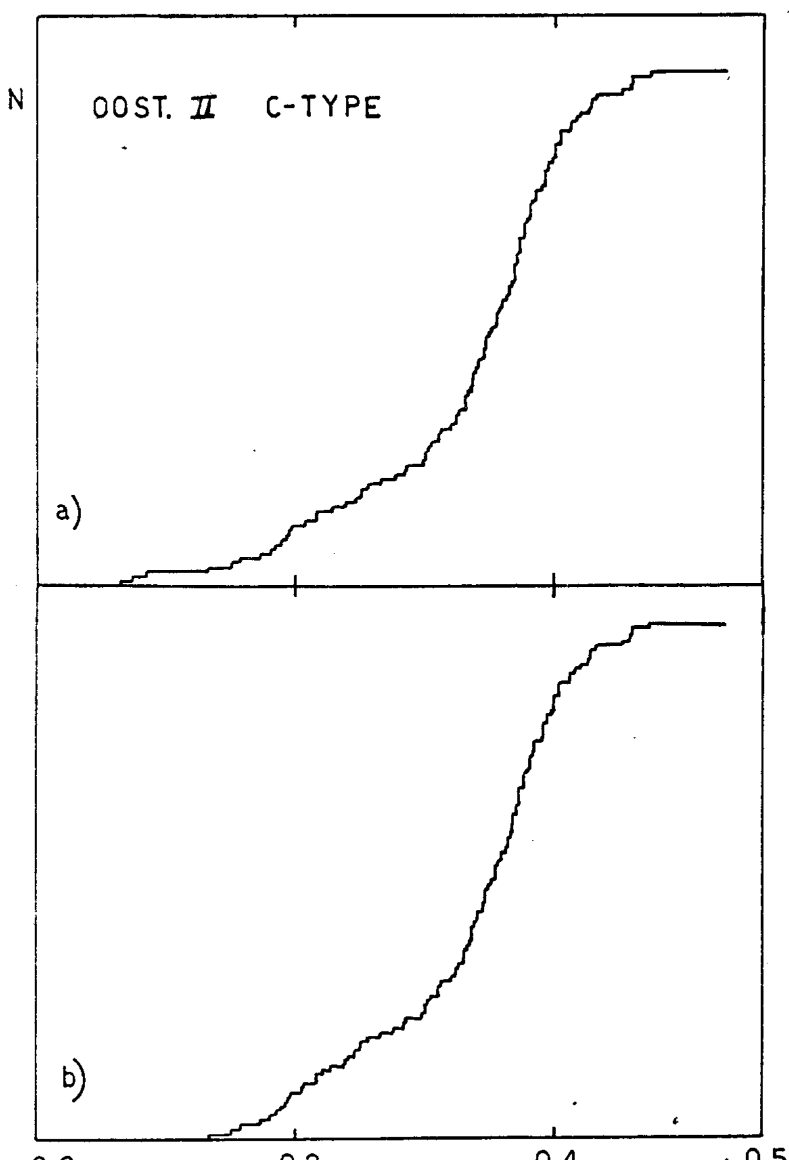

Fig.1

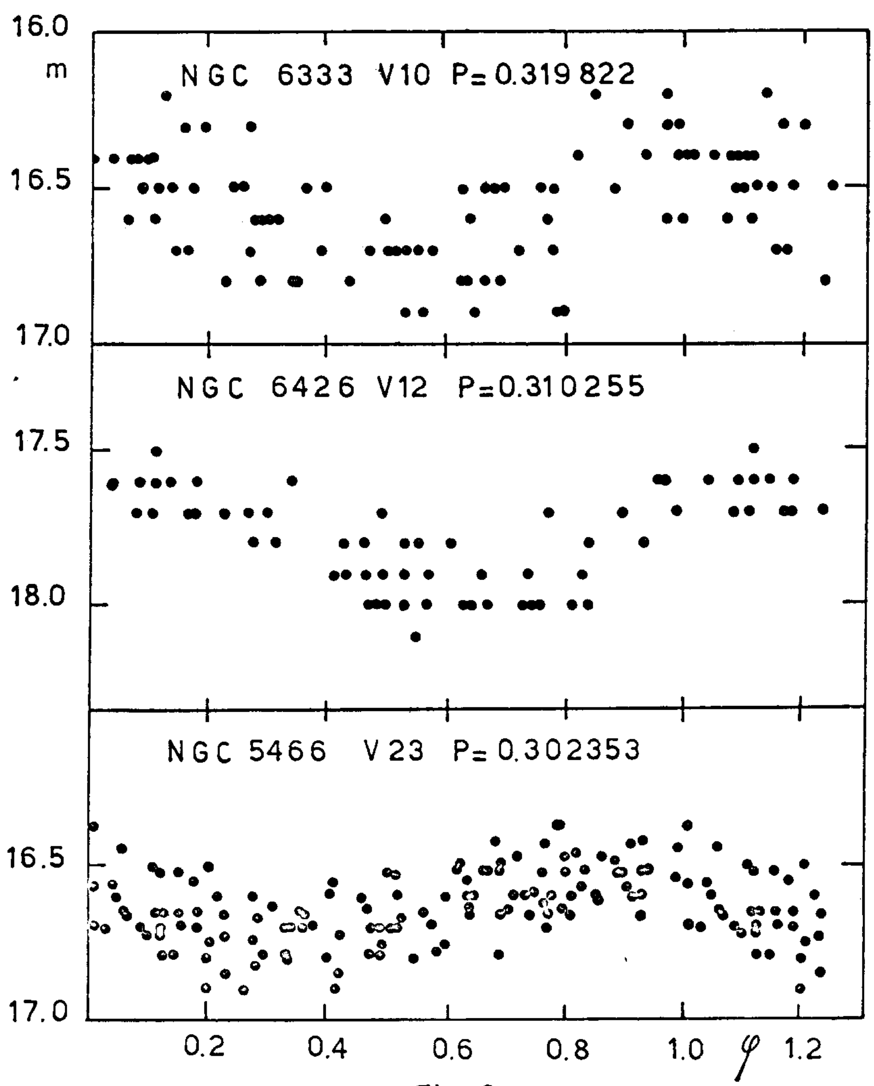

Fig. 2

June 20,1974.

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COMMISSION 27 OF THE I. A. U.
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Konkoly Observatory
Budapest
1974 July 4

PHOTOELECTRIC OBSERVATIONS OF THE FLARE STARS AD Leo AND WX UMa (1974)

Continual photoelectric monitoring of the flare stars AD Leo and WX UMa were carried out at the Okayama Station of the Tokyo Astronomical Observatory. The observations were made with the simultaneous three-colour photometer attached to the 91 cm reflector.

AD Leo

During the 28 hours of monitoring in total, 10 flares were observed. The detailed coverages are given in Table I. The characteristics of the flares are given in Table II.

WX UMa

During the 12.3 hours of monitoring in total, no flare activity was detected. The detailed coverages are given in Table I.

Some more details will be published in the Tokyo Astronomical Bulletin.

Table I

Monitoring of AD Leo and WX UMa

Monitoring Intervals

Date 1974	Coverage (UT)	Total Coverage Time	σ (mag) U	B	V
Feb.		AD Leo			
13^d	11^h24^m - 17^h11^m	5^h47^m	.09	.03	.01
14	12 35 - 16 25	3 50	.05	.01	.01
16	11 46 - 14 10	2 24	.10	.04	.02
17	13 25 - 20 20	6 55	.09	.03	.01
18	10 59 - 19 10	8 11	.07	.04	.02
21	11 10 - 11 30	0 56	.12	.07	.04
	12 56 - 13 32				
Apr.		WX UMa			
23	16 57 - 17 49	0 52	.15	.04	.02
26	11 22 - 16 31	5 09	.19	.04	.02
27	11 01 - 11 30	1 56	.16	.03	.01
	12 15 - 14 11				
29	10 58 - 15 23	4 25	.12	.04	.01

Table II

Flares of AD Leo at Okayama

Flare No.	Time of Max. (UT)	Filter	$\frac{I_{o+f}-I_o}{I_o}$	Max. Δm mag.	P min	d_b min	d_a min
1	1974 Feb.13^{d}14^{h}06^m.5	U	2.86	1.47	4.3	0.4	6.7
		B	0.33	0.31	0.6	0.4	6.5
		V	0.12	0.12	0.2	0.5	6.0
2	13 15 55.3	U	2.94	1.49	1.5	0.3	4.5
		B	0.39	0.36	0.2	0.3	4.0
		V	0.12	0.12	<0.1	0.3	1.1
3	13 16 55.0	U	1.42	0.96	2.7	1.1	>6.0
		B	0.14	0.14	0.2	1.1	>3.5
		V	0.03	0.03	<0.1	0.9	1.6
4	14 15 38.4	U	1.25	0.88	4.6	2.7	8.0
		B	0.14	0.14	0.3	2.3	5.0
		V	0.02	0.02	*	*	*
5	17 14 34.7	U	5.19	1.98		4.0	>180.0
		B	0.61	0.52		3.0	>180.0
		V	0.20	0.20		2.5	>180.0
6	17 14 35.9	U	6.80	2.23			
		B	0.80	0.64			
		V	0.27	0.26			
7	17 14 40.3	U	5.08	1.96			
		B	0.66	0.55			
		V	0.24	0.23	U>1318		
					B> 230		
8	17 15 01.4	U	100.00	5.01	V> 65		
		B	13.86	2.93			
		V	3.57	1.65			
9	17 16 02.4	U	7.09	2.27			
		B	1.11	0.81			
		V	0.50	0.44			
10	17 16 03.8	U	7.32	2.30			
	17 16 03.6	B	1.07	0.79			
		V	0.47	0.42			

Tokyo Astronomical Observatory
15 June, 1974

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COMMISSION 27 OF THE I. A. U.
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Konkoly Observatory
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THIRTEEN NEW LOW AMPLITUDE SOUTHERN VARIABLE STARS

During the course of an investigation of the space distribution of early-type stars in Monoceros-Canis Major (Clariá 1973, Ph.D.thesis Univ. Córdoba) a number of stars were found to be low amplitude variables. UBV observations were made during 1971-72 of 247 stars in the above mentioned region using the 16-inch and 36-inch telescopes of the Cerro Tololo Inter-American Observatory, Chile. A large number of standard stars, taken from the E-regions (Cousins 1963, Roy.Obs. Bull.No.69) were observed each night. The accuracy of the V measures is about ±0.01 mag. and the resulting mean nightly extinction coefficients K_v=0.14, K_{bv}=0.09 - 0.03(b-v), and K_{ub}=0.30 - 0.01(u-b), were very close to the standard CTIO values. The stars in the following list were found to have variations greater than 0.08 mag. in V.

HD/CD	maximum brightness in V	V amplitude	n
51454	9.33	0.11	3
51477	8.04	0.10	3
51542	9.46	0.09	3
51625	9.83	0.10	5
52721	6.49	0.23	6
53339	9.26	0.13	4
53595	9.83	0.09	4
53754	8.18	0.12	4
53755	6.42	0.11	5
53756	7.26	0.21	4
-9°1848	9.94	0.18	3
56800	8.23	0.23	3
56873	10.60	0.18	3

Notes

HD 52721 : Visual binary (ADS 5713), Δm = 0.7 mag.,sep. = 0".6. Photometry refers to the combined light of both components.

HD 53755 : Triple system (ADS 5782), Δm(AB) = 3.9 mag.,sep. (AB) = 6".5. Photometry refers to the pair AB only.

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INFORMATION BULLETIN ON VARIABLE STARS
Number 908

Konkoly Observatory
Budapest
1974 July 14

VARIABILITY OF 59 Aur AND 38 Cnc

The two stars 59 Aur and 38 Cnc which have been reported to show light variations in surveys by Danziger and Dickens (ApJ 149,55,1967) and Breger (ApJ 162, 597, 1970), were observed photoelectrically in B filter by the authors on the nights of 24 Nov., 1973 and 4 Jan,1974 with the 38 cm reflector of this observatory, employing an unrefrigerated 1P21 photomultiplier. The light curves obtained show a variability with periods and amplitudes as follows:

Star	HD	Sp	M_V	P	Amp.
59 Aur	50018	A 7 n	1.33	$0\overset{d}{.}136$	$0\overset{m}{.}03$
38 Cnc	73575	F0 III	0.66	$0\overset{d}{.}108$	$0\overset{m}{.}07$

The star 38 Cnc is a member of the Praesepe cluster and its absolute magnitude M_V is taken from Breger (ApJ 176, 273, 1972). The positions of these stars in the colour-magnitude diagram (Leung AJ 75, 643,1970) as well as their periods fit well into the period-luminosity relationship for Delta Scuti stars given by Leung (loc.cit).

Further investigations for beating phenomenon and more accurate period determination are in progress.

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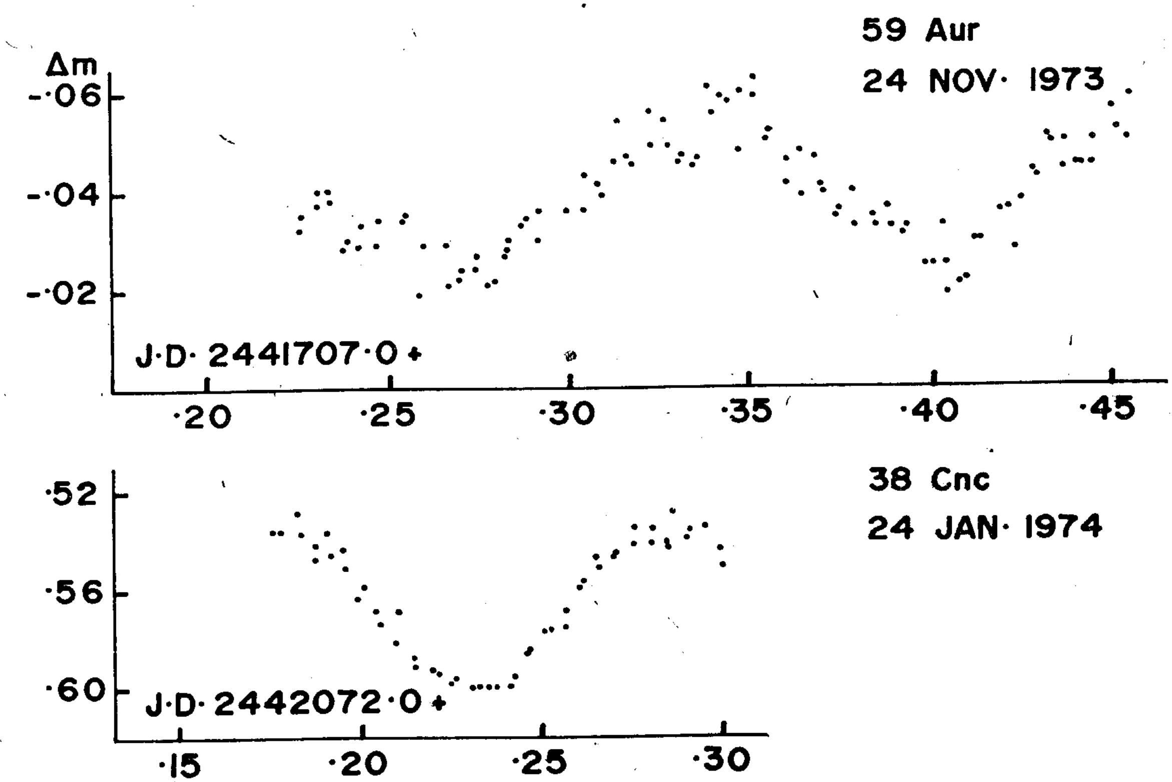

Light curves of 59 Aur and 38 Cnc. Δm is the difference of instrumental magnitudes of variable and comparison stars (v-c).

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INFORMATION BULLETIN ON VARIABLE STARS
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FLARE STARS IN THE REGION OF NGC 7000

Systematic observations of the area embracing the emission nebulae NGC 7000, IC 5070, S 81 and S 85 were started in June 1972 at the Byurakan Astrophysical Observatory in order to discover and investigate flare stars and other nonstable objects in the region.

There are a great number of objects in this region showing Hα-line in emission. Some of them are T Tauri type stars (1),(2). There is - in evolutionary sense - a very interesting star, as well: the Fuor V 1057 Cygni (3),(4).

Therefore, one can expect that our observations make it possible to discover some flare stars connected with the above mentioned complex objects.

It is important to note that among the regions in which flare stars have ever been searched this area is the nearest one to the galactic plane ($b=-1^{\circ}$). Our observations can add some more informations about the red dwarfs among the foreground stars as well.

The observations were carried out with the 40 in./50 in. and 21 in./21 in. telescopes of the Byurakan Astrophysical Observatory by the method of multiple exposures. Each of our exposures was equal to 10 minutes.

The star BD+41°3922 ($RA_{1950.0}= 20^h51^m6$, $D_{1950.0}= +42^{\circ}13'$), situated in a region of comparatively low star density was chosen as center of our region in order to avoid a great number of confusions which could take place with our observational method.

The flare stars discovered by Haro and Chavira (5) are in the region, partly overlapping ours.

The result of the preliminary examination of the most part of the obtained observational material is given in this note.

The number of plates and exposures as well as the effective time of observations for each telescope are presented in Table 1.

Table 1

Telescope	Number of Plates	Number of Exposures	t eff.
40 in.	166	944	157^h20^m
21 in.	168	978	163^h00^m

We used Eastman Kodak 103 aO or ORWO ZU 2 plates with 2mm Schott UG2 ultraviolet filter (40in.), or without filter (21 in.). The average limiting magnitudes were $\sim 18^m.0$ U and $\sim 16^m.7$ pg, respectively. A number of plates, $t_{eff} = 39^h25^m$, have been obtained with both telescopes simultaneously. From such observations it is possible to obtain some information of the colours of the flares. The data of observed flares are summarized in Table 2.

Table 2

Designation	RA 1950.0	D	m_{pg}	$m_{pg/U}$	Date of Flare-up	Telescope
B1	$20^h48^m.8$	$+40^\circ43'$	$19^m.5$	$3^m.5$	10.07.1972	21 in.
T1	21 00.7	42 08	17.0	1.3	11.07.1972	21
B2	21 00.0	42 26	19.0	3.7	11.07.1972	21
B3	20 53.9	44 09	18.5	3.1	3.10.1972	21
B4	20 50.5	41 26	20.0	3.9	11.10.1972	21
T1	21 00.7	42 08	17.0	1.7	24.11.1972	21
B5	20 54.0	43 31	19.5	4.0U	4.07.1973	40,21
B6	20 43.9	42 41	20.0	4.5U	27.07.1973	40
B7	20 47.1	41 02	19.5	4.5U	27.07.1973	40
T5	20 58.2	43 20	18.0	2.0U	29.07.1973	40
B8	20 55.6	43 39	18.5	2.5U	30.07.1973	40
T5	20 58.5	43 20	18.0	1.5U	1.08.1973	40
T5	20 58.2	43 20	18.0	1.5U	17.08.1973	40
B9*	20 49.2	44 04	17.5	3.0U	24.08.1973	40,21
B10	20 48.5	41 33	14.5	0.7U	23.09.1973	40
B11	20 48.7	41 46	20.5	6.4	19.10.1973	21

*The light curve is very peculiar

Table 2 contains the following data:

Column 1. The serial number of the flare stars discovered at Byurakan (B) and Tonantzintla (T) Observatories.

Columns 2 and 3. Coordinates for 1950.0

Column 4. The approximate photographic magnitudes at minimum

Column 5. The observed amplitude in pg or in U light.

Columns 6 and 7. The date of the flare-up and the telescope used.

In this way we have found 16 flare-events in 13 different flare stars for $t_{eff} = 280^h55^m$. The flare stars T1 and T5 discovered by Haro and Chavira (5) have shown 2 and 3 outbursts, respectively.All other flare stars have been discovered in the course of this work. It should be mentioned that the flare activity in the direction of NGC 7000 is comparatively low (for instance, in comparison with the Pleiades).

This does not contradicts Haro and Chavira's conclusions (5).

It is interesting to say that no conspicuous flare-event was discovered for the stars known to have Hα emission.

It may be added that, contrary to the Hα objects listed in (1) and (2), the flare stars do not show any concentration toward NGC 7000 or IC 5070. They are apparently distributed all over this region.

The results of more detailed investigations of the discovered flare stars, including the identification charts, will be published later on.

The authors thank Acad.V.A. Ambartsumian and Prof.L.V. Mirzoyan for advices and helpful discussion of the results of this paper.

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References:

(1) G.Herbig, 1958, Ap.J., 128, 259.
(2) G.Welin, 1973, Astron.Astrophys.Suppl., 9, 183.
(3) G.Welin, 1971, Astron.Astrophys., 12, 312.
(4) V.A.Ambartsumian, 1971, Astrofisika, 7, 557.
(5) G. Haro, E. Chavira, 1973, Bol.Inst.Tonantzintla, 1, 17.

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INFORMATION BULLETIN ON VARIABLE STARS
Number 910

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Budapest
1974 July 19

A SUSPECTED PERIOD INCREASE IN THE ECLIPSING BINARY RW Per

The purpose of this note is to draw attention to a possible period change that has occurred in the eclipsing binary RW Per. Spectroscopic observations of RW Per were made at the Dominion Astrophysical Observatory on March 19, 1974 with the hope of observing circumstellar emission lines during totality. According to the ephemeris of Woodward (Harvard Bull. 917,7,1943), as listed by Kordylewski (Rocznik Astronomiczny Observatorium Krakowskiego, 1973), mid-eclipse was predicted to occur at 04:12 UT March 19. Two spectrograms were obtained:

Plate Number	Time of mid-exposure (UT)	Exposure Time (min.)
76046	04:10	63^m
76047	05:39	113^m

On the first plate there was an A-type spectrum, with no evidence of any lines of the secondary, while on the second plate the prominent hydrogen lines were weaker, and metallic lines from the secondary component had begun to show up. From this spectroscopic evidence, it appears that the eclipse was 3 to 5 hours later than predicted.

Hall (Mass Loss From Stars, pp.171-83,1969) has listed all available times of primary minimum for RW Per. The corresponding (O-C) diagram, based on Woodward's ephemeris, reveals that the four most recent times of minima deviate systematically from the course of the earlier ones. These four times are listed below and are plotted in the following (O-C) diagram. The time of minimum estimated spectroscopically has also been included as a vertical bar in the diagram and it is apparent that it confirms the trend in the residuals.

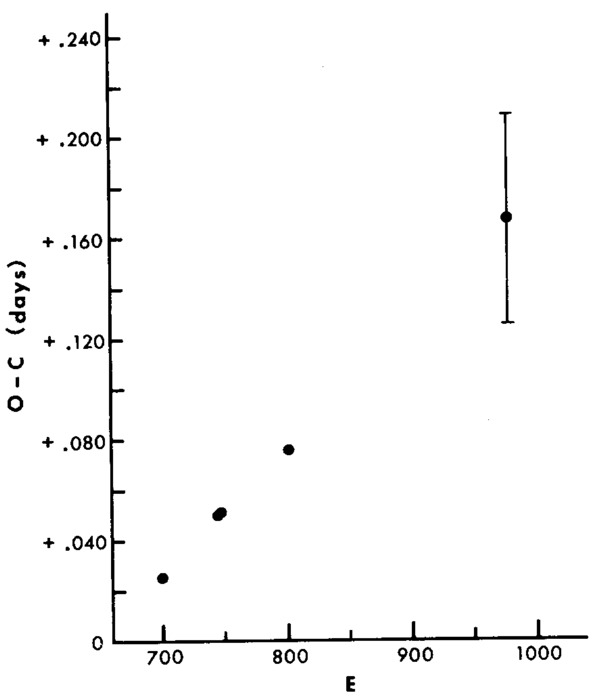
The following ephemeris is based on a least-squares fit to the four photometric times of minima:

$$T_{min} = \text{JD } 2429217.274 + 13^{d}.19894 \cdot E$$

Certainly this new ephemeris is only a provisional one, and times of minima are needed in the future in order to confirm it. If it proves to be correct, then it can be concluded that a period increase off magnitude $\Delta P/P \approx 4 \times 10^{-5}$ occurred at $E \approx +700$.

Recent times of Minima for RW Per

Heliocentric JD 2400000.+	Epoch	(O-C) days	Reference
38456.53	+700	+0.025	Kordylewski (IBVS No.46,1964)
39063.684	+746	+0.050	Hall(Mass Loss From Stars,171,1969)
39076.883	+747	+0.051	Hall(Mass Loss From Stars,171,1969)
39802.822	+802	+0.075	Hall(Mass Loss From Stars,171,1969)



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COMMISSION 27 OF THE I. A. U.
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Number 911

Konkoly Observatory
Budapest
1974 July 24

CSV 1855 = HENIZE 782

Lee (IBVS No. 813, 1973) has drawn attention to the suspected variable CSV 1855, listed by Wackerling (Mem.R.A.S. 73, 153, 1970) as the Be star Henize 782. Lee found emission lines of hydrogen (Hα - Hδ) and Fe II, and drew comparison with Merrill's iron star, XX Oph.

Photometry of Hen 782 at the near-infrared wavelengths of 1.25 μm (J), 1.65 μm (H), 2.2 μm (K) and 3.5 μm (L) was secured on 1974 May 3.82 with the 1-metre Elizabeth II telescope of the South African Astronomical Observatory; V was estimated at 12 at the time of the observation:

$K = 4.70 \pm .05$ $J-K = 2.32 \pm .07$ $H-K = 1.16 \pm .07$ $K-L = 1.39 \pm .08$

The infrared observations indicate the presence of circumstellar dust emission at a colour temperature of a little under 1300 $^{\circ}K$. The star provides most of the flux at J but under half that at H. Thus $V-J \sim 5$ magnitudes, a value appropriate to an unreddened M star or to an early-type star with $A_V \sim 6$.

140 Å/mm Carnegie image-tube plates of Hen 782 were taken on May 15 and 16 with the 1.9 metre Radcliffe telescope. The two spectrograms are very similar and show the following features:

Emission lines: The Balmer series is present as far as H_8. There are more than 40 lines of Fe II and, as is often the case, multiplet 42 is somewhat enhanced. Weak lines of He I may be present and there is marginal evidence for [Fe II] and [O I]. The emission lines are rather broad and there appears to be a weak violet component to Hγ displaced from the principal line by several hundred km/sec.

Absorption lines: Ca II (H and K), Na I (D lines, not resolved) and a few TiO bands characterise the absorption spectrum which resembles that of an M star. Higher resolution is necessary to accurately spectral type Hen 782 or to ascertain whether a velocity difference exists between the absorption and emission lines.

Hen 782 is unusual in combining a low-excitation (Be-type) emission-line spectrum, prominent late-type absorption features in the visible, and circumstellar dust radiation in the 2 μm region. To classify this star is difficult: it appears to be intermediate between the VV Cephei stars, which show no dust radiation, and the forbidden-line stars, for which the underlying visible spectrum is continuous.

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COMMISSION 27 OF THE I. A. U.
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Budapest
1974 July 25

THE PERIOD OF LR SAGITTARII

A recent discussion of LR Sgr by Vidal (1974) points out the need for more observations to establish the period. I have estimated the brightness on some 400 photographs obtained at the Maria Mitchell Observatory from 1957 to the present. A period of 275 days satisfies these observations as well as the early date of maximum JD 18885 published in the GCVS and the 1954-55 observations, near minimum, in the Lick Atlas. Maxima on the Nantucket plates occurred on or near the following Julian days: 36750, 37580, 37875, 40070, and 41450. These observations span 22 epochs while the early Innes maximum occurred 63 cycles earlier. Mean magnitude at maximum, according to the sequence for V 1017 Sgr by McLaughlin (1946) as revised by Vidal and Rodgers (1974) is about 13.8pg.

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References:

McLaughlin, Dean B. 1946, P.A.S.P., 86, 46.
Vidal, N.V. 1974, P.A.S.P. 86, 308.
Vidal, N.V. and Rodgers, A.W. 1974, P.A.S.P. 86, 26.

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Number 913

Konkoly Observatory
Budapest
1974 July 29

COOPERATIVE RADIO AND OPTICAL OBSERVATIONS OF CLOSE BINARY STARS

I am currently investigating radio emission from close binary stars. I am planning extensive observations using the NRAO Interferometer in the near future. This study could be greatly enhanced if simultaneous optical observations could be secured. The objects and dates of observation are as follows:

α Sco B	-	Aug 10 - 15
R Aqr	-	Aug 10 (Aug 11-15--tentative)
β Lyr	-	Sept 7 - 12
β Per (Algol)	-	Sept 7 - 12
HDE 226868(CygX-1)	-	Sept 12 - 23 (Aug 11-15--probable)
CC Cas	-	Sept 12 - 23

Additional observations of AR Lac and b Per are tentatively planned for late October. I will inform you of the exact dates when they become firm. Interested participants are requested to contact me for further details at the following address:

July 18, 1974

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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS

Number 914

Konkoly Observatory
Budapest
1974 August 5

POLARIMETRIC OBSERVATIONS OF R CORONAE BOREALIS STARS

In Table 1 are listed multicolor polarimetric observations of R Coronae Borealis obtained during a recent descent to light minimum. The filters used have been described in the literature (Coyne and Gehrels 1967, Coyne, Gehrels and Serkowski 1974) and for R CrB the effective wavelengths are as follows: U(0.37 mi-crons), B(0.44), G(0.52), O(0,66), R(0.85), I(0.97). The observations were obtained with the 152-cm Catalina and 225-cm Kitt Peak telescopes of the University of Arizona using a rotating half-wave plate polarimeter coupled to a Nova computer. The position angles, θ, are given in equatorial coordinates and differential magnitudes are given with respect to HD 147169 ($V=9^m_.06$, $U-B=+0^m_.03$, $B-V=+0^m_.42$).

Although we were not able to observe up to the time of visual light minimum, the variation of polarization and flux support the "discrete cloud" model proposed to explain our previous polarimetric observations which extended through a minimum of R CrB (Coyne and Shawl 1973). In particular within a period of 22 days (MJD 42089-42111) the ratio of the polarization in the Ultraviolet to that in the Blue changes from 1.1 to 1.4. This means, according to the model of Coyne and Shawl (1973) that in this short period of time there was a decrease by a factor of about 1.5 in the mean radius of the graphite particles causing the polarization. This could be due either to a growth of grains or to a local redistribution of existing grains in the circumstellar region of R CrB.

Scattered observations of various other R CrB stars are given in Table II. There appears to be nothing outstanding in the wavelength dependence of the polarization at the epochs observed. Infact, except for the rather steeper drop in the ultraviolet part of the polarization curve for SU Tau, the measured polarizations appear to be interstellar.

Table 1. Polarimetric Observations of R CrB

Date (MJD)	Filter	p (10^{-2})	e (10^{-4})	θ (deg)	Δm *
42089	U	4.04	17	10°	$2^m.04$
	B	3.71	5	-6	2.22
	O	1.58	11	179	0.73
	R	1.12	11	177	0.77
	I	0.77	23	174	0.71
42090	U	3.92	8	9	2.24
	B	3.35	5	179	2.66
	G	2.62	4	178	2.36
42095	B	5.08	7	10	2.64
	R	1.08	15	7	0.66
42101	U	5.43	21	11	2.27
	G	4.50	6	9	2.37
42102	R	1.26	19	6	0.69
	I	1.42	48	8	0.49
42107	U	5.69	13	9	2.72
	B	5.17	9	9	2.78
	G	3.28	11	8	2.19
	R	0.77	87	169	0.65
42111	U	5.80	34	8	2.90
	B	4.23	6	10	2.55
	G	2.43	10	10	2.10
	O	0.51	58	178	0.55
	R	0.23	29	170	0.35

* Δm = m(R CrB) - m(HD 147169).

Table II. Polarimetric Observations of Other R CrB Stars.

Star	Date (MJD)	Filter	p (10^{-2})	e (10^{-4})	θ (deg)
SU Tau	41576	U	1.20	14	168°
		B	1.81	6	162
		G	2.16	7	164
	41589	R	1.53	8	171
		I	1.62	13	174
XX Cam	41319	N	2.76	11	129
		U	2.63	5	130
		B	2.85	3	128
		G	2.91	5	127
	41587	O	2.78	7	128
		R	2.10	5	128
		I	1.76	8	131
Rho Cas	41319	O	1.43	2	55
		R	1.13	3	56
		I	0.96	4	56
	41614	U	1.26	3	54
		B	1.37	1	55
		G	1.43	1	54

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References:

Coyne, G. and Gerhels,T. 1967, Astron.J. 72, 887.
Coyne, G., Gehrels,T. and Serkowski,K. 1974,Astron.J.79, 565.
Coyne, G.,and Shawl,S. 1973, Astrophys.J.186, 961.

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Budapest
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MAXIMA OF RZ CEPHEI

During 1972-1973 photoelectric observations of the RRc star RZ Cephei were carried out at the Cluj Astronomical Observatory. The preliminary results are given.

The observations were made in V light with a 50 cm Newton reflector, a photometer employing an unrefrigerated 1P21 photomultiplier tube and a Corning 3384 filter.

The light curve shows a broad maximum with some fine structure, i.e., a pre-maximum hump which may be variable in shape.

Having in view the shape of the light curve during its maximum, Pogson's method was used in order to derive the time of maxima.

In order to have a general picture of the period variation we continued Geyer's (Z.f.Ap.44,98,1958) O-C diagram and for this purpose $(O-C)_1$'s were computed by using the linear elements

$$\text{Max.hel.} = \text{J.D. } 2410000.000 + 0^d.308668 \cdot E$$

Comparing our results with figure 2 of Geyer's paper we conclude that the period has been lengthening. For the last ten years we have derived the following elements

$$\text{Max.hel.} = \text{J.D. } 2441475.373 + 0^d.308686 \cdot E$$

which were used to compute the differences $O-C_2$.

The numbers of the observations used are given under n.

Max.hel. 2440000	n	E_1	O-C	E_2	$O-C_2$
1475.380	24	101970	$+0^d.504$	0	$+0^d.007$
1519.519	24	102113	.504	143	+ .004
1546.372	15	102200	.502	230	+ .001
1605.335	24	102391	.510	421	+ .005
1605.640	9	102392	.506	422	+ .002
1608.420	40	102401	.508	431	+ .003
1897.350	20	103337	.525	1367	+ .003
1902.286	13	103353	.522	1383	.000
1902.592	10	103354	.520	1384	- .002
1903.520	29	103357	.522	1387	.000
1904.445	30	103360	.521	1390	- .002
1907.530	22	103370	.519	1400	- .003
1942.410	41	103483	.519	1513	- .005
1963.402	40	103551	.522	1581	- .004
1975.439	19	103590	.521	1620	- .005
1984.396	30	103619	.527	1649	.000
1985.325	7	103622	.530	1652	+ .003
1991.190	14	103641	.530	1671	+ .003
1991.495	21	103642	.526	1672	- .001
2006.310	25	103690	.525	1720	- .003

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PHOTOELECTRIC OBSERVATIONS OF THE ECLIPSING BINARY IM AURIGAE

The star IM Aur was observed photoelectrically at the Fort Skała Observatory in Cracow during the autumn, 1969. The observations have been made at the 20 cm Grubb refractor using an FEU-17 phototube. The following comparison stars were used:

HD 33601 = BD +46°0979; V = $7^m.47$, B-V = $-0^m.16$, B8,
HD 34299 = BD +47°1126; V = 8.07, B-V = -0.18, A0,
HD 34380 = BD +44°1165; V = 8.27, B-V = 0.00, A0,
HD 34399 = BD +44°1167; V = 8.76, B-V = -0.23, A0,

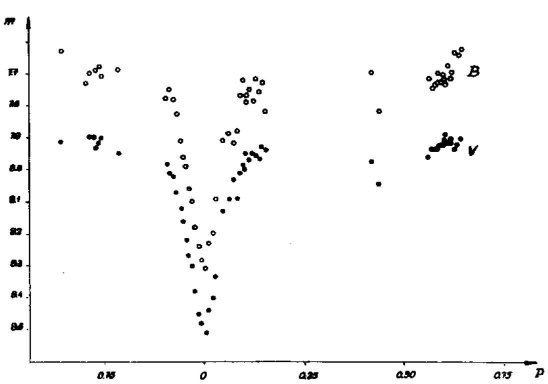
(systematic errors of the above values of V and B-V are probable).

The observations are listed in the Table and presented in the Figure. The heliocentric moments of minima were determined by the tracing-paper method of Kordylewski:

JD hel.	filter	lim.error	$(O-C)^I$	$(O-C)^{II}$
2440515.5463	B	$\pm 0^d.0008$	$-0^d.0431$	$-0^d.0002$
2440515.5468	V	±0.0006	-0.0426	+0.0003

The values $(O-C)^I$ were obtained by using the elements given by Margoni et al. (IBVS No. 131, 1966). Recent determination of the elements leads to new values of O-C, called as $(O-C)^{II}$. These elements follow from times of minima obtained photoelectrically by Kondo (A.J. 71, 51), Margoni et al. (IBVS No.131) and by the author:

Min I JD hel. = 2440515.5465 + $1^d.247296 \cdot E$.



Photoelectric Observations of IM Aurigae

JD hel. 2440000+	Phase	B	V	JD hel. 2440000+	Phase	B	V
481.6029	0.7863	$7^{m}.69$	7.95	515.6399	0.0749	$7^{m}.92$	$8^{m}.03$
514.4330	0.1073	7.79	7.95	.6489	0.0821	7.88	8.09
.4434	0.1156	7.75	7.97	.6575	0.0890	7.77	8.01
.4515	0.1221	7.79	7.95	.6659	0.0957	7.72	7.99
.4598	0.1288	7.72	7.96	.6725	0.1010	7.77	8.00
.4706	0.1374	7.76	7.97	516.4366	0.7136	7.73	7.90
.4818	0.1464	7.73	7.93	.4457	0.7209	7.70	7.90
.4926	0.1551	7.82	7.93	.4536	0.7273	7.69	7.93
515.4299	0.9065	7.78	7.98	.4616	0.7345	7.68	7.92
.4390	0.9138	7.75	8.01	.4722	0.7422	7.71	7.90
.4494	0.9222	7.78	8.02	542.4414	0.5626	7.72	7.96
.4588	0.9297	7.83	8.07	.4515	0.5707	7.75	7.94
.4755	0.9431	7.91	8.12	.4570	0.5751	7.74	7.94
.4823	0.9485	7.96	8.16	.4638	0.5805	7.73	7.94
.4920	0.9563	7.99	8.22	.4694	0.5850	7.70	7.93
.4987	0.9617	8.06	8.27	.4761	0.5904	7.73	7.93
.5080	0.9691	8.1	8.3	.4817	0.5949	7.71	7.93
.5282	0.9773	8.18	8.38	.4879	0.5999	7.72	7.91
.5303	0.9870	8.24	8.45	.4945	0.6051	7.74	7.90
.5390	0.9940	8.28	8.48	.5016	0.6108	7.68	7.92
.5521	0.0045	8.31	8.51	.5082	0.6161	7.72	7.92
.5637	0.0138	8.23	8.44	.5142	0.6209	7.70	7.91
.5736	0.0217	8.20	8.40	.5234	0.6268	7.64	7.94
.5824	0.0288	8.09	8.33	.5308	0.6343	7.65	7.93
.6223	0.0463	7.91	8.13	.5379	0.6399	7.63	7.91
.6311	0.0678	7.89	8.09	543.5095	0.4189	7.70	7.98
				.5345	0.4389	7.82	8.05

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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 917

Konkoly Observatory
Budapest
1974 August 15

MW PAVONIS

Tha variability of MW Pav (BV894 = HD 197070 = CoD-72°1636) was announced by O.J.Eggen (IBVS 308A,1968). W.Strohmeier (IBVS 308B, 1968) published a list of observed times of minima and obtained a period of $0\overset{d}{.}562979$. However, this period was found to be incompatible with minima observed by R.M.Williamon (IBVS 574,1971) who deduced P = $0\overset{d}{.}79499080$. In this note we present times of minimum derived from 390 photoelectric UBV observations made at the Bosque Alegre station of Cordoba Observatory with the 1.54m reflecting telescope. Individual minima are listed in Table I together with the older photographic ones from Strohmeier, Eggen and Knigge, and the photoelectric minima from Williamon. They were used to determine the following least square linear ephemeries:

$$\text{Min.I=JD hel } 2440862\overset{d}{.}6076 + 0\overset{d}{.}79498855\ E$$
$$\pm.0013 \qquad \pm.00000091$$

The W column in Table I gives the weights assigned to each observation. The residuals (O - C) are distributed at random for both minima; therefore, we infer that the secondary minimum is not displaced from phase Φ = 0.5 as pointed out by Williamon (c/f above).

The observations of the system will be completed in the next observing seasons; at present, they cover well the secondary minimum and the preceding maximum. The secondary minimum shows constant light during an interval of about 125 minutes, indicating it to be a total occultation. The differential light and color curves are shown in the Figure, the differences are given in the sense variable star -minus- comparison star (HD 197417).

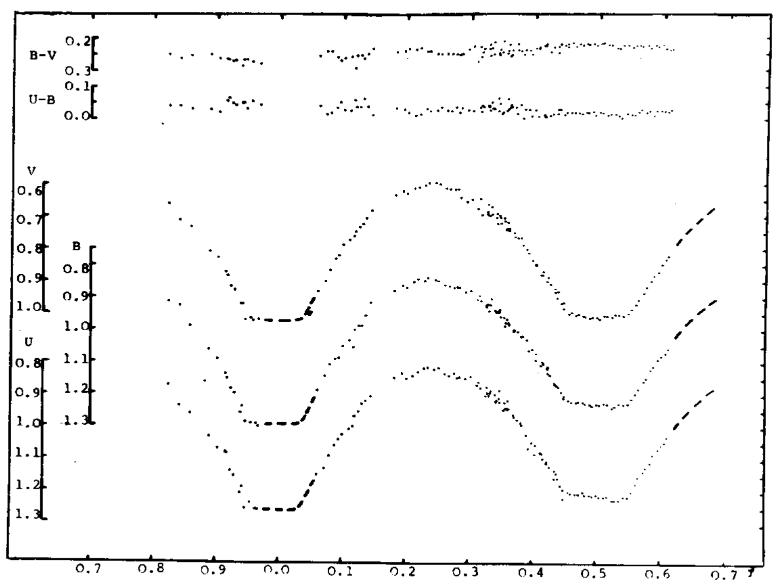
1974 August 1

EMILIO LAPASSET
Cordoba Observatory
Argentine.

Times of Minimum

JD hel.	E	W	(O - C)
243....			
8204.542 (S)	-3343.5	1	-0.021
8228.465	-3313.5	1	+0.052
8263.395	-3269.5	1	+0.002
8267.336	-3264.5	1	-0.031
8295.222	-3229.5	1	+0.030
8314.276	-3205.5	1	+0.004
8316.278	-3203.0	1	+0.019
8555.549	-2902.0	1	-0.002
8641.402	-2794.0	1	-0.008
8649.311	-2784.0	1	-0.048
8992.401	-2352.5	1	+0.004
8994.412	-2350.0	1	+0.028
9029.333	-2306.0	1	-0.031
9374.375	-1872.0	1	-0.014
9376.374	-1869.5	1	-0.002
9378.372	-1867.0	1	+0.008
9380.374	-1864.5	1	+0.023
9404.252	-1834.5	1	+0.051
9654.198	-1520.0	1	-0.027
9656.198	-1517.5	1	-0.014
244....			
0064.049	-1004.5	1	+0.007
0068.021 (S)	- 999.5	1	+0.004
0120.058 (E)	- 934.0	1	-0.030
0120.083	- 934.0	1	-0.005
0120.933	- 933.0	1	+0.050
0122.888	- 930.5	1	+0.017
0124.005	- 929.0	1	-0.058
0124.010	- 929.0	1	-0.053
0124.016	- 929.0	1	-0.047
0440.037 (K)	- 531.5	1	-0.034
0450.013	- 519.0	1	+0.004
0451.983	- 516.5	1	-0.013
0722.290	- 176.5	1	-0.002
0746.188	- 146.5	1	+0.046
0750.164 (K)	- 141.5	1	+0.047
0862.6111 (W)	0.0	2	+0.0035
0862.6080	0.0	2	+0.0004
0862.6100	0.0	2	+0.0024
0863.8065	1.5	2	+0.0064
0863.8084	1.5	2	+0.0083
0863.8065	1.5	2	+0.0064
0864.6035	2.5	2	+0.0084
0864.6043	2.5	2	+0.0092
0864.6015	2.5	2	+0.0064
0870.5585	10.0	2	+0.0010
0870.5584	10.0	2	+0.0009
0870.5615 (W)	10.0	2	+0.0040
1122.146 (K)	326.5	1	-0.025
1587.6352 (L)	912.0	2	-0.0020
1587.6335	912.0	2	-0.0037
1587.6347	912.0	2	-0.0025
1589.6261	914.5	2	+0.0015
1589.6265	914.5	2	+0.0019

JD hel. 243....	E	W	(O - C)
1589.6270	914.5	2	+0.0024
1592.8031	918.5	2	-0.0015
1592.8031	918.5	2	-0.0015
1592.8007	918.5	2	-0.0039
1606.7126	936.0	2	-0.0043
1606.7132 (L)	936.0	2	-0.0037
1606.7144 (L)	936.0	2	-0.0025



COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 918

Konkoly Observatory
Budapest
1974 August 21

ON THE VARIABILITY OF π PsA

π PsA was pointed out to be a Cepheid variable by Strohmeier et al. (IBVS 86, 1965), who assigned a period of $7^{d}.975$ and a small amplitude ($A_{pg}=0^{m}.3$). Kukarkin et al. (GCVS 1970) still quote these characteristics in the edition of the GCVS. Buscombe and Morris (MN 123, 183, 1961) found the star to be a single-lined spectroscopic binary with p = $356^{d}.567$, and Gliese's (Heid.Ver.22,1969) data read as follows:

$V= 5^{m}.10$, $B-V = + 0^{m}.29$, $(U-B)_{C} = + 1^{m}.56$
$\mu_{\alpha}= 0''.071$, $\mu_{\delta}= 0''.085$, $\pi = 0''.050 \pm 0''.010$ (p.e.)
Spectral type : FO IV - FO V (IBVS 680, 1972)

New observations by Bopp et al. (MN 147,355,1970) led to a revision in star's orbital period : $P = 178^{d}.3177 \pm 0^{d}.0038$ (p.e.) .The measured γ velocity was 6km/s. Gliese's proper motion data were retained, and for the parallax a value $\pi = 0''.044$ was given. These authors found systematic deviations of old radial velocity measures from the computed curve, which they suggest may indicate the presence of a third body in the system.

More recently, Petit (IBVS 680 and 695, 1972) argued against the Cepheid nature of the star by saying that it could hardly be a δ Cephei variable if the proper motion and luminosity class were to be confirmed. He has also mentioned the recent UBV observation by Corben et al. (MNASSA 31,7,1972), which agrees whith Gliese's data and led to $U - B = - 0^{m}.01$, thus confirming the above quoted $(U - B)_{C}$ value (see Cousins and Stoy, (RO Bull.64,1963), for the $(U-B) - (U-B)_{C}$ relation).

π PsA was included in a program of five-color photometry (Lick's UVBGR, ApJ 98,20,1943) of southern Cepheids performed during 1970 at the ITA Astronomical Observatory S. José dos Campos, Brazil. No variability has been detected within $0^{m}.02$ in light and color, and the UBV data has been confirmed (Astr.Aph. 1974, in press).

Our intention here is to throw some more light on the problem, and to call attention on some properties of this star which, we think deserves further examination.

From Bopp et al's parallax we deduce that the star is at a distance of 23 pc, which gives $M_V \simeq + 3^m.3 \pm 0^m.5$ assuming an error of $\pm$ 0".010 in π. In comparing its M_V, (B - V) and (U - B) values with the new standard data of Allen (Astr.Quant. 3rd ed.204 and 206, 1973) for main-sequence stars, we note that:

a) The (B - V) index and the absolute magnitude are typical for a FlV unevolved object.

b) The star has a (U - B) excess of about $0^m.06$.

π PsA figures in Lindeman and Hauck's (Astr.Aph.Suppl 11,119, 1973) uvbyβ catalogue with the following characteristics:

$b - y = 0^m.200$, $m_1 = 0^m.159$, $c_1 = 0^m.690$ and $\beta = 2^m.741$.

From these, some conclusions can be reached:

1) Its position in the $[m_1] - [c_1]$ diagram by Strömgren (Ann. Rev.Astr.Aph. 4,433,1966) is in good agreement with the assigned F0V spectral classification. The star lies near the ZAMS line in Crawford et al's (Astr.Aph.Suppl.5,109,1972) $(b - y) - c_1$ plot.

2) Its β, (b - y) and c_1 values are typical of A star, according to the calibration by Crawford (IAU Coll. "Stellar Rotation" 204,1970). The metallic line index m_1 indicates, however, metal-content deficiency relative to the Hyades stars ($\Delta m_1 = + 0^m.022$), confirming the (U - B) excess referred to above.

3) From Crawford's M_V (β) calibration one gets $M_V \simeq 2^m.7$ (rms= $=0^m.3$), which agrees statistically with the values calculated from parallax measures.

4) The iron-hydrogen ratio can be estimated from the $m_1 - [F_e/H]$ relation by Stromgren (In Vol 3.Ch.IX of Stars and Stellar Systems, 1963), for F-to-late G main sequence stars. For π PsA, one gets $[F_e/H] = 0.076$ (rms = 0.15). Thus, in terms of metal-content one can also verify that the star in far from having Cepheid characteristics.

If the star's variability is real (the only reference about it being that of Strohmeier et al.), the amplitude, absolute magnitude and colors would rather be suggestive of δ Scuti or AI Velorum "dwarf Cepheids" types. Baglin et al's (Astr.Aph.23,221,1973) data on these short-period variables can help to test the hypothesis. Some brief conclusions are reached:

- from the P - ΔC_1 relation one might expect for π PsA ($\Delta c_1 = 0^m.03$) a fundamental period of about $0^d.05$.

- it is near the instability strip in the M_V - (b-y) diagram, if we take $M_V = 2^m.7$, as suggested by uvbyβ data.

-its metallic line index m_1 is somewhat smaller than that expected for a main sequence δ Scuti object, as can be seen from the $m_1-(b-y)$ plot.
-the observed discrepancies by Bopp et al. in radial-velocity curves could be explained by beat phenomena and variations of amplitudes, frequently present in δ Scuti stars.

It seems, therefore, most probable that π PsA is not a classical Cepheid variable. New accurate observations are needed to check a possible small-amplitude variation (a few hundredths of magnitude, at most), to solve the differences in the M_V calculations and to determine the nature of the systematic discrepancies of radial velocity measurements mentioned by Bopp et al.

São Paulo, maio de 1974

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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 919

Konkoly Observatory
Budapest
1974 August 25

EPOCHS OF MINIMUM LIGHT, EZ HYDRAE

UBV observations of EZ Hydrae, BD $-13^{\circ}2854$, were obtained on a few nights in 1969 and 1970. The Johnson UBVRI photometer which contains an RCA 1P21 photomultiplier for use with the UBV filters was attached to the 5-ft B telescope formerly housed at the Catalina Site No. 2 of the University of Arizona, Tucson, and now at the National Observatory of Mexico in Baja California, Mexico.

An iterative process using the Hertzsprung (B.A.N. 4, 179, 1928) method yielded the epochs of minimum light listed in Table I. The O-C'-s were computed from an improved ephemeris

$$\text{JD Hel. Min. I} = 2440255.8482 + 0^{d}.44976658\ E$$
$$\pm 12 \qquad \pm 13$$

determined by introducing all available times of minimum light into a least squares solution.

Table I

JD Hel. 2440000+	Epoch	O - C
253.8256	-4.5	+0.0014
255.8477	0.0	-0.0005
269.7921	31.0	+0.0012
634.7745	842.5	-0.0020

An analysis of the observations will be published separately.

August 19, 1974

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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 920

Konkoly Observatory
Budapest
1974 August 31

RECOMMENDATION FOR THE FLARE STAR OBSERVERS

The international radio optical programme is planned for the nights of October 7/8 to October 20/21 inclusive. Continuous radio observations will be made at Jodrell Bank with the MK 1A coupled to the MK III radio telescope in an improved interferometric system. Observations will be made on three stars each night according to the following schedule:

Wolf 630		1630 U.T.
	to	2000 U.T.
UV Ceti		2100 U.T.
	to	0300 U.T.
AD Leo		0400 U.T.
	to	0900 U.T.

Optical observers interested in this field are asked to join in this co-operative programme.

P.F. CHUGAINOV
Crimean Astrophysical
Observatory

A.C.B. LOVELL
University of Manchester
Nuffield Radio Astronomy
Laboratories
Jodrell Bank

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 921

Konkoly Observatory
Budapest
1974 September 5

Veröffentlichungen der Remeis-Sternwarte Bamberg
Astronomisches Institut der Universität Erlangen-Nürnberg
Band X, Nr. 111
Rosemary Hill Observatory, University of Florida
Contribution No. 46

NEW SOUTHERN VARIABLE STARS

On sky patrol plates taken at the Southern Station of the University of Florida, Gainesville and the Remeis-Sternwarte, Bamberg, located at the Mount John Observatory, New Zealand, the 13 stars of the following list were found to be variable (10 new stars and 3 confirmations of stars in the Catalogue of Suspected Variables).

For the first time in 1973, simultaneous plates were taken in two colors on Kodak 103a-O (blue sensitive) and Kodak 103a-E (red sensitive). Thus estimates of color or spectral type can now be made, which aids in variable type identification.

The brightnesses of these stars were estimated by comparison with standard stars in the Harvard-Groningen Atlas, Selected Areas (1965, A. Brun and H. Vehrenberg). Red photographic magnitudes are marked with an asterisk (*).

Finding charts, 1° in declination, with south up, are also given.

BV-Nr.	RA (1900.0)	Dec. (1900.0)	Maximum Brightness pg	Ampl. pg	Remarks
BV 1609 Lep	= $5^h14^m50^s$	$-13^\circ56'.7$	12.0*	$4^m.0$×	1
	= CSV 544 =	Ross 351			
BV 1610 Lep	= $5^h18^m06^s$	$-13^\circ53'.6$	12.2*	0.6	2
BV 1611 Lep	= 5 19 40	-14 11.5	11.6*	0.5	3
BV 1612 Ori	= 5 19 45	-10 44.8	11.7	0.5	4
BV 1613 Lep	= 5 21 09	-14 28.9	11.6*	2.9	5
BV 1614 Ori	= 5 22 04	-09 18.7	11.5*	2.1	6
BV 1615 Lep	= 5 56 27	-12 12.1	13.4*	0.2	7
BV 1616 Lep	= 6 05 10	-13 05.9	11.6*	4.5×	8
	= CSV 717 =	Ross 354			
BV 1617 Mon	= $6^h18^m26^s$	$-10^\circ02'.3$	12.4	1.2	9
BV 1618 Mon	= 6 22 10	-10 11.7	13.6	1.1	10
BV 1619 CMa	= 6 43 12	-13 33.0	12.1	1.3	11
	= CSV 873 =	S 3773			
BV 1620 CMa	= $6^h44^m18^s$	$-16^\circ28'.3$	13.4	0.1	12
BV 1621 CMa	= BD-16°1860 ($8^m.0$) =	HD 56429 (A0)		0.6	13

×Amplitude until plate limit ($15^m.5$)

Remarks:

1) BV 1609 is a long period variable with the following maxima:

JD 243 9054.521	JD 243 9083.476	JD 244 0589.336
9059.510	9768.578	0590.336
9060.506	9769.588	0591.335
9082.466	244 0585.343	1980.134

2) BV 1610 is an Algol-type eclipsing binary with a small color difference - probably an early F star. The following minima were found.

JD 243 9054.521	JD 244 2035.969
9060.507	2038.960

3) Much structure is evident in the light curve of BV 1611, with many more minima that maxima. Although much past information exists for this star, efforts failed to yield a period.

4) BV 1612 had small amplitude variation in 1973 ($0^{\mathrm{m}}.2-0^{\mathrm{m}}.5$). It was at least 3^{m} fainter in 1965 (below the plate limit). It reappeared faintly in October 1966 with more small amplitude variation.

5) BV 1613 is probably a Mira type variable, whose minima are below the plate limit on blue plates. Efforts failed to yield a period.

6) BV 1614 shows many more minima than maxima.

7) BV 1615 is a late type eclipsing binary which is below the plate limit in the blue at minimum.

8) BV 1616 is an eclipsing binary with a long period probable.

9) BV 1617 is prominent on the red plates, but just above the plate limit on the blue plates.

10) BV 1618 is a late type eclipsing binary.

11) BV 1619 is an RR-Lyrae type variable, whose preliminary ephemeris can be given by Max = JD 243 8739.506 + $0^{\mathrm{d}}.452239$
± 0.000007

The following maxima were found:

Maximum	E	O-C	Maximum	E	O-C
JD 243 8739.506	0	$0^{\mathrm{d}}.000$	JD 243 9118.455	838	$-0^{\mathrm{d}}.028$
8759.432	44	0.027	9139.378	884	0.093
8768.403	64	-0.046	9167.324	946	-0.001
8797.329	128	-0.064	9181.285	977	-0.059
8798.322	130	0.026	9444.539	1559	-0.009
8812.271	161	-0.046	9450.515	1572	0.089
8813.271	163	0.050	244 0566.508	4040	-0.047
8817.269	172	-0.023	0685.015	4302	-0.027
8818.268	174	0.072	0709.951	4357	0.037
8822.266	183	0.000	2039.047	7296	0.000

No other periods between $0^{\mathrm{d}}.3$ and $53^{\mathrm{d}}.6$ were found.

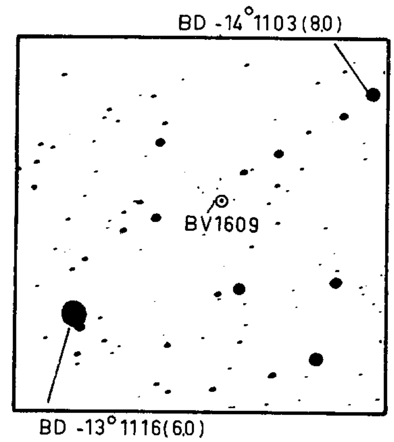
12) BV 1620 is just east of a star of similar brightness which makes a good comparison star. The variable was much fainter in 1965 until regaining the 1973 level in November 1966. Small amplitude variations are superimposed on this long term variation.

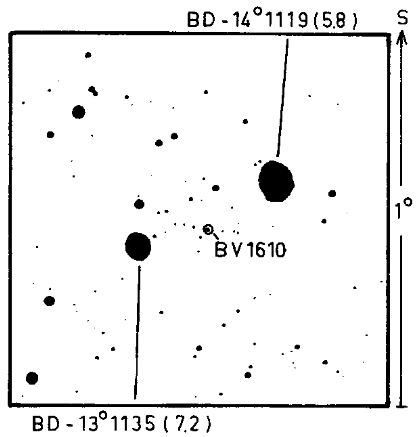
13) BV 1621 is probably an eclipsing system with only two minima observed, JD 243 8814.270; JD 244 2038.045.

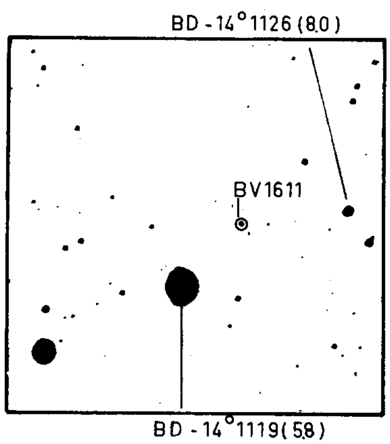
Bamberg, August, 1974

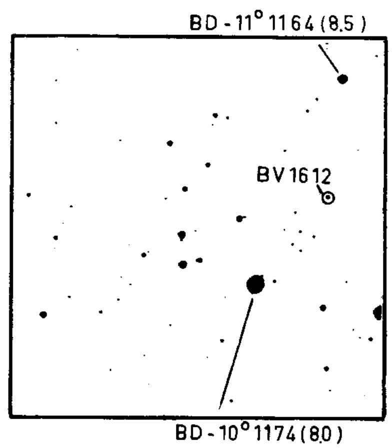
N.L. MARKWORTH

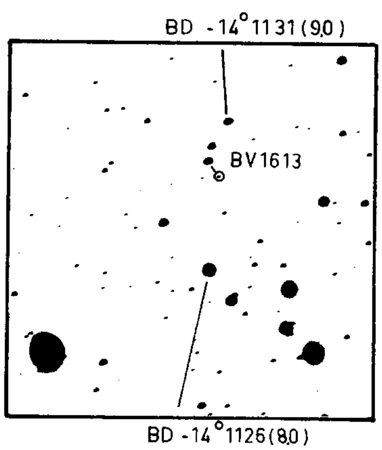
Remeis-Sternwarte Bamberg
and University of Florida
Gainesville

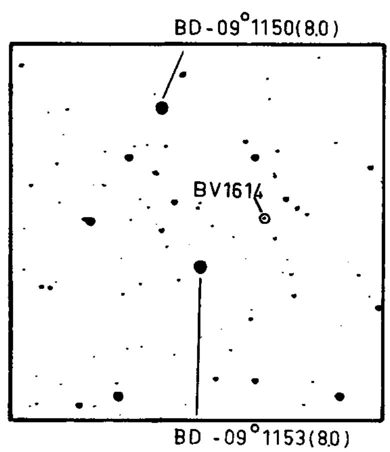

BD -14°1103 (8.0)
BV1609
BD -13°1116 (6.0)

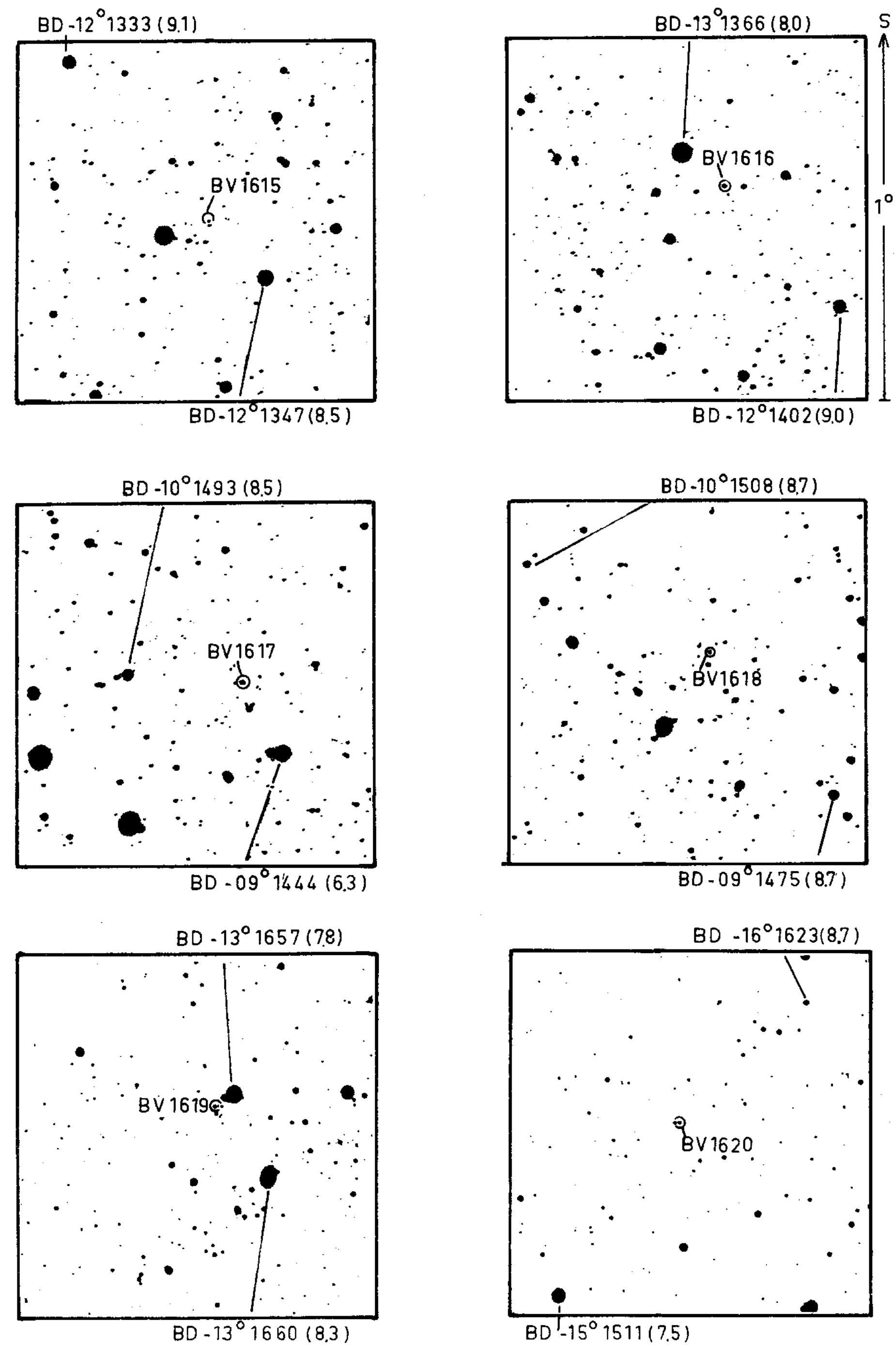

BD -14°1119 (5.8)
BV1610
BD -13°1135 (7.2)
S
1°


BD -14°1126 (8.0)
BV1611
BD -14°1119 (5.8)


BD -11°1164 (8.5)
BV1612
BD -10°1174 (8.0)


BD -14°1131 (9.0)
BV1613
BD -14°1126 (8.0)


BD -09°1150 (8.0)
BV1614
BD -09°1153 (8.0)


BD -12°1333 (9,1)
BV 1615
BD-12°1347 (8,5)
BD-13°1366 (8,0)
BV 1616
S
1°
BD-12°1402 (9,0)
BD -10°1493 (8,5)
BV 1617
BD -09°1444 (6,3)
BD-10°1508 (8,7)
BV 1618
BD-09°1475 (8,7)
BD -13°1657 (7,8)
BV 1619
BD -13°1660 (8,3)
BD -16°1623 (8,7)
BV 1620
BD -15°1511 (7,5)

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 922

Konkoly Observatory
Budapest
1974 September 6

EPOCHS OF MINIMUM LIGHT, AK HERCULIS

R and I light curves of AK Herculis, a W Ursae Majoris system which undergoes complete eclipses, with secondary minimum being total, were observed photoelectrically in 1969. The Johnson UBVRI dual channel photometer, housing an RCA 7102 photomultiplier for use with the R and I filters, was attached to the 28-inch telescope of the Catalina Observatory of the University of Arizona. Two primary and three secondary eclipse curves are defined by the observations. The Hertzsprung (B.A.N. 4, 179, 1928) method was used to determine the epochs of minimum light listed in Table I; and the O-C's (I) and (II) were computed from the ephemerides given by Woodward (Harvard Obs. Circ. No. 446, 11, 1942) and Bookmyer (P.A.S.P. 84, 566, 1972), respectively.

TABLE I

JD Hel. 2440300+	Min.	O-C(I)	O-C(II)
87.8211	I	+0.0195	-0.0012
94.7765	II	+0.0198	-0.0010
95.8297	I	+0.0192	-0.0016
97.7275	II	+0.0202	-0.0007
99.8341	II	+0.0191	-0.0017

The light curves and an analysis of the observations will be published separately.

Michael Prost assisted with the observations.

August 26, 1974

BEVERLY B. BOOKMYER

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COMMISSION 27 OF THE I. A. U.
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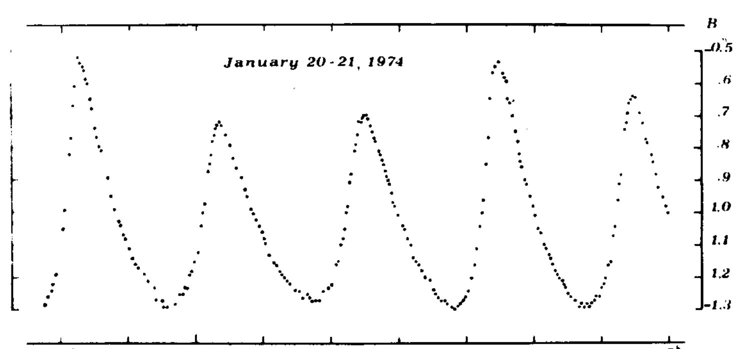
Number 923

Konkoly Observatory
Budapest
1974 September 7

ON THE BEAT PERIOD OF AE UMa*

AE Ursae Majoris has been found recently by V.P. Tsessevich (1) to be a dwarf Cepheid variable. Tsessevich noted also that the light curve varies strongly.

Some hundreds B and V photoelectric measures obtained at the Merate Observatory during the first months of 1974 give evidence of a beat phenomenon in the light curves. A nine hours observing run is reported in the figure. It appeared evident there was a remarkable variation in the light maxima, which can reach two tenths of magnitude from one maximum to the next. A preliminary analysis of our observations confirms the fundamental period given by Tsessevich: $P_o = 0^d.087017$ and displays a beat phenomenon whose period is approximately: $P_b = 0^d.294$.



P. BROGLIA, P. CONCONI

Merate August 26, 1974.

(1) Tsessevich V.P., 1973, Astron. Circ. 775.

* S. also B. Szeidl, IBVS 903, 1974.

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 924

Konkoly Observatory
Budapest
1974 September 14

OBSERVATIONS OF THE CARBON STAR V493 MONOCEROTIS

The object V493 Mon (Maffei 1966) has recently been identified as an extremely red | (B-V) > 6.0 | carbon star (Kalinowski, Burkhead and Honeycutt 1974). The possibility exists that V493 Mon, located approximately 2.5 minutes of arc from the center of the old open cluster Trumpler 5 Kalinowski 1975 , is a highly evolved, low mass cluster member ($M < 1.4\ M_{\odot}$). Observations which would aid in determing the star's variability class may help settle the question of cluster membership.

A program to monitor V493 Mon's variability photoelectrically in V, R and I will begin this fall at Indiana University. Supplementary observations by other interested observers would be appreciated. The star's coordinates are $\alpha = 6^{h}35^{m}10^{s}.2$, $\delta = +9^{\circ}26'56''$ (1975.0). Previous photoelectric measures, in March, 1974, yielded V = 13.6, V-R = 3.8, and V-I = 5.6. Sparse (and preliminary) photographic data reveal a variation in V between 13.5 and 14.8.

Interested participants are requested to contact me, relating the specifics of their observations, at the address given below. I can supply a limited number of finding charts to observers planning programs. The field around V493 Mon is very crowded (contamination on small scale plates prevented Maffei from discerning the star's highly unusual nature) and investigators are cautioned that the previously published declination (Epoch 1900.0) for the star is in error by approximately 2 minutes of arc.

September 3, 1974

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References:

Kalinowski, J.K., Burkhead, M.S. and Honeycutt, R.K. 1974, Ap.J. Letters , 193, in press.
Kalinowski, J.K., 1975, Ph.D. Thesis, Indiana University, in preparation.
Maffei, P. 1966, Memorie della Societa Astronomica Italiana, 37, 475.

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 925

Konkoly Observatory
Budapest
1974 September 19

VARIABLE STARS AMONG THE FOUR-COLOUR (uvby) STANDARD STARS

From 1971 to 1973 four-colour (uvby) observations were made in the southern sky by Mr. Bent Grønbech, Dr. Bengt Strömgren and the author with a four-channel spectrograph-photometer attached to the Danish 50 cm reflector on Cerro La Silla (ESO), Chile. Among the 133 four-colour standards (Crawford and Barnes, 1970) measured regularly, five were noted as being variable. Of these, HR 2707 and 7152 were previously known (V571 Mon and ε CrA), while HR 373 and 3084 do not appear in the General Catalogue of Variable Stars (GCVS, 3.ed) and HR 4133 appears in the Special Supplement to GCVS (1972) as a suspected variable. However, HR 373 has been noted as variable by Cousins (1962), who found a range of $0^m.12$ in V from five observations.

Table 1

	HR 373	HR 3084	HR 4133
V	$5^m.407$	$4^m.500$	$3^m.860$
scatter	$0^m.051$	$0^m.016$	$0^m.015$
weight	55.5	82.0	32.0
no.of nights	24	41	16

The y observations have been transformed to the standard V magnitudes of the UBV system. In Table 1 the mean V magnitudes are given; the weight is the number of observations, some of them having only half weight. The internal r.m.s. error of one V value determined from 7094 standard star observations is $0^m.008$ (including HR 2707, 3084 and 4133, but excluding HR 373 and 7152).

The spectral type of HR 373 is gG5, and the star is probably a yellow semi-regular variable (SRd). If this is true, it must be one of the brightest members of its class since only o^1 Cen and V441 Her (89 Her) are brighter. The amplitude is probably not very much larger than $0^m.2$ and the star may resemble IS Gem and VW Dra (HR 2512 and 6448) with respect to amplitude, period and spectral type. It shows no variation in b-y or m_1 but the scatter in c_1 is 0.014 while the r.m.s. error of one c_1 value computed from the standard star observations is $0^m.005$.

HR 3084 is a spectroscopic binary with variable radial velocity, spectral type B3V (Catalogue of Bright Stars) or B3IV (Cousins and Stoy, 1963). The variations have an amplitude of about $0\overset{m}{.}07$ and could be due to pulsations (β Canis Majoris type variable) or to ellipsoidal variations. The four-colour indices show no variations.

HR 4133 is an early type supergiant (B1Ib) and the variations have an amplitude of about $0\overset{m}{.}07$. They are possibly intrinsic, due to pulsations (Abt, 1957). The four-colour indices ahow no variations.

1974, September 5.

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References:

Abt, H.A. 1957, Ap.J. 126, 138.
Cousins, A.W.J. 1962, MNASSA 21, 20.
Cousins, A.W.J. and Stoy, R.H. 1963, Roy.Obs.Bull. No.64.
Crawford, D.L. and Barnes, J.V. 1970,A.J. 75, 978.

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INFORMATION BULLETIN ON VARIABLE STARS
Number 926

Konkoly Observatory
Budapest
1974 September 27

FLARE STARS IN THE OBSCURING CLOUDS OF OPHIUCHUS AND SCORPIUS

From the 31st of March to the 24th of May of this year, 36 ultraviolet multiple exposure plates were obtained using our Tonantzintla Schmidt camera and centering at $\alpha = 16^h23^m$ and $\delta = -24°20'$, covering about 20 square degrees. In most cases 6 different consecutive exposures of 10 or 15 minutes each were made, with a time interval of less than one second between exposures. There were 210 different exposures with a total time of effective observation of 43^h5^m.

The field covered during our present search coincides with the region in Ophiuchus and Scorpius in which Struve and Rudkjobing (ApJ 109, 92 1949) and Haro (Astr.J. 54, 188 1949) found 23 H α emission objects. By the way, it has been proven that the great majority, if not all, of these emission stars are of the T Tauri type. In particular the Struve et al. object N°24, described as "(underexposed) a double star", in which they did not detect emission lines corresponds to the Haro H α emission star N°7 and shows a very red and small cometary nebula. It seems that both the H α emission and the red cometary nebula are mainly related to southern component of this double star.

Table 1

Flare Stars in Ophiuchus and Scorpius

Tonantzintla Number	R.A. (1900)	Dec. (1900)	Mag. in U at Minimum	Δ m U	Date of Flare-Up
1	$16^h17^m.9$	$-25°44'$	>18.5	>4.7	23-V-1974
2	16 19 2	-26 09	>18.0	>3.5	22-V-1974
3	16 20 0	-24 43	15.8	2.0	23-V-1974
4	16 22 3	-25 00	18.0	3.0	26-IV-1974

Table 1 gives the data for the 4 flare stars found. The brightest flare star, during minimum, is N°3 and it is located in a rather obscure area in **Ophiuchus.** Flare stars Nos. 1, 2 and 4 lie in Scorpius. The coordinates and magnitudes are approximate. Identification charts for these 4 flare stars and the reproduction of the outburst photographs will be published later.

September 12, 1974.

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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 927

Konkoly Observatory
Budapest
1974 September 30

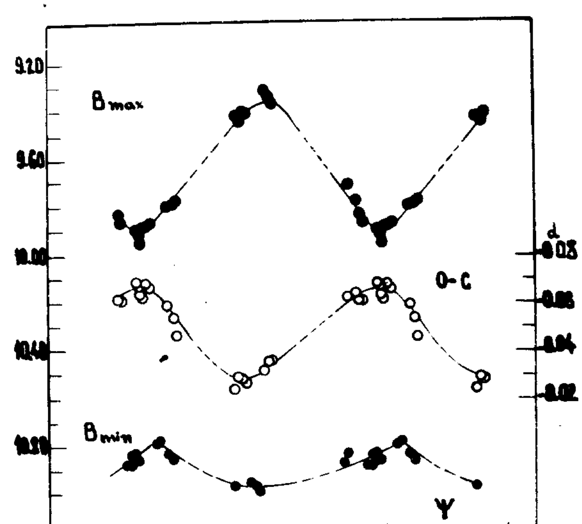
PHOTOELECTRIC UBV OBSERVATIONS OF THE RR LYRAE-TYPE VARIABLE XZ CYG

The variable XZ Cyg has been observed photoelectrically at the Odessa Observatory near Majaky (USSR) with the 22-inch reflector, during the period from August 7 to October 16, 1972.

Max.hel.	O-C	Max.hel.	O-C	Max.hel.	O-C
2441...					
537,3312	$-0\overset{d}{,}0608$	564,4249	-0,0239	573,2764	-0,0358
541,5233	-0.0672	565,3529	-0.0289	591,4432	-0,0623
543,3882	-0,0682	566,2864	-0,0284	593,3077	-0,0639
544,3236	-0,0658	567,2214	-0,0264	594,2432	-0,0614
548,5291	-0,0588	571,4141	-0,0322	598,4346	-0,0685
550,4078	-0,0461	572,3438	-0,0355	599,3725	-0,0636
				607,3132	-0,0533

The table shows the moments of the nineteen maxima obtained in B and the corresponding O-C's. The data for O-C were calculated with the elements:

$$\text{Max.hel.} = 2440445{,}789 + 0\overset{d}{,}466497 \cdot E:$$



The figure shows the change of the B magnitudes at maxima and minima and the corresponding O-C values versus the phase Ψ of the secondary cycle. The phase Ψ was calculated with the help of the elements:

$$\text{Max. A. J.D.} = 2441571{,}50 + 57\overset{d}{,}52 \cdot N$$

wich we have found for our observing season.

The B-max curve is displaced with respect to the O-C curve by 0,12 of the secondary cycle.

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INFORMATION BULLETIN ON VARIABLE STARS

Number 928

Konkoly Observatory
Budapest
1974 October 2

IS 88 HER AN ECLIPSING VARIABLE ?

Recently P. Harmanec, P. Koubský and J. Krpata (Astr.Astroph. 33, 117. 1974) confirmed the 87-day period of 88 Her (=HD 162732) as a spectroscopic binary. In their paper two possible models of the system were mentioned, one having an inclination of i = 90°. Then eclipses could be expected at phases 0.29 and 0.80.

Since I have observed 88 Her several times on a photometric program of shell stars (H. Haupt and A. Schroll, Astr. Astroph. Suppl. 15, 34. 1974) I will give the details here:

Approx. date of observation		V	B-V	U-B	Phase
1968 Feb 8.0 UT	JD 2439894^d.5	6^m.69	-0^m.07	-0^m.40	0.967
1969 Aug 14.0	2440447.5	6.68	-0.10	-0.47	0.353
1969 Aug 20.0	2440453.5	6.65	-0.11	-0.46	0.423

At these times the star was certainly outside eclipse and showed a constant brightness and color. Another color determination is from D.L. Crawford (ApJ 137, 530. 1963) who gives B-V = -0^m.15 and U-B = 0^m.39. Old measurements of the Potsdam Durchmusterung give -- after reduction to the V-system: V = 6^m.64 (mean of two values).

Using the velocity curve of Harmanec et al (1974) I have computed the dates ($\pm$ 3^d) of possible eclipses in the near future:

1974	Oct	26.5	Dec	9.7
1975	Jan	21.1	Mar	6.3
	Apr	17.7	May	31.9
	July	13.3	Aug	26.5
	Oct	7.9	Nov	21.1

They should be looked for.

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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
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Konkoly Observatory
Budapest
1974 October 4

THE ORBITAL PERIOD OF RR PICTORIS

The first photoelectric observations of the exnova RR Pic have been obtained by van Houten (1966, BAN 18, 439) revealing a "Cepheid-like" variation with a period near 3.5 hours. Mumford (1971,ApJ 165, 369) confirmed van Houten's period but he was not able to improve it due to the unknown cycle difference between the two epochs. New photoelectric observations with the 1m telescope of the European Southern Observatory (La Silla, Chile) in Dec. 1972 (UBV) and in Jan.1974 (high speed mode, white light) confirm the variations reported above and render possible the determination of a unique cycle relation between all available observations. The resulting elements for the light maximum of RR Pic are

$$\text{HJD (Max)} = \underset{\pm 3}{2438815.379} + \underset{\pm 2}{0.1450255} \cdot E \quad \text{(m.e.)}$$

with a mean O-C of $0^d.006$ for a single observation of a maximum. There is no indication for systematic deviation among the observing epochs or for a changing period. The mean amplitude of the lightcurve was $0^m.23$ but the periodic variation was always superimposed on erratic variations up to $0^m.1$ on a time scale of a few minutes. - A more detailed discussion of the observations of RR Pic will be published elsewhere.

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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
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Konkoly Observatory
Budapest
1974 October 4

THREE PHOTO-ELECTRIC MINIMA OF THE ECLIPSING VARIABLE RZ Cas

Three photo-electric minima have been obtained photo-electrically at the Leiden Observatory of the eclipsing variable star RZ Cas.This star shows a variability in its period. The observations were made in the nights of December 23/24, 1962, February 28/March 1, 1963 and July 31/August 1, 1963, in yellow light with the 45-cm Zunderman reflector. A yellow filter Corning 3384 was used, with an effective wavelength of 5390 Å. The comparison star was BD +69° 180.The magnitude differences were derived in three decimals. The time was measured in seconds and has been computed in five decimals of a Heliocentric Julian Day. The time of minimum and its mean error were computed with the method of Hertzsprung,as revised and described by Kwee and Van Woerden (BAN 12, 327, 1956). The resulting epochs are:

J.D. Hel.	2438022.49446	± .00006 m.e.
	2438089.42796	± .00017 m.e.
	2438242.41899	± .00020 m.e.

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INFORMATION BULLETIN ON VARIABLE STARS
Number 931

Konkoly Observatory
Budapest
1974 October 7

PHOTOELECTRIC MINIMA OF ECLIPSING VARIABLES

In the next table 11 photoelectric minima of eclipsing binaries are given. The observations were carried out using the 50 cm telescope of Bucharest Observatory. (O-C)-s are computed utilizing the elements given in Rocznic Astronomiczny 1974.

Min. Hel.	E	O-C	Observer
TX Her			
2441491,4223	3314	$+0^d,0026$	M.Ganea
RX Her			
2442222,4427	5533,5	$+0^d,0044$	R.Dinescu
V566 Oph			
2442225,4170	17039	$+0^d,0166$	R.Dinescu
2442230,3329	17051	$+0^d,0174$	H.Minţi
*DR Vul			
2442253,2696	1142,5	$+0^d,0802$	A.Dumitrescu
AI Dra			
2442253,4483	3928	$+0^d,0058$	A.Dumitrescu
AB And			
2442258,3792	18526,5	$+0^d,0044$	H. Minţi
2442258,5451	18527	$+0^d,0037$	H. Minţi
265,3490	18547,5	+0,0034	H. Minţi
300,3636	18654	+0,0046	H. Minţi
300,5295	18654,5	+0,0040	H. Minţi

* For this star we used the elements from SAC 1973. We think that the moment of minimum for the star given in SAC 1974 is erroneous.

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COMMISSION 27 OF THE I. A. U.
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Konkoly Observatory
Budapest
1974 October 14

PHOTOELECTRIC MONITORING OF THE FLARE STAR AD Leo

The results of photoelectric observations of the flare star AD Leo, made through a standard B filter, are presented. Two flares were detected during photoelectric monitoring of the star over a total of 32^h35^m, spread over 14 nights during period 20 Nov 1973-26 April 1974. The records of effective coverage are given in Table I. The details of the characteristics of the flare events are given in Table II. The flare characteristics of AD Leo were computed using the same techniques and procedure as those employed earlier by Kapoor, Sanwal, Sinvhal (1973, I.B.V.S. No.810). For energy calculations the quiescent state luminosity of the star was taken to be 8.2×10^{29} ergs sec^{-1} $100A^{-1}$ in the B filter with reference to Oke and Schild's (1970, Astrophys.J. 161, 1015) calibration of αLyr.

The light curves of the flares are shown in Figs 1 and 2. Both light curves are combinations of spike and slow flares as characterized by Moffett (1974, Sky and Telescope, 48, 94). One can see that before a flare starts, the brightness of the star undergoes dimming, as it often happens in most of the flares, of UV Ceti type. The declining branch of the flare in Fig. 1 could not be covered up to pre-flare brightness of the star. The flares correspond nearly to type II flares (Oskanyan, 1969, Non-Periodic Phenomena in Variable Stars Ed. L. Detre, Academic Press, Budapest, p.131).

The author is thankful to Dr.S.D. Sinvhal for suggestions and guidance. Part of this work was carried out with financial assistance with PL 480 funds under Smithsonian Institution. Project No SFG-0-6425.

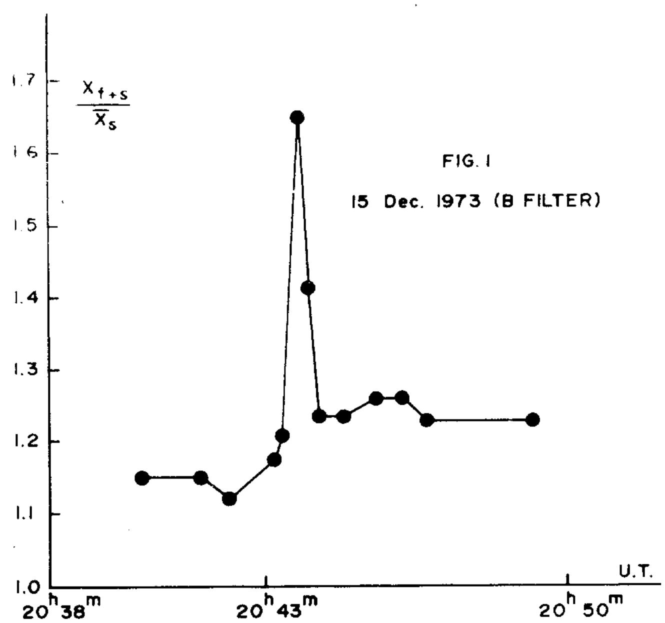

FIG. 1

15 Dec. 1973 (B FILTER)

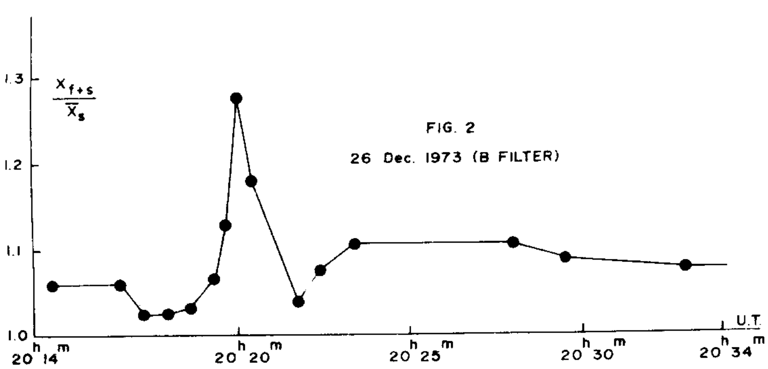

FIG. 2

26 Dec. 1973 (B FILTER)

Table I

Coverage of AD Leo

Date 1973	Telescope	(Times rounded off to nearest minute of UT)		
20 Nov.	52 cm	19^h58^m-20^h00^m	20^h04^m- 08^m	20^h09^m- 11^m
		20 12 - 18	20 20 - 32	20 33 - 46
		20 48 - 21 00	21 01 - 11	21 12 - 15
		21 19 - 21	21 23 - 25	21 27 - 29
		21 30 - 33	21 35 - 40	21 44 - 50
		21 57 - 22 01	22 02 - 04	22 06 - 09
		22 10 - 12	22 13 - 17	22 20 - 22
13 Dec.	56 cm	19 15 - 32	19 34 - 41	19 45 - 55
		19 57 - 20 00	20 01 - 02	20 03 - 11
		20 12 - 15	20 16 - 19	20 20 - 27
		21 09 - 17	21 18 - 34	
14 Dec.	56 cm	18 34 - 39	18 41 - 47	18 48 - 52
		18 53 - 19 01	19 04 - 24	19 25 - 32
		19 53 - 20 00	20 01 - 04	20 05 - 12
		20 12 - 32	20 54 - 21 17	-
15 Dec.	56 cm	18 04 - 09	18 12 - 14	18 15 - 20
		18 21 - 25	18 30 - 36	18 41 - 54
		18 55 - 57	19 02 - 08	19 09 - 22
		19 24 - 30	19 45 - 20 06	20 15 - 39
		20 40 - 42	20 43 - 48	20 49 - 52
		21 00 - 04	-	-
25 Dec.	56 cm	18 05 - 10	18 11 - 15	18 16 - 19
		18 21 - 30	18 33 - 45	19 25 - 52
		19 53 - 20 01	20 02 - 15	20 16 - 29
26 Dec.	56 cm	17 05 - 09	17 11 - 22	17 24 - 33
		17 34 - 41	17 42 - 45	17 53 - 57
		17 58 - 18 10	18 12 - 25	18 27 - 42
		18 43 - 45	18 46 - 51	18 52 - 57
		19 00 - 11	19 12 - 17	19 20 - 45
		19 46 - 51	19 52 - 55	19 56 - 20 00
		20 01 - 10	20 11 - 22	20 23 - 38
		20 40 - 50	20 51 - 21 03	21 04 - 22
27 Dec.	56 cm	16 50 - 54	16 55 - 57	17 02 - 03
		17 04 - 08	17 09 - 15	17 16 - 22
		17 23 - 30	17 32 - 18 03	18 04 - 08
		18 20 - 41	18 42 - 46	18 47 - 59
		19 06 - 17	19 22 - 42	19 43 - 50
		19 50 - 20 06	20 07 - 09	20 21 - 31
		20 33 - 40	20 41 - 43	20 45 - 49
		20 49 - 21 02		
21 Jan.1974	52 cm	19 12 - 21	19 32 - 44	20 19 - 23
24 Jan.	52 cm	15 32 - 40	15 47 - 16 09	16 21 - 39
		16 59 - 17 14	17 15 - 18	17 23 - 33
		17 34 - 41	17 42 - 18 20	18 24 - 41
		18 46 - 58		
31 Jan.	52 cm	15 31 - 37	15 48 - 16 00	16 01 - 09
		16 10 - 12	16 13 - 15	16 16 - 29
		16 30 - 45	16 46 - 52	16 54 - 17 42
		17 50 - 59	18 47 - 19 13	19 14 - 33
		19 34 - 39	19 41 - 20 07	20 08 - 30
		20 31 - 35		

Table I (continued)

Date 1974	Telescope	(Times rounded off to nearest minute of UT)		
10 Apr.	56 cm	16^h18^m - 20^m	16^h22^m - 28^m	16^h29^m - 40^m
		16 42 - 46	16 47 - 53	18 02 - 20
		18 22 - 46	18 47 - 19 07	19 08 - 26
		19 27 - 30	19 31 - 44	19 45 - 50
		19 51 - 58	19 59 - 20 26	
11 Apr.	56 cm	16 01 - 08	16 09 - 22	16 26 - 56
		16 57 - 17 12	17 13 - 18	
12 Apr.	56 cm	15 37 - 58	15 59 - 16 19	16 21 - 55
		16 57 - 17 15	17 18 - 25	17 33 - 18 14
		18 15 - 43	18 44 - 52	18 59 - 19 14
		19 15 - 33	19 38 - 50	19 55 - 20 18
		20 19 - 31		
26 Apr.	56 cm	17 13 - 30	17 31 - 44	17 45 - 18 02
		18 03 - 13	18 15 - 18	18 29 - 42
		18 44 - 58	18 59 - 19 14	19 15 - 23
		19 24 - 35	19 37 - 44	

Note: 1. The flare intervals have been underlined.

2. Total coverage: 32^h35^m spread over 14 nights.

3. Photomultiplier used: 1P21, unrefrigerated.

Table II

Characteristics of the Flares on AD Leo

(dM4e : $V=9^m.43$; $U-V=2^m.61$)

Date 1973	UT max	Flare duration before max tb	after max ta	$\frac{X_{fm+s}}{\bar{X}_s}$	Δm	$\frac{\sigma}{X_s}$	P (min)	F(z)	Energy released at flare max (10^{29} ergs/s)	Total emission during the flare up (10^{30} ergs/s)
15 Dec.	$20^h20^m03^s$	2.2	3	1.651	.544	.031	0.32	1.254	7.58	8.82
26 Dec.	20 43 44	3.4	13	1.276	.265	.079	0.54	1.190	5.86	14.88

Note : For notation see Oskanyan (1970, I.B.V.S. No. 488).

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INFORMATION BULLETIN ON VARIABLE STARS
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Konkoly Observatory
Budapest
1974 October 18

OPTICAL PHOTOMETRY OF CYGNUS X-2

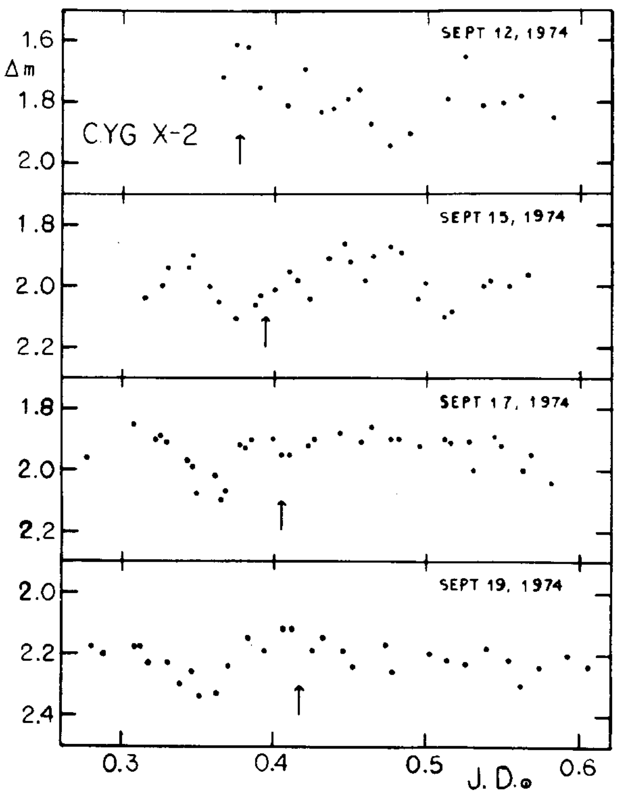
It was reported by Lyutyj (1974) that the optical counterpart of the x-ray source Cygnus X-2 is a double line spectroscopic binary with a period $0\overset{d}{.}251451$.

We have made photometric observations in order to check Lyutyj's suggestion, looking for brightness variability with a period of orbital revolution. No deep eclipses could be expected because there are no x-ray eclipses observed. However because of relatively large range of radial velocity variations (Burbidge et al. 1967, Kristian et al. 1967, Kraft and Demoulin 1967) we may expect periodic variability due to tidal deformation of the components or even shallow grazing eclipses.

The unfiltered 1P21 photomultiplier was used on a 60 cm reflector in the Ostrowik station of the Warsaw University Observatory.As a comparison we used star no. 1 from the Fig. 3 in a paper by Giacconi et al.(1967).

Figure 1 gives results of our observations. The arrows point on times of spectroscopic conjuction with the HeII component behind according to Lyutyj's elements. It can be seen that the observed variability is not related to the Lyutyj's period of the orbital motion. The object's average brightness decreased by 0.4 mag during the week covered by our observations. Beside that there are variations on a time scale of 1 hour and an amplitude about 0.2 mag, and these variations seems to be more pronounced when the object is brighter.Similar short time scale flickering was already observed by Kristian et al. (1967).

With the present observational material it could not be excluded that the shallow dips in the light curve that occur at the begining of nights Sept. 15, 17, and 19 are due to eclipses even though that possibility is not very likely. The possible periods that fit these three dips are $1\overset{d}{.}990$, $0\overset{d}{.}663$, and $0\overset{d}{.}398$. Few other values of the period could be considered if one is willing to believe that the intrinsic flickering has prevented us from detecting an additional minimum on the night of Sept. 12 and in case of period $0\overset{d}{.}249$ still another minimum on Sept. 19.



Warsaw University Observatory

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I. SEMENIUK
A. SCHWARZENBERG-CZERNY

References:

Burbidge, E.M., Lynds, C.R., and Stockton, A.N. 1967, Ap.J.Letters 150, L95
Giacconi, R., Gorenstein, P., Gursky, H., Usher, P.D., Waters, J.R., Sandage, A., Osmer, P., and Peach, J.V. 1967, Ap.J.Letters, 148, L129
Kraft, R.P., and Demoulin, M.-H. 1967, Ap.J.Letters, 150,L183
Kristian, J., Sandage, A., and Westphal, J.A. 1967, Ap.J.Letters, 150, L99
Lyutyj, W.M. 1974, IAU Circular, 2691

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UBVRI OBSERVATIONS OF BH CRUCIS

The red variable star BH Crucis ($\alpha = 12^h13^m.5$, $\delta = -56^\circ01'.9$; 1950) was discovered by Welch (1969). Photoelectric UBV observations have been discussed by Walker, Marino, and Welch (1972), and by Walker and Marino (1972). They found the light elements for this star to be

$$JD(min.)\ 2440827 + 420^d.25E.$$

The most notable feature of the light curve is a double maximum. Keenan (1971) has published a description of the spectrum which shows the star to be a member of a class intermediate between the carbon and S-type stars.

Occasional observations were made by the author during observing runs at the Cerro Tololo Inter-American Observatory in the interval 1971-74. The telescopes used are listed in the second column of Table I. The UBV measures were made through CTIO UBV filter set No. 2 (V, no. 291; B, no. 43; U, no. 247; red leak, OG5 + UG2) together with a refrigerated 1P21 photomultiplier. Standards were chosen from the list of Johnson and Harris (1974). The VRI measures were obtained through CTIO VRI filter set No. 2 (V Corning 3384 and 9780; R, Schott KG-1/4, [illegible]-5/2, and RG-6/1.5; I, Schott RG-715/2 and RG-780/1) together with standards chosen from Johnson et al. (1966). The r.m.s. errors of a single observation in Table I are about $0^m.020$ for the UBV observations and about $0^m.025$ for the VRI observations. The exception, of course, is the (U-B) color index; these measures are an indication only that the star is very red. The presence of the double colons means that the flux measured was just above the background noise.

The UBV observations reported herein fall within the general range in colors and magnitudes quoted by Walker and Marino (1972). The phases given in Table I were calculated using the light elements quoted above. [Note that the inked-in phases on the abscisse in the figure in both Walker and Marino (1972) and Walker, Marino and Welch (1972) are in error. However, the shape of the light curve is accurate.] As is evident from the light curve of Walker et al., the light curve does not precisely repeat from cycle to cycle. An attempt to improve the period indicated a possibly improved value of 419ᵈ27, but the new data are too few to be conclusive. Hence, for the present, the light elements given by Walker et al. should be used.

Johnson (1966) tabulates intrinsic colors for giant and super-giant stars. The brightness of the star near phase 0.25 approximates the star's average magnitude. The (R-I, V-R) color indices herein, taken near phase 0.25, indicate BH Crucis to have the colors of a M4 star from the (R-I) index, or more red than a M5 star from the (V-R) color index.

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TABLE I

UBV Data for Welch's Red Variable

U.T. Date	CTIO Telescope	$JD_{\odot}$ 2440000+	Phase	V*	B-V	U-B	I	R-I	V-R
011871	#2 16 in.	969.7935	0.340	7.67	+2.65	+5.1::			
011871		969.7963	0.340	7.66	2.65	4.8::			
012071	"	971.7894	0.345	7.71	2.68	3.9:			
012071	"	971.7924	0.345	7.70	2.67	4.0:			
052071	"	1091.5172	0.629	7.32	2.46	2.20			
052171	"	1091.5748	0.630	7.30	2.49	2.20			
051272	"	1449.5728	0.481	7.75	2.61	3.6			
051572	"	1452.5832	0.489	7.77	2.63	3.1			
031973	24 in.	1760.7096	0.222	(8.79)			4.62	+1.70	+2.47
032073	"	1761.6230	0.224	(8.74)			4.62	1.70	2.42
032273	"	1763.6250	0.229	(8.71)			4.58	1.69	2.44
032673	"	1767.6949	0.238	(8.48)			4.52	1.66	2.30
032973	"	1770.6748	0.246	(8.52)			4.52	1.64	2.36
042074	#1 16 in.	2157.5293	0.166	9.24	3.66	3.4:			
042074	"	2157.5336	0.166	9.24	3.64	5.4::			

*Note that V-magnitudes in parenthesis are values calculated from the VRI data.

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References:
Johnson, H.L., 1966 An.Rev.Astr.Astroph. 4,193
Johnson, H.L., and Harris, D.L. III, 1954 Ap.J. 120,196
Johnson, H.L., Mitchell, R.I., Iriarte, B., and Wisniewski, W.Z., 1966 Comm.Lun.Plan.Lab., No.63.
Keenan, P.C. 1971 M.N.R.A.S. 153, 1P
Walker, W.S.G., and Marino, B.F., 1972 I.B.V.S.No.679
Walker, W.S.G., Marino, B.F., and Welch, R.G., 1972 Royal Astr.Soc. New Zealand, Var. Star Section, Circular No.151
Welch, R.G., 1969 ibid, Circular No. 151

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PHOTOMETRY OF POSSIBLE ULTRASHORT PERIOD CEPHEIDS IN THE DISK POPULATIONS

During the course of other programs with the 40-inch reflector several bright candidates for ultrashort period cepheids have been monitored, mainly during bright moonlight. The results for several new variables have been published from time to time and the present note contains the remainder observed thus far. Four new variables are listed in Table 1 and the light curves are shown in the figures. A dozen, probably constant stars are listed in Table 2 together with the length of time (continuous) that the star was monitored, the comparison star used, the mean magnitude difference and the rms deviation from that mean.

The columns of Table 1 contain the following information:

I. HR/HD (name)

II. V_E/B-V/U-B based on single observations with the 40-inch reflector.

III. $[m_1]/[c_1]/\beta$ derived from photometry with the 40- and 16-inch reflectors.

IV. $\Delta[m_1]/\Delta[c_1]/M_V$ (Eggen 1971).

V. $\mu_\alpha/\mu_\delta/\rho$. The proper motions (0".001) are on the FK system with precessional corrections and ρ is in km/sec.

VI. U/V/W. Space motion vectors (km/sec).

Mount Stromlo and Siding Spring Observatory

O.J. EGGEN

References:

Eggen, O.J. 1967, The Magnetic and Related Stars (Ld.R.Cameron).
Eggen, O.J. 1969, Ap.J. 155, 701.
Eggen, O.J. 1971, Pub. A.S.P., 83. 741.

Table 1

NEW VARIABLES

I	II	III	IV	V	VI
1505	6.83	280	- 64	+36	+25
55 Eri	+0.38	697	+107	-29	-37
	+0.18	2.727	(+1.6)	+40.0	-13
3350	5.10	218	+ 4	-68	+17
71935	+0.26	894	+205	+22	-22
	+0.14	2.766	+1.2	+24.7	-16
4746	6.23	226	- 7	-92	+50
108506	+0.445	703	+286	-11	-29
	+0.075	2.673	+0.6	-12:	-19
8102	6.48	202	+ 20	+38	+40
201707	+0.31	875	+190	+ 3	-16.5
	+0.15	2.765	+1.2	-39.2	+10

1505 ADS 3409, 10". The observations were made under excellent seeing conditions and the secondary component, G8 III, was used as a comparison star. More observations are needed but the star is almost certainly variable. The adopted luminosity is from a previous discussion (Eggen 1969) where the system was found to have the same space motion as the variable ρ Puppis (HR3185).

3350 The period appears to be near $0\overset{d}{.}07$.

4746 The period may be near $0\overset{d}{.}05$. Previously (Eggen 1967) suspected to be a member of the Hyades Group (which it is not) and a short period variable. The radial velocity is variable.

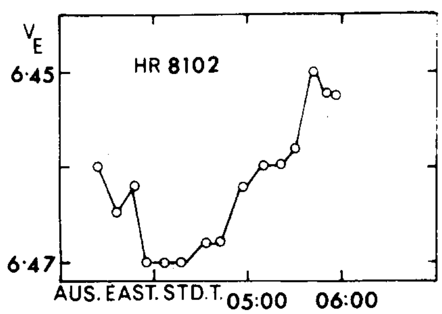
8102 Additional observations are needed to confirm the variation. Probably a member of the Hyades Group despite the relatively large value of $\Delta[m_1]$.

Table 2

PROBABLY CONSTANT STARS

HR/HD	T HRS	C_p*	ΔV	RMS
550	2.0	593	0.100	0.002
981	3.0	1025	0.050	0.002
HD 22413	1.5	22582	0.088	0.003
HD 43760	3.0	43393	0.015	0.003
2661*	3.0	2674	0.534	0.005
3140	3.0	3154	0.668	0.002
4042	1.5	4068	0.977	0.001
5348	3.0	5337	0.029	0.002
6366	4.5	6389	0.055	0.002
7101	4.5	7143	0.108	0.002
133604*	3.5	HR5614	0.562	0.008
137949	2.5	HR5750	0.870	0.003

* 2661 Var ?
133604 Var ?



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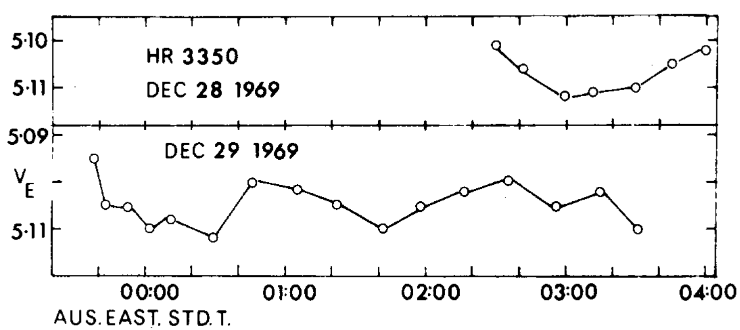

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5·11
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DEC 28 1969
5·09
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01:00
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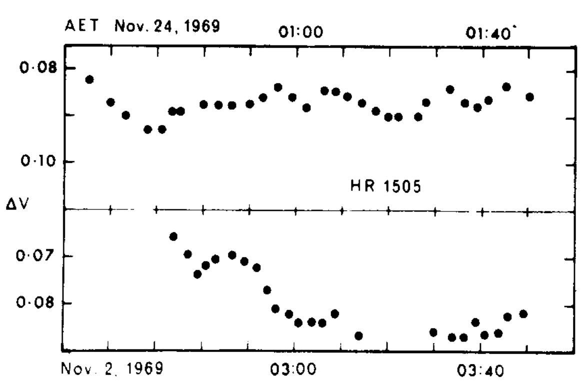

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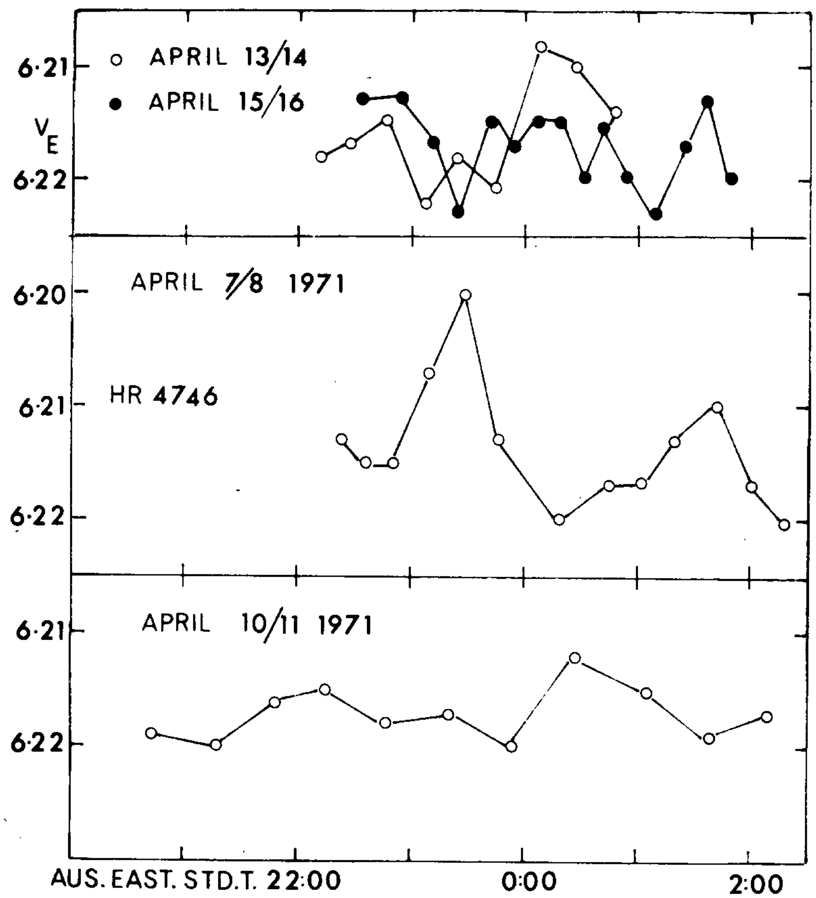

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APRIL 15/16
6·21
V_E
6·22
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6·20
HR 4746
6·21
6·22
APRIL 10/11 1971
6·21
6·22
AUS. EAST. STD.T. 22:00
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2:00

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MAXIMA OF THE RR_S-VARIABLES CY Aqr DY Her AND DY Peg

During test runs of the newly designed photoelectric double beam photometer for the 106cm Cassegrain reflector of the Hohe List Observatory these RR_S-Lyrae stars have been observed in B and V. The photometer allows the simultaneous photometric monitoring of the variable and a comparison star within the field of the telescope with fairly high time resolution.

The maxima times of the individual B-light curve cycles given in the table were derived by using Pogson's method. The epochs and (O-C)'s are based on the light elements given by Kukarkin et al. (Gen.Cat.Var.Stars 1, 19, 1969) for CY Aqr, Hardie and Lott (Astrophys. Journal 133, 71, 1961) for DY Her and Grigorevsky and Mandell (Perem.Zvezdy 13, 190, 1960) for DY Peg. On the average the deviations from these elements amount 9.4 per cent of the period for CY Aqr, 1 per cent for DY Her, and 7.6 per cent for DY Peg as can be seen from the last column of the table. The "noise" of the period length of the individual cycles amounts to ±0.65% for CY Aqr resp. ±1.56% for DY Peg, which is slightly above the present time resolution of our equipment for such short periods.

Table

Star	Maxima J.D. hel 244 0000 + d	E	O-C d	(O-C)/P %
CY Aqr	1958.3639±0.0003	47589	-0.0059	- 9.7
	1959.2799±0.0010	47604	-0.0055	- 9.0
	1959.3405±0.0003	47605	-0.0059	- 9.7
	1959.4018±0.0003	47606	-0.0057	- 9.3
	1959.4634±0.0003	47607	-0.0051	- 8.4
	1959.5234±0.0003	47608	-0.0062	-10.2
DY Her	1840.4222±0.001	56522	-0.0015	- 1.0
DY Peg	1937.4701±0.001	80438	-0.0062	- 8.5
	1937.5444±0.001	80439	-0.0048	- 6.5
	1957.3785±0.001	80711	-0.0066	- 9.1
	1957.4535±0.001	80712	-0.0046	- 6.3
	1957.5243±0.001	80713	-0.0067	- 9.2
	1957.5998±0.001	80714	-0.0042	- 5.7

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PHOTOELECTRIC MINIMA OF ECLIPSING BINARIES

The following Table gives photoelectric minima obtained during the years 1972 and 1973 at the Ege University Observatory, Izmir (Turkey) and the Nürnberg Observatory (Germany). Minima of eclipsing binaries observed at both Observatories 1960 - 1971 were published in Astr.Nachr. 288, 69 (1964); 289, 191 (1966); 291, 111 (1968); IBVS 456 (1970), 530 (1971) and 647 (1972).

The Table gives besides the heliocentric minima three different O-C's, the type of filter (UBV), the abbreviations of the names of the observers and the type of the instruments used (Izmir: 48cm Cassegrain, Nürnberg: 34cm Cassegrain, both with phototube 1P21).

Abbreviations of the observers' names:

Ab - A. Alabaş	Hu - R. Hufnagel
An - H. Alkan	Ib - C. Ibanoglu
Bo - G. Bode	Ky - E. Kuyucu
By - C. Baygün	Me - M. Meier
Bz - S. Bozkurt	Ms - M. Çirak
Eb - J. Ebersberger	Od.- O. Demircan
Ek - S. Ertükel	Pl - E. Pohl
Er - A.Y. Ertan	Rk - R. Akinci
Gd - N. Güdür	Rn - R. Pekünlü
Gl - Ö. Gülmen	Sb - R. Sendelbeck
Gö - G. Görz	Sc - H. Schellemann
Gp - G. Grampp	Sh - T. Scharold
Gr - R. Gröbel	Sr - C. Sezer
Hk - W. Huck	Tn - Z. Tunca
Hn - H Haliçinarli	Vo - H. Vogel
Hö - D. Hölzl	We - T. Weber
Hs - H. Karacan	Wu - J. Wunner

Remarks:

O-C (I) : GCVS, Moscow 1969/70,
FT Ori GCVS (1970), phase of secondary minimum
ϕ_S= 0,746·P (Cristaldi, S. 1970,Astron.Astrophys. 5,228.)

O-C (II) : SAC 44/45, Krakow 1972/73,

O-C (III) : new elements :
i Boo IBVS 209 (1967) Pohl
VZ CVn, T_{Min}= 24 38880.5807+0^d.84246150·E (Ibanoglu, unpublished)
RZ Cas Scientific Reports of the Faculty of Science, Ege University No. 120, Astronomy No. 12 (1971), A.Kizilirmak
AK Her IBVS 369 (1969) Ibanoglu and Kurutac

The (O-C)'s for secondary minima (Min II) were calculated on the supposition that they are symmetric between primary minima (if not special data are given).

m: only the elements I or the elements II give secondary minimum.

The sign = between O-C (I) and O-C (II) indicates, that the elements (I) and (II) are equal.

The sign : means that the time of minimum is uncertain.

Star	Min.hel. 2441	O-C (I)	O-C (II)	O-C (III)	Filt.	Obs.	Instr. cm	Rem
RT And	619.2458	-0.0101	-0.0062			Gl/An	48	
	924.2795	-0.0080	-0.0075			Gl/Ms	48	
BX And	618.3634	+0.0035=	+0.0035		B,V	Rk/Hs	48	
	679.371	-0.000 =	-0.000			Hk/Sh	34	
	900.538	0.000 =	0.000			Sc/Sh/Vo	"	MinII
	951.484 :	+0.001:=	+0.001 :		B	Od/By/Ek	48	
	951.486 :	+0.003:=	+0.003 :		V	"	"	
CN And	509.4954	-0.0379			B	Gd/Hs	"	MinII
	509.4930	-0.0403			V	Gd/Hs	"	MinII
	512.5049	-0.0366			B	Gd/Rk/Rn	"	
	512.5044	-0.0371			V	Gd/Rk/Rn	"	
	567.5761	-0.0383			B	Gl/Rk/Rn	"	
	567.5746	-0.0398			V	Gl/Rk/Rn	"	
	568.5016	-0.0384			B	Gd/Rn	"	
	568.5012	-0.0388			V	Gd/Rn	"	
	577.5282	-0.0364			B	Gl/Hs	"	MinII
	577.5278	-0.0368			V	Gl/Hs	"	MinII
KO Aql	887.4717	+0.0822	-0.0080		B	Ib/Tn/Sr	"	
	887.4710	+0.0815	-0.0087		V	"	"	
KP Aql	499.3406	+0.0397	+0.0016		B	Gl/Hs	"	MinII
	499.3420	+0.0411	+0.0030		V	Gl/Hs	"	"
	834.4077	+0.0452	+0.0046		B	Gl	"	
	834.4070	+0.0445	+0.0039		V	Gl	"	
	861.3482	+0.0460	+0.0052		B	Ib/Gl	"	
	861.3475	+0.0453	+0.0045		V	Ib/Gl	"	
	898.3925	+0.0483	+0.0073		B	Ib/Er/Sr	"	
	898.3904	+0.0462	+0.0052		V	"	"	
	903.4416	+0.0463	+0.0051		B,V,	Ib/Er	"	MinII
OO Aql	571.3468	-0.0242	+0.0065 (m)		B	Od	"	
	571.3476	-0.0234	+0.0073 (m)		V	Od	"	
	626.331 :	-0.027:(m)	+0.004:		B,V	Od/Hs	"	
	890.3721	-0.0256(m)	+0.0096		B	Od/Sr/Ky	"	
	890.3711	-0.0266(m)	+0.0086		V	"	"	
	922.2987	-0.0270(m)	+0.0086		B,V	Ib/Tn/Er	"	
	940.2886	-0.0283	+0.0076 (m)		B,V	Ib/Gl/Tn	"	
σ Aql	911.341 :	-0.046:=	-0.046:		B,V	An/Sr/Ms	"	
RX Ari	661.475	+0.021			B	Rk/An	"	
	661.474	+0.020			V	Rk/An	"	
SX Aur	677.3552	+0.0200	+0.0166			Eb/Hk/Hu	34	
	691.272:	+0.021:	+0.018:		B	An/Hs	48	MinII
	691.271:	+0.020:	+0.017:		V	An/Hs	"	"
	692.4826	+0.0214	+0.0180		B	An/Hs	"	"
	692.4812	+0.0200	+0.0166		V	An/Hs	"	"
	763.275:	+0.024:	+0.021:		B,V	An/Hs	"	
	769.3249	+0.0238	+0.0204		B	An/Hs	"	
	769.3235	+0.0224	+0.0190		V	An/Hs	"	
	775.371:	+0.020:	+0.016:		B	An/Hs	"	
	775.372:	+0.019:	+0.015:		V	An/Hs	"	
	957.4884	+0.0203	+0.0169		B	Ib/Gl	"	MinII
	957.4889	+0.0208	+0.0174		V	"	"	"
WW Aur	399.305	+0.001	-0.003			Hö/Hu	34	
AR Aur	941.464	+0.018 =	+0.018			Sc/Sh/Vo	"	

Star	Min.hel.	O-C (I)	O-C (II)	O-C (III)	Filt.	Obs.	Instr. cm	Rem.
	2441							
BF Aur	684.373	+0.005	+0.017			Eb/Hu/Sh	34	MinII
	752.456	+0.010	+0.022			Eb/Vo	"	
TZ Boo	356.5277	+0.0053			B	Gd/Gl/Hs	48	MinII
	356.5284	+0.0060			V	Gd/Gl/Hs	"	"
	392.483:	+0.004:			B	Rk/Rn	"	"
	392.484:	+0.005:			V	Rk/Rn	"	"
	443.4479	+0.0060			B	Bz/Ib	"	
	443.4479	+0.0060			V	Bz/Ib	"	
	450.427:	+0.002:			B	Bz/Ib	"	MinII
	450.428:	+0.003:			V	Bz/Ib	"	"
	453.398:	+0.001:			B	Bz/Ib	"	"
	453.397:	+0.000:			V	Bz/Ib	"	"
	462.313	+0.001				Rk/Rn	"	"
	465.437:	+0.005:			B	Rk/Hs	"	
	465.436:	+0.004:			V	Rk/Hs	"	
	484.4587	+0.0086			B	Ib/Hs	"	
	484.4574	+0.0073			V	Ib/Hs	"	
i Boo	384.5323	+0.0148	+0.0169	+0.0125		Gl/Hs	"	MínII
	392.432	+0.014	+0.016	+0.012		Gö/Hö	34	
	435.4166	+0.0144	+0.0168	+0.0121		Gd/Hs	48	MinII
	462.464:	+0.013:	+0.015:	+0.010:		Rk/Rn	"	"
	585.392:	+0.014:	+0.017:	+0.011:		Bo/Hk	34	"
	599.314	+0.009	+0.013	+0.007		Hö/Hk	"	"
	758.407:	+0.021:	+0.025:	+0.018:		Sh/Vo	"	"
	798.444	+0.019	+0.024	+0.017		Sh/Vo	"	
	819.464:	+0.016:	+0.020:	+0.014:		Sc/We	"	MinII
SV Cam	681.2879	-0.0045	-0.0013			Pí/Sh	"	
As Cam	547.5273	-0.2117			B	Bz/Gl	48	MinII
	547.5282	-0.2108			V	Bz/Gl	"	"
	578.4065	-0.2112			B	Gl/Hs	"	"
	578.4065	-0.2112			V	Gl/Hs	"	"
	580.3330	-0.0002			B	Gd/Od	"	"
	580.3338	+0.0006			V	Gd/Od	"	
VZ CVn	327.5098	-0.0019		-0.0003	V	Ib/Rk	"	MinII
	357.418:	-0.001:		0.000:	V	Bz/Ib/Rk	"	
RZ Cas	333.3257	-0.0043	-0.0087	+0.0013		Gö/Hö	34	
	511.4206	-0.0013	-0.0063	+0.0024	B	Rk/Rn/Ab	48	
	511.4206	-0.0013	-0.0063	+0.0024	V	Rk/Rn/Ab	"	
	560.4240	-0.0030	-0.0082	0.0000		Eb/Hk	34	
	566.4022	-0.0010	-0.0062	+0.0020		Eb/Hö	"	
	584.3326	+0.0007	-0.0046	+0.0034	B	Rk/Hs	48	
	584.3326	+0.0007	-0.0046	+0.0034	V	Rk/Hs	"	
	860.4375	+0.0034	-0.0029	+0.0030		Hk/Sb	34	
	921.394	+0.002	-0.004	+0.002		Hö/Sb	"	
	933.346	+0.002	-0.005	+0.001	B	Ob/By/Ek	48	
	933.345	+0.001	-0.006	0.000	V	"	"	
	934.5418	+0.0024	-0.0042	+0.0017		Eb/Sc	34	
TV Cas	595.3586	-0.0062	+0.0010			Hk	34	
TW Cas	671.301	-0.014	-0.017		B	Od/Hs	48	
	671.300	-0.015	-0.018		V	Od/Hs	"	
DO Cas	936.3666	+0.0024=	+0.0024		B,V	Gl/Sr	"	
	960.331:	+0.003:=	+0.003:			Sh/Vo	34	
MN Cas	656.5043	-0.0053	+0.0170		B	Rk/An	48	
	656.5032	-0.0064	+0.0159		V	Rk/An	"	
	682.384	-0.004 (m)	+0.018			Eb/Hk/Hu	34	

Star	Min.hel.	O-C (I)	O-C (II)	O-C (III)	Filt.	Obs.	Instr. cm	Rem.
	2441							
PV Cas	666.2908	+0.0652	+0.0043		B	Od	48	
	666.2907	+0.0651	-0.0044		V	Od	"	
	855.341:	+0.066:	-0.005:		B,V	Ib	"	
	924.4506	+0.0319	-0.0010		B	Gl/Ms	"	MinII
	924.4501	+0.0314	-0.0015		V	"	"	
U Cep	395.361	+0.023	+0.019			Me/Wu	34	
VW Cep	596.364	-0.071	+0.007			Hk	"	
	678.327	-0.072	+0.006			Eb/Hu	"	MinII
	698.419:	-0.071:	+0.008:			Sh/Vo	"	"
	814.426	-0.071	+0.010			Sc/Sh/Vo	"	"
	829.456	-0.070	+0.011			Eb/Sc	"	"
	989.344	-0.076	+0.007			Sc/Sh/Vo	"	
RW Cet	952.4322	-0.0344	-0.0043		B	Tn/Er/Ms	48	
	952.4315	-0.0351	-0.0050		V	"	"	
KR Cyg	528.4524	-0.0083	+0.0100			Od/Ab		
	627.331	-0.013	+0.006		B	Od/Hs	"	
	627.333	-0.011	+0.008		V	Od/Hs	"	
MR Cyg	674.242	-0.006	-0.002			Eb/Pl	34	
	839.429:	-0.006:	-0.002:		B	Od	48	MinII
	839.432:	-0.003:	+0.001:		V	Od	"	
477 Cyg	931.4592	-0.0129	+0.0052			Bo/Hö	34	
836 Cyg	492.3348	-0.0017	-0.0034			Rk/Rn/Ab	48	
	521.408:	-0.005:	-0.007:		V	Rk	"	MinII
	525.321:	-0.013:	-0.014:			Rk/Rn	"	"
	854.327:	+0.001:	-0.001:		B,V	Gl	"	
	881.446:	+0.003:	+0.002:		B,V	Od/By/Ek	"	MinII
TW Dra	503.4655	-0.0248	+0.0018			Gr/Hk	34	
	764.500:	-0.029:	+0.001:			Gp/Gr	"	
TZ Dra	519.3351	+0.0054	+0.0057			Od/Ab/Hs	48	
UZ Dra	570.2834	+0.0014=	+0.0014		B	Od	"	
	570.2829	+0.0009=	+0.0009		V	Od	"	
WW Dra	918.503:	+0.126:=	+0.126:			Eb	34	
AI Dra	463.4384	+0.0075	+0.0083			Gd/Rn	48	
	529.3737	+0.0081	+0.0088			Od/Ab	"	
	831.4739	+0.0073	+0.0080			Eb/We	34	
	849.4561	+0.0072	+0.0080			Sc/Sh/Vo	"	
BS Dra	461.4252	+0.0542=	+0.0542		B	Gl/Hs	48	
	461.4252	+0.0542=	+0.0542		V	Gl/Hs	"	
	471.5166	+0.0536=	+0.0536		B	Rk/Hs	"	
	471.5163	+0.0533=	+0.0533		V	RK/Hs	"	
	488.3335	+0.0505=	+0.0505		B	Rk/Rn	"	
	488.3319	+0.0489=	+0.0489		V	Rk/Rn	"	
	493.3817	+0.0527=	+0.0527		B	Gl/Rk	"	MinII
	493.3838	+0.0548=	+0.0548		V	Gl/Rk	"	"
	826.4196	+0.0546=	+0.0546		B,V	Ib/Gl	"	
UX Eri	922.5394	-0.0232	+0.0395			Ib/Tn/Sr	"	MinII
YY Eri	680.3167	-0.0066	-0.0006			Eb/Sh/Vo	34	
	928.5125	-0.0059	+0.0022		B	Ib/Tn	48	
	928.5116	-0.0068	+0.0013		V	"	"	
RX Her	524.3530	+0.0004	-0.0002			Gd/Hs	"	

Star	Min.hel.	O-C (I)	O-C (II)	O-C (III)	Filt.	Obs.	Instr. cm	Rem.
	2441							
SZ Her	931.389	+0.023	+0.013		B,V	Od/By	48	
TX Her	455.3767	-0.0086	+0.0011			Rk/Rn	"	MinII
	492.453:	-0.009:	+0.001:			Rk/Rn/Ab	"	"
	768.4670	-0.0095	+0.0002		B	Ib/An	"	"
	768.4677	-0.0088	+0.0009		V	Ib/An	"	"
AK Her	512.445	-0.017=	-0.017	+0.002		Gr/Hk	34	
	786.436	-0.018=	-0.018	+0.003	B	Ob/Hs	48	
	786.433	-0.021=	-0.021	0.000	V	Ob/Hs	"	
	832.3795	-0.0203=	-0.0203	+0.0004	B	Od	"	
	832.3802	-0.0196=	-0.0196	+0.0011	V	Od	"	
	853.456	-0.020=	-0.020	+0.001		Sc/Sh/Vo	34	
338 Her	945.3359	+0.0736	+0.0197		B,V	Tn/Er	48	
AI Hya	411.368:	-0.542:				Bz/Ib	"	
SW Lac	598.3161	-0.0354	-0.0380		B	Od/An	"	
	598.3154	-0.0361	-0.0387		V	Od/An	"	
	683.3055	-0.0390	-0.0416			Ed/Hu	34	
AR Lac	513.393:	-0.022:	-0.023:		B	Rk/Ab	48	MinII*
	513.391:	-0.024:	-0.025:		V	Rk/Ab	"	"
UV Leo	390.441	-0.007	+0.005			Gp/Me	34	
	466.3544	-0.0042	+0.0072			Rk/Hs	48	
	766.3971	-0.0042	+0.0077			Eb/Sh/Vo	34	
AM Leo	386.4876	-0.0004	-0.0241			Gd/Hs	48	
FL Lyr	959.2641	-0.0014	+0.0049		B,V	Gl/Tn/Er	"	
U Oph	494.4387	-0.0059	-0.0026		B	Rk/Hs	"	
	494.4392	-0.0054	-0.0021		V	Rk/Hs	"	
451 Oph	527.3779	+0.0120			B	Rk/Rn	"	MinII
	527.3772	+0.0113			V	Rk/Rn	"	"
456 Oph	897.5343	+0.1710			B	Od/By/Ek	"	
	897.5340	+0.1707			V	"	"	
	951.3835	+0.1729			B	"	"	
	951.3830	+0.1724			V	"	"	
502 Oph	491.3772	+0.0036=	+0.0036			Hs	"	MinII
	888.320:	+0.001:=	+0.001:		B	Od/By/Ek	"	
	888.321:	+0.002:=	+0.002:		V	"	"	
566 Oph	479.4702	+0.0093=	+0.0093		B	Rk/Hs	"	
	479.4704	+0.0095=	+0.0095		V	Rk/Hs	"	
	845.489	+0.014 =	+0.014			Sc/Sh/Vo	34	MinII
	851.4283	+0.0134=	+0.0134		B,V	Ib/An	48	
	895.468	+0.017 =	+0.017			Sc/Sh/Vo	34	
ER Ori	626.416	-0.016=	-0.016		B	Od/Hs	48	
	626.415	-0.017=	-0.017		V	Od/Hs	"	
	664.3099	-0.0163=	-0.0163		B,V	Od/An	"	MinII
FT Ori	575.5135	+0.0120	+0.0229		B	Gl/Rn	"	
	575.5136	+0.0121	+0.0230		V	Gl/Rn	"	
	675.5048	-0.0094			B	Ib/Gl	"	MinII
	675.5047	-0.0095			V	Ib/Gl	"	"
AT Peg	661.2728	-0.0478	-0.0042		B	Rk/An	"	
	661.2729	-0.0477	-0.0041		V	Rk/An	"	

*

Star	Min.hel. 2441	O-C (I)	O-C (II)	O-C (III)	Filt.	Obs.	Instr. cm	Rem.
AG Per	673.385	-0.009	-0.004			Eb/Gr/Hk	34	
DM Per	609.496	+0.044 =	+0.044			Bo/Hk	"	
	920.4575	+0.0449=	+0.0449		B,V	Er/Ms	48	
IZ Per	332.440	+0.017 =	+0.017			Hk/Me	34	
β Per	647.3510	-0.0428	-0.0041			Eb/Hö	"	
UV Psc	888.4944	+0.0145 =	+0.0145		B	Od/By/Ek	48	
	888.4939	+0.0140 =	+0.0140		V	"	"	
525 Sgr	939.339:	+0.001: =	+0.001:		B,V	Od/By	"	
RS Sct	922.3702	+0.0188	+0.0031		B,V	Ib/Tn/Sr	"	
	958.239	+0.019	+0.003		B,V	Od/By/Ek	"	
CD Tau	576.4704	+0.0053	-0.0113		B	Gd/Hs	"	MinII
	576.4709	+0.0058	-0.0108		V	Gd/Hs	"	"
	619.4068	+0.0025	-0.0139		B	Gl/An	"	
	619.4073	+0.0030	-0.0134		V	Gl/An	"	
	660.6300	+0.0041	-0.0125		B	Ib/Gl	"	
	660.6307	+0.0046	-0.0118		V	Ib/Gl	"	
	662.3462	+0.0027	-0.0143		B	Rk/An	"	MinII
	662.3458	+0.0023	-0.0147		V	Rk/An	"	"
	674.373	+0.007	-0.010			Eb/Me	34	
X Tri	320.3701	-0.0071	-0.0212		B	Ib/Hs	48	
	320.3707	-0.0065	-0.0206		V	Ib/Hs	"	
	321.3422	-0.0065	-0.0206		B	Gl/Hs	"	
	321.3422	-0.0065	-0.0206		V	Gl/Hs	"	
	357.289:	-0.006 :	-0.021 :		B	Bz/Ib/Rk	"	
	357.289:	-0.006 :	-0.021 :		V	Bz/Ib/Rk	"	
	572.4850	-0.0050	-0.0204		B	Gd/Rn	"	MinII
	572.4836	-0.0064	-0.0218		V	Gd/Rn	"	"
	575.3965	-0.0081	-0.0235		B	Gl/Rn	"	"
	575.3965	-0.0081	-0.0235		V	Gl/Rn	"	"
	593.3692	-0.0088	-0.0243		B	Ib/An	"	
	593.3702	-0.0078	-0.0233		V	Ib/An	"	
W UMa	401.4263	-0.0690	-0.0029			Eb/Hu	34	
	708.374	-0.076	-0.002			Eb/Hk/Hu	"	
TX UMa	717.4200	-0.0022	-0.0020			Eb/Sh/Vo	"	
	815.4459 :	-0.0001 :	+0.0002 :			Sc/Sh/Vo	"	
VV UMa	776.267 :	+0.020 :	-0.015 :		B,V	Od	48	
AG Vir	391.427	+0.031	-0.006			Hu/Me	34	
AH Vir	765.4077:	+0.0150:=	+0.0150 :			Me/Sh/Vo	"	
	859.3401	+0.0136 =	+0.0136		B	Gl	48	
	859.3405	+0.0140 =	+0.0140		V	Gl	"	
BE Vul	944.3450	+0.0101	0.0000		B,V	Od/Ek	"	
DR Vul	509.344 :	+0.009 :	-0.020 :			Gd/Hs	"	

Correction for Bulletin Nr.647

The minima for iBoo ends with J.D. 2441 141.4886: From 2441 047.3915 to .... 125.320 minima of the star VZ CVn are given.

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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
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Konkoly Observatory
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FLARE STARS IN NGC 7000 REGION.II.

By the program of flare star observations in stellar aggregates systematic observations of the NGC 7000 nebula region were began at the Byurakan Astrophysical Observatory in 1972.

The method of the observations and first results have been already published [1]. Here we bring the results of a survey of the plates obtained by the observers of the Physics of Stars and Nebulae section of the Byurakan Observatory with the 40 in. and 21 in. telescopes in 1972-1973.

Table 1 gives the data for the plates, number of exposures and the effective time coverage of observations (Teff).

Table 1

Telescope	Number of plates	Number of exposures	Teff
40 in.	31	182	30^h20^m
21 in.	56	320	51^h20^m

Some of the plates (Teff = 4^h50^m) have been obtained by both telescopes simultaneously in ultraviolet (40 in.) and photographic (21 in.) light. The first plates obtained in 1972 (26 plates with the 40 in. and 8 plates with the 21 in. telescopes - total Teff= 30^h20^m) have V 1057 Cyg as a centre, while the others BD+41°3922 ($RA_{1950.0}=20^h51^m6$, $D_{1950.0}=+42°13'$).

Total time of all multiple-exposure observations is 77^h20^m. Seven flares of 7 different stars have been found on these plates. In Table 2 we present the data on these flares. We continue the designations of flare stars, discovered in Byurakan [1] and in Tonantzintla [2].

Table 2

Designation	RA 1950.0	D 1950.0	m_{min} pg	Δm u/pg	Date	Telescope	Observer
B 12	20^h56^m2	43°41'	16^m8	1^m5 u	4.08.1972	40 in.	Chavushian
T 1	20 00,7	42 08	17.0	0.8 u	4.08.1972	40 in.	"
T 2	20 57,3	42 26	14.6	2.1 u	7.08.1972	40 in.	"
						20 in.	Ohanian
B 13	21 04,5	44 25	17.2	1.5 u	7.08.1972	40 in.	Chavushian
B 14	20 49,3	44 00	15.0	1.7 u	16.08.1972	40 in.	Parsamian
B 15	20 58,8	42 10	17.3	3.5 u	21.08.1972	40 in.	Mirzoyan
						21 in.	Jankovics
B 16	20 40,1	40 03	18.1	2.6pg	24.06.1973	21 in.	Tsvetkov

Column 1-Designation

Column 2 and 3 - Coordinates for 1950.0

Column 4 - Photographic magnitudes at minimum. The standards in selected area SA 40 and method, described by Popova and Tsvetkov [3] have been used.

Column 5 - Amplitude of flares in ultraviolet (u) or photographic (pg) light.

Column 6 and 7 - Date and the telescope used

Column 8 - Observer

The flare stars T1 and T2 were discovered by Haro and Chavira [2] and have shown 4 [1] and 2 flares, respectively. The other flare stars listed have been discovered by us in the course of this work.

On the base of the known data on flare stars in the NGC 7000 region [1,2 and present work], the total number of the flare stars in this region has been estimated by Ambartsumian's formula [4]. The lower limit of the total number is equal to

$$N = \sum_k n_k = 221 \qquad (k = 0, 1, 2, \ldots)$$

The result of a more detailed study, including the identification charts of the flare stars discovered will be published later on.

The authors thank the observers mentioned in Table 2 for giving their plates and Professor L.V. Mirzoyan for helpful advices.

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References:

[1] L.Erastova, M.Tsvetkov, IBVS No.909. 1974

[2] G.Haro, E.Chavira, Bol.Inst.Tonantzintla, 1, 17, 1973

[3] M.Popova, M.Tsvetkov, Bol.Section Astron.Bulgarian Acad.Sci.6, 31, 1973.

[4] V.A.Ambartsumian, L.V.Mirzoyan et al., Astrofisika,7,319,1971.

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A NEW SOUTHERN FLARE STAR : CPD-72°2640

During the survey program on red dwarf variables (BY Dra stars) that is being carried at ITA Observatory since 1971 (Ferraz Mello and Torres 1971) the star CPD-72°2640 (CoD-72°1700) was observed to flare in 1973 July 30.

This star was included in the survey after its classification by Upgren et al. (1972) like a M2Ve star. The program was not specifically designed to obtain flare data of the included stars, so we were not able to define a good light curve for the event (Fig.1).

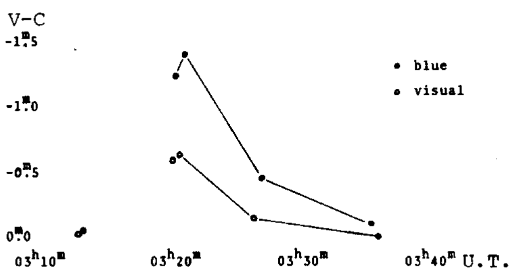

Fig. 1

Nevertheless, it was a very intense one (at least $1^m.4$ in blue color), and the flare nature of CPD-72°2640 may be considered certain.

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References:

Ferraz Mello, S. and Torres, C.A., 1971 I.B.V.S. No.577
Upgren, A.R., Grossengacher, R., Penhallow, W.S., MacConnell, D.J., and Frye, R.L. 1972 Astronomical Journal 77,486

FLARE ACTIVITY OF EQ Vir

EQ Vir (HD118100, Sp K5Ve) was found to be a flare star by Ferraz Mello (1972) and this was confirmed also by Chugainov (1973b). It is also a BY Dra star (Ferraz Mello and Torres, 1971), with the improved period of 3.958 days for 1971 observations. Nevertheless, EQ Vir may have period variations like other BY Dra stars (Chugainov 1973a,b).

In order to study the flare activity of EQ Vir, it was monitored photoelectrically in the ultraviolet for a total of 11.9 hours, using the 20 inch Cassegrain reflector of ITA Astronomical Observatory at São Jose dos Campos (Brazil). The coverage is given in Table 1; all breaks greater than 2 minutes are considered.

Table 1

Date 1974	Begin (UT) End	Date 1974	Begin (UT) End
May 14	$22^h21^m.9$ - $24^h00^m.0$	May 15	$23^h01^m.7$ - $24^h00^m.0$
May 15	00 00.0 - 00 53.4	May 16	00 00.0 - 00 49.8
	01 27.6 - 04 14.3	June 19	22 55.0 - 24 00.0
	21 34.9 - 22 59.1	June 20	00 00.0 - 02 21.4

The time constant of the data system was always one second. Reduction methods used were the same as those described by Kunkel (1968,1973).

Only two events were observed, and the results are given in Table 2. They are, respectively: event U.T., U-magnitude of peak light after subtraction of the quiescent component, flare duration at 0.5 peak light, airmass, and the U-mag. of one standard deviation, measured prior to the onset of the flare.

Table 2

Event UT 1974 May 15	U_{peak}	$T_{0.5}$ (min.)	Airmass	U_σ
03^h20^m	11.80	9.7	1.23	14.0
23 21.9	12.59	4.3	1.14	14.1

In spite of low quality, the data at hand suggest a high activity level of EQ Vir, possibly close to the upper limit for flare activity found in solar neighborhood flare stars (Kunkel 1970).

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References:

Chugainov,P.F. 1973a Izvestya Krymskoi Astrofizicheskoi Obs.v.48,p.3-22
Chugainov,P.F. 1973b Private communication
Ferraz Mello,S. 1972 I.A.U. Circular No. 2482
Ferraz Mello,S. and Torres, C.A.O. 1971 I.B.V.S. No.577
Kunkel, W.E. 1968 I.B.V.S. No.315
Kunkel, W.E. 1970 P.A.S.P. 82,1341
Kunkel, W.E. 1973 Ap.J. Suppl. 25,1

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RECENT ACTIVITY OF U CEPHEI

The eclipsing binary U Cephei is one of the most typical representatives of the semi-detached binaries similar to Algol. Since the time of Struve it has been known that the radial velocity curve of the primary (B7 V) component is badly distorted, probably by gas streams flowing between the two components. However, all efforts made at Victoria (A.H. Batten, Publ.Dom.Astrophys.Obs.14,191, 1974 (in press)) to detect emission lines typical for gaseous rings either failed or revealed only marginal emission features at Hα, except on one occasion when weak emission was observed at higher Balmer lines (A.H. Batten, Publ.Astr.Soc.Pacific. 81, 904, 1969).

Recently, however, very strong emission lines were observed in the system. During the primary minimum of August 8, 1974, Plavec, Polidan, and Burger, working with the Lick 120-inch telescope, discovered strong emissions which behaved in accord with the qualitative model of a ring proposed in 1942 by A.H. Joy. At the second contact, the red lobe of the emission at Hα is very strong, while the blue lobe is marginal. At mid-eclipse, the red lobe is weaker and the blue lobe is equally strong. The blue lobe then dominates at the third contact. Concurrent seven-colour photometric observations by Lee McDonald determined the time of minimum at Aug. 8.4345 (heliocentric). They show strong distortions of the light curve at the second and third contracts, no doubt indicating that the emission lines contribute to the light observed through the filters. In certain colours the effect is so strong that for example in Strömgen's y-colour the totality is greatly reduced in duration and the light curves may be mistaken for those of a partially-eclipsing system.

Observations at Victoria during September and October confirm the picture presented above. B.W. Baldwin independently discovered the emission during the eclipse of September 7. Plates obtained during this eclipse showed emission in every hydrogen line from Hβ to at least H 18, and in some lines of ionized metals. Their behaviour during the different phases of the eclipse is as just described. Baldwin also independently discovered the distortion of the light curve at the next observable eclipse on September 12 as reported in I.A.U. Circular No. 2701. We have confirmed the existence of emission and the distortion of the light curve at the eclipses of September 12, 17, 22, 27 and October 7. During most of the period emission has been visible at Hα during full light. The out-of-eclipse spectral type has changed to something like A0 and the B - V colour has changed correspondingly. A plate obtained during the eclipse of October 17 shows that the emission strength has now markedly decreased, but the weather was not good enough to permit simultaneous photometry that night and we do not know the present shape of the light curve. Heliocentric times of minima determined from photoelectric observations at Victoria by Baldwin and Scarfe are:

J.D. 2,442,302.8402
307.8280
312.8095
317.7950
327.7697

Previous observations made mostly by Batten indicated that for several years at least, the gas stream probably flowed directly from the G8 IV star to the B7 star and most of the material they carried was deposited on the B7 star. This picture seems to be changed now, and a real ring or disk surrounds the B7 star. Further observations and studies must decide whether this is a consequence of a greatly increased rate mass transfer, or increased velocity of ejection from the G8 star, or of an outburst in the outer layers of the B star. Thus such observations may quite well be of fundamental importance.

Systematic spectroscopic and photometric observations of U Cephei are very desirable. Fortunately, the star will be favorably placed for observations for several months to come, because of its very high northern declination. It should be realized that even simple timing of minima is unusually important, despite the recent decrease in emission strength, because the phenomenon may very well be accompanied by a sudden jump in period.

It is quite possible, too, that these events are fairly frequent in U Cephei or in other similar Algol systems. We recommed frequent checks at the times of primary minima.

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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
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Konkoly Observatory
Budapest
1974 October 29

IMPROVED LIGHT ELEMENTS FOR THE ECLIPSING BINARIES RZ Cha, YZ Cha AND DZ Mus

Photoelectric UBV observations of these three stars have been carried out with the 50 cm photometric reflector of the European Southern Observatory by one of the authors (E.G.).The observed minima lead to a revision of the published light elements.

RZ Cha = BV 473.

With the elements given by Strohmeier, Knigge and Ott in IBVS No.66. 1964 no predicted minima during the observational period J.D.2442139 to 2442152 could be observed. By chance a minimum tip and the following light rise to maximum was catched. The period is slightly longer by $0\overset{d}{.}0037$. A weighted least square solution of the minima of Table 1 yields the following elements:

$$\text{Min} = \text{J.D.}_{\odot}\ \underset{\pm .002}{2438439.410} + \underset{\pm .000061}{2\overset{d}{.}832093} \cdot E$$

The mean dispersion of the (O-C) in Table 1 is $\pm 0\overset{d}{.}038$. The light curve is of EA-type with a deep secondary minimum.

YZ Cha = BV 704.

No trace of a secondary minimum of this EA-type eclipser was observed predicted by the light elements given by Strohmeier in IBVS No.184, 1967, though the two completely covered pe-minima are in accordance with these. Since they are extremely wide, and slightly different in depth by less than $0\overset{m}{.}05$ the period has to be doubled. A weighted least square solution of the minima of Table 2 gives the following elements with a mean dispersion of $\pm 0\overset{d}{.}031$ for (O-C):

$$\text{Min I} = \text{J.D.}_{\odot}\ \underset{\pm .002}{2428820.613} + \underset{\pm .000184}{4\overset{d}{.}457357} \cdot E$$

Min I is shallower than Min II.

This double star system consiststherefore of nearly equal components, similar to EI Cep or PV Cas.

DZ Mus = BV 1209

The two observed pe-minima show a slight phase displacement to the published light elements by Strohmeier and Patterson in IBVS No 330, 1969. This demands a slightly longer period. The weighted least square solution of the minima of Table 3 gives the light elements:

$$\text{Min} = \text{J.D.}_{\odot} \quad \underset{\pm .002}{2418093.728} + \underset{\pm .000091}{3^{d}.247619} \cdot E$$

The (O-C) of Table 3 show a mean dispersion of $\pm 0^{d}.028$.The absence of a noticable secondary minimum and the fairly large width of the photoelectrically observed minima would also favour the doubling of the period of this EA-system. A decision is perhaps only possible by spectrographic observations.

Table 1 : RZ Cha

Minima	E	O-C	Minima	E	O-C
243 8439.402	0	- 0.008	243 9181.375	262	- 0.044
.446	0	+ 0.036	.421	262	+ 0.002
.492	0	+ 0.082	.471	262	+ 0.052
8473.335	12	- 0.060	9235.230	281	+ 0.002
.378	12	- 0.017	9259.267	289.5	- 0.034
.423	12	+ 0.028	9269.238	293	+ 0.024
8500.263	21.5	- 0.037	9535.403	387	- 0.027
.307	21.5	+ 0.007	.450	387	+ 0.020
.352	21.5	+ 0.052	9562.303	396.5	- 0.032
8817.449	133.5	- 0.046	.349	396.5	+ 0.014
.494	133.5	- 0.001	.396	396.5	+ 0.061
8827.362	137	- 0.045	244 0026.802	560.5	+ 0.004
8878.311	155	- 0.074	0629.996	773.5	- 0.038
8915.208	168	+ 0.006	0630.045	773.5	+ 0.011
			2146.620(pe)	1309	0.000

Table 2 : YZ Cha

Minima	E	O-C	Minima	E	O-C
242 8820.623 (S)	0	- 0.009	243.8914.254	2264.5	- 0.045
8878.553 (S)	13	- 0.006	9179.458:	2324	- 0.053
243 8524.254	2177	- 0.026	.503	2324	- 0.008
.299	2177	+ 0.019	.549	2324	+ 0.038
8553.199	2183.5	- 0.052	9197.344	2328	+ 0.003
.242	2183.5	- 0.011	9235.275	2336.5	+ 0.047
8562.201	2185.5	+ 0.034	9972.889	2502	- 0.032
8760.556	2230	+ 0.036	244 0712.842	2668	+ 0.000
8818.446	2243	- 0.021	.887	2668	+ 0.045
.492	2243	+ 0.027	1064.938	2747	- 0.035
8827.362	2245	- 0.018	.986	2747	+ 0.013
8885.266:	2258	- 0.060	1093.910	2753.5	- 0.036
.312	2258	- 0.014	2143.655(pe)	2989	0.000
.359	2258	+ 0.033	2145.881(pe)	2989.5	0.000

Remarks: (S) = Minima from Sonneberg plate collection.

Table 3 : DZ Mus

Minima	E	O-C	Minima	E	O-C
241 8093.736 (H)	0	+ 0.008	243 4315.597 (S)	4995	+ 0.012
9509.675 (H)	436	- 0.015	4419.434 (S)	5027	- 0.075
242 1331.585 (H)	997	- 0.019	8206.220	6193	- 0.012
8710.211 (H)	3269	+ 0.016	8521.251	6290	- 0.001
9382.482 (H)	3476	+ 0.030	.296	6290	+ 0.044

Table 3 : DZ Mus (continued)

Minima	E	O-C	Minima	E	O-C
243 8547.198	6298	- 0.034	243 9268.214	6520	+ 0.014
.242	6298	+ 0.010	9294.208	6528	+ 0.023
8560.198	6302	- 0.025	9972.889	6737	- 0.048
.242	6302	+ 0.019	.934	6737	- 0.003
8901.213	6407	- 0.010	9998.872	6745	- 0.046
.258	6407	+ 0.035	.917	6745	- 0.001
8914.208	6411	- 0.005	244 1099.890	7084	+ 0.029
.254	6411	+ 0.041	2145.596(pe)	7406	- 0.002
			2148.840(pe)	7407	+ 0.002

Remarks:

(H) = Minima from Harvard } plate collection
(S) = Minima from Sonneberg } plate collection

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COMMISSION 27 OF THE I. A. U.
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Konkoly Observatory
Budapest
1974 October 30

PHOTOELECTRIC OBSERVATIONS OF THE Ap STAR HD 27309 = 56 Tau

In his catalogue, Osawa (Ann. Tokyo AO, Ser. II.9.123, 1965) pointed out the Si (λ 3955, λ 4200) spectral peculiarity of the star HD 27309 ($5^{m}.32$).

The first photoelectric observations of the star were made by Hildebrant (Dissertation, AdW der DDR, Berlin, 1972) in the UBV system. In spite of the small number of observations, which did not permit the precise determination of the light curve from, a period of $2^{d}.69$ could be determined for the light variation.

Within the range of a program of investigation of Ap-stars in ten different regions of the spectrum in the interval between 3000 and 8000 A (Nikolov, Dissertation, AdW der DDR, Berlin, 1974) the author observed HD 27309 = 56 Tau photoelectrically with the 35 cm reflector of the Academy of Sciences of the GDR at Shemaha Astrophysical Observatory (Azerbaijan SSR) from January 19 to February 18,1973 (J.D. 2441702-732). Every observation usually consists of five symmetric blocks each of which has the following form: background, comparison star, twice variable, comparison star, background. HD 27176 (A5; $5^{m}.56$) was used as a comparison star. The observations are given in the Table in which the headings are selfexplanatory. The differences in magnitude are in the sense comparison HD 27176 minus variable. The phases are calculated by the elements J.D. (min. light) = 2440979.153+ $+2^{d}.69 \cdot E$.

Table I

J.D. 2440000+	Ph	Δm 3450 Å	Δm 3750 Å	Δm 4050 Å	Δm 4620 Å	Δm 5160 Å
1702,274	0,82	1,247	1,056	0,842	0,504	0,322
1705,298	0,94	1,297	-	0,856	0,518	0,359
1707,239	0,66	1,219	1,020	0,820	0,460	0,288
1711,223	0,14	1,335	1,112	0,870	0,528	0,350
1712,261	0,53	1,262	1,059	0,838	0,507	0,324
1713,202	0,88	1,295	1,061	0,845	0,516	0,342
1718,228	0,75	1,232	1,032	0,835	0,482	0,319
1720,276	0,50	1,303	1,100	0,843	0,515	0,329

Table I (continued)

J.D. 2440000+	Ph	Δm 3450 Å	Δm 3750 Å	Δm 4050 Å	Δm 4620 Å	Δm 5160 Å
1721,223	0,86	1,271	1,056	0,844	0,510	0,336
1724,207	0,97	1,302	1,073	0,853	0,512	0,326
1725,225	0,35	1,370	1,141	-	0,554	0,400
1728,268	0,48	1,366	1,130	0,865	0,536	0,348
1729,190	0,83	1,252	1,047	0,833	0,495	0,323
1732,199	0,94	1,289	1,072	0,848	0,522	0,352

Table I (continued)

J.D. 2440000+	Ph	Δm 5420 Å	Δm 6000 Å	Δm 6470 Å	Δm 7150 Å	Δm 8100 Å
1702,274	0,82	0,266	0,140	0,076	-0,067	-0,158
1705,298	0,94	0,280	0,154	-	-0,029	-
1707,239	0,66	0,220	0,087	-	-0,096	-0,199
1711,223	0,14	0,311	0,175	0,085	-0,021	-0,099
1712,261	0,53	0,267	0,138	0,044	-0,072	-0,148
1713,202	0,88	0,280	0,143	0,047	-0,051	-0,135
1718,228	0,75	0,249	0,120	0,031	-0,095	-0,163
1720,276	0,50	0,279	0,166	0,075	-0,044	-0,128
1721,223	0,86	0,275	0,143	0,036	-0,053	-0,140
1724,207	0,97	0,270	0,132	0,047	-0,064	-0,122
1725,225	0,35	0,352	0,195	0,122	-	-0,086
1728,268	0,48	0,296	0,154	0,080	-0,038	-0,120
1729,190	0,82	0,265	0,122	0,039	-0,082	-0,154
1732,199	0,94	0,277	0,124	0,053	-0,051	-0,122

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MULTI-COLOUR PHOTOMETRY OF V1216 SAGITTARII

The flare star V1216 Sgr was observed photoelectrically using the 24" Cassegrain reflector of the Ruhr-Universtiy of Bochum at La Silla (ESO), Chile. The photometer used is a one channel type with computer controlled filter switching. Since the switching time lowered the detection efficiency, the instrument has been operated just in two colours. In practice this is accomplished by two subsequent observations, the first measurement is done with an U-filter followed by an observation either in B, or V, or H_β respectively.

Once each five seconds data from the blue-sensitive photomultiplier are stored in the computer's memory which has been adjusted of retaining up to 45 minutes of data. After this time the data are subject to be printed when the maximum of the intensity shows a departure from the steady level of greater than 0.1 magnitudes.

The transformation from the instrumental to standard UBV-system has been determined by differential measurements.

The mean standard magnitude of one recommended comparison star of Andrews (1968, IBVS No.265) has been used. This star with the code letter d has nearly the same colour as V 1216 Sgr, thus extinction does not affect seriously the amount of

$$m_{Sgr} - m_d ,$$

whereas the difference of the differences

$$\Delta m = (m_{Sgr} - m_d)_{UBV\text{-}Standard} - (m_{Sgr} - m_d)_{Instrument}$$

contains the transformation to the standard system.

Thus, we have

			U	B	V
Andrews (IBVS No.265,1968) $m_{Sgr}-m_d$		=	0.2	0.2	-0.15
this report		=	0.3	-0.2	-0.06

Except in B the deviation from the standard system is equal or less than $0\overset{m}{.}1$.

The result that may be drawn can be summarized as

V 1216 Sgr			U	B	V
	m	=	12.8	12.1	10.1

Error rate : $\pm\ 0\overset{m}{.}1$

Below the peak magnitudes of the total number of events are listed and presented along with four light curves (Fig.1 and Fig.2) of the most significant events.

Table

Flares of V1216 Sgr

Date June,1974	U.T. Max	U Δm	B Δm	H_β Δm	V Δm
14.	3^h21^m	>1			<0.1
15.	2 57	1.45			<0.1
17.	4 08	1.34	0.13		
21.	2 36	0.67	0.09		
	5 23	1.07	0.11		
22.	2 55	1.43	0.17		
23.	4 17	1.20		0.18	
28.	7 32	1.77		0.89	

Total Observing Time : 54^h

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Fig. 1.

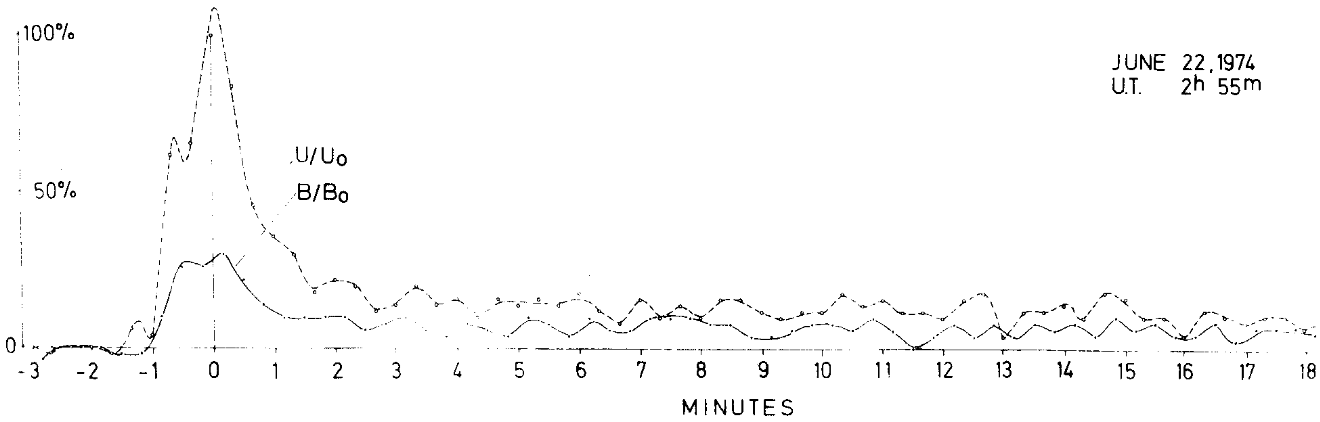
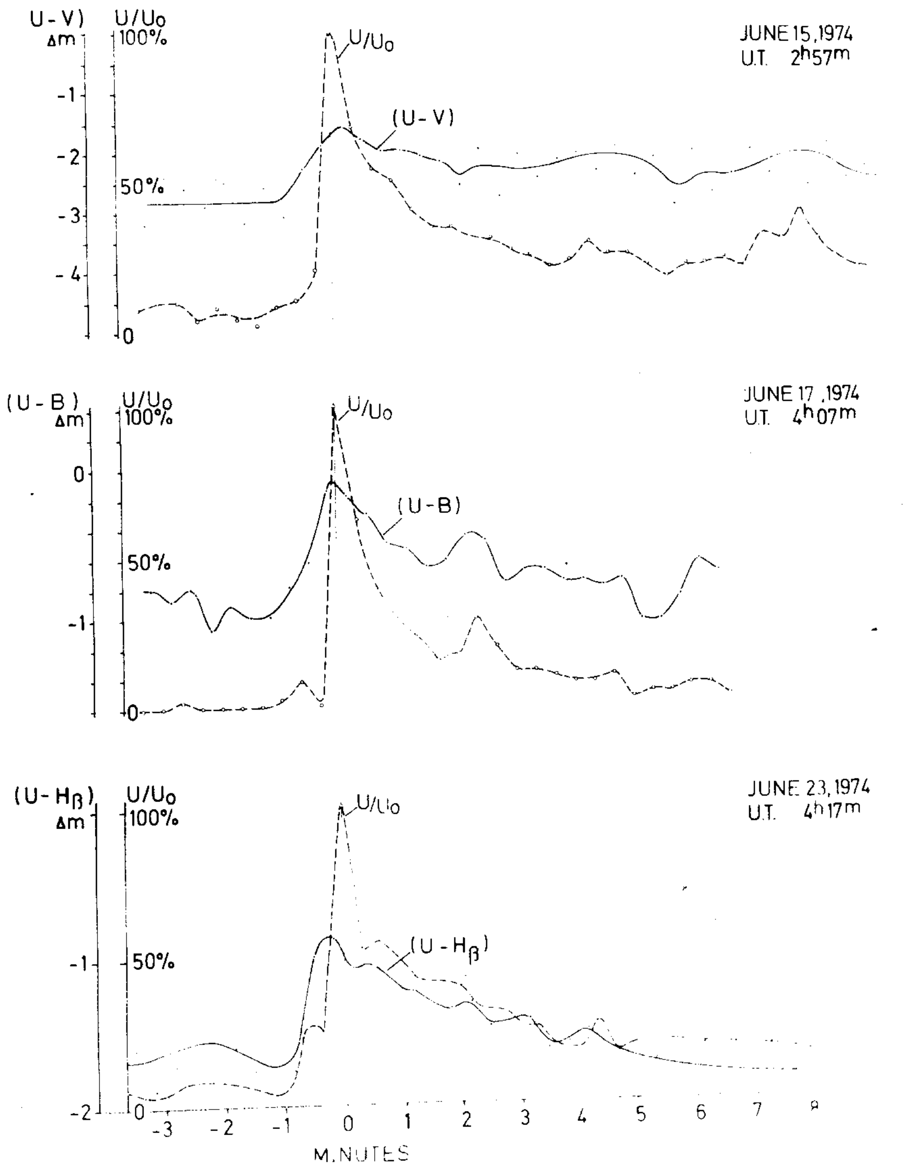

100%
50%
0
U/Uo
B/Bo
JUNE 22, 1974
U.T. 2h 55m
-3
-2
-1
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
MINUTES

Fig. 2.



U-V)
Δm
U/Uo
100%
50%
0
-1
-2
-3
-4
U/Uo
(U-V)
JUNE 15,1974
U.T. 2h57m
(U-B)
Δm
U/Uo
100%
50%
0
-1
U/Uo
(U-B)
JUNE 17,1974
U.T. 4h07m
(U-Hβ)
Δm
U/Uo
100%
50%
-1
-2
0
U/Uo
(U-Hβ)
JUNE 23,1974
U.T. 4h17m
-3
-2
-1
0
1
2
3
4
5
6
7
M.NUTES

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1974 November 25

CG LIBRAE

The variable CG Librae was presented by S.V.M. Clube et al. (Mem.R.A.S. 72,101-1969) as a c-type RR Lyr variable with period $P = 0^{d}.442689$ and amplitude $0^{m}.6$. The corresponding light curve (Fig.1a) is however rather scattered and asymmetrical.

Using the data given by Clube et al. the new period $P = 0^{d}.3068674$ has been found. The corresponding light curve (Fig.1b), which is fairly sinusoidal, seems to be more proper for an RRc variable.

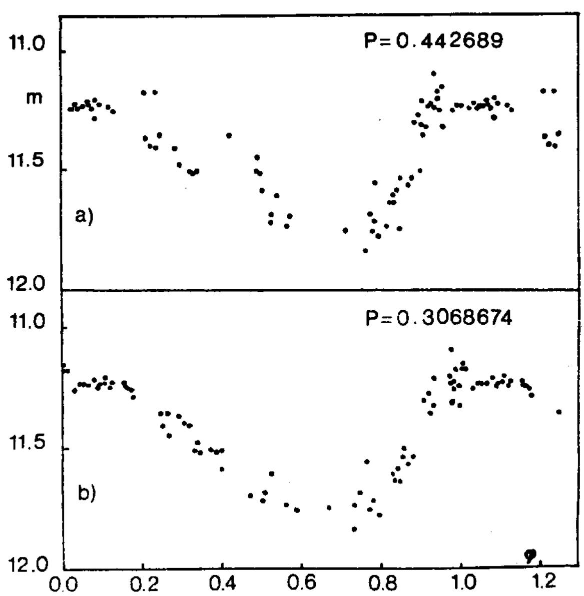

FIG 1

November 12, 1974.

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Konkoly Observatory
Budapest
1974 November 26

1974 UBV PHOTOMETRY OF THE RADIO STAR UX ARIETIS = HD 21242

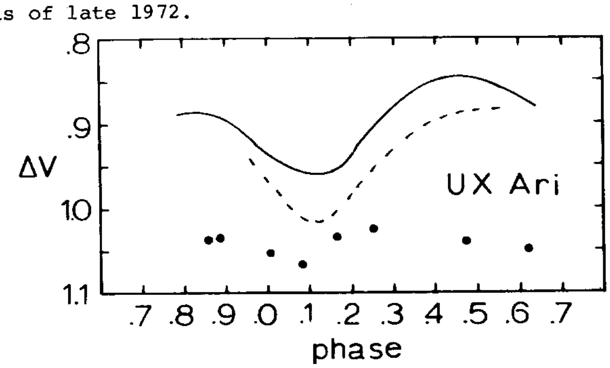
The purpose of this short note is to announce that the light curve of UX Arietis has changed. UX Ari is of particular interest because it is the brightest ($V \approx 6^m_\cdot5$) RS Canum Venaticorum-type binary known to date (Carlos and Popper 1971) and because it is a radio star (Gibson et al. 1975). The last photometric observations were made in 1972 (Montle and Hall 1972; Atkins and Hall 1972, Hall, Montle, and Atkins 1975).

We obtained 30 differential UBV observations with respect to 62 Arietis on 8 nights in October 1974. The constancy of 62 Ari was again verified, via 10 differential observations with respect to BS 999 on 7 nights in October 1974. The mean difference was consistent with the value found by Hall, Montle, and Atkins; and the standard deviation of each observation from that mean was about $\pm 0^m_\cdot013$ in all three colors.

In the Figure below we have plotted nightly normals of the V observations. Here Δ is in the sense UX Ari minus 62 Ari, and the phase is reckoned with the ephemeris

$$JD(hel.) = 2440133.76 + 6^d_\cdot43791 \cdot E$$

which we derived from data in Table II of Carlos and Popper. The solid line indicates roughly the light curve as of early 1972; the broken line, as of late 1972.



We can make three conclusions. (1) The overall level of the light curve has decreased: by more than $0^{m}.1$. (2) The amplitude has dwindled dramatically: from about $0^{m}.14$ to about $0^{m}.04$. We note that the amplitude of the wave in RS CVn is also variable (Hall 1972), having ranged between $0^{m}.18$ and about $0^{m}.05$. (3) There is some indication that minimum light still occurs where it did in 1972: around $0^{P}.1$. If so, then this would imply that, relative to the orbital motion, the wave did not migrate measurably between 1972 and 1974.

We are continuing UBV photometry of UX Ari and encourage others to observe this interesting system also.

November 15, 1974

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References:

Atkins, H.L., Hall, D.S. 1972, P.A.S.P. 84, 638.
Carlos, R.C., Popper, D.M. 1971, P.A.S.P. 83, 504.
Gibson, D.M., Hjellming, R.M., Owen, F.N. 1975, Ap.J.Letters (submitted).
Hall, D.S. 1972, P.A.S.P. 84, 323.
Hall, D.S., Montle, R.E., Atkins, H.L. 1975, Acta Astr. (submitted).
Montle, R.E., Hall, D.S. 1972, I.B.V.S. No. 646.

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Number 946

Konkoly Observatory
Budapest
1974 November 29

PRELIMINARY CHART OF THE REGION OF NOVA SAGITTARII 1974

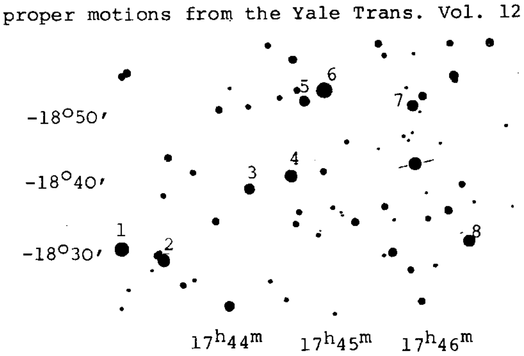
The chart by Marilyn Ogburn was made from plates taken with the 66 cm refractor of this observatory on October 20th and October 21, 1974. At that time, the Nova was 9.5 magnitude (photovisual).

The following precise position of Nova Sagittarii 1974 is reported:

UT	Equinox	1950
Nov. 11.979	$17^h\ 45^m\ 44^s.07$	$-\ 18^\circ\ 44'\ 41''.6$

Reference configuration: BD $-18^\circ 4650$
BD $-18^\circ 4648$
BD $-18^\circ 4657$
BD $-18^\circ 4659$

with proper motions from the Yale Trans. Vol. 12, Part II.



Limiting magnitude ≈ 13 m_{pv}

Star	BD Designation	Star	BD Designation
1	$-18^\circ 4637$	5	$-18^\circ 4646$
2	$-18^\circ 4640$	6	$-18^\circ 4648$
3	$-18^\circ 4643$	7	$-18^\circ 4650$
4	$-18^\circ 4644$	8	$-18^\circ 4652$

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1974 November 30

PREDISCOVERY OBSERVATIONS OF NOVA PERSEI 1974

On Sonneberg Sky Patrol plates, taken by H. Huth, the following observations were obtained:

Date	J.D.	mpg
1974 Aug.16/17	244 2276.6	12.7
Sep.11/12	2302.5	8.9
Sep.20/21	2311.5	9.2
Nov. 6/7	2358.4	11.0

If the reddish star of mpg $\approx$ 12.7 which lies close to the nova's position is the prenova , which is not at all certain or even probable, then the magnitudes given above can be taken unchanged for the nova. Otherwise the brightness of that star has to be taken into account. In this case the nova must be called "invisible fainter 13^m" on Aug. 16/17. A detailed study of the light curve of the prenova when identified might be possible on numerous astrographic plates of the Sonneberg field alpha Persei and will be published in Mitteilungen über Veränderliche Sterne.

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Budapest
1974 December 6

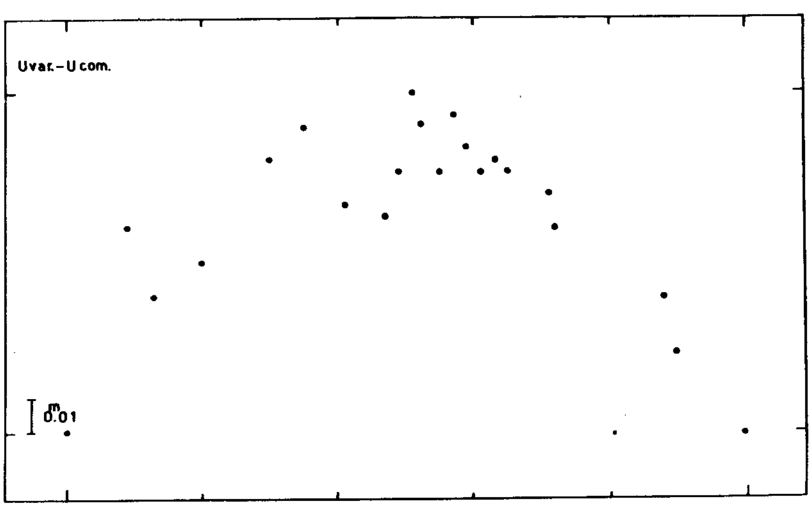
HD 192913 : A NEW PERIODIC MAGNETIC VARIABLE

This star was observed photoelectrically in UBV system with the 60 cm reflector of Bologna Observatory for 19 nights since June 19, 1973 to October 26, 1974, using HD 191747 as comparison star.

HD 192518 and probably also HD 192044 were found to be rapid variable stars.

HD 192913 shows, in U light, variations of $0^m.090$ with a period of $16^d.82$. The light curve is plotted by the formula

$$\text{J.D. Min} = 2441853.6 + 16^d.82 \cdot E$$



Osservatorio Astronomico
dell'Universita di Bologna

November 26, 1974

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R. FOSCHINI
A. PICCIONI

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 949

Konkoly Observatory
Budapest
1974 December 6

REQUEST TO FLARE STAR OBSERVERS

We are planning an extensive series of X-ray observations of the flare star UV-Ceti (1950 r.a. = $01^h36^m25^s$, 1950 dec = $-18^\circ12.7'$) with the Astronomical Netherlands Satellite (ANS) during 3-8 January 1975. The Smithsonian X-ray experiment on ANS will observe in the 1-30keV energy range with 1 sec time resolution and spectrum recording every 4 seconds. Flares could be detected to at least the limit $\sim 5 \times 10^{-10}$ erg/cm^{2}sec in the 1.5keV-7keV band. In addition, the soft X-ray (0.25keV-8keV) experiment on ANS will be observing with comparable sensitivity and time resolution. On 5 and 6 January it will be possible for the third ANS experiment, a uv telescope (1500-3000 Å), to also observe the star. The satellite can maintain pointing (within an arc minute) on the star for about 15 minutes during each 98-minute orbit.

We urgently request all possible optical observers to search for flares during this period. We hope observers will record data with high time resolution for as long as possible while the star is visible after local sunset. Due to the satellite orbit, especially long observations are possible over Asia and Australia. Observers can obtain a list of approximate ANS observing times by 20 December upon notifying either Dr. J. Grindlay at the Center for Astrophysics or Dr. J. Heise, Laboratory for Space Research, Beneluxlaan 21, Utrecht, Netherlands (telex no. 47224).

During a similar observing program on YZ-CMI in 1974 October, it is very likely that we detected an X-ray flare. Unfortunately there was no coincident optical or radio observation at that particular time. We hope it will be possible for many observers to monitor UV-Ceti and communicate times of any flares to us.

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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 950

Konkoly Observatory
Budapest
1974 December 7

THE CHANGING PERIOD OF HQ LYRAE

HQ Lyrae ($19^h23^m19^s$ + $42^o20'.5$) is listed in the GCVS as a questinoned Mira type star with a period of 322 days. This variable was rediscovered by Lucia Dexter at the Maria Mitchell Observatory. On the basis of approximately 150 plates taken in recent years she found a period of 290 days. I then examined the star on some 700 plates taken between JD21030 and 42300. These indicated that a constant period will not satisfy all of the observations. They are best represented by the formula,

$$\text{Max.} = \text{J.D.}2424770 + 289.5n + 30 \sin 8^o n.$$

The upper portion of the diagram shows the difference between observed and computed times of maximum for a constant period of 289.5 days, where the smooth curve represents the function 30 sin 8^on.The lower diagram indicates that the observed (or interpolated) times of maximum show a spread of $\pm$10 days around the times of predicted maximum. This spread is smaller than the uncertainty in interpolation of time of maximum for some incompletely observed cycles.

The observations cover a span of 61 cycles after JD_o, the first actually observed maximum. A number of earlier observations at cycle -12 are at minimum fainter than the limiting magnitude of the plates. The previously published JD_o, 28020, is some 20 days past our observed maximum at that cycle. Our most recent well defined maximum, with observations on both the ascending branches of the light curve, occurred at JD 41880 (cycle 59).

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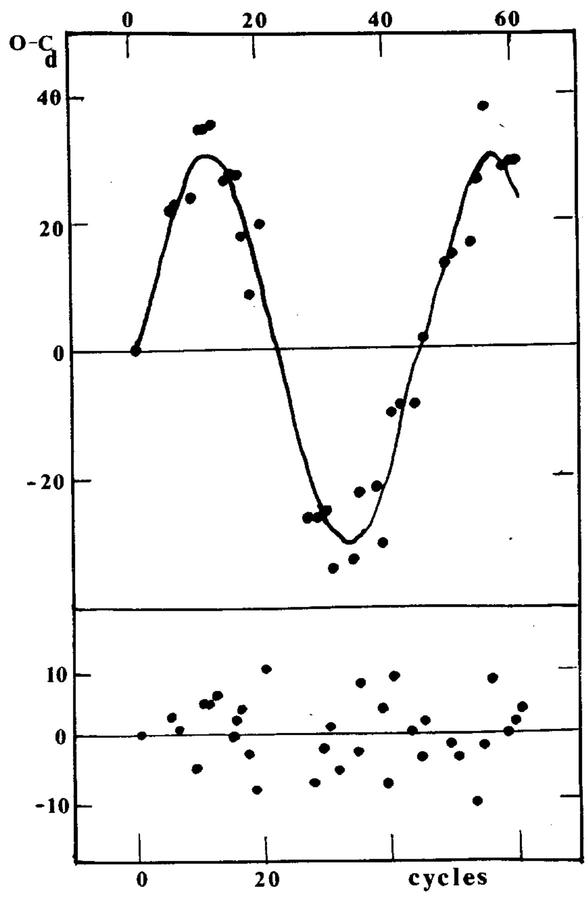

0
20
40
60
O-C
d
40
20
0
-20
10
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-10
0
20
cycles

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 951

Konkoly Observatory
Budapest
1974 December 11

MINIMA OF ECLIPSING VARIABLES

The list below contains photoelectric minima of eclipsing variables observed with the 60 cm reflector of the Bologna **Observatory.** The heliocentric times of minima and mean errors were obtained by the method of Kwee and Van Woerden. Linear elements in the 1969 General Catalogue of Variable Stars were used to compute the E and O-C values. N denotes the number of single observations used in computing the time of minimum; the colour of the observations is reported in the last column.

The time of secondary minimum of AK Her at E = 7830.5 was obtained by fitting the observations of J.D. 2440090 (descending branch) and J.D. 2440058 (ascending branch) and using the period given by Purgathofer and Widorn (Mitt. Univ. Sternw. Wien, 12, 1964).

Star	J.D. hel (2400000 +)	m.e.	N	E	O-C	
AS Cam	40626.5230	±0ᵈ.0007	39	8526	-0ᵈ.0447	blue
	40626.5215	.0005	38	8526	-0.0462	yellow
	41007.3606	.0003	36	8748	-0.0459	blue
	41007.3594	.0003	36	8748	-0.0471	yellow
AZ Cam	40655.4791	.0005	29	10811	-0.0148	blue
	40655.4792	.0005	28	10811	-0.0147	yellow
AO Cas	40855.4016	.0007	78	2459	-0.0419	blue
AK Her	40058.4030	.0001	28	7830.5	-0.0088	yellow
	40354.5208	.0002	19	8533	-0.0123	"
	40381.4986	.0004	23	8597	-0.0121	"
	40407.4234	.0001	24	8658.5	-0.0111	"
	41124.4318	.0003	28	10359.5	-0.0167	"
	41126.5398	.0005	15	10364.5	-0.0164	"
DI Her	40363.5280	.0001	45	2386.5	+2.7795	blue
TX Her	40735.4714	.0001	68	5054	-0.0103	yellow
	41182.4508	.0003	24	5271	-0.0097	blue
	41182.4511	.0002	23	5271	-0.0094	yellow
V451 Oph	40422.4890	.0002	46	2848.5	-0.0053	yellow
ER Vul	40182.266	.001	15	6430	-0.089	yellow
	40183.3107	±0.0005	27	6431.5	-0ᵈ.0917	yellow

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INFORMATION BULLETIN ON VARIABLE STARS
Number 952

Konkoly Observatory
Budapest
1974 December 13

A NEW VARIABLE STAR IN M13

Two bright stars in the globular cluster M13 = NGC 6205 have recently been suspected by Russev (Astr. Zh. 51, 122, 1974) to vary in brightness. The two suspected variables are stars 414 and 973 in Ludendorff's catalogue (Publ. Potsdam Obs. 15, no. 50, 1905), the corresponding Kadla (Iz. Pulkova Obs. 24, 92, 1966) and Arp (Astr. J. 60, 317, 1955) numbers being K444 = Arp III-56 for L414 and K544 = Arp I-48 for L973. Both of the stars are bright red giants with B-V ≈ 1.5 and therefore could be possible members of the semi-regular class of cluster variables about which little is known.

We have investigated the variability of these two stars on the plates of M13 at our disposal. Our methods for testing the reality of the variability were the same as those used previously (IBVS 798, 1973; IBVS 849, 1973). Briefly, the B magnitudes of the two suspects were determined in relation to a sequence of comparison stars using a Becker type iris photometer. As a control, two non-variable stars close to and of approximately the same brightnesses as the two suspects were also measured and were reduced in the same manner as for the possible variables.

We found no evidence that L414 varied during the three years covered by our observations. The magnitudes from the 56 plates were distributed in roughly Gaussian fashion about the mean value of 13.65 with a dispersion of 0.05 mag. Our mean value agrees well with the B magnitude given by Kadla. The dispersion in the measures is identical to that found for the two control stars (as well as in agreement with the results found in our previous investigations using the same plate material) and thus can be entirely explained as due to random measuring errors. We conclude that within the accuracy of our measures L414 does not vary.

Measurements of L973 are difficult due to the presence of two close companions about three magnitudes fainter, and some of our measures have probably been affected by these stars. Nevertheless, our observations indicate that L973 definitely varies over a range of about 0.4 magnitudes. Our mean B of 13.50 differs by 0.12 mag. from Kadla's value, while the histogram of the measures is non-Gaussian with a dispersion of 0.14 mag., significantly greater than that for the other stars. The available observations can be approximately represented by a period near 39^d but the light curve shows the irregular behavior characteristic of semi-regular variables. The variations of L973 for the three years covered by our plates is shown in the figure. Variable stars with periods of the order of 40^d are very rare in globular clusters and further studies of this star would be worthwhile.

The details of our studies of the M13 variables will be published elsewhere. We wish to thank M. Ibañez for permission to re-reduce his measures of L414 made for another purpose and the U.S. Naval Observatory for the observing time during which the plates were taken.

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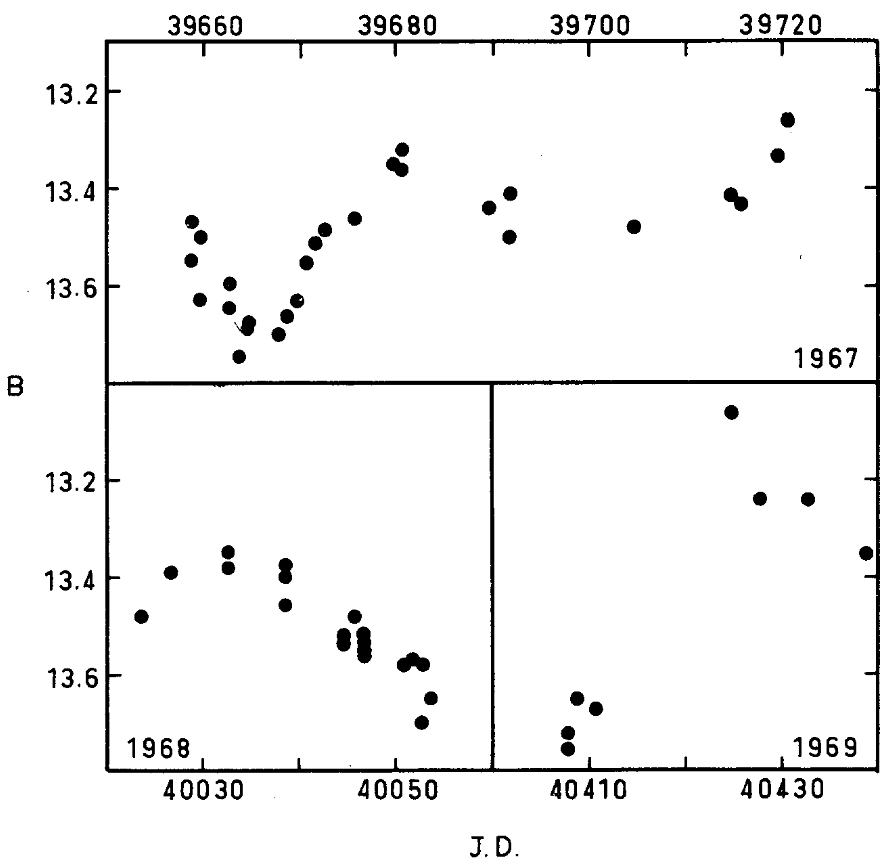

39660
39680
39700
39720
13.2
13.4
13.6
1967
B
13.2
13.4
13.6
1968
1969
40030
40050
40410
40430
J.D.

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Konkoly Observatory
Budapest
1974 December 23

PHOTOELECTRIC OBSERVATIONS OF RW TAURI

The eclipsing binary RW Tauri was observed by the author on two nights at the Fernbank Science Center Observatory for the purpose of obtaining times of primary minimum.These observations were made with the 91 cm Cassegrain reflector and an EMI 6256s photomultiplier. Because of the rapid light variations, only the yellow filter of the standard UBV system was used.

All observations were made with respect to a twelfth magnitude comparison star located 1' north of RW Tauri as shown in Fig.1. The magnitude difference in the sense variable minus comparison and the corresponding Julian dates are given in the table. The observations of universal date 21 November,1974, are plotted in Fig.2.The resudual light that is evident just after second contact and just before third contact is due to luminous ring around the B component as explained by Grant (Ap.J. 129, 62, 1959).

The method of Hertzsprung (BAN 4, 178, 1928) was used to calculate the time of minimum of 21 November, 1974. Only the ascending branch was observed on 17 March, 1974, and a tracing paper method

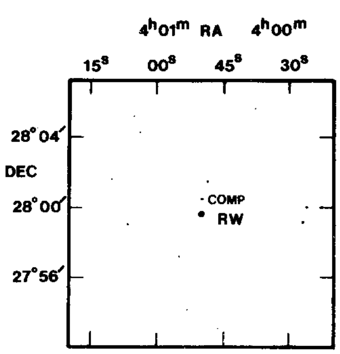

Fig.1. A FINDING CHART FOR RW TAURI. COORDINATES ARE REFERRED TO EPOCH 1950.

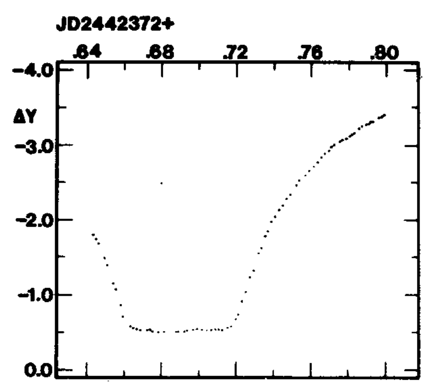

Fig.2. YELLOW LIGHT CURVE OF 21 NOV. 1974

was used for this time of minimum calculation. The times of minimum are given as: 17 March, 1974 JD(Hel) 2442123.498
21 November,1974 JD(Hel) 2442372.6902

The (O-C)'s as calculated from Grant's period are -0.066 and -0.0704 respectively.

OBSERVATIONS OF RW TAURI IN YELLOW LIGHT

JD (Hel) 2442000+	V-C	JD (Hel) 2442000+	V-C	JD (Hel) 2442000+	V-C
123.5551	-2.310	123.6370	-3.620	272.7270	-1.235
.5567	-2.348	.6397	-3.638	.7283	-1.332
.5596	-2.441	123.6411	-3.675	.7320	-1.557
.5610	-2.480	372.6437	-1.803	.7330	-1.613
.5646	-2.640	.6452	-1.750	.7354	-1.763
.5659	-2.714	.6462	-1.690	.7366	-1.840
.5700	-2.751	.6497	-1.481	.7390	-1.969
.5713	-2.772	.6511	-1.391	.7403	-2.035
.5755	-2.822	.6541	-1.154	.7424	-2.119
.5769	-2.877	.6559	-1.107	.7441	-2.177
.5814	-3.026	.6582	-0.852	.7467	-2.275
.5826	-3.030	.6599	-0.703	.7483	-2.334
.5850	-3.064	.6634	-0.584	.7520	-2.465
.5863	-3.095	.6646	-0.566	.7537	-2.514
.5887	-3.125	.6677	-0.550	.7567	-2.605
.5901	-3.167	.6692	-0.546	.7588	-2.662
.5928	-3.164	.6722	-0.538	.7618	-2.731
.5940	-3.179	.6737	-0.541	.7629	-2.762
.5967	-3.213	.6768	-0.519	.7657	-2.838
.5979	-3.244	.6801	-0.507	.7669	-2.879
.6001	-3.246	.6816	-0.510	.7695	-2.933
.6013	-3.261	.6882	-0.518	.7709	-2.965
.6037	-3.320	.6897	-0.517	.7721	-2.987
.6050	-3.330	.6923	-0.515	.7751	-3.045
.6074	-3.373	.6938	-0.524	.7764	-3.066
.6086	-3.386	.6970	-0.535	.7776	-3.079
.6111	-3.431	.6989	-0.545	.7802	-3.112
.6123	-3.438	.7019	-0.521	.7814	-3.140
.6159	-3.482	.7036	-0.530	.7826	-3.158
.6173	-3.505	.7067	-0.528	.7854	-3.226
.6200	-3.544	.7082	-0.531	.7865	-3.245
.6213	-3.552	.7110	-0.531	.7878	-3.261
.6239	-3.596	.7127	-0.521	.7905	-3.289
.6250	-3.615	.7156	-0.554	.7916	-3.305
.6278	-3.679	.7173	-0.573	.7928	-3.316
.6290	-3.712	.7196	-0.673	.7961	-3.364
.6317	-3.687	.7210	-0.730	.7972	-3.367
.6329	-3.642	.7232	-0.906	.7985	-3.391
.6356	-3.628	.7246	-1.043		

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COMMISSION 27 OF THE I. A. U.
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Number 954

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Budapest
1975 January 10

MINIMA OF ECLIPSING VARIABLES

The list below contains visual minima of eclipsing variables. For each minimum both the descending and ascending branch of light curve was observed. The time of minimum was measured from each light curve by the tracing paper method.

After each star name the standard deviation, σ, expected for a single visual minimum of a star with that light curve is given. These standard deviations are calculated from studies by Mallama (1974, JAAVSO, 3, 11 and 1974, JAAVSO, submitted).

Column one lists the heliocentric time of minimum. In column two is the number of visual estimates contributing to the light curve. Columns three and four give the epoch and O-C according to the linear elements of GCVS 1969, not including the 1971 supplement. The last column lists the visual observer.

JD hel. (2442000+)	n	epoch	O-C	Observer
WZ Andromedae, σ = $.^{d}006$				
359.603	12	10471	$-.^{d}016$	Krobusek
CX Aquarii, σ = $.^{d}004$				
309.764	10	10533	+.016	Krobusek
343.673	8	10594	+.010	Krobusek
OO Aquilae, σ = $.^{d}006$				
203.681	10	16388	-.029	Krobusek
232.709	7	16392	-.028	Mallama
232.709	8	16392	-.028	Krobusek
234.721	9	16396	-.043	Krobusek
234.724	9	16396	-.040	Mallama
235.744	8	16398	-.033	Mallama
235.750	9	16398	-.027	Krobusek
245.641	8	16417.5	-.019	Krobusek
247.644	7	16421.5	-.043	Krobusek
248.667	8	16423.5	-.034	Krobusek
250.699	11	16427.5	-.029	Krobusek
256.786	9	16439.5	-.023	Krobusek
264.635	8	16455	-.030	Krobusek
265.647	8	16457	-.031	Krobusek
266.638	7	16459	-.054	Krobusek
324.687	13	16573.5	-.033	Krobusek
337.609	8	16599	-.034	Krobusek
RZ Cassiopeiae, σ = $.^{d}004$				
235.738	18	4260	-.004	Krobusek
235.743	23	4260	+.001	Mallama
265.626	13	4285	+.003	Krobusek
314.635	16	4326	+.007	Krobusek
EK Cephei, σ = $.^{d}006$				
314.713	18	748	+.004	Krobusek
RZ Draconis, σ = $.^{d}005$				
229.668	10	23201	-.009	Krobusek
234.619	9	23210	-.016	Krobusek
235.723	9	23212	-.013	Mallama
240.682	10	23221	-.013	Krobusek
245.629	8	23230	-.023	Krobusek
253.625	10	23244.5	-.015	Krobusek
272.638	9	23279	-.007	Krobusek
337.630	11	23397	-.019	Krobusek

JD hel (2442000+)	n	epoch	O-C	Observer
RZ Draconis, σ = $^{d}.005$				
342.595	8	23406	$-^{d}.012$	Krobusek
359.661	7	23437	-.023	Krobusek
AI Draconis, σ = $^{d}.005$				
230.663	10	2647	-.009	Krobusek
236.670	13	2652	+.004	Krobusek
266.635	16	2677	-.001	Krobusek
272.636	12	2682	+.006	Krobusek
296.616	11	2702	+.010	Krobusek
SW Lacertae, σ = $^{d}.005$				
250.648	12	14586	-.064	Krobusek
256.748	10	14605	-.058	Krobusek
309.660	9	14770	-.066	Krobusek
TZ Lyrae, σ = $^{d}.005$				
239.693	10	40789	+.019	Krobusek
247.630	6	40804	+.024	Krobusek
248.680	10	40806	+.016	Krobusek
265.614	11	40838	+.028	Krobusek
266.665	11	40840	+.021	Krobusek
X Trianguli, σ = $^{d}.003$				
337.560	8	4905	-.034	Krobusek
W Ursae Minoris, σ = $^{d}.010$				
235.706	9	5160	-.028	Krobusek
235.715	9	5160	-.019	Mallama
264.645	10	5177	-.009	Krobusek
RU Ursae Minoris, σ = $^{d}.007$				
236.744	18	30062	-.011	Krobusek
245.665	13	30079	-.014	Krobusek
265.619	13	30117	-.007	Krobusek

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INFORMATION BULLETIN ON VARIABLE STARS
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Konkoly Observatory
Budapest
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PHOTOMETRIC OBSERVATIONS OF THE SUSPECTED VV CEPHEI STAR BD +61°219

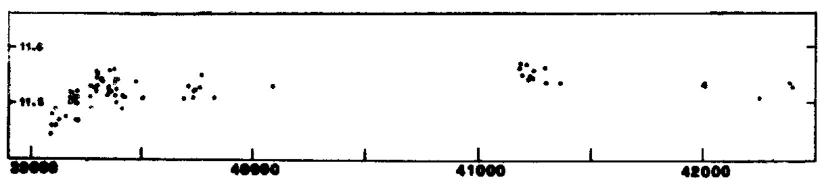
The star BD +61°219 has been classified as a VV Cephei binary by M^me Barbier (1971) on the basis of spectrographic evidence. As this star lies in a field patrolled since the end of 1965 with the 20 cm astrograph of the Teramo Observatory, I have examined its photometric behaviour during these years. On the 81 available plates the magnitude of the star has been determined with a Zeiss G2 Schnellphotometer using 6 comparison stars whose photographic magnitudes had been calibrated photoelectrically; the results are given in the following table, the mean internal error of one magnitude being ±0.05:

J.D. 24	m_{pg}	J.D.	m_{pg}	J.D.	m_{pg}
39089.3	11.80	39295.6	11.20	39505.4	11.45
090.3	11.70	298.5	11.30	684.5	11.45
093.5	11.60	298.6	11.25	712.6	11.35
107.3	11.55	299.5	11.25	732.4	11.45
114.4	11.70	300.5	11.35	734.5	11.40
126.4	11.65	320.5	11.30	740.5	11.40
154.3	11.60	321.5	11.30	761.4	11.35
172.4	11.50	326.5	11.30	767.5	11.25
175.3	11.45	348.4	11.45	827.5	11.45
175.4	11.40	350.5	11.35	40090.5	11.35
181.4	11.50	351.6	11.40	41183.4	11.20
184.3	11.40	352.6	11.40	188.4	11.15
198.3	11.50	353.5	11.20	193.5	11.25
200.3	11.45	361.6	11.40	214.3	11.15
202.3	11.65	376.4	11.20	221.5	11.30
203.3	11.50	377.4	11.30	236.4	11.25
206.3	11.50	379.4	11.45	243.4	11.30
207.3	11.40	382.5	11.30	245.4	11.20
209.3	11.65	384.5	11.50	297.5	11.15
211.3	11.45	385.5	11.40	301.4	11.30
215.3	11.65	392.5	11.30	365.4	11.30
264.6	11.45	412.4	11.45	42003.3	11.35
267.6	11.35	413.5	11.55	007.3	11.30
268.6	11.55	414.6	11.45	010.3	11.35
270.6	11.35	417.5	11.45	252.4	11.45
293.6	11.40	476.4	11.30	385.3	11.30
294.6	11.40	501.4	11.45	398.2	11.35

At the beginning of the observations, from about J.D. 39100 to 39300 (November 1965 - July 1966), the light curve shows a rising of $0^m.4$; afterwards the star seems to stay at maximum brightness with some fluctuations between $11^m.2$ and $11^m.4$ but unfortunately the observations are too scanty to draw a certain conclusion. The initial rising might be the final phase of an eclipse, the slow recovery of the maximum brightness after the fourth contact being characteristic of some VV Cephei eclipsing variables as in the case of AZ Cassiopeiae (Tempesti 1968); if this conjecture is right, the period should be not shorter than 3500 days.

Photoelectric observations performed in two nights with a 40 cm refractor give, by comparison with the very close Johnson's standard star BD +61°195, the following magnitude and colour:

$V = 9^m.46 \pm 0.03$ $\qquad$ $B - V = +2^m.14 \pm 0.05$



Photographic light curve of BD +61°219

P. TEMPESTI
Osservatorio Astronomico
di Teramo - Italy

References:

Barbier, M., 1971. Astron and Astrophys. 14, 396
Tempesti, P., 1968, Atti dell'XI Convegno della Soc.Astron.Italiana Teramo, Note e Comunicazioni N. 44.

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INFORMATION BULLETIN ON VARIABLE STARS
Number 956

Konkoly Observatory
Budapest
1975 January 15

RZ Eri

This eclipsing binary with a period of 39 days consists of an early type primary and a late type secondary with CaII H and K in emission. Cesco and Sahade (1945) studied the system spectroscopically and determined an orbit for the primary component. Later Gaposchkin (1951) and Gadomski (1957) derived photometric elements from photographic observations.

As the light curve shows total primary eclipses it is possible from a few observations to determine photometric indices for the two components. In the bottom of primary eclipse we measure only the light of the cool secondary and by subtracting this light from the out-of-eclipse observations we get the light of the primary. In November,1973 observations were carried out on six nights around a primary minimum which was predicted to happen at HJD 2442002.89. The observations were obtained by means of the Copenhagen 50 cm telescope at Cerro La Silla and a four channel uvby-photometer. HR 1545 was used as a comparison star. Table 1 lists the observations.

Table 1

RZ Eri - HR 1545

HJD 24	Δu	Δv	Δb	Δy	Phase
42000.796	2.274	1.774	1.579	1.450	
000.827	2.280	1.770	1.582	1.454	
001.743	2.296	1.782	1.591	1.459	partial
001.793	2.318	1.805	1.612	1.476	partial
002.673	3.944	3.452	2.843	2.453	total
002.730	3.928	3.450	2.834	2.452	total
002.752	3.918	3.439	2.836	2.438	total
002.815	3.929	3.449	2.844	2.452	total
003.754	2.355	1.840	1.640	1.498	partial
004.672	2.276	1.766	1.576	1.445	
005.759	2.268	1.768	1.573	1.444	

From observations of standard stars we derive for HR 1545:

$V = 6.261 \quad b-y = 0.302 \quad m_1 = 0.139 \quad c_1 = 0.411$,

hence we get for the two components of RZ Eri:

Primary:

$V = 8.26 \quad b-y = 0.285 \quad m_1 = 0.200 \quad c_1 = 0.867$

Secondary:

$V = 8.71 \quad b-y = 0.717 \quad m_1 = 0.307 \quad c_1 = 0.340$.

The $([m_1],[c_1])$ indices for the primary component correspond to an F5 giant or an Am star. This may be compared with the classification by Morgan (Cesco and Sahade, 1945), who finds a spectral type of F5 from the metallic lines alone but A5 from the H/K ratio, indicating a metal-line star. Popper once questioned this (1967), but in a recent private communication (1974), he no longer disputes Morgan's classification. Thus the problem of spectral type of the primary component is still not solved. The indices of the secondary correspond to a K giant.

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References:

Cesco, C.U. and Sahade, J. :Ap.J. 101, 370 (1945).
Gadomski, J. : Acta Astron. 7, 83 (1957).
Gaposchkin, S. : Harvard Bull. No. 920 (1951).
Popper, D.M. : PASP 74, 129 (1962).
Popper, D.M. : Private communication (1974).

TIMES OF MINIMA FOR V523 Sgr AND V526 Sgr

The following observations of apsidal motion systems were obtained by means of the 50 cm Copenhagen Telescope at Cerro La Silla, Chile and a four channel uvby photometer. Each time of minimum is the mean for all four colours.

V523 Sgr.

A primary minimum was observed at

Min I: HJD 24 41836.8745 ± 4

The latest discussion of the apsidal motion is given by de Kort (1956), who arrived at an apsidal motion period of 248 years and eccentricity 0.2. Using the revised phase formula we obtain by plotting in his Fig.2. an O-C of about $-^{P}.02$, indicating an eccentricity slightly lower than 0.2.

V526 Sgr.

Two minima were observed as follows:

Min II::HJD 24 41828.7271 ± 3 O-C=$-^{d}.0027$

Min I : HJD 24 41829.9003 ± 2 O-C=$+^{d}.0105$

An extensive discussion of the apsidal motion is given by O'Connell (1967). The residuals to his ephemeris (formula 4) are given above, and although they seem to be quite large, it is probably not possible to improve the apsidal motion parameters significantly with the material available.

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European Southern Observatory

References:
de Kort, J. 1956: Vistas in Astronomy, 2, 1187.
O'Connell, D.J.K. 1967: Ricerche Astron., 7, No.11.

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 957

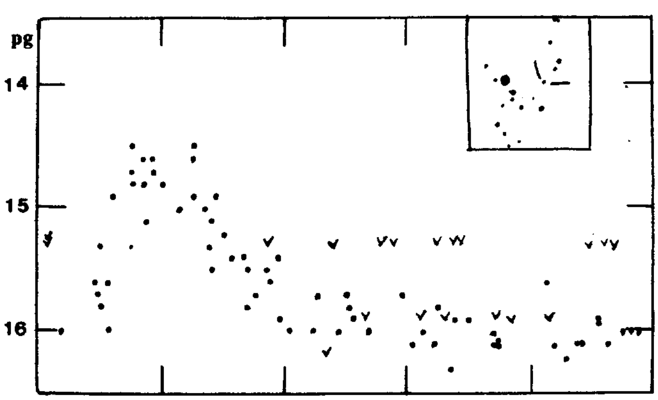
Konkoly Observatory
Budapest
1975 January 15

A NEW RR LYRAE VARIABLE IN COMA BERENICES

On Nantucket plates taken between 1964 and 1974 I have found a new RR Lyrae-type star at $12^h14^m23^s$ $+29^\circ00'.4$ (1900). Step estimates of its brightness on about 100 plates were carried out by the students Donna Henry, Sharon Beck and Janet Johnston. The means of their estimates have been reduced to very provisional photographic magnitudes on the basis of stars in SA 56 some 2.5 degrees distant.

In the Figure, I have represented the observations by a reciprocal period of 1.87099^{-d}. The insert is a diagram of the field approximately 20'x 20' with North at the top. The brightest star in the field is BD $+29^\circ2280$.

The elements are: Max = J.D. 40377.654 + $0^d.534476$, range 14.8-16.1pg. Miss Johnston has tested this period against possible spurious periods but did not succeed in finding any other period which would satisfy the observations equally well.



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Maria Mitchell Observatory
Nantucket, Mass., U.S.A.

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 958

Konkoly Observatory
Budapest
1975 January 17

SEVENTEEN LONG PERIOD VARIABLES IN SAGITTARIUS

Recent results obtained at the Maria Mitchell Observatory of long period variables in Sagittarius are summarized in Table I. Most of them are slightly revised periods of some previously published. The observations in general span the years 1924 to 1974. Diagrams (South at top) are given in Figure 1 for those of the stars for which such charts had not previously been available.

The first star, discovered in 1973 by Barbara Capron, proves to be an unusual type (Figure 2). Semi-regular cycles reminiscent of RV Tauri light curves are found, but with a double period on the order of 4000 days. Variables 8 and 15, discovered by Harriet Dinerstein in 1973, are both typical Mira type stars. Observations of V519 and V520 Sgr, updated by Josefa Manella, could not be adequately represented by a constant period, but are adequately represented by parabolic corrections:

V519 Max=JD $35085+178^{d}.25n+0.0046n^2$

V520 Max= $34910+260n+0.051n^2$

The initial Julian Dates given in the formulae are interpolated values. The dates given in the Table correspond to recent well observed maxima.

The Semi-regular variable V1666 shows fairly well defined cycles from about JD 23600 to 33800 (Harvard plates). The later Nantucket plates, however, do not yield well defined cycles, partly perhaps because of larger observational errors on plates of smaller scale in a crowded star field.

The students who ascertained the periods shown in the final columns of the table are O.L., Olivia Lovelace; J.M., Josefa Manella and P.O., Pamela Owensby.

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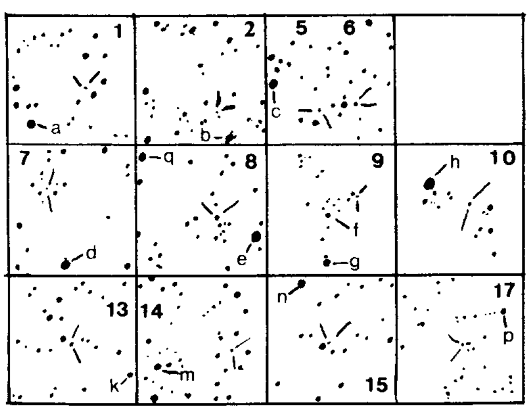
Table I. Long Period Variables in Sagittarius.

No.	Desig. Sgr.	R.A. (1900) h m s	Dec. ° '	Max.	Min.	Type	J.D.	Period Old d	Period New d	Ep.	Comp.
1	-	18 11 39	-29 30.4	12.	15.			-	~4000		D.H.
2	V508	13 00	25 53.3	13.5	16.5	M	41920	294	293.8	62	O.L.
3	V1289	14 36	31 11.7	13.0	15.5	M	36760	-	220	25	P.O.
4	V1599	14 52	30 28.2	11.4	14.5	SR	36090	138.8	138.5	131	P.O.
5	V517	21 34	26 0.0	13.0	17:	M	41120	280	281.5	65	J.M.
6	V519	21 49	26 0.1	13.2	17.0	SR	40080	177	178.25+Δ	154	J.M.
7	V518	21 50	26 21.2	14.0	16.3	SR	37845	160	159.5	114	J.M.
8	-	22 05	16 50.2	10.8	15.	M	37520	-	410	35	P.O.
9	V520	22 19	25 51.4	13.3	17.0	M	41135	263	260+Δ	70	J.M.
10	V1666	23 03	25 4.7	13.8	15.9	SR	36728	102:	102.4:		D.H.,J.M.
11	V933	24 30	31 12.5	11.5	16.1	M	36760	280.9	282	50	P.O.
12	V935	25 32	31 16.0	11.1	15.3	M	36060	239.0	240	59	P.O.
13	V1683	27 05	20 59,6	12.0	16.2	M	40080	216	216.5	84	P.O.,D.H.
14	IU	28 58	31 22.4	13.5	17.	M	41100	382:	268.9	84	J.M.
15	-	32 33	20 40.1	15:	16.5	M	39030	-	307	60	D.H.
16	V1702	33 05	20 48.5	13.3	15.2	SR	42250	95	101.5	180	J.M.
17	S4277	34 06	29 54.0	14.0	16.0	SR	41890	-	144.5	42	J.M.

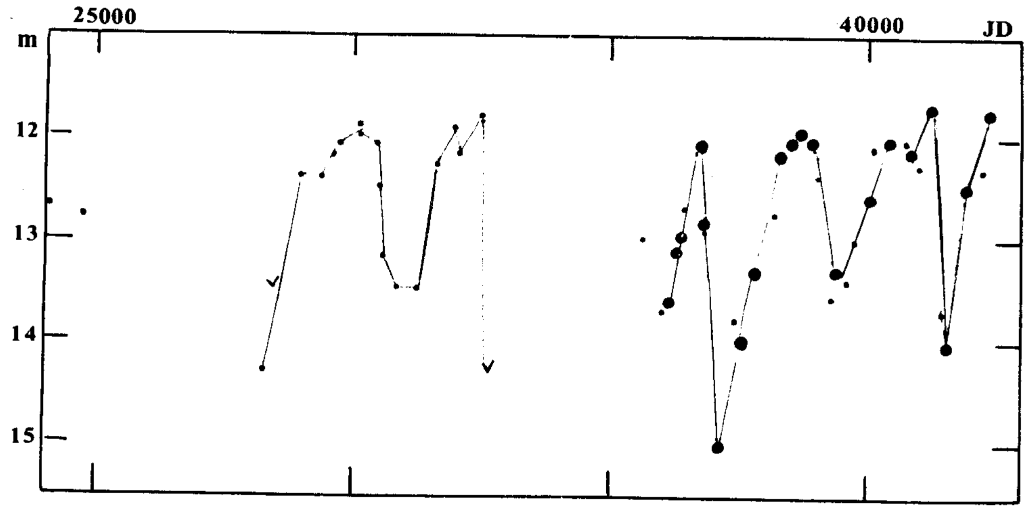
Figure 1



Finder charts for variables for which charts have not previously been published. The letters indicate Durchmusterung stars near the variables:

Var.	DM		Var.	DM		Var.	BD	
1	a	CoD-29°14764	8	q	BD-17°5199	13	k	BD-20°5178
2	b	-25 13005	8	e	-16 4888	14	m	CoD-31 15696
5,6	c	-26 13175	9	f	CoD-25 13150	15	n	BD-20 5213
7	d	-26 13194	9	g	-25 13149	17	p	CoD-30 15966
			10	h	-25 13163			

Figure 2



Light curve of Var. No.1. Means over 100 days: small dots average of less than 10 individual observations, large from 10 to 70. Deep minima occur at semi-regular intervals of about 4000 days, with more shallow secondary minima unevenly spaced between the primary.

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
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Konkoly Observatory
Budapest
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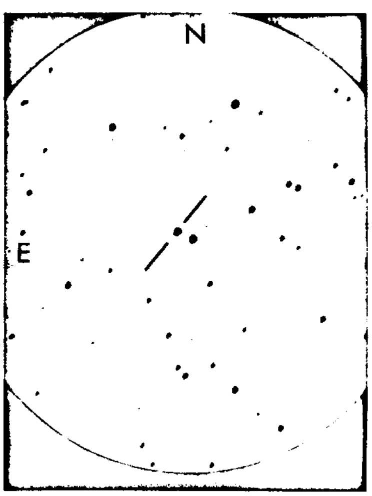
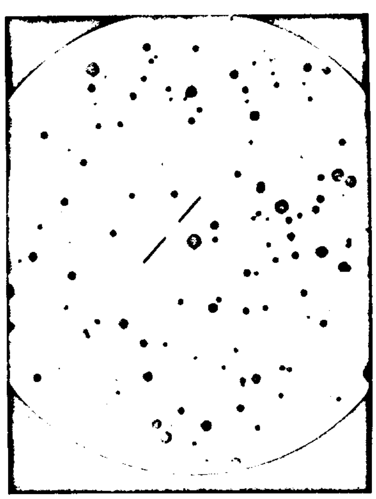
IDENTIFICATION CHART FOR NOVA PERSEI 1974





Left: Nova Persei 1974 as it appeared on a plate taken with the Warner and Swasey Observatory's Burrell Schmidt telescope on November 23, 1974. A 5 minute exposure on Kodak 103a-D + GG II filter.

Right: Palomar Sky Survey blue-sensitive print shows a 19th. mag blue star near the position of the nova which appears to be the best candidate for the prenova.

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INFORMATION BULLETIN ON VARIABLE STARS
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Konkoly Observatory
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BLAZHKO EFFECT IN THE RR LYRAE TYPE STAR WY DRACONIS

The RR Lyrae type variable star, WY Draconis, little studied before, was observed photographically at the University Observatory of Cluj (by a Newton telescope of D=50 cm and F=250 cm) during the period 15. October 1959 - 9. October 1970. The investigation was proposed by Prof. W. Tsessevich. 36 maxima were obtained, giving the new elements of the star:

$$\text{Max. hel.} = \text{JD } 2430786{,}5302 \underset{\pm\ 512}{} + 0^{d}\!.5889466 \underset{\pm\ 21}{} E \qquad (1)$$

Observed maxima as well as the O-C differences given in the table prove a periodic variation of the period which could not be determined with certainty because of the sporadic observations. The observations gave evidence of a large variation in the height of maxima (about $0^{m}\!\!,6$) as well as a remarkable variation in the shape of the light curve. The light curves (Fig.1) corresponding to JD 2439269 (ψ = 0.056) and JD 2439786 (ψ = 0.900) illustrate this variation. The brightness of 27 light maxima (m_{max}) and of 13 minima was determined with an accuracy of a few hundredths of magnitude. The period of variation in the height of the maxima was determined as : $P_1 = 24.2823 x P_o = 14^{d}\!\!,301$. The time of maxima can be given by the formula :

$$E = - 4955 + 24.2823\,(n+\psi) \qquad (2)$$

where the epoch E corresponds to the elements (1) , n is the number of secondary cycles, taken from the initial epoch E_o=-4955, and ψ is the secondary phase taken as a fraction of the basic period $P_o = 0^{d}\!.5889466$.

Values of m_{max} are plotted against the phase ψ in Fig.2 showing, with some deviations, the periodicity of the variation of the light curve.

A more accurate study of this phenomenon using more observations is hoped in the future.

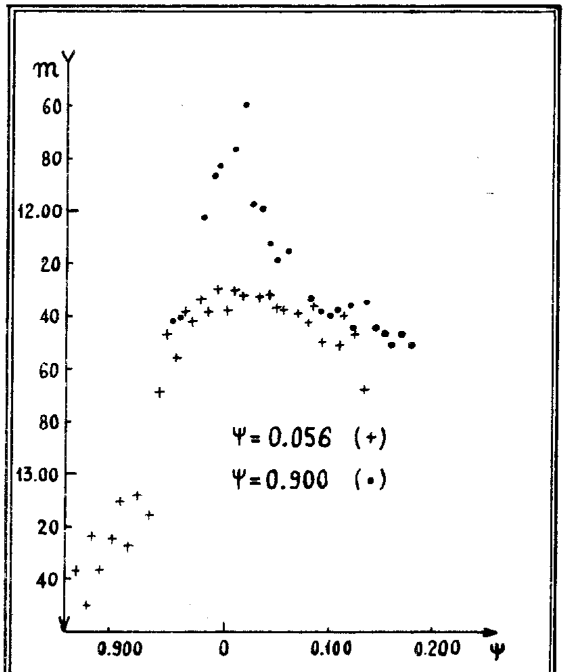
m
60
80
12.00
20
40
60
80
13.00
20
40
0.900
0
0.100
0.200
ψ
Ψ = 0.056 (+)
Ψ = 0.900 (•)

FIG. 1

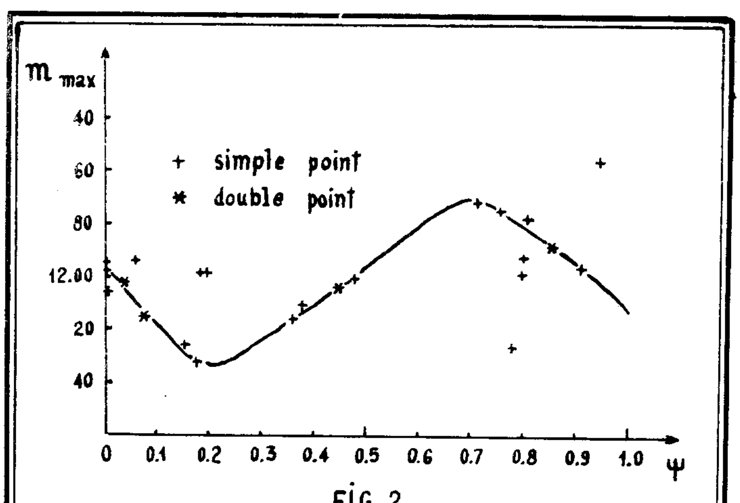
m max
40
60
80
12.00
20
40
+ simple point
* double point
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
ψ

FIG. 2

Max.hel. JD 24...	O-C	n	ψ	m_{max}	m_{min}	
36868.3040	+0.0042	0	0	11.94	13.62	Gh. Chiş
36869.4610	-0.0167	0	0.0809	12.04	13.42	"
36895.4038	+0.0125	1	0.8050	12.01	-	"
36898.3440	+0.0079	2	0.1006	-	-	"
38624.5415	+0.0030	122	0.8052	11.77	-	I. Mihoc
38637.4980	+0.0026	123	0.7112	11.71	13.74	"
38697.5670	-0.0009	127	0.9115	11.95	13.61	"
38729.3680	-0.0037	130	0.1353	-	-	"
38938.4500	+0.0030	144	0.7553	11.74	-	"
38948.4600	+0.0008	145	0.4476	-	-	"
39200.5217	-0.0063	163	0.0807	11.95	13.72	D. Chiş
39230.5610	-0.0036	165	0.1812	12.32	-	"
39269.4358	+0.0007	167	0.8995	11.76	-	"
39285.3370	+0.0004	169	0.0115	-	-	"
39339.5250	+0.0053	172	0.8006	11.92	-	"
39716.4390	-0.0065	199	0.1564	12.25	13.58	"
39719.3925	+0.0022	199	0.3629	12.15	-	"
39720.5637	-0.0045	199	0.4447	-	-	"
39766.5090	+0.0030	202	0.6568	-	-	"
39770.6275	-0.0011	202	0.9455	11.55	13.65	"
39778.2947	+0.0098	203	0.4816	12.00	13.70	"
39786.5302	0.0000	204	0.0575	12.30	13.67	"
39791.2600	+0.0183	204	0.3882	11.78	-	"
39801.2540	+0.0002	205	0.0171	-	-	"
40014.4550	+0.0025	220	0.0581	11.93	13.64	"
40034.4860	+0.0093	221	0.0043	12.10	13.52	"
40093.3730	+0.0016	225	0.0031	11.97	-	"
40104.5775	+0.0161	226	0.2970	-	-	"
40663.4830	+0.0113	265	0.3786	12.10	-	"
40683.4885	-0.0074	266	0.7775	12.26	-	"
40732.3770	-0.0014	270	0.1960	11.98	-	"
40789.5070	+0.0008	274	0.1908	11.98	-	"
40812.4671	-0.0080	275	0.7963	11.98	-	"
40822.5000	+0.0127	276	0.4979	12.30	13.48	"
40858.4390	+0.0260	279	0.0101	12.04	13.44	"
40869.6110	+0.0081	279	0.0102	-	-	"

Astronomical Observatory Cluj,
Rumania

DORIN CHIŞ
GHEORGHE CHIŞ
IOAN MIHOC

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS

Number 961

Konkoly Observatory
Budapest
1975 January 24

60^{th} NAME – LIST OF VARIABLE STARS

The present 60^{th} Name–list of variable stars has been compiled in accordance with the rules established in the 56^{th} list. It contains all necessary identifications for 498 new variable stars designated in 1974. In the square brackets the reference number is given for the work where (not always firstly) the information on discovery of the variable had been published. This reference number accompanies designation or number of the star given for it in the cited work. Name of the discoverer is mentioned only in the cases when it does not coincide with the name of the author of the cited work.

Reference numbers 0001–5216 correspond to the numbers from literature list published in the first volume of the 3^{rd} edition of General Catalogue of Variable Stars (pages A42–A121). The numbers 5217–5824 correspond to the supplementary list published in the First supplement to the Catalogue (pages 279–289). The numbers 5825–6828 correspond to the supplementary list published in the Second supplement to the Catalogue (pages 361–380). The numbers 6829–6913 correspond to the list given in the present edition (pages 13–14).

The serial numbers of flare variables in the Pleiades cluster are preceded here by the symbol Plf.

We are grateful to *T.D.Nishtcheva* for the help in compiling of this list.

B.V.Kukarkin, P.N.Kholopov,
N.P.Kukarkina, N.B.Perova

Moscow Bureau of Variable Stars,
Astronomical Council of the
USSR Academy of Sciences,
Sternberg Astronomical Institute

Moscow, November, 1974

GX And = BD+43°44(8.1)[6829] = =SAO 036248 = ADS 246A = = HD 1326(Ma) = Gliese 15 A = = СПЗ 2042. Close to GQ And.

GY And = HR 465 = BD+44°341(7.0) = = SAO 037393 = HD 9996 (A0p) = = Babcock 4[4170] = КЗП 5936.

GZ And = ADS 1693 A [6830] = КЗП 102376.

HH And = Ross 248 [6831] = КЗП 5777.

α And [6832] = 21 And = HR 15 = BD +28°4(2.0) = SAO 073765 = ADS 94 = = HD 358(A0p).

ZZ Ant = CoD−33°6107(9.8) = 252.1935 [4194, 4455] = HV 8202 = P3294 = = КЗП 1456.

AA Ant = 254.1935[4194] = HV 8248 = = P 3382 = КЗП 1552.

AB Ant = CoD−34°6528(7.1) = CPD −34°3982(8.1) = SAO 201156 = = HD 88539(Na) = Herschel 32 [6353].

AC Ant = СПЗ 1877[6833]. Near V Ant.

AD Ant = CPD−36°4374(10.0) = S 4933 [4455] = BV 1470[6618] = КЗП 1616.

LR Aps = HV 8935 = 291.1933[4453] = = BV 1116 [5502] = P 1115 = = КЗП 2781 = 3[6834].

LS Aps = 5[6834].

LT Aps = 8[6834].

LU Aps = S 5364 [4193] = BV 1123[5502] = = 11[6834] = КЗП 7687.

δ^1 Aps = HR 6020 [4456, 5840] = CoD −78°712(5.2) = CPD−78°1092 (7.0) = SAO 257380 = HD 145366 (Mb).

λ Aqr [1371, 4659] = 73 Aqr = HR8698 [5909] = BD−8°5968 (4.2) = SAO 146362 = HD 216386 (Ma) = = IRC−10588 = P 2372 = КЗП 5625.

V1296 Aql = СПЗ 1619[5507].

V1297 Aql = $19^h06^m40^s.8$+ 1°03′27″ (1900) [6105].

V1298 Aql = BD+4°4048 (B)[6835, 4638] = КЗП 102917.

V1299 Aql = 386.1934[0196] = P 5243 = = КЗП 5008.

V1300 Aql = IRC −10529[6005].

V629 Ara = S 5908 [4001] = КЗП 7478.

V630 Ara = HV 8952 = 458.1935 [4194] = = BV 962 [5234] = P 4136 = = КЗП 2807.

V631 Ara = A7 [4489] = КЗП 7574.

V632 Ara = 4 [6834].

V633 Ara = S 7638 [6561] = BV 1435 [6031] = КЗП 7621.

V634 Ara = 6 [6834].

V635 Ara = HV 9044 = 507.1935 [4194] = = P 4279 = КЗП 3097.

V636 Ara = 9 [6834]. Close to КЗП 3172.

V637 Ara = 10 [6834]. Near КЗП 3172.

V638 Ara = HV 9065 = 519.1935 [4194] = = P 4325 = КЗП 3204.

V639 Ara = HV 9092 = 803.1935 [4725] = = BV 1439 [6031] = P 4387 = = КЗП 3324.

V640 Ara = HV 9117 = 530.1935 [4194] = = P 4431 = КЗП 3453.

V641 Ara = S 7654 [6561] = КЗП 7739.

NY Aur = BD+42°1629 (6.5) = SAO 041475 = = HD 51418 (A0) [6836].

BZ Boo = BD+28°2245 (8.0) = SAO 082918 = HD 118743 (A5)[6456].

CC Boo = S 10762 [6128].

CD Boo = S 10763 [6128].

BR Cnc = BD+20°2133 (8.4) = SAO 097975 = HD 73175 (A2) [5842, 6838].

BS Cnc = BD+ 20°2144 (8.8) = SAO 098002 = HD 73450(A0)[5842, 6838].

BT Cnc = 38 Cnc = BD+20°2149 (7.0) = = SAO 098006 = HD 73575(F0) [5842, 6838]. Near RY Cnc.

BU Cnc = BD+ 19°2064(8.0) = SAO 098009 = HD 73576 (A3)[5842, 6838].

BV Cnc = BD+ 19°2072 (9.0) = SAO 098026 = HD 73746 (A5) [5842, 6456]. Near BN Cnc.

BW Cnc = BD+ 20°2173 (8.7) = SAO 080349 = HD 73798 (A2)[6838].

BX Cnc = BD+ 19°2083 (8.4) = SAO 098053 = HD 74028 (A3)[5842, 6838].

BY Cnc = BD + 19°2084 (8.0) = SAO 098054 = = HD 74050 (A5) [5842, 6838].

AQ CVn = SS 199 II [6839].

AR CVn = S 10760 [6128].

FZ CMa = BD – 11°1755 (8.7) = HD 52942 (B5) = BV656 [4665].

GG CMa = HR 2741 = CoD – 30°4143 (6.9) = = CPD – 30°1579 (7.2) = HD 55958 (B3) [5182, 4456, 6840] = K3II 6567.

GH CMa = BD – 20°1889 (7.8) CPD – 20°2300 (8.7) = SAO 173565 = = HD 57890 (Mb) [6023] = = IRC – 20129.

BC CMi = HR 3061 [6354, 5150] = BD +3°1824 (7.5) = SAO 116054 = = HD 64052 (M4) = DO 2341 (M5) = = IRC 00163 = K3II 6597.

AH Cap = 255.1932 [5148] = P 2303 = = K3II 5465.

V340 Car = CoD – 52°1638 (9.1) = CPD – 52°979 (9.2) HD 48505 (Mc) = = HV 2940 [5076] = 88.1907 [4455] = BV 650 [4665] = = Zi 574 = K3II 843.

V341 Car = HR 3126 [5889] = CoD – 58°1926 (7.0) = CPD – 58°1028 (7.7) = SAO 235638 = = HD 65750 (K5).

V342 Car = 213.1934 [4618] = HV 8140 = = P 3188 = K3II 1319.

V343 Car = d Car = HR 3457 [4456, 4457, 6352] = CoD – 59°2020 (4.3) = CPD – 59°1080 (4.4) = SAO 236181 = HD 74375 (B2) [6840] = = K3II 6654.

V344 Car = f Car = HR 3498 [4583, 6352, 6311] = CoD – 56°2441 (4.6) = = CPD – 56°1865 (4.7) = SAO 236268 = HD 75311 (B3) [2904] = = K3II 6664.

V345 Car = E Car = HR 3642 [5909, 6352] = CoD – 70°575 (5.2) = = CPD – 70°861 (4.7) = SAO 256583 = HD 78764 (B3p) = = K3II 6690.

V346 Car = S 6238 [4001] = K3II 6715.

V347 Car = CoD – 72°589 (8.9) = CPD – 72°916 (8.5) = HD 89143 (A0) = = BV 830 [5201].

V348 Car = CoD – 57°3224 (9.2) = CPD – 57°3237 (8.4) = HD 90707 (B) [6837].

V349 Car = CoD – 57°3259 (8.5) = CPD – 57°3334 (9.5) = HD 91093 (Ma) [6149].

V350 Car = BV 1542 [6318].

V351 Car = BV 1543 [6318].

V352 Car = S 6338 [3127] = BV 1544 [6318] = K3II 6819.

V353 Car = CoD – 59°3582 (8.1) = CPD – 59°3100 (7.7) = SAO 238831 = = HD 97151 (B2) [6313; 5899].

V523 Cas = Wr 16 [2637] = K3II 5867.

V524 Cas = IRC + 70012 [6005] = CH3 1892 [6842].

V525 Cas = DO 23764 (M2) = 630.1936 [5177] = P 2479 = K3II 90.

V526 Cas = HR 238 [6843] = BD + 50°161 (6.7) = SAO 021767 = HD 4818 (A5).

V527 Cas = CH3 1893 [6842].

V528 Cas = BD + 60°487 (8.1) = SAO 012303 (8.2) = HD 15239 (B) [6844].

V529 Cas = BD + 60°488 (8.5) = SAO 012304 (8.5) = HD 15238 (B) [6844].

V530 Cas = 406.1934 [6845, Barrett; 4455] = IRC + 60411 = = P 5762 = K3II 5744.

V531 Cas = S 10123 [3903]. Near V404 Cas.

V532 Cas = DO 43910 (R) = CH3 1730 [6846].

V533 Cas = CH3 1731 [6846].

V769 Cen = CoD – 47°6586 (10) = CPD – 47°4814 (10.4) = BV 1581 [6847].

V770 Cen = WR A 795 [6848].

V771 Cen = CoD – 60°3554 (7.0) = CPD – 60°2948 (8.8) = SAO 251408 = HD 99619 (K2) [5899].

V772 Cen = CoD – 62°565 (9.0) = CPD – 62°2234 (9.0) = SAO 251544 = HD 101712 (Ma) [6149].

V773 Cen = CoD−36°8875 (9.7) = HV12312 [4657, *Greenstein*] = BV 738 [4655] = КЗП 7087.

V774 Cen = CoD−38°8883 (7.5) = CPD −38°5633 (7.8) = SAO 204949 = = HD 120958 (B5) [6313].

V775 Cen = CoD−51°7870 (9.9) = CPD −51°6466 (9.0) = SAO 241340 = = HD 121715 (F5) = 97.1907 = = HV 2949 [5076] = BV 1379 [5937] = Zi 1038 = КЗП 2086.

V776 Cen = 387.1935 [4194] = HV 8646 = = BV 1427 [6031] = P 3859 = КЗП 2238.

ε Cen [6356] = HR 5132 = CoD −52°5743 (2.6) = CPD−52°6655 (3.0) = SAO 241047 = HD 118716 (B1).

NP Cep = СПЗ 1891 [6842].

NQ Cep = DO 23258 (M6) = IRC+70008 = = 5.1939 [4192] = КЗП 49.

NR Cep = 628.1936 [5177] = P 2460 = = КЗП 52.

NS Cep = HBV 480 [6325].

NT Cep = BD+61°2146 (9.0) = SAO 019461 = HBV 486 [6325].

NU Cep = HBV 489 [6325].

NV Cep = VV 448 [6329].

NW Cep = VV 454 [6329].

NX Cep = VV 467 [6329].

NY Cep = BD+62°2147 (7.7) = SAO 020351 = HD 217312 (B8) [6849, 6328].

AV Cet = 44 Cet = HR 401 [6346] = BD −8°243 (6.7) = SAO 129275 = = HD 8511 (A5).

AW Cet = 5 [6850].

BZ Cha = BV 1533 [6318].

CC Cha = BV 1535 [6318].

CD Cha = BV 1537 [6318].

CE Cha = BV 1538 [6318].

CF Cha = BV 1539 [6318].

CG Cha = S 6307 [4001] = BV 1540 [6318] = = КЗП 6790.

CH Cha = S 6310 [4001] = BV 1541 [6318] = = КЗП 6793.

CI Cha = CoD−81°402 (9.3) = CPD −81°486 (9.8) = Herschel 37 [6353].

CK Cha = S 6364 [4001] = BV 862 [5566] = = КЗП 6846.

CL Cha = S 6424 [4001] = BV 1074 [5523] = = КЗП 6969.

CM Cha = S 6429 [4001] = BV766 [3900] = = КЗП 6974.

SY Col = 104.1933 [4453] = HV 8054 = = P 382 = КЗП 763.

GK Com = BD+20°2664 (6.9) [6841] = SAO 099901 = IRC+20236 = HD 104207 (Mb) [6023].

GL Com = 1 [6851, *Hoffleit*].

GM Com = BD+28°2087 (7.8) = SAO 082186 = HD 106103 (F5) = Coma Tr 19 [6456].

GN Com = 13 Com [6456] = HR 4717 = = BD+26°2344 (5.3) = SAO 082291 = HD 107966 (A2).

GO Com = СПЗ 382 [0839] = P 866 = = КЗП 1959 [6852].

GP Com = G61−29 [6853].

V669 CrA = S 7372 [4001] = КЗП 7839.

V670 CrA = 929.1935 [4725, 4001] = HV 9466 = P 4734 = КЗП 4190.

V671 CrA = S 7420 [4001] = КЗП 7913.

TW CrB = BD+27°2585 (9.4) = Wr 104 [4239] = КЗП 7265.

SV Crv = BD−14°3587 (6.8) = SAO 157536 = HD 111499 (Mb) = = IRC−10272 = BV 372 [4171] = = КЗП 6963.

SV Crt = HR 4369 [4170] = BD −6°3344 (6.5) = SAO 138106 = = ADS 8115 = HD 98088 [5126] = = КЗП 6830.

BI Cru = S 4958 [4455] = BV 1417 [6031] = КЗП 1855.

V1436 Cyg = СПЗ 1780 [6854].

V1437 Cyg = СПЗ 1782 [6854].

V1438 Cyg = СПЗ 1784 [6854].

V1439 Cyg = VV 480 [6855].

V1440 Cyg = DO 18041 (M5) = IRC +40358 = СПЗ 2037 = P [6856].

V1441 Cyg = VV 482 [6855].

V1442 Cyg = VV 483 [6855].

V1443 Cyg = GR 212 [6282].

V1444 Cyg = GR 213 [6282].

V1445 Cyg = GR 214 [6282].

V1446 Cyg = GR 215 [6282].

V1447 Cyg = VV 484 [6855].
V1448 Cyg = GR 216 [6282].
V1449 Cyg = GR 217 [6282].
V1450 Cyg = GR 218 [6282].
V1451 Cyg = GR 219 [6282].
V1452 Cyg = GR 220 [6282].
V1453 Cyg = VV 485 [6855].
V1454 Cyg = GR 221 [6282].
V1455 Cyg = GR 222 [6282].
V1456 Cyg = GR 223 [6282].
V1457 Cyg = GR 224 [6282].
V1458 Cyg = GR 225 [6282].
V1459 Cyg = GR 226 [6282].
V1460 Cyg = GR 227 [6282].
V1461 Cyg = VV 486 [6855].
V1462 Cyg = GR 228 [6282].
V1463 Cyg = GR 229 [6282] = 2[1222] = = КЗП 8364.
V1464 Cyg = GR 230 [6282].
V1465 Cyg = GR 231 [6282].
V1466 Cyg = VV 487 [6855] = 34 [1222] = = КЗП 8394.
V1467 Cyg = GR 233 [6282].
V1468 Cyg = GR 234 [6282].
V1469 Cyg = GR 235 [6282].
V1470 Cyg = GR 236 [6282].
V1471 Cyg = GR 237 [6282].
V1472 Cyg = VV 488 [6855] = 35 [1222] = = КЗП 8415.
V1473 Cyg = VV 489 [6855] = 29 [1222] = = КЗП 8429.
V1474 Cyg = VV 490 [6855] = 28 [1222] = = КЗП 8431.
V1475 Cyg = GR 239 [6282].
V1476 Cyg = GR 240 [6282].
V1477 Cyg = GR 241 [6282].
V1478 Cyg = MSB 349 [6857] = MWC 349 [6858] = КЗП 5206.
V1479 Cyg = S 7811 [4771] = UHα 38[6859] = = КЗП 8584.
V1480 Cyg = S 8381 [4341] = КЗП 8633. Near V584 Cyg.
V1481 Cyg = HBV 478 [6860].
V1482 Cyg = VV 428 [6329].
V1483 Cyg = VV 429 [6329].
V1484 Cyg = VV 436 [6329].
KQ Del = BD+12°4268 (9.2) = HD 357081 (M4) = DO 6589 (M5) = = IRC+10460 = BV 199 [4054] = = КЗП 8473.
XX Dor = CPD−69°317 (9.6) = HD 268892 (F5) [6861].
CR Dra = BD+55°1823 (9.5) [6862, 6863] = = КЗП 102794.
DN Eri = 2 [6429, *De Lannoy*].
DO Eri = HR 1217 [6257] = BD−12°752 (6.1) = SAO 149251 = HD 24712 (F0).
DP Eri = CoD−24°2062 (7.3) = CPD −24°511 (8.0) = SAO 169075 = = HD 25675 (Mb) [6351] = = IRC−20048.
DQ Eri = BD−2°867 (6.7) = SAO 131122 = = HD 27498 (Mb) [6023] = DO 754 (M5) = IRC 00057.
TU For = 1 [6429, *De Lannoy*].
TV For = 3 [6429, *De Lannoy*].
TW For = 5 [6429, *De Lannoy*].
NR Gem = S 7949 [4065] = КЗП 6473.
NS Gem = S 7958 [4065] = КЗП 6501.
NT Gem = S 7959 [4065] = КЗП 6504.
V644 Her = HR 6290 [6838] = BD + 13°3258 (6.3) = SAO 102474 = = HD 152830 (F2).
V645 Her = BD+29°2902 (7.3) = SAO 084694 = HD 152896 (A5) [6456].
V646 Her = S 10684 [5884].
V647 Her = СПЗ 2043 = Gliese 669A [6864] = Ross 868. Near V639 Her.
V648 Her = BD+26°3038 (7.0) = SAO 085188 = HD 159223 (A5) [6456]. In [6456] erroneously designated as HD 159238.
IN Hya = BD+0°2499 (7.5) = SAO 117605 = HD 80567 (Mb) [6113] = = DO 2743 (M5) = IRC 00186.
IO Hya = BD−21°2987 (8.5) = CPD −21°4618 (7.8) = SAO 178437 = = HD 87870 (Ma) [4456] = = IRC−20205 = КЗП 6771.
IP Hya = S 6550 [4001] = КЗП 7116.
AV Ind = 612..1935 [4194] = HV9720 = = P 5525 = КЗП 5353.
V337 Lac = VV 441 [6329].
V338 Lac = VV 447 [6329].
V339 Lac = VV 451 [6329].
V340 Lac = VV 452 [6329].

V341 Lac = BD + 52°3144 (8.5) = SAO 034185 = IRC + 50423 (M0) = = VV 453 [6329].
V342 Lac = VV 455 [6329].
V343 Lac = VV 459 [6329].
V344 Lac = VV 462 [6329].
V345 Lac = VV 464 [6329].
V346 Lac = VV 465 [6329].
V347 Lac = GR 242 [6087].
V348 Lac = DO 41405 (M2) = VV 472 [6329].
V349 Lac = VV 479 [6329].
DF Leo = BD + 8°2215 (7.3) = SAO 117646 = HD 81028 (Ma) [6023] = DO 2756 (M5) = IRC + 10205.
RZ Lep = BD−22°1070 (8.7) = CoD −22°2135 (8.6) = CPD−22°771 (9.1) = SAO 170200 = HD 34738 (Ma) [6059].
SS Lep = 17 Lep [6865, Widing] = HR 2148 = BD−16°1349 (5.1) = = SAO 151093 = HD 41511 (A0) = = IRC−20084 = КЗП 6421.
FY Lib = BD−11°3841 (7.0) = SAO 158929 = HD 132112 (Mb) [6351] = = IRC−10308.
FZ Lib = BD−8°3947 (7.0) = SAO 140456 = = HD 136140 (Mb) [6351] = IRC −10317.
GG Lib = CoD−23°12359 (7.2) = CPD −23°6208 (7.9) = SAO 183548 = = HD 138344 (Mb) [6866] = = IRC−20288.
GN Lup = CoD−32°10773 (9.6) = CPD −32°3888 (9.6) = h 4765A [3761, *Dawson*] = HV 8717 = 455.1933 [4488] = P 1006 = КЗП 2325 = = КЗП 7185.
GO Lup = CoD −36°10169 (7.3) = CPD −36°6810 (8.2) = SAO 206673 = = HD 137597 (Mb) [6023].
GP Lup = 266.1933 [4453] = HV 8728 = = P 1011 = КЗП 2343.
GQ Lup = CoD−35°10525 (10) = = BV 1387 [5937].
GR Lup = S 7530 [4001] = КЗП 7247.
V456 Lyr = СПЗ 1778 [6854].
UY Men = BV 1522 [6318].
UZ Men = BV 1523 [6318].
VV Men = BV 1524 [6318].
VW Men = BV 1527 [6318].
VX Men = BV 1528 [6318].
VY Men = BV 1530 [6318].
VZ Men = BV 1531 [6318].
AV Mic = CoD−42°15034 (6.4) = CPD −42°9130 (7.6) = SAO 230323 = = HD 196829 (Mb) [6351].
V593 Mon = СПЗ 1558 [5125].
V594 Mon = СПЗ 1538 [6867].
V595 Mon = СПЗ 1553 [5125]. Near QZ, LL, V590 Mon.
V596 Mon = СПЗ 1541 [6867].
V597 Mon = СПЗ 1547 [6867]. Near LP Mon.
V598 Mon = СПЗ 1559 [5125]. Near V341, V580 Mon.
V599 Mon = СПЗ 1556 [5125].
V600 Mon = СПЗ 1550 [5125].
V601 Mon = СПЗ 1549 [6867]. Near V353 Mon.
V602 Mon = СПЗ 1542 [6867]. Near V358 Mon.
V603 Mon = СПЗ 1540 [6867]. Near V345 Mon.
V604 Mon = СПЗ 1551 [5125]. Near V348 Mon.
V605 Mon = СПЗ 1557 [5125]. Near V356 Mon.
V606 Mon = СПЗ 1552 [5125]. Near V357, V359 Mon.
V607 Mon = СПЗ 1543 [6867]. Near КЗП 6479.
V608 Mon = СПЗ 1544 [6867] = Walker 166 [6360, 6868] = КЗП 102519.
V609 Mon = СПЗ 1537 [6867]. Near V358 Mon.
V610 Mon = СПЗ 1546 [6867]. Near IQ Mon.
V611 Mon = СПЗ 1545 [6867].
V612 Mon = СПЗ 1555 [5125]. Near V368 Mon.
V613 Mon = BD+5°1414 (8.7) [6059] = = SAO 114437 = HD 49368 (Ma) = DO 1774 (M4) = IRC +10139.
V614 Mon = BD−3°1685 (7.7) = SAO 134049 = HD 52432 (R5) [6869, *Rumsey*; 6870; 6059] = = DO 1886 (R) = IRC 00141.
EH Mus = BV 1546 [6318].

EI Mus = S 8975 [3776] = BV 1547 [6318].

EK Mus = 182.1933 [4453] = HV 8437 = = P 814 = КЗП 1856.

EL Mus = 1 [6525].

EM Mus = BV 1071 [5523] = 3 [6525].

EN Mus = 4 [6525].

EO Mus = 6 [6525].

EP Mus = S 8995 [3776] = 7 [6525].

EQ Mus = 8 [6525].

ER Mus = S 9005 [3776] = 9 [6525].

ES Mus = 10 [6525].

ET Mus = S 6423 [4001] = 11 [6525] = = КЗП 6967.

EU Mus = 12 [6525].

EV Mus = 14 [6525].

EW Mus = 17 [6525].

EX Mus = 21 [6525].

OZ Nor = CoD−44°10889 (7.3) = CPD −44°7910 (7.5) = HD 148259 (B3) [5921, 4456] = BV 1557 [6871] = КЗП 7355.

PP Nor = 423.1935 [4194] = HV 8891 = = BV 1432 [6031] = P 4055 = = КЗП 2693.

V998 Ori = Ross 42 [6872] = Wr 13 = = Gliese 206 [6873] = КЗП 6183.

V999 Ori = П 1231 = СПЗ 1857 = 4 [6369].

V1000 Ori = П 1536 = Brun 316 [4923] = = КЗП 6222. Near V980 Ori.

V1001 Ori = П 2249 = Brun 891 [4923] = = КЗП 6302.

V1002 Ori = СПЗ 1496 [4422].

V1003 Ori = G 102−32 [6874].

V1004 Ori = 59 Ori = HR 2100 = BD +1°1171 (6.5) = SAO 113315 = = ADS 4555 = HD 40372 (A5) [6838].

ω Ori = 47 Ori = HR 1934 [4614] = = BD+4°1002 (5.0) = SAO 113001 = HD 37490 (B3 p) [6870] = КЗП 6361.

NV Pav = 12 [6834].

NW Pav = S 7656 [6561] = BV 1250 [5829] = КЗП 7801.

NX Pav = S 7119 [4001] = BV 1253 [5829] = КЗП 7890.

NY Pav = 122.1932 [4454] = HV 9508 = P 1651 = КЗП 4308.

NZ Pav = HR 7524 = CoD−65°2616 (6.4) = CPD−65°3827 (6.9) = = SAO 254669 = HD 186786 (A5) [6338].

ε Peg [2898; 5195; 6876; 6875; 6877] = 8 Peg = HR 8308 = = BD+9°4891 (2.3) = SAO 127029 = ADS 15268 = HD 206778 (K0) = DO 40008 (M3) = = IRC+10503 = Zi 2039 = = КЗП 102124.

V396 Per = HR 1063 [6879] = BD +47°847 (6.5) [6878] = SAO 038917 = HD 21699 (B8) = = Zi 194 = КЗП 100285.

V397 Per = ADS 2859 B [6880]. Near X Per.

V398 Per = СПЗ 1754 [6881].

δ Per [5160, 6882, 6913, 6905] = = 39 Per = HR 1122 = BD +47°876 (3.5) = SAO 039053 = = HD 22928 (B5) = Zi 203 = = КЗП 100296.

AO Phe = S 7142 [4001] = КЗП 5892.

AP Phe = S 7152 [4001] = КЗП 5913.

AQ Phe = S 7153 [4001] = КЗП 5914.

AR Phe = CoD−42°487 (10.0) = S 7155 [4001] = КЗП 5919.

AS Phe = S 7162 [4001] = КЗП 5929.

AT Phe = S 7165 [4001] = КЗП 5935.

AU Phe = S 7177 [4001] = КЗП 5949.

γ Phe [5945, 6876] = HR 429 [4613] = = CoD−43°449 (3.4) = CPD −43°172 (5.4) = SAO 215516 = = HD 9053 (K5) = КЗП 5925.

SX Pic = S 4849 [4455] = КЗП 681.

XX Psc = 59 Psc [6883] = HR 214 = = BD+18°101 (6.3) = SAO 092082 = HD 4490 (A5).

XY Psc = SN in anon. galaxy? [6884].

XZ Psc = HR 9047 [1371, 5195] = = BD−0°4585 (6.2) = SAO 146973 = HD 224062 (Mb) = = DO 8101 (Mb) = IRC 00535 = P 2421 = КЗП 5807.

YY Psc = 30 Psc = HR 9089 [1371, 4659, 5840] = BD−6°6345 (5.0) = SAO 147042 =

= HD 224935 (Mb) = IRC−10608=
= P 2423 = КЗП 5825.

NP Pup = HR 2591 = CoD−42°2818 (6.7)=
= CPD−42°1122 (8.2) = SAO
218296 = HD 51208 (Na) [6869,
6258].

NQ Pup = BD−11°2141 (8.2) = SAO
153536 = HD 64332 (Mbp) [6059] =
= IRC−10181.

NR Pup = 110.1933 [4453] = HV 8104 =
= P 519 = КЗП 1199.

NS Pup = h[1] Pup = HR 3225 [4619] =
= CoD−39°4084 (4.8) = CPD
−39°2175 (7.4) = SAO 198908 =
= HD 68553 (K5) = КЗП 6621.

UU Pyx = 404.1933 [4488] = HV 8153 =
= P 569 = КЗП 1355.

UV Pyx = 853.1936 [4579] = HV 8157 =
= P 3225 = КЗП 1361.

UW Pyx = CoD−33°5429 (9.9) = 406.1933
[4488] = HV 8161 = P 574 =
= КЗП 1368.

HH Sge = GR 36 [2786] = КЗП 8418.

HI Sge = GR 43 [2786] = КЗП 8484.

V3873 Sgr = 1 [6384, *Hu*].

V3874 Sgr = 911.1936 [2936] = HV 9443 =
= 3 [6384, *Kwitter*] = P 4689 =
= КЗП 4125.

V3875 Sgr = B30 [6885, *Bonnell*].

V3876 Sgr = 6 [6384, *Bonnell*].

V3877 Sgr = CoD−35°12756 (7.5) = CPD
− 35°8085 (8.2) = SAO 210361 =
= HD 171451 Mb [6351]. Near
V3636 Sgr.

V3878 Sgr = 8 [6384, *Hu*].

V3879 Sgr = HR 7023 [6113] = BD
−19°5134 (6.5) = CPD
−19°7033 (7.8) = SAO 161754 =
= HD 172816 (Mb) = IRC 20510.

V3880 Sgr = IRC−20540 [6005].

V3881 Sgr = 961.1935 [2771, 0085] =
= HV 9634 = P 5044 = КЗП
4702.

V3882 Sgr = 810.1936 = HV 9642 [2936] =
= P 5054 = КЗП 4731.

V3883 Sgr = 811.1936 = HV 9645 [2936] =
= P 5060 = КЗП 4754.

V3884 Sgr = S 5084 [0085] = КЗП 4766.

V3885 Sgr = CoD−42°14462 (9.7) [6886] =
= CPD−42°8912 (9.6).

V3886 Sgr = S 5093 [0085] = BV 1569
[6871] = КЗП 4871.

V3887 Sgr = S 5095 [0085] = КЗП 4904

η Sgr = HR 6832 [4659, 5840] =
= CoD−36°12423 (3.0) = CPD
−36°8128 (6.6) = HD 167618
(Mb) = BV 784 [5599].

ρ[1] Sgr = 44 Sgr = HR 7340 [6255] =
= BD−18°5322 (4.0) = SAO
162512 = HD 181577 (A5).

V872 Sco = Ross 174 [6888] = P 1066 =
= КЗП 2595.

V873 Sco = 885.1936 = HV 8851 [2936] =
= P 4016 = КЗП 2597.

V874 Sco = 283.1933 = HV 8856 [2590] =
= P 1072 = КЗП 2605.

V875 Sco = S 7534 [4001] = КЗП 7293.

V876 Sco = СПЗ 1788 [6889].

V877 Sco = СПЗ 1681 [5919].

V878 Sco = СПЗ 1801 [6889].

V879 Sco = СПЗ 1802 [6889].

V880 Sco = CoD−33°11363 (9.9) =
= 446.1935 = HV 8933 [4194] =
= P 4109 = КЗП 2778.

V881 Sco = CoD−33°11380 (9.4) = CPD
−33°4099 (8.8) = HD 150384
(A0) = BV 1558 [6871].

V882 Sco = S 7568 [4001] = КЗП 7469.

V883 Sco = CoD−37°11118 (7.5) = CPD
−37°6811 (7.5) = HD 152901
(B5) [6866] = BV 1390 [5937].

V884 Sco = CoD−37°11206 (7.11) =
= CPD−37°6877 (7.0) = SAO
208356 = HD 153919 (Od)
[6866, 6890].

V885 Sco = CoD−37°11880 (8.7) = CPD
−37°7477 (8.6) = HD
161562 (A0) = BV 1562
[6871].

AI Scl = HR 359 [6113] = CoD
−38°420 (6.1) = CPD
−38°107 (6.4) = SAO
192980 = HD 7312 (A5).

V372 Sct = СПЗ 1212 [6887] =
= КЗП 7892.

FP Ser = 40 Ser = HR 5919 = BD
+9°3116 (7.0) = SAO 121254 =
= HD 142500 (A2) [6456].

FQ Ser = BD + 9°3153 (7.5) = SAO 121385 = HD 145050 (Mb) [6351] = DO 3958 (M6) = IRC + 10303. Near КЗП 2581.

FR Ser = BD + 4°3801 (7.0) = SAO 123673 = HD 171586 (A0) [4170] = ADS 11477 = Zi 1442 = КЗП 101740.

o Ser = 56 Ser = HR 6581 [6255] = BD −12°4808 (4.5) = SAO 160747 = HD 160613 (A2).

RY Sex = Gliese 398 [6873].

V594 Tau = 149 [6891].

V595 Tau = 150 [5891].

V596 Tau = Plf 415 = K 17 [6892].

V597 Tau = Plf 361 [6893] = СПЗ 2021.

V598 Tau = Plf 393 = 35 b [6894].

V599 Tau = Plf 429 [6893] = СПЗ 2036.

V600 Tau = Plf 300 = 82 [6819].

V601 Tau = Plf 394 = 36 b [6894]. Near KW Tau.

V602 Tau = Plf 305 = 99 [6819].

V603 Tau = 119 [6891].

V604 Tau = 125 [6891].

V605 Tau = 137 [6891].

V606 Tau = Plf 427 [6893] = СПЗ 2035.

V607 Tau = Plf 356 [6893] = СПЗ 2016.

V608 Tau = Plf 346 [6893] = СПЗ 2011.

V609 Tau = Plf 343 [6893] = СПЗ 2010. Near V432 Tau.

V610 Tau = Plf 306 = 100 [6819].

V611 Tau = Plf 426 [6893] = СПЗ 2034.

V612 Tau = 122 [6891].

V613 Tau = Plf 298 = 80 [6819]. Near V435 Tau.

V614 Tau = 98 [6819].

V615 Tau = S 10767 [6895] = Plf 377.

V616 Tau = Plf 418 = K 22 [6892].

V617 Tau = Plf 420 [6893] = СПЗ 2031.

V618 Tau = Plf 370 [6893] = СПЗ 2029.

V619 Tau = Plf 359 [6893] = СПЗ 2019. Near V434 Tau.

V620 Tau = 120 [6891].

V621 Tau = 131 [6891]. Near V435 Tau.

V622 Tau = Plf 396 = 38 b [6894].

V623 Tau = Plf 397 = 39 b [6894].

V624 Tau = BD + 23°495 (8.3) = SAO 076104 = HD 23156 (A5) [6400].

V625 Tau = 16 b [6397]. Near MU Tau.

V626 Tau = 145 [6891].

V627 Tau = Plf 398 = 40 b [6894].

V628 Tau = 107 [6819].

V629 Tau = Plf 391 = As 115 [6896]. Near V511 Tau.

V630 Tau = Plf 399 = 41 b [6894]. Near MY Tau.

V631 Tau = Plf 400 = 42 b [6894]. Near MY Tau.

V632 Tau = Plf 302 = 90 [6819]. Near КЗП 100304.

V633 Tau = Plf 378 = S 10768 [6895]. Near NQ Tau.

V634 Tau = Plf 430 = As 10 [6897]. Near NU Tau.

V635 Tau = Plf 414 = K 16 [6892]. Near V524 Tau.

V636 Tau = Plf 360 [6893] = 126 [6891] = СПЗ 2020.

V637 Tau = Plf 355 [6893] = СПЗ 2015.

V638 Tau = 121 [6891].

V639 Tau = Plf 354 [6893] = СПЗ 2014.

V640 Tau = Plf 379 = S 10769 [6895].

V641 Tau = 148 [6891]. Near V447 Tau.

V642 Tau = Plf 401 = 43 b [6894]. Near V449 Tau.

V643 Tau = Plf 402 = 44 b [6894, 6898].

V644 Tau = Plf 358 [6893] = СПЗ 2018. Near V453 Tau.

V645 Tau = Plf 363 [6893] = СПЗ 2023.

V646 Tau = Plf 403 = 45 b [6894].

V647 Tau = BD + 23°534 (8.0) = SAO 076191 = HD 23607 (A0) [6400].

V648 Tau = Plf 417 = K 20 [6892]. Near V540 Tau.

V649 Tau = Plf 352 [6893].

V650 Tau = BD + 23°539 (8.0) = SAO 076198 = HD 23643 (A0) [6400].

V651 Tau = Plf 347 [6893] = СПЗ 2038.

V652 Tau = H II1553 [2952] = T 58 b [6894] = КЗП 6052.

V653 Tau = 138 [6891].

V654 Tau = Plf 240 = A 60 [6900]. Near V542 Tau.

V655 Tau = Plf 404 = 46 b [6894]. Near QW Tau.

V656 Tau = Plf 392 = A 116 [6896].

V657 Tau = Plf 380 = S 10770 [6895]. Near V343 Tau and V457 Tau.

V658 Tau = Plf 350 [6893] = Plf 405 = 47 b [6894]. Near V541 Tau.
V659 Tau = 147 [6891].
V660 Tau = Plf 406 = 48 b [6894].
V661 Tau = Plf 407 = 49 b [6894]. Near V546 Tau.
V662 Tau = Plf 257 [6394] = СПЗ 2039 = = 124 [6891]. Near V463 Tau.
V663 Tau = Plf 408 = 50 b [6894]. Near V362 Tau.
V664 Tau = Nr. 412 [6901] = 51 b [6894] = = Plf 409 = P 114 = КЗП 100337.
V665 Tau = S 10771 [6895] = Plf 381. Near КЗП 100337.
V666 Tau = Plf 421 [6893] = СПЗ 2032. Near V365 Tau.
V667 Tau = Plf 419 = K 23 [6892].
V668 Tau = Plf 410 = 52 b [6894]. Near V363 Tau.
V669 Tau = Plf 411 = 53 b [6894].
V670 Tau = 118 [6891].
V671 Tau = Plf 307 = 101 [6819].
V672 Tau = S 10772 [6895] = Plf 382. Near КЗП 100350.
V673 Tau = Plf 412 = 54 b [6894].
V674 Tau = 130 [6891].
V675 Tau = S 10773 [6895] = Plf 383.
V676 Tau = Plf 362 [6893] = СПЗ 2022. Near V376 Tau.
V677 Tau = Plf 413 = HII 3063 [5609] = = 55 b [6894]. Near V382 Tau.
V678 Tau = Plf 368 [6893] = СПЗ 2027.
V679 Tau = H II 3197 [2952] = 59 b [6894] = = КЗП 6059. Near V387 Tau.
V680 Tau = 33 b [6397]. Near V396 Tau.
V681 Tau = Plf 369 [6893] = СПЗ 2028.
V682 Tau = Plf 371 [6893] = СПЗ 2030.
V683 Tau = 123 [6891].
V684 Tau = Plf 353 [6893] = СПЗ 2013.
V685 Tau = Plf 367 [6893] = СПЗ 2026. Near V576 Tau.
V686 Tau = 135 [6891].
V687 Tau = Plf 416 = K 19 [6892].
V688 Tau = Plf 425 [6893] = СПЗ 2033.
V689 Tau = 141 [6891].
V690 Tau = Plf 301 = 89 [6819].
V691 Tau = Plf 366 [6893] = СПЗ 2025.
V692 Tau = Plf 389 = As 113 [6896].
V693 Tau = Plf 299 = 81 [6819]. Near V584 Tau.
V694 Tau = 134 [6891].
V695 Tau = СПЗ 1670 [6902].
V696 Tau = 58 Tau = HR 1356 [5842] = = BD+14°682 (5.9) = SAO 093876 = HD 27459 (F0).
V697 Tau = СПЗ 1849 [6903].
V698 Tau = СПЗ 1752 [6904, *Горыня*] = = IRC+30089.
V699 Tau = СПЗ 1738 [6634, *Перова*]. Near V591 Tau.
NV Tel = CoD−48°12392 (9.4) = CPD −48°9723 (8.8) = HD 167405 (A0) = BV 1002 [5562].
NW Tel = CoD−51°11479 (10) = = HV 9858 [4230] = BV 1565 [6871] = КЗП 3973.
NX Tel = 934.1935 = HV 9516 [4725] = = P 4850 = КЗП 4329.
NY Tel = CoD−47°12722 (9.6) = CPD −47°9166 (10.3) = S 5060 [0085] = = BV 1219 [5800] = КЗП 4508.
NZ. Tel = 959.1935 = HV 9619 [2771] = = BV 1456 [6031] = P 5011 = = КЗП 4618.
IP TrA = BV 1271 [5834].
IQ TrA = CPD−64°3218 (9.9) = BV 1550 [6318].
IR TrA = 469.1933 = HV 8791 [2926] = = P 1037 = КЗП 2468.
IS TrA = BV 1276 [6163].
IT TrA = 1 [6834].
IU TrA = BV 1278 [6163].
BS Tuc = CoD−63°48 (7.5) = CPD −62°90 (7.1) = SAO 248325 = = HD 6870 (A2) [5944].
CM UMa = СПЗ 864 [4394, *A. Parenago*] = КЗП 1487.
CN UMa = СПЗ 1850 [6906].
CO UMa = HR 4333 [1371] = BD +37°2162 (5.9) = SAO 062427 = HD 96813 (Mb) [6907] = IRC +40222.
CP UMa = СПЗ 1852 [6908].
CQ UMa = HR 5153 [6909] = BD +57°1456 (6.1) = SAO 028838 = HD 119213 (A2).
CR UMa = 84 UMa = HR 5187 = BD + 55°1634 (6.5) = SAO 028885 = HD 120198 (A0p) [6456].

GO Vel = CoD−40°4455 (7.3) = CPD −40°2697 (8.4) = SAO 220203 = = HD 73588 (Ma) [6323] = КЗП 6647.

GP Vel = CoD−40°4838 (7.1) = CPD −40°3072 (7.8) = SAO 220767 = = HD 77581 (B0) [6910].

GQ Vel = 259.1935 = HV 8268 [4194] = = P 3399 = КЗП 1582.

GR Vel = CoD−45°6020 (10) = 265.1935 = = HV 8282 [4194] = P 3412 = = КЗП 1605.

GS Vel = CoD−55°3622 (9.4) [6149] = CPD −55°3816 (9.6) = HD 301022 (M0).

FI Vir = Ross 128 = Gliese 447 [6911].

FK Vir = BD+6°2606 (8.1) = SAO 119372 = = HD 107937 (Mb) [6023] = DO 3224 (M5) = IRC + 10253.

FL Vir = Wolf 424 A [6062] = Gliese 473 A.

FM Vir = d^2 Vir = 32 Vir [6912] = HR 4847 = = BD+8°2639 (6.0) = SAO 119574 = = HD 110951 (A5).

FN Vir = Wolf 461 = Gliese 493.1 [6873].

FO Vir = BD+1°2819 (7.1) = SAO 119959 = = HD 117362 (A2) [6456].

FP Vir = BD+9°2785 (7.3) = SAO 120026 = = HD 118289 (Mb) [6351] = DO 3373 (M5) = IRC + 10273.

FQ Vir = BD−14°3872 (9.3) = HD 123179 (A2) = BV 1554 [6871] = SA 130 No.37 [5208] = КЗП 102738.

FR Vir = BD−18°3757 (7.3) = SAO 158383 = HD 123598 (Ma) [6113] = = IRC−20264.

FS Vir = HR 5331 = BD+4°2841 (6.7) = = SAO 120364 = HD 124681 (Ma) [4621].

TY Vol = BV 1529 [6318].

TZ Vol = BV 1534 [6318].

UU Vol = CoD−68°540 (9.0) = CPD −68°761 (9.5) = HD 311307 (M4) = = S 4898 [0085] = BV 1096 [5857] = КЗП 1276.

UV Vol = 114.1933 [2590] = HV 8128 = = BV 858 [5566] = P 541 = = КЗП 1288.

MP Vul = СПЗ 1776 [6854].

MQ Vul = СПЗ 1777 [6854].

MR Vul = СПЗ 1779 [6854].

MS Vul = СПЗ 1781 [6854].

MT Vul = СПЗ 1783 [6854].

MU Vul = GR 32 [2786] = КЗП 8390.

MV Vul = BD+21°4117 (9.4) = HD 346184 (K0) = GR 54 [5040] = = КЗП 8474.

MW Vul = BD+27°3668 (7.1) [4170] = = SAO 088444 = HD 192913 (A0p) = = КЗП 8481.

MX Vul = BD+24°4131 (9.5) = HD 346571 (F5) = GR 52 [2786] = = КЗП 8518.

Supplementary Literature List

6829. *Н.И.Шаховская*, Изв. КрАО **47**, 111, 1973.

6830. *R.L. Walker*, IBVS No. 855, 1973.

6831. *G.E. Kron*, AJ 55, 69, 1950.

6832. *K.D. Rakoš*, Bamb Ver **9**, Nr. 100, 59, 1971.

6833. *В.П.Цесевич*, АЦ № 762, 1973.

6834. *R. Deurinck, B. Vissenberg*, IBVS No. 794, 1973.

6835. *G.H. Herbig*, PASP **68**, 531, 1956.

6836. *A.F. Gulliver, D.A. MacRae, J.R. Percy, J.E. Winzev*, JRAS Can **66**, No. 1, 72, 1972.

6837. *F.L. Evans*, MN **146**, 101, 1969

6838. *M. Breger*, AsAp 22, No. 2, 247, 1973.

6839. *A.G.D. Philip*, AJ 72, 828, 1967

6840. *A. Van Hoof*, IBVS No. 807, 1973.

6841. *L. Häggkvist, T. Oja*, AsAp Suppl 12, 381, 1973

6842. *Н.Б.Перова*, АЦ № 773, 1973.

6843. *A.K. Bhatnagar, S.K. Gupta*, IBVS No. 778, 1973.

6844. *J.R. Percy, K. Madore*, AJ **77**, 381, 1972.

6845. *H. Knox-Shaw*, AN **253**, 222, 1934.

6846. *Н.Лиуде*, АЦ № 607, 1971.

6847. *W.H. Schneider*, IBVS No. 826, 1973.

6848. *N.V. Vidal, D.T. Wickramasinghe, B.A. Peterson, M.S. Bessell, M.E. Perry*, IAU Circ No. 2521, 1972.

6849. *J.R. Percy, K. Madore*, Bamb Ver **9**, Nr 100, 201, 1971

6850. *J.S. Drilling, P. Pesch*, AJ **78**, No. 1, 47, 1973.

6851. *D.J. Henry*, JAAVSO **1**, 29, 1972.

6852. *C.T. Kowal*, IAU Circ No. 2562, 1973.

6853. *B. Warner*, IAU Circ No. 2374, 1971.

6854. *Н.Е.Курочкин*, ПЗ **18**, № 5, 497, 1972.

6855. *W.J. Miller*, Ric Astr **8**, No. 22, 445, 1973.

6856. *К.А.Бархатова, А.Е.Василевский*, ПЗ **16**, № 2, 191, 1967.

6857. *P. Swings, O. Struve*, ApJ **95**, 159, 1942.

6858. *L.L.E. Braes, H.J. Habing, A.A. Schoenmaker*, IAU Circ No. 2450, 1972.

6859. *G. Welin*, AsAp Suppl **9**, 183, 1973.

6860. *L. Kohoutek*, IBVS No. 683, 1972.

6861. *A.D. Andrews*, QJRAS **12**, № 3, 324, 1971.

6862. *M. Petit*, CT **70**, 401, 1954.

6863. *S. Cristaldi*, Bamb Ver **9**, Nr. 100, 124, 1971.

6864. *N.L. Shakhovskaya*, IBVS No. 730, 1972.

6865. *O. Struve*, PASP 70, 208, 1958.

6866. *A.W.J. Cousins*, MNASSA 32, 11, 1973.

6867. *Г.С.Бадалян*, АЦ № 435, 1967

6868. *R.H. Koch, P.M. Perry*, AJ 79, 379, 1974.

6869. *B.F. Marino, W.S.G. Walker*, NZ Circ 184, 1971.

6870. *M.P. Fitzgerald*, AsAp Suppl 9, 297, 1973.

6871. *W. Strohmeier, R. Knigge*, Bamb Ver 10, Nr. 106, 1973.

6872. *R. Weber*, PASP **70**, 156, 1958.

6873. *W.E. Kunkel*, IBVS No. 748, 1972.

6874. *H.L. Giclas, R. Burnham, N.G. Thomas*, Lowell Bull No. 120, 1963.

6875. *F.J. Wood*, IAU Circ No. 2450, 1972.

6876. *A. Gutiérrez-Moreno, H. Moreno, J. Stock, C. Torres, H. Wroblewski*, Cerro Calan Publ № 1, 1966.

6877. *J.F.J. Schmidt*, AN 45, 95, 1857.

6878. *A. Müller*, AN **156**, 308, 1901.

6879. *J.E. Winzer*, AJ 79, 45, 1974.

6880. *W. Haupt, A.E.J. Moffat*, ApL **13**, 77, 1973.

6881. *Ю.А.Фадеев, С.Ю.Шугаров*, ПЗ Приложение 1, № 5, 351, 1972.

6882. *J. Stebbins*, ApJ **53**, 105, 1921.

6883. *S.K. Gupta, A.K. Bhatnagar,* IBVS No. 751, 1972.
6884. *L. Pigatto,* IAU Circ No. 2453, 1972.
6885. *B. Hatfield,* JAAVSO **1**, No. 2, 70, 1972.
6886. *G. Wegner,* ApL **12**, 219, 1972.
6887. *Н.Е. Курочкин,* ПЗ **11**, №2, 111, 1956.
6888. *F. Ross,* AJ **37**, 91, 1927.
6889. *В. Сатыволдиев,* АЦ №728, 1972.
6890. *C. Jones, W. Liller,* IAU Circ No. 2503, 1973.
6891. *L. Pigatto, L. Rosino,* Mem SAIt **44**, N. 3, 339, 1973.
6892. *L. Balázs, M. Kun, G. Szécsényi-Nagy,* IBVS No. 803, 1973.
6893. *В.А. Амбарцумян, Л.В. Мирзоян, Э.С. Парсамян, О.С. Чавушян, Л.К. Ерастова, Э.С. Казарян, Г.Б. Оганян, И.И. Янкович,* АФ 9, 461, 1973.
6894. *G. Haro, E. Chavira, G. Gonzalez,* Ton Bol **1**, No. **1**, 3, 1973.
6895. *W. Götz,* IBVS No. 771, 1973.
6896. *L. Pigatto,* IBVS No. 776, 1973.
6897. *L. Pigatto, L. Rosino,* Asiago Contr №246, 1971.
6898. *G. Haro, E. Chavira,* IBVS No. 788, 1973.
6899. *P.M. Corben, B.S. Carter, R.M. Banfield, G.M. Harvey,* MNASSA **31**, 7, 1972.
6900. *L. Rosino, L. Pigatto,* Bamb Ver **9**, Nr. 100, 116, 1971.
6901. *K. Graff,* Bergd Abh **2**, Nr. 3, 16, 1920.
6902. *Р.К. Мухаметкалиева,* ПЗ Приложение **1**, №5, 325, 1972.
6903. *В.П. Цесевич,* АЦ №733, 1972.
6904. *Н.Н. Самусь,* ПЗ Приложение **1**, №5, 339, 1972.
6905. *M.R. Molnar,* PASP **85**, 307, 1973.
6906. *В.П. Горанский,* ПЗ Приложение **1**, №5, 302, 1972.
6907. *O.J. Eggen,* PASP **83**, 251, 1971.
6908. *Н.Н. Самусь,* ПЗ Приложение **1**, 343, 1972.
6909. *E.W. Burke, Jr., J. T. Howard,* ApJ **178**, 491, 1972.
6910. *W.A. Hiltner, J. Werner, P. Osmer,* ApJ **175**, L 19, 1972.
6911. *D.T. Hoxie, T.A. Lee,* IBVS No. 707, 1972.
6912. *C. Bartolini, F. Grilli, G. Parmeggiani,* IBVS No. 704, 1972.
6913. *T. Herczeg,* Bonn Veröff, Nr. 54, 1959.

New Abbreviations

Cerro Calan Publ – Universidad de Chile, Facultad de Ciencias Fisicas y Matematicas. Departamento de Astronomia. Publicaciones. Observatorio Astronomico Nacional, Cerro Calan, Santjago de Chile.

JAAVSO – The Journal of the American Association of Variable Star Observers.

Ton Bol – Boletin del Instituto de Tonantzintla

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PHOTOELECTRIC LIGHTCURVE AND MINIMA OF THE ECLIPSING BINARY CW Cas

During 1972 we have observed photoelectrically the eclipsing binary CW Cas with the 40 cm refractor of the Teramo Observatory. The observations have been performed with a conventional photometer equipped with an E.M.I. 9502 photomultiplier and Schott GG 14 + GG 13 (2 mm) filters for the V light and Schott BG 12 + GG 13 (2 mm) for the B one.

The comparison and check stars are respectively the "a" and "b" stars used by Broglia (1957) : the coordinates, the V and B-V magnitudes are given in Table I.

Table I

Star	R.A. 1975	D.1975	V	B-V
a	$00^h43^m58^s$	+ 62°59!5	$10^m.72\pm0.03$	0.94 ± 0.03
b	00 44 16	+ 63 00.5	10.79 ± 0.04	0.44 ± 0.04

From the observed seven minima we have computed the new elements by a least squares solution, obtaining

$$\text{Min I} = JD_{\odot}\ 2441649.40322 + 0.3188449$$
$$\pm.00009\ \pm.0000028$$

The difference from the Broglia's period (1964) $\Delta P=0.00002$ is much greater than the error and this suggests a variation of the period; a confirmation is given from the systematic trend of the O-C's for all the minima available in the literature, but the data are insufficient for a valuable determination of a variability law.

In Table II are listed the epochs and their errors, computed by the Hertzsprung's method, and the computed O-C's.

Table II

Observed minima Date $JD_{\odot}$2441	Mean error	E	O-C
632.34501	±0.00049	- 53.5	- 0.00001
634.41764	.00011	- 47.0	+ 0.00013
649.40339	.00008	0	+ 0.00017
650.35954	.00027	3.0	- 0.00021
650.51889	.00015	3.5	- 0.00029
658.33083	.00008	28.0	- 0.00005
658.49059	.00026	28.5	+ 0.00029

The composite yellow light curve is drawn in the figure.

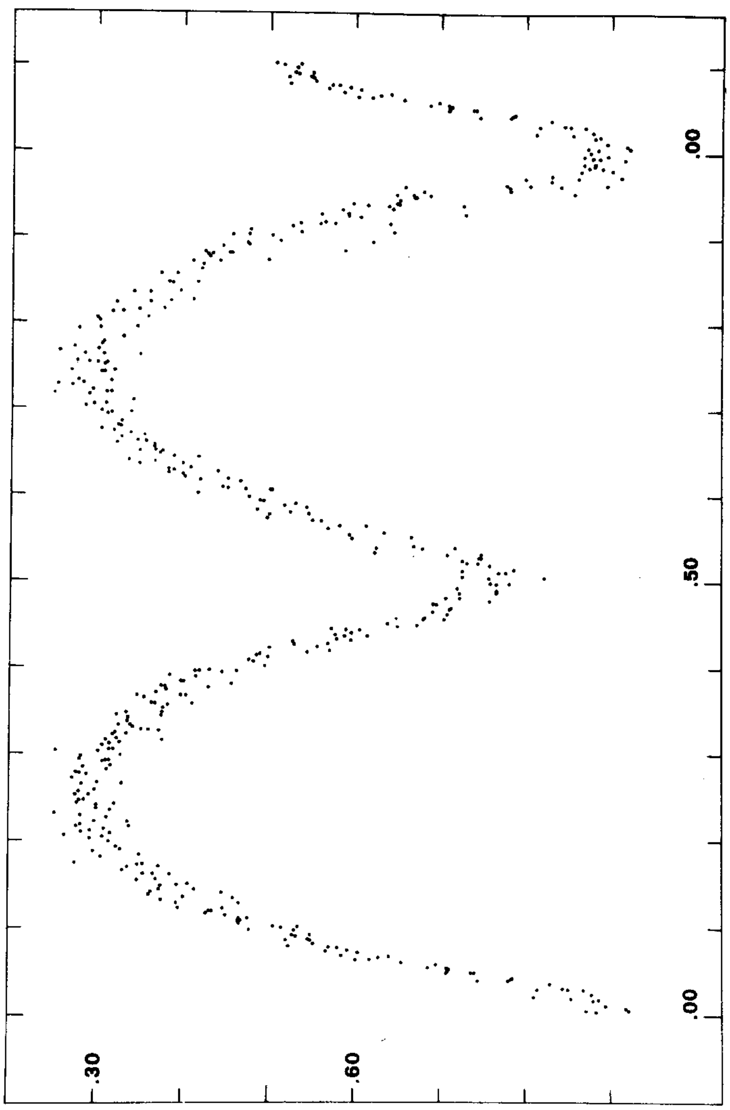
$JD_{\odot}$	ΔV
2441542.	
.4928	0.32
.4968	.38
.5007	.30
.5049	.31
.5083	.31
.5112	.31
.5147	.35
.5213	.33
.5252	.35
.5288	.36
.5319	.38
.5351	.41
.5381	.40
.5416	.41
.5464	.42
.5498	.50
.5530	.59
.5562	.62
.5595	.64
.5630	.64
.5662	.73
.5696	.73
.5745	.86
.5778	.89
.5810	.91
.5842	.89
.5873	.91
2441632.	
.3122	0.43
.3175	.49
.3195	.57
.3218	.53
.3238	.58
.3258	.60
.3289	.67
.3309	.71
.3329	.71
.3350	.71
.3368	.70
.3388	.72
.3405	.72
.3424	.72
.3443	.76
.3465	.73
.3484	.77
.3516	.74
.3535	.75
.3557	.62
.3575	.62
2441634.	
.2754	.59
.2785	.58
.2814	.50
.2844	.49
.2873	.49

$JD_{\odot}$	ΔV
2441634.	
.2918	.47
.2962	.40
.2991	.38
.3020	.34
.3062	.35
.3091	.32
.3120	.35
.3151	.33
.3209	.30
.3236	.30
.3277	.25
.3309	.25
.3358	.27
.3391	.30
.3439	.30
.3469	.31
.3516	.27
.3549	.30
.3578	.32
.3610	.32
.3754	.42
.3798	.43
.3873	.54
.3908	.58
.3943	.59
.3976	.65
.4011	.67
.4047	.78
.4116	.87
.4151	.89
.4187	.87
.4225	.88
.4264	.87
.4301	.74
.4336	.71
.4375	.62
.4409	.57
2441649.	
.2450	.82
.2481	.79
.2526	.75
.2562	.72
.2601	.67
.2684	.50
.2717	.52
.2747	.48
.2780	.45
.2813	.45
.2846	.39
.2893	.42
.2924	.38
.2958	.35
.2994	.32
.3108	.34
.3146	.29

$JD_{\odot}$	ΔV
2441649.	
.3180	.28
.3213	.30
.3246	.29
.3280	.28
.3314	.30
.3380	.30
.3413	.30
.3445	.35
.3477	.38
.3510	.36
.3544	.39
.3579	.39
.3658	.45
.3692	.47
.3727	.48
.3760	.56
.3797	.56
.3833	.65
.3866	.65
.3899	.78
.3935	.86
.3984	.87
.4020	.90
.4055	.92
.4093	.86
.4129	.84
.4163	.78
.4197	.71
.4232	.60
.4283	.52
.4320	.53
.4353	.53
.4386	.48
.4422	.45
.4459	.46
.4493	.41
.4547	.36
.4583	.35
.4620	.35
.4675	.29
.4712	.31
.4753	.31
.4807	.28
.4840	.29
.4876	.33
.4911	.29
.4970	.28
.5004	.32
.5039	.38
.5076	.37
.5131	.32
.5167	.38
.5206	.35
.5247	.46
.5289	.45
.5347	.50

$JD_{\odot}$	ΔV
2441649.	
.5386	.56
.5424	.61
2441650.	
.2402	.38
.2435	.35
.2464	.39
.2507	.37
.2535	.33
.2565	.30
.2594	.33
.2623	.31
.2650	.29
.2702	.32
.2736	.28
.2827	.27
.2857	.25
.3004	.33
.3040	.36
.3074	.34
.3112	.38
.3144	.37
.3190	.44
.3221	.45
.3254	.47
.3287	.50
.3321	.53
.3357	.59
.3391	.64
.3423	.67
.3465	.76
.3494	.80
.3524	.86
.3554	.88
.3583	.87
.3614	.88
.3661	.81
.3691	.82
.3722	.78
.3750	.71
.3781	.70
.3811	.64
.3843	.58
.3872	.55
.3915	.52
.3943	.47
.3976	.43
.4007	.47
.4043	.45
.4074	.39
.4111	.39
.4140	.37
.4200	.33
.4229	.32
.4262	.32
.4294	.28

$JD_\odot$	ΔV	$JD_\odot$	ΔV	$JD_\odot$	ΔV	$JD_\odot$	ΔV
2441650.		2441658.		2441658.		2441660.	
.4353	.30	.3107	.61	.4239	.31	.2172	.53
.4386	.28	.3124	.65	.4261	.33	.2222	.64
.4417	.28	.3143	.69	.4283	.31	.2242	.60
.4448	.30	.3161	.78	.4303	.32	.2265	.67
.4498	.31	.3181	.80	.4324	.32	.2287	.68
.4530	.31	.3201	.83	.4345	.32	.2310	.84
.4565	.30	.3221	.83	.4366	.34	.2594	.74
.4594	.33	.3241	.90	.4385	.34	.2613	.71
.4628	.33	.3259	.88	.4405	.38	.2631	.66
.4661	.34	.3287	.88	.4454	.36	.2650	.63
.4707	.37	.3306	.87	.4473	.36	.2668	.60
.4738	.41	.3324	.92	.4493	.37	.2687	.57
.4770	.41	.3342	.90	.4513	.38	.2713	.52
.4799	.43	.3363	.89	.4532	.40	.2731	.55
.4862	.46	.3382	.88	.4552	.42	.2748	.53
.4894	.48	.3402	.84	.4573	.42	.2766	.51
.4932	.54	.3422	.83	.4591	.50	.2784	.47
.4963	.57	.3443	.79	.4613	.48	.2802	.45
.5017	.57	.3462	.74	.4637	.49	.2820	.43
.5052	.68	.3480	.69	.4659	.50	.2861	.38
.5087	.71	.3501	.66	.4680	.53	.2880	.36
.5118	.76	.3530	.59	.4702	.59	.2899	.37
.5150	.77	.3548	.59	.4725	.61	.2917	.41
.5183	.78	.3566	.55	.4747	.64	.2935	.37
.5231	.73	.3585	.55	.4768	.68	.2953	.37
.5259	.73	.3603	.53	.4791	.69	.2979	.34
.5291	.75	.3623	.48	.4820	.69	.2995	.28
.5322	.67	.3643	.47	.4844	.71	.3096	.26
.5386	.57	.3661	.47	.4867	.77	.3112	.29
.5415	.56	.3680	.43	.4893	.77	.3129	.34
.5447	.52	.3699	.40	.4914	.76	.3145	.34
.5479	.53	.3719	.39	.4937	.78	.3175	.25
.5528	.50	.3739	.40	.4960	.76	.3211	.32
.5559	.47	.3758	.36	.4981	.73	.3226	.29
.5594	.44	.3780	.38	.5001	.71	.3331	.28
.5626	.40	.3799	.35	.5023	.68	.3350	.32
.5674	.37	.3820	.36	.5062	.60	.3369	.31
.5705	.36	.3837	.33	.5086	.63	.3389	.28
.5737	.34	.3858	.35	.5107	.61	.3409	.25
.5770	.32	.3886	.31	.5131	.55	.3428	.31
.5818	.34	.3907	.30	.5152	.55	.3446	.31
.5847	.31	.3925	.32	.5174	.54	.3466	.32
.5883	.29	.3942	.31	.5200	.49	.3487	.35
.5915	.27	.3961	.31	.5226	.42	.3505	.33
.5973	.32	.3980	.28	.5249	.45	.3531	.34
.6002	.31	.3997	.28	.5275	.42	.3549	.33
.6032	.31	.4017	.30	.5295	.40	.3566	.38
.6061	.27	.4038	.28	.5320	.41	.3582	.37
2441658.		.4057	.32	.5342	.37	.3614	.40
.2899	.41	.4076	.30	.5374	.37	.3631	.38
.2920	.43	.4117	.28	.5396	.37	.3648	.38
.2938	.42	.4135	.30	2441660.		.3665	.40
.2959	.44	.4155	.28	.2056	.43	.3685	.38
.3043	.56	.4174	.27	.2106	.51	.3701	.41
.3063	.60	.4196	.28	.2129	.46	.3818	.60
.3089	.58	.4216	.29	.2150	.48	.3837	.58
						.3852	.58



Yellow light curve of CW Cas (1972)

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R. DE SANTIS

References:

Broglia, P., 1957, Merate Contr. N. 113
Broglia, P., 1964, Mem.Soc.Astron. Italiana 35, 23

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 963

Konkoly Observatory
Budapest
1975 February 4

HD 169454 : A POSSIBLE ZETA Aur SYSTEM

HD 169454 was observed photoelectrically in B light with the 16 in. reflector of Siding Spring Observatory for 13 nights in August and September 1970 as comparison star for the magnetic variable HD 168814.

Between JD 2440829.9 and 2440832.9 the luminosity of this star decreased by $0^m.04$, while before and after these days it stayed approximately constant. This diminution could be explained as due to an eclipse of a long period system. The spectral classification B1Ia+ of HD 169454 by Morgan et al. (1) could support this hypothesis.

In the following table are given Julian days, mean differences of magnitudes B(HD 169454) - B(HD 168815) in the Johnson system, the number (N) of observations for night and the standard error

s.e. = $(\Sigma(\Delta B-\overline{\Delta B})/N\ (N-1))^{1/2}$ if N >3.

JD	$\overline{\Delta B}$	N	s.e.
2440 811.97	-0.690	1	
812.93	-0.678	4	.002
813.97	-0.679	4	.001
815.97	-0.682	3	.003
817.89	-0.678	4	.001
818.91	-0.673	4	.001
819.89	-0.682	1	
829.90	-0.678	6	.003
832.93	-0.637	3	.002
834.93	-0.645	5	.001
835.96	-0.634	2	
836.96	-0.626	2	
840.94	-0.646	2	

According to our observations the totality should continue at least for 8 days.

(1) Morgan, W.W., Code, A.D., Whitford, A.E., 1955, Astrophys.Journ. Suppl. 2, 41.

Osservatorio Astronomico dell'Università
di Bologna

C. BARTOLINI
S. SCARDOVI

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INFORMATION BULLETIN ON VARIABLE STARS
Number 964

Konkoly Observatory
Budapest
1975 February 17

PHOTOELECTRIC MINIMA OF ER Ori AND XY Leo

In the next tables four minima of two eclipsing binaries are given. The photoelectric observations in V light were carried out using the 40 cm refractor of the Teramo Observatory. The heliocentric times of the minima and the mean errors were obtained with the method of Hertzsprung. In the third column (N) is reported the number of the single observations used in computing the time of minimum.

	J.D. hel. (2400000+)	m.e.	N	E	(O-C)
ER Ori	42023.35162	± $0^d.00002$	15	13024.5	$-0^d.0185$
	42030.55008	.00001	13	13041.5	- .0179

The comparison and check stars of ER Ori are BD $-8^{\circ}1051$ and BD $-8^{\circ}1056$, respectively. (O-C)'s were computed from the elements of the "1973 Rocznik Astronomiczny".

				E^I	$(O-C)^I$	E^{II}	$(O-C)^{II}$
XY Leo	42051.61956	.00003	20	24131.0	0.1198	23117.0	0.0329
	42099.48964	.00001	27	24299.5	.1175	23285.5	.0320

The comparison star is BD $+18^{\circ}2306$. The E^I and $(O-C)^I$ have been computed from the elements of Koch (1960); the E^{II} and $(O-C)^{II}$ from those of Tempesti - De Carlo (1968), since the "1973 Rocznik Astronomiczny" gives the initial epoch of Koch and the period of Tempesti - De Carlo.

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References:

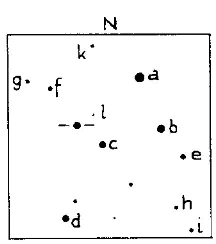
Koch R.H., 1960, Astron.Journ. 65, 374
Tempesti P., De Carlo R., 1968, Note e Comunicazioni dell'Osservatorio di Teramo n. 45

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 965

Konkoly Observatory
Budapest
1975 February 20

THE NEXT MINIMUM OF THE LONG PERIOD ECLIPSING BINARY EE Cep

This very interesting eclipsing star with $P = 2049^d$ and $D = 0^P.013$ (Meinunger, Mitt. veränderl. Sterne 6, p,89) enters the next minimum on April 26/27, 1975 (mid-eclipse May 8). The minimum takes about 25 days.
According to Herbig (ApJ 131,p.632) the spectral type is B5:neb. An image-tube spectrogram taken by Notni at Tautenburg shows also a bright Hα-line. Spectroscopical observations at the minimum are therefore of great interest.
The author intends to publish a summarizing report; observers are requested to place their observations at his disposal. On Sonneberg plates taken by Götz we measured a sequence of comparison stars. The magnitudes are in the system of Hoag's sequence in NGC 7235 (Hoag et al.,Publ. US Nav.Obs. Second Series Vol. XVII,p.478).
EE Cep (max.) and star c were observed photoelectrically by Barbier et al. (Astron. and Astrophys. 27,p.421). These observations contradict the measurements of EE Cep given by Fernie (ApJ 172,p.383), who probably observed another star.



	V	B	U	
EE Cep	10.72	11.09	10.91	BD +55°2693
a	10.5	10.7	11.0	BD +55°2690
b	11.5	11.3	11.5	
c	11.32	11.57	11.49	BD +55°2691
d	12.3	12.4	12.6	
e	12.7	13.0	13.0	
f	13.1	13.6	13.6	
g	13.1	13.7	13.9	
h	12.2	13.5	14.3:	
i	13.1	13.7	13.8	
k	13.3	14.3:	14.1	
l	13.4	14.7	-	

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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 966

Konkoly Observatory
Budapest
1975 February 25

CSV 7917

A possible Nova Scuti 1958 was reported by the late S.Apriamishvili (1962) (the coordinates in that report are for 1950, not 1900), and on this account it is No. 7917 in the Catalogue of Stars Suspected of Variability. I shall refer to this catalogue as the CSV.

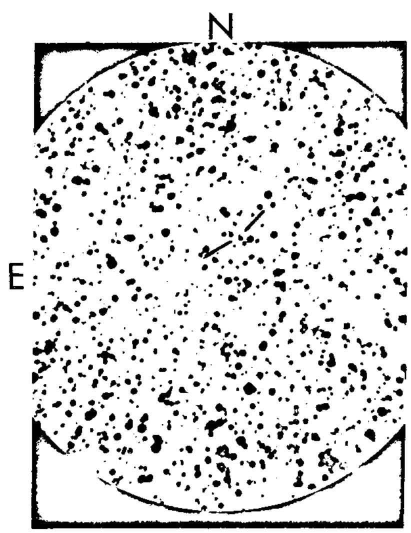
I have noted that an S star found here some years ago,No.12 in Table 2 of the paper by Nassau, Blanco, and Morgan (1954), is variable and quite close to the position of CSV 7917. Kharadze and Dolidze of Abastumani Observatory have very kindly made available to me photographic prints from Apriamishvili's discovery plate,and comparison of these with the Case material leaves no doubt that S-WS 12 and CSV 7917 are the same star. It is missing from the blue Palomar Sky Survey print, as Apriamishvili had noted, and which supported his suspicion that the star was a nova. However, it appears to be present on the red print; I was assisted in reaching this conclusion by our fortunate possession of a transparency of the red Palomar print, made to the scale of our Burrell Schmidt plates.

The accompanying chart, from the red Palomar print, shows the star in a field approximately 6′ in radius.

Apriamishvili discovered the star from its Hα emission, and this plus my previous remarks suggest that it is a long-period variable. However, the situation may not be that simple; the Abastumani people do not think their spectrum is type S, and my plates (chiefly infrared) do not establish the form of the light curve. I can only say the following: The star was bright on May 27 and June 19, 1947; July 20, 1952; July 12, Aug. 12, and Sept. 8, 1955. It was faint(at least two mags. fainter, and usually invisible) Aug. 2, 1951;July 4, 1959; and July 30, 1962. As this summary suggests, my material is inadequate for meaningful determinations of magnitude values.

Kharadze feels that the Abastumani discovery spectrogram is like a Wolf-Rayet star. This circumstance, and Apriamishvili's failure to find the star on a number of other plates, suggests possible membership in, or relationship to, the Z Andromedae group; if this is the case, it is the first one in which the cool component is S-type. Somewhat against this, and perhaps favoring the long-period variable status, is the fact that my material shows the S-type spectrum to be distinctly variable in flux in the photographic infrared.

My only spectral plates that give useful information about the spectrum are infrared (there is one unwidened red-region spectrum, of uncertain character), and appear mostly to show a red continuum with the λ7909 LaO band characteristic of S-type stars.



C. B. STEPHENSON
Warner and Swasey Observatory

References:
Apriamishvili, S. 1962, Astron.Circ. No. 229, 1
Nassau, J.J., Blanco, V.M., and Morgan, W.W. 1954, Astrophys.J., 120, 478

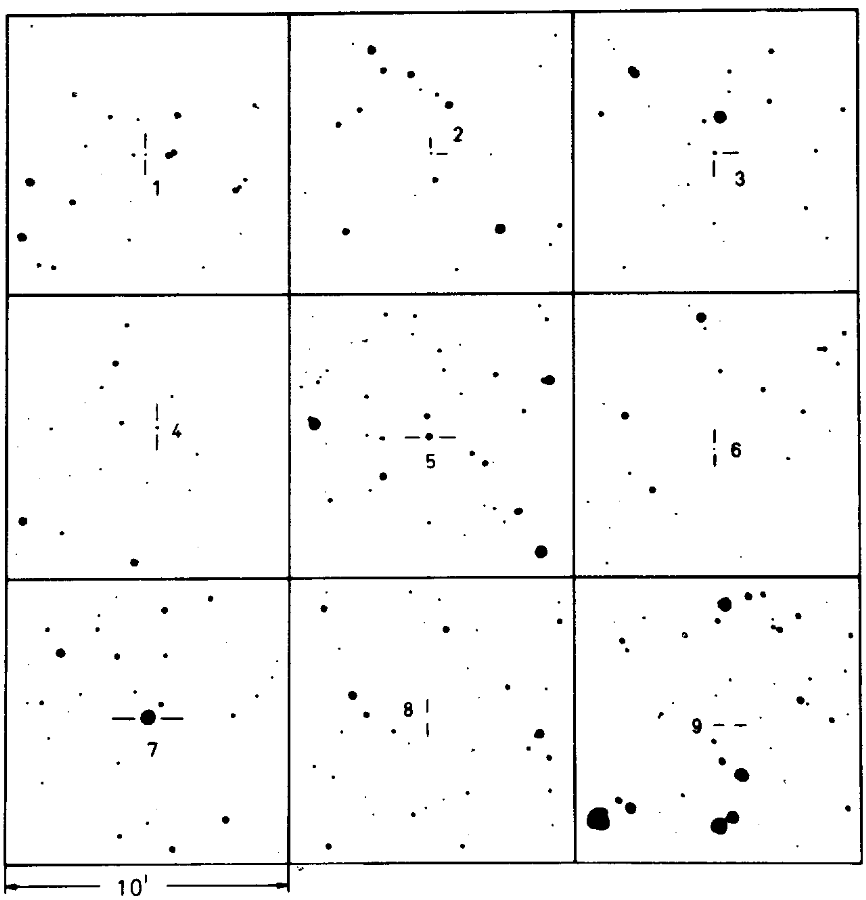
COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 967

Konkoly Observatory
Budapest
1975 February 27

NINE NEW VARIABLE STARS IN A FIELD AROUND μ Cep

For a variable star search in stellar associations a total of 21 blue plates centered on μ Cep have been obtained in 1961/62 with the B-objective (Sonnefeld four lens system F/5; F=206 cm) of the Bruce double camera of the Heidelberg-Königstuhl Observatory by one of the authors (E.H.G.). Each plate covers a field of about 6.6 x 8.3 square degrees. Two pairs of plates have been searched for variable stars, resulting in the discovery of nine variables, not designated in the GCVS (1969), GCVS 1. and 2. Suppl. (1971/1974) and the CSV catalogs I and II. For the estimates of the range of variability we used a sequence of B-magnitudes, derived by means of photographic transfer of a photoelectric sequence in the near-by cluster NGC 7128 (Hoag,A.A. et al. 1961, Publ. US Naval Obs. Vol. 17 part 7). This transfer has been done with the astrograph of the Hoher List Observatory (same four lens system F/5;F=150 cm). The preliminary results are given in the table. The accuracy of the coordinates corresponds to the positional accuracy of the Bonner Durchmusterung. The remarks in the last column refer to the estimated colours on the POSS-charts, where "r" means, that the star is brighter on the red print, "b", that the star is brighter on the blue print and "r=b", that the star has roughly the same brightness on both prints. The identification charts, which are enlargements from two original plates, have north up and east to the left.
Details will be published elsewhere.

No.	RA_{1900}	D_{1900}	Max	Min	colour
1	$21^h23^m38^s$	$+61^\circ56'.7$	$16^m.5$	$17^m.2$	r=b
2	24 40	55 34.7	16.1	(17.6	r=b
3	30 56	55 07.9	15.0	15.8	r
4	31 37	55 28.8	15.5	16.1	r
5	35 16	61 00.1	13.8	14.6	r=b
6	47 03	57 09.6	16.3	17.2	r
7	54 52	59 52.7	11.3	11.9	b
8	59 21	61 27	16.6	17.1	r=b
9	22 06 53	61 17	16.6	17.4	r



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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 968

Konkoly Observatory
Budapest
1975 March 3

FLARE OBSERVATIONS OF V1216 SAGITTARII

During the period 14th July - 22nd July 1974 observations were made at Boyden Observatory of the flare star V1216 Sagittarii with the 41cm Nishimura Reflector. The detecting element was a cooled EMI 6256A photomultiplier tube fitted with a standard Johnson B filter. The table gives details of the observations over a total monitoring time of 20^h03^m. Seven flares were observed during this time, all of them being of moderate intensity. One flare was particularly large, but unfortunately the recording equipment went off scale and it was only possible to estimate the intensity as greater than 6.00. Considering the time intervals between the following flares

1 and 5	$95^h10^m00^s$		($\sim 2x48^h$)
2 " 3	50 25 30		($\sim 1x48^h$)
5 " 7	94 23 30		($\sim 2x48^h$)

we possibly have more evidence for the forty-eight hour interval previously reported for this star (Andrews, A.D. 1966 and A.H.Jarrett and J.P. Eksteen, 1969).

Date July 1974	Universal Time	Total Hours Per Night	Flare No.	U.T. of Max.	Duration minutes	$\frac{I_o+f-I_o}{I_o}$
14	23^h04^m-23^h36^m	6^h40^m	1	$23^h07^m.5$	32	3.00
x 15			2	19 49.0	18	>6.00
17	22 02 -22 27.5	4 35	3	22 14.5	25.5	1.70
18	19 28.3-19 46	4 36	4	19 36.5	17.6	1.77
18	22 08.5-22 36	4 36	5	22 17.5	27.5	1.97
21	21 01 -21 17	2 45	6	21 10.6	16.0	1.81
22	20 33 -20 48.8	1 27	7	20 41.0	15.8	1.93

xRecording gear went off scale; values are estimated.

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Department of Astronomy,
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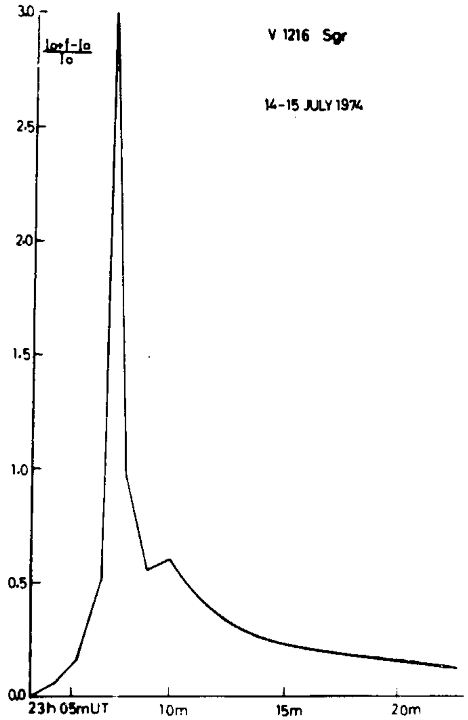
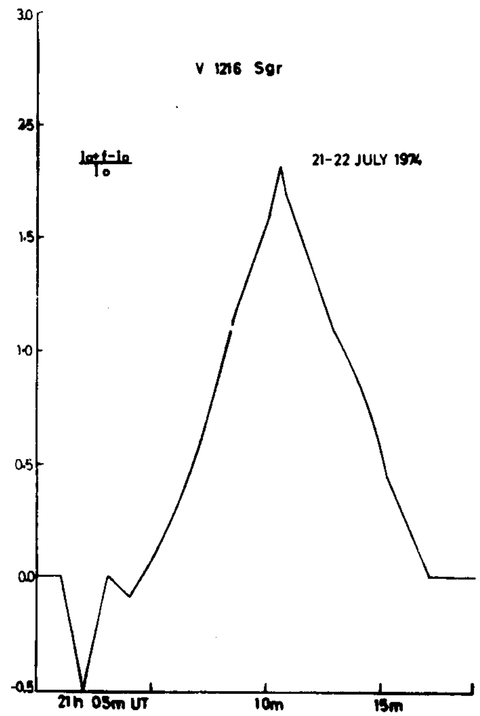
Bloemfontein.
Republic of South Africa.

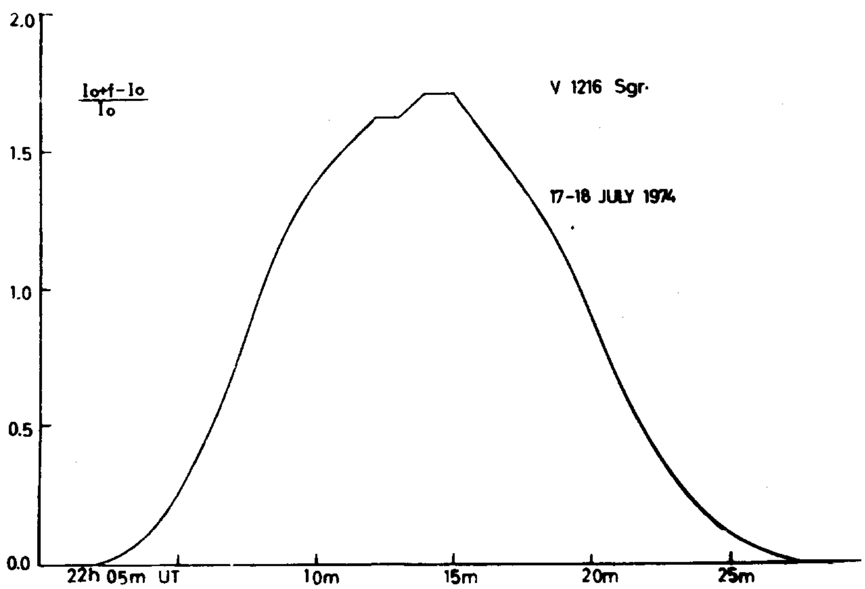
References:
Andrews, A.D. 1966 P.A.S.P. 78, 542
A.H. Jarrett and J.P. Eksteen, 1969, MNASSA, 28, 131



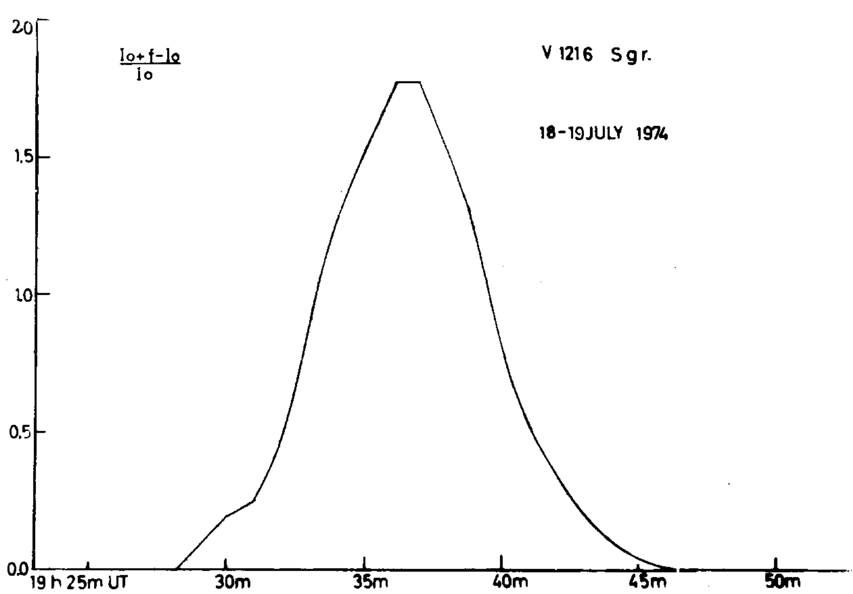
V 1216 Sgr
14-15 JULY 1974
(Io+f-Io)/Io
3.0
2.5
2.0
1.5
1.0
0.5
0.0
23h 05mUT
10m
15m
20m



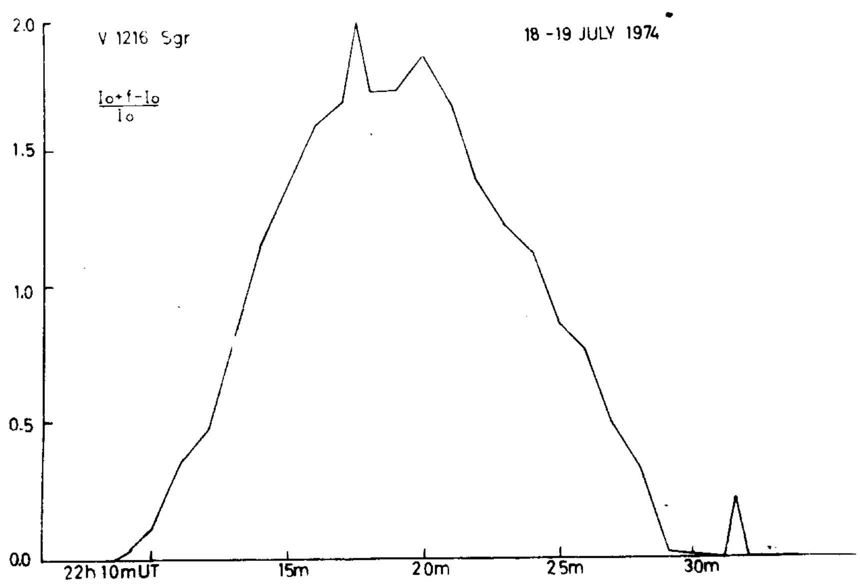
V 1216 Sgr
21-22 JULY 1974
(Io+f-Io)/Io
3.0
2.5
1.5
1.0
0.5
0.0
-0.5
21h 05m UT
10m
15m

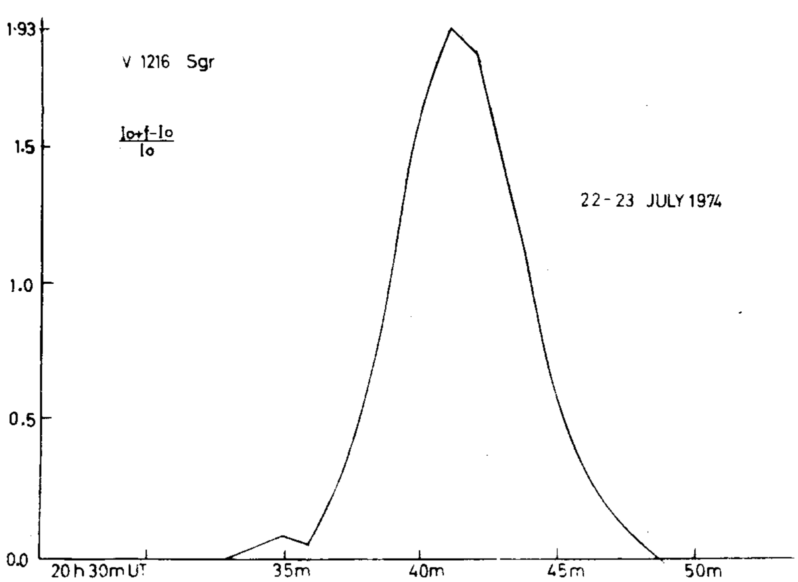


2.0
1.5
1.0
0.5
0.0
Io+f-Io / Io
V 1216 Sgr.
17-18 JULY 1974
22h 05m UT
10m
15m
20m
25m



2.0
1.5
1.0
0.5
0.0
Io+f-Io / Io
V 1216 Sgr.
18-19 JULY 1974
19 h 25m UT
30m
35m
40m
45m
50m


V 1216 Sgr
18 -19 JULY 1974
Io+f-Io / Io
2.0
1.5
1.0
0.5
0.0
22h 10mUT
15m
20m
25m
30m


V 1216 Sgr
Io+f-Io / Io
22-23 JULY 1974
1·93
1.5
1.0
0.5
0.0
20 h 30m UT
35m
40m
45m
50m

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 969

Konkoly Observatory
Budapest
1975 March 5

υ^1 PUPPIS, A PULSATING B3 Ve STAR

The variability of this star (HD57150, $\alpha_{1975} = 7^h17^m25^s$ $\delta_{1975} = -36^o41'$, $m_v = 4.78$, S = B3 Ve) which shows strong H emission was discovered by the author in 1970 at the ESO Observatory, where he made discrete photometric observations with the 6" Zeiss telescope on several early B-type stars, in a search for new β CMa variables. In the publication (1) where the discovery was announced, the following statement was made. "It is possible that the successive cycles have a different amplitude and shape with a mean duration of the order of 6.5 hours, but this is hardly more than a guess".

Photometric observations with the 60" Boyden reflector, which were started in January and are still being continued, confirm the presumption of the changing amplitude, but prove that the period must be doubled. They show that the star is indeed a pulsating variable with a period that changes between 12^h and 13^h. It seems difficult to attribute these changes of the period entirely to those phase shifts which result from the interference of two oscillations. The minimum amplitude observed up to now (6th February) is $0\overset{m}{.}025$ in V, the longest observed change in brightness is $0\overset{m}{.}06$ but the maximum amplitude may be higher. The amplitude in v is 1.3 - 1.4 times the amplitude in V. Certain cycles seem to present singularities.

The beat period could not be determined yet because of breaks in the observations, due to bad weather.

With its unusual long period and its low luminosity the star violates the P-L relation known to hold for the "classical" β CMa stars

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(1) Mededelingen v.d. Kon.Acad. v. Wetenschappen, Letteren en Schone Kunsten v. Belgie, XXXV, Nr.4, 1973

NOTE ON υ^2 PUPPIS

The variability of υ^2 Puppis (HD57219, $\alpha_{1975} = 7^h17^m45^s$, $\delta_{1975} = -36^\circ42'$, $m_V = 5.10$, S = B3V) has been announced in I.B.V.S. No. 807 where the star was described as a β CMa star with a period of ~3 hours, (amplitude of the light oscillations $0^m.02$V), it being also the brighter component of a spectroscopic binary with a period close to twenty-four hours. Those were the conclusions from a photometric observation campaign made with the 6" Zeiss reflector of the ESO Observatory at La Silla.

Observations now going on at the Boyden Observatory confirm the existence of the 3^h-oscillations, though their amplitude is smaller than it was seen in Chile (presently $0^m.02$ in u and a bit less in V). But the 5-6 hour runs on the star show moreover each night a gradual decrease of the star's brightness by $0^m.02$ in u and almost nothing in V. This is interpreted as the reflection effect in a close binary. The difference in longitude between Bloemfontein and La Silla ($6\frac{1}{2}^h$) and the orbital period ($= 24^h$) make it plausible now to see in the sudden rise in brightness of the star observed night after night at the same hour in La Silla, the end of an eclipse.

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Number 970

Konkoly Observatory
Budapest
1975 March 7

PHOTOMETRIE PHOTOGRAPHIQUE DE 3C 120

Nous avons continué les observations photographiques en B de la galaxie de Seyfert 3C 120 à l'Observatoire de Haute-Provence avec le télescope Schmidt (GS) de 60 cm d'ouverture et 208 cm de distance focale, en décembre 1972 et en 1973 et 1974.

Les 11 étoiles de Kinman dont on peut trouver les magnitudes dans un travail précédent (Bertaud,Véron,Pollas (1972)) nous ont encore servi d'étoiles de comparaison. Leurs magnitudes B sont comprises entre 14,17 et 15,75.

Nous avons mesuré les magnitudes de 7 étoiles supplémentaires qui sont indiquées par les lettres α,β,γ,δ,ε,λ et μ dans la figure ci-contre, en utilisant non seulement les clishés actuels, mais tous ceux obtenus antérieurement.

Les étoiles β,λ et μ sont respectivement les étoiles A',E et G de la séquence publiée par Angione (1970). Les étoiles α et β sont légèrement plus brillantes que celles de Kinman et l'étoile μ plus faible.

Le tableau I donne les résultats obtenus pour ces étoiles avec les erreurs quadratiques moyennes et le nombre de clichés utilisés.

Tableau I

Etoile	Magnitude B	E.Q.M.	N
α	$14^m.05$	$0^m.08$	35
β	13.85	0.09	37
γ	14.67	0.06	47
δ	15.37	0.06	48
ε	15.62	0.08	47
λ	15.70	0.05	35
μ	16.18	0.10	37

Angione a donné respectivement pour les étoiles A' = α, E = λ et G = μ les valeurs 13,94, 15,68 et 16,18.

Le tableau II donne les magnitudes obtenues pour 3C 120. Tous les clichés ont été posés 10 min. excepté le cliché GS 1187 posé 11 min. et les deux clichés GS 2030 et 2199 posés 5 min. Les mesures ont été effectuées avec un photomètre à iris Askania avec des ouvertures d'iris, pour 3C 120, correspondant en moyenne à 9" sur le ciel.

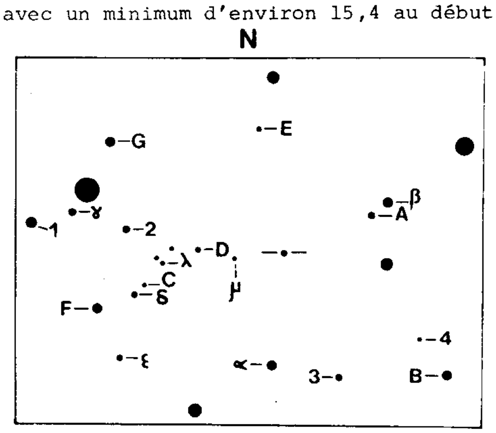
Tableau II: Magnitudes de 3C 120

No GS	Date TU	Magnitudes B	No GS	Date TU	Magnitudes B
1146	1972 Déc. 2,004	14,63	1187	1972 Déc. 6,895	15,00
1155	- 5,085	14,88	1291	1973 Fév. 3,858	14,82
1156	- 5,101	14,89	1731	- Oct.22,117	15,33
1157	- 5,114	14,88	1751	- - 24,047	15,30
1158	- 5,127	14,82	1758	- - 25,060	15,29
1172	- 5,976	14,95	1768	- - 26,024	15,26
1173	- 5,992	14,84	1839	- Nov.21,008	14,84
1175	- 6,073	14,80	2030	1974 Fév.20,843	14,82
1176	- 6,088	14,79	2193	- Nov.10,015	15,00
1177	- 6,104	14,92	2199	- Déc. 6,930	15,09
1178	- 6,121	14,83	2213	- - 13,947	15,10

L'erreur quadratique moyenne de ces valeurs est de $0^m,07$. Elle a été déterminée à l'aide des quatre étoiles $\gamma,\delta,\varepsilon$ et λ dont les magnitudes tombent à l'intérieur de l'intervalle défini par les étoiles de la séquence de comparaison et recouvrent bien l'intervalle de variation de 3C 120.

On voit d'après ce tableau que l'amplitude de variation de 3C 120 a été d'au moins $0^m,7$ entre le 2 décembre 1972 et le 13 décembre 1974. Un minimum à 15,3 est assez bien marqué du 22 au 26 octobre 1973.

Ces résultats sont à rapprocher de ceux de Kinman (1968) qui avait trouvé une amplitude d'au moins $0^m,8$ entre le 15 février 1967 et le 4 février 1968 avec un minimum d'environ 15,4 au début de février 1968.



CH. BERTAUD, B. DUMORTIER, C. POLLAS
Observatoire de Meudon

Angione, R.J., 1970, Dissertation,Univ. of Texas at Austin
Bertaud, Ch., Véron, M.-P., Pollas C., 1972, I.B.V.S. No.703
Kinman, T.D., 1968, Astron.Journ. 73, 885

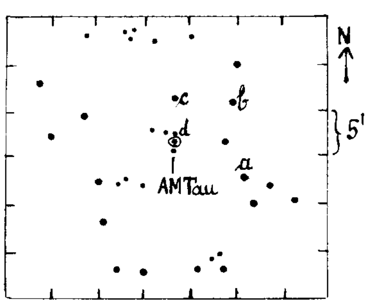
COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 971

Konkoly Observatory
Budapest
1975 March 10

A NEW ECLIPSING VARIABLE

The star $\alpha_{1900.0}=5^h46^m33^s$, $\delta_{1900.0}=+16^\circ16'.5$ was observed by the writer visually from 3.X.1947 to 26.III.1960. 106 estimates of brightness were obtained and it was found that the star is an eclipsing variable of β Lyrae type. The following data were determined : $m_{max,vis}= 10^m.9$; $A_1=0^m.60$; $A_2=0^m.35$, period $P=1^d.98453$ and the elements: JD hel $2437016.357+1^d.98453\cdot E$.

The figure gives the chart of the variable's neighbourhood taken from "Carte Photographique du Ciel" Bordeaux, Zone+16°, No.44. The new eclipsing variable is situated close to the north of the known eclipsing variable AM Tau.



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PERIOD INCREASE IN RW PERSEI CONFIRMED

The purpose of this note is to present a new time of primary minimum for the Algol-type eclipsing binary RW Persei which confirms the period increase suspected by Baldwin (1974).

The time was derived from differential UBV photoelectric observations obtained at Dyer Observatory on four different nights in 1970. One of these nights was on the falling branch, the other three on the rising branch. There was relatively little overlap, and this occurred only about $0^m_.3$ down from maximum light; thus the derived time is in principle vulnerable to any asymmetry which might have been present in the light curve. With the tracing paper method the time of minimum was determined to be JD(hel.) = 2,440,898.3330 ± $0^d_.0005$. Here the error is that indicated by examining the three colors separately, but the real uncertainty could be somewhat more.

The O-C residual based on the ephemeris

$$JD(hel.) = 2,429,217.587 + 13^d_.198454\ E$$

is $+0^d_.114$ at E = + 885. This value fits very nicely in the O-C diagram of Baldwin and thus confirms the suspected period increase, which is supposed to have occurred around 1960. Baldwin's suggested provisional new ephemeris

$$JD(hel.) = 2,429,217.274 + 13^d_.19894\ E$$

yields an O-C residual of only $-0^d_.003$ at E = +885, which is not large enough to call for a refinement of his period at this time.

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References:

Baldwin, B.W. 1974, I.B.V.S. No.910

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OBSERVATIONS PHOTOGRAPHIQUES DE 3C 120 (BW Tau)

A l'Observatoire d'Alger on a fait les observations de la galaxie de Seyfert 3C 120 à l'aide de l'astrographe normal (D=34 cm, F/10), sur émulsion A-600y(1) sans le filtre. Les 35 photos obtenues ont été estimées en utilisant la méthode de Nijland-Blazhko. L'erreur quadratique moyenne de nos observations à vue d'oeil est de 0.09 magnitude.

Les étoiles 1,2,3 et 4 de CH.Bertaud et al (2) ont été utilisées comme les étoiles de comparaison.

On donne les magnitudes photographiques de 3C 120 (BW Tau) dans le tableau:

No	1975	UT	JD 2442	m_{ph}	No	1975	UT	JD 2442	m_{ph}
1	6 janv.	18^h35^m	419.274	15.3	19	17 janv.	20^h52^m	430.369	15.2
2		18 52	286	15.2	20		21 07	380	15.2
3		19 07	296	15.2	21		21 22	390	15.2
4		19 22	307	15.2	22		21 37	401	15.2
5		19 37	315	15.2	23		21 52	411	15.2
6		19 52	323	15.2	24		22 09	423	15.2
7		20 07	338	15.1	25		22 22	432	15.2
8		20 22	347	15.1	26		22 37	442	15.2
9		20 37	359	15.1	27		22 52	453	15.2
10		20 52	369	15.2	28	6 févr.	20 10	450.340	15.1
11		21 07	380	15.2	29		20 22	349	15.2
12		21 22	390	15.2	30		20 37	359	15.2
13	9 janv.	21 37	422.401	15.3	31		20 52	369	15.3
14		21 52	411	15.3	32		21 07	380	15.2
15		22 07	422	15.3	33		21 22	390	15.2
16		22 22	432	15.3	34		21 37	401	15.2
17		22 37	442	15.3	35		21 52	411	15.2
18		22 52	452	15.2					

L'éclat de 3C 120 varie entre les valeurs 15.1 et 15.3 sans les écarts considérables.

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Observatoire d'Alger

(1) O.D. Dokuotchaeva, T.A. Biroulia, 1973; Soob.gos.astr.inst. Sternberg, 183, 37.
(2) CH. Bertaud, M.-P. Véron et C. Pollas, 1972; IBVS, 703

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INFORMATION BULLETIN ON VARIABLE STARS
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Budapest
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NOVA RS OPHIUCHI AS A SEMIREGULAR VARIABLE

In the years following its last outburst RS Ophiuchi has been photoelectrically monitored at the Teramo Observatory and the magnitudes measured from 1970 to 1973 are reported in the table. As comparison star was utilized BD $-6^{o}4660$ with the following photometric values

$$V = 9^m.30 \pm 0^m.01 \quad B-V = +1^m.25 \pm 0^m.23$$

which were obtained by means of many transfers from several Johnson's standard stars (Johnson and Harris, 1954)

Observations of RS Ophiuchi
in V light

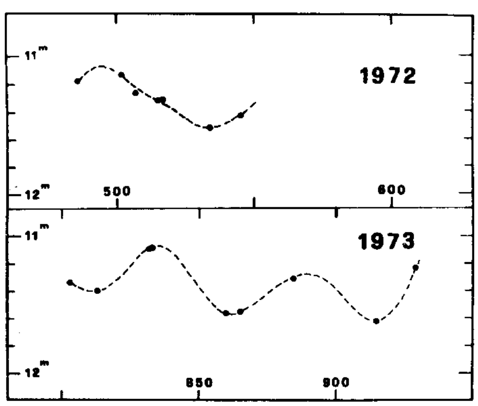
Date		J.D.	V	m.e.	Date		J.D.	V	m.e.
1970					1973				
June	3	39741.466	10.68	±0.01	April	30	41803.578	11.34	±0.02
July	29	39767.431	10.71	1	May	10	41813.539	11.41	2
1972					"	29	41832.431	11.09	1
June	17	41486.457	11.18	1	"	31	41834.448	11.08	1
July	3	41502.456	11.13	2	June	26	41860.400	11.56	2
"	8	41507.374	11.26	5	July	1	41865.454	11.55	3
"	16	41515.527	11.32	1	"	21	41885.378	11.31	1
"	18	41517.397	11.31	2	Aug.	20	41915.416	11.62	2
Aug.	4	41534.405	11.52	1	Sept.	3	41929.341	11.23	3
"	15	41545.413	11.43	3					

The B-V colour showed no great variations and during all the time covered by the table remained almost constant at a value around $+1^m.2$.

It has been known for a long time that RS Ophiuchi during its minimum stage undergoes light fluctuations ranging for the most time from 10.5 to 11.5 but sometimes raises up to 9.7 or fades down to 12.5; these data are based essentially on visual estimates:therefore no variation law could be detected and the fluctuations were classified as "irregular". The figure, where the Teramo observations of 1972 and 1973 are reported, shows the existence of a semiregular variation with a range of half a magnitude: in 1973 a 50 days wave is clearly apparent; in 1972 there is an indication of a longer period (70 days?). These fluctuations can be safely ascribed to the M type component which has been recognized to constitute a symbiotic pair with the hotter companion (Barbon et al., 1969).

The photoelectric program is still in course and a wider report on the photometric behaviour of this Nova from the 1967 outburst onwards will be published elsewhere within a few months.

Spectrographic observations which would be made in concomitance with my photometric program in spring and summer 1975 would be extremely useful to get a suitable model for this binary system.



V light curve of RS Ophiuchi
at minimum.

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References:

Johnson. H.L., Harris, D.L. 1954, Astrophys. J. 120, 196

Barbon, R., Mammano, A., Rosino, L. 1969, Spectroscopic Observations of the Recurrent Nova RS Oph from 1959 to 1968, in Non-Periodic Phenomena in Variable Stars, Ed. L. Detre, Academic Press, Budapest.

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Konkoly Observatory
Budapest
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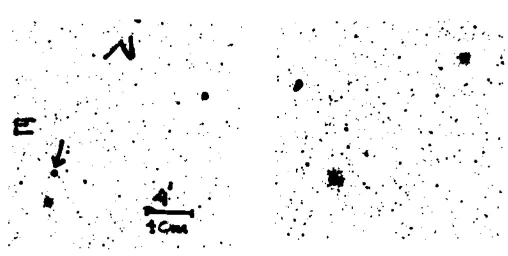
A FLARE STAR IN LUPUS

On the plate taken by Hidajat (1969) we have noted a conspicous bright stellar image that does not appear on the plate taken 15 minutes later. The finding charts presented here are the reproductions from the direct V plates (exp. times 10^m) taken with the Bosscha Schmidt Telescope. The discovery plate (left) was made on JD 2440800.03 (August 1,1970). The arrow identifies the object. The position of the object, estimated from SAO stars, is R.A. = $15^h05^m.7$; Dec.=$-48^{\circ}46'$ (1975), located north of the bright star HD 133592.

A check on our deep red spectral plate (103aE+RG1, exp.time 60^m) shows a faint object in the position of the afore-mentioned stellar image. This plate was secured on June 12-13, 1969. Unfortunately, no plates taken immediately prior to August 1, 1970 is available at our Observatory. As can be estimated from the 2 plates, taken on August 1, 1970, the object has changed its brightness by 4 magnitudes within 15 minutes. To the best of our knowledge, no flare star in that position has been reported.



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Reference:

B. Hidajat, 1969, Inf. Bull. for the Southern Hem., 14, 19

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Budapest
1975 March 18

PRE-MAXIMUM BRIGHTNESS OF NOVA Sgr 1969

Bateson (1969) announced the discovery of Nova Sgr 1969 (R.A.= $18^h28^m.3$; Dec. = $-32^o38'$). On September 20, 1969 the photoelectric magnitude and color of the nova became V=11.3 and B-V=-0.061. Candy (1969) observed that the star does not appear of the Perth Astrographic Plates taken in 1902, 1904, 1910 and 1914. These plates reached the limiting magnitudes between 13 and 14. His recent estimate (1969) for the magnitude of the nova yields m=9.7.

Recently, Knight (1972) used the Nantucket plates to obtain the light curve of the Nova. Her light curve indicates that by the end of 1969 the star remained at magnitude of approximately 12. Using the Nantucket plates collected between 1957-1968 she found that the star's brightness remained constant at m~13.

The purpose of our present note is to provide the information on the magnitudes of the star in 1965 and 1966. The photographic material used here are those that have been described by Hidayat and Radiman (1973). The following presents are the magnitudes:

1965, August	20	V= 12.78	B= 13.57
1966, June	17	12.07	14.06
Sept.	8	12.92	14.13
Sept.	16	12.52	13.65

The data may indicate little variation of the magnitudes. Another evidence for a possible variation in B is obtained from the spectral plates taken on August 27, 1965. A faint, but distinct, spectrum on the position of the star appears similar to that described by Stephenson and Herr (1963) for Nova Her 1963. Since the spectral plates record stars with B<12.8, the brightness of the Nova at the epoch must have been brighter than the plate limit.

We are grateful to Mr F. Bateson who has kindly sent us his preprint of his identification chart for the nova.

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References:

F. Bateson, 1969, IBVS 389
M.P. Candy, 1969, IBVS 408
B. Hidajat and I. Radiman, 1973, Contr.Bosscha Obs. No.46
P. Knight, 1972, IBVS 694
C.B. Stephenson and R.B. Herr, 1963, P.A.S.P. 75, 253

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INFORMATION BULLETIN ON VARIABLE STARS
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Budapest
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STATISTICAL ANALYSIS OF INFRARED COLOR-INDICES OF VARIABLE LATE TYPE STARS

Observations of infrared radiation for a large sample of cool stars have been carried out among others by Gillett, Merrill and Stein (1971). These authors have made four-color infrared photometry at 3.5, 4.9, 8.4, and 11 μm over the period 1969 October - 1970 June at Kitt Peak Observatory for 59 stars of spectral type M, 31 carbon stars and 7 stars of spectral type S.

I have used these observations for the discussion of the changes of [11] - [8.4] and [8.4] - [3.5] color indices with the physical properties of M and carbon variable stars such as the visual light amplitude and the light period. This work has been motivated by several earlier observations which have indicated the existence of the changes of intrinsic stellar polarization with the light phase (Dyck 1968) and occurrence of infrared excesses mainly for variable stars (Gehrz and Woolf 1970, 1971). There are also some theoretical considerations of the possibility of the grain formation in the circumstellar envelopes of cool variable stars (Fix 1969, 1970, Donn et al. 1968).

The relations of the infrared color indices [8.4] - [3.5] and [11] - [8.4] to the visual amplitudes of light variations (Kukarkin et al. 1969) are shown in Figs.1 and 2 for M type stars and carbon stars respectively. In these figures and the following ones the long-period variables (LPV) are shown as crosses. The semiregular and irregular variables (SR, Lb) are considered as one stellar group and are signed in different ways according to the luminosity classes in the case of M type stars only (see Fig.1). In Figs.1 and 2 the semiregular-irregular and long-period variable stars seem to form two separate sequences. The infrared color indices increase with the visual light amplitudes for the two sequences of variable stars of M type stars as well as for carbon stars. The largest infrared excesses among M type stars generally occur for stars that have the highest luminosity classified as supergiants. However, visual amplitudes of light variations are strongly affected by differential molecular absorptions. Now, there is no way to eliminate these effects for carbon stars, but we were able to correct visual amplitudes of M type stars for a TiO differential absorption according to data given by Smak (1964). The corrections are contained between $0^m.3$ and $3^m.3$. The [8.4]-[3.5] and [11] - [8.4] color indices are shown against the corrected visual amplitude $(\Delta m_V)_C$ in Fig.3. It seems that there is a separation of semiregular-irregular and long-period variable stars for [11] - [8.4] color index. The [8.4] - [3.5] color indices increase with the corrected visual amplitude, although there is a large scatter. It would be necessary to investigate the changes of the infrared color indices with the infrared light variations, e.g. at 1.04μm. These amplitudes are not affected by the molecular absorptions and they measure the changes of the photospheric temperatures and radii of cool stars. Unfortunately, the infrared amplitudes of light variations are known only for a small number of long-period variables, mainly of spectral type M (Lockwood and Wing, 1971). I have investigated the changes of infrared color indices with infrared light amplitudes at 1.04μm for long-period variables and have obtained a continuous increase of these color indices with infrared light amplitudes.

Finally, I have discussed the behaviour of [8.4] - [3.5] and [11] - [8.4] color indices with the light period for M type stars (Fig.4) and carbon stars (Fig.5). The inspection of these figures shows that there is probably a continuous increase of [8.4] - [3.5] color indices with the ligth period for M type stars as well as for carbon stars. If the [8.4] - [3.5] color indices measure the infrared emission from circumstellar grains, then their increase with the light period and with visual light amplitude may be explained by the rise of luminosities and the drop of the temperatures. The temperature decrease and the luminosity increase are connected with the larger mass loss and the larger infrared emission from grains formed around cool stars.

However, it seems that two separate relations occur between [11] - [8.4] color index and light period (Fig.4) for semiregular-irregular and long-period variables of spectral type M (except three semiregular supergiants). This behaviour of [11] -[8.4] color indices can be explained, if we assume after Gehrz and Woolf (1971) that the circumstellar silicate envelopes of long-period variables are optically thick. In shells of large optical depth, self absorption of thermal radiation at 11μm and circumstellar emission at 8.4μm ought to diminish the [11] - [8.4] color indices.

The changes of the [11] - [8.4] color indices with light period are quite different for carbon stars (Fig.5). There is probably a maximum of these color indices for semiregular carbon stars at P=250 days. It is difficult to explain such a behaviour because of the lack of period-luminosity relation for carbon stars. However, if one supposes, that luminosities of carbon stars increase with light periods, what is the case for M type stars, then may be, the influence of molecular absorption, which is the most important for the latest spectral subclasses, can affect the color indices in such a way.

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References:

Dick, H.M., 1968 A.J., 73, 688
Donn, B., Wickramasinghe, N.C., Hudson, J.P., and Stecher, T.P., 1968 Ap.J. 153, 451
Fix, J.D., 1969 Mon.Not.R.Astr.Soc., 146, 37
Fix, J.D., 1970 Contr.Kitt Peak Obs., No 554, 213
Gehrz, R.D., and Woolf, N.J., 1970 Ap.J., 161, 213
Gehrz, R.D., and Woolf, N.J., 1971 ibid., 165, 285
Gillett, F.C., Merrill, K.M., and Stein, W.A., 1971 Ap.J., 164, 83
Kukarkin, B.V., Parenago, P.P., Efremov, Yu.N., and Kholopov, P.N., 1969 General Catalogue of Variable Stars, 3rd ed., Moscow
Lockwood, G.W., and Wing, R.F., 1971 Ap.J., 169, 63
Smak, J., 1964 Ap.J.Suppl., 9, 141

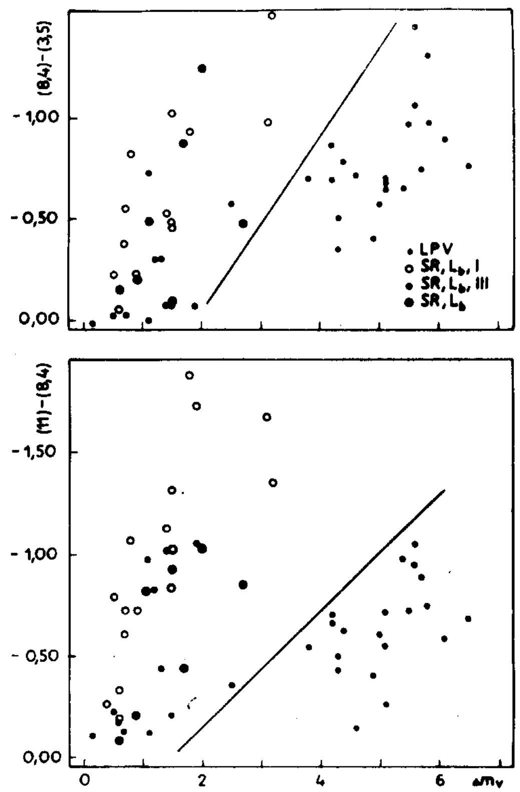

Fig.1. Relation between infrared color indices and visual light amplitudes for variable stars of spectral type M.

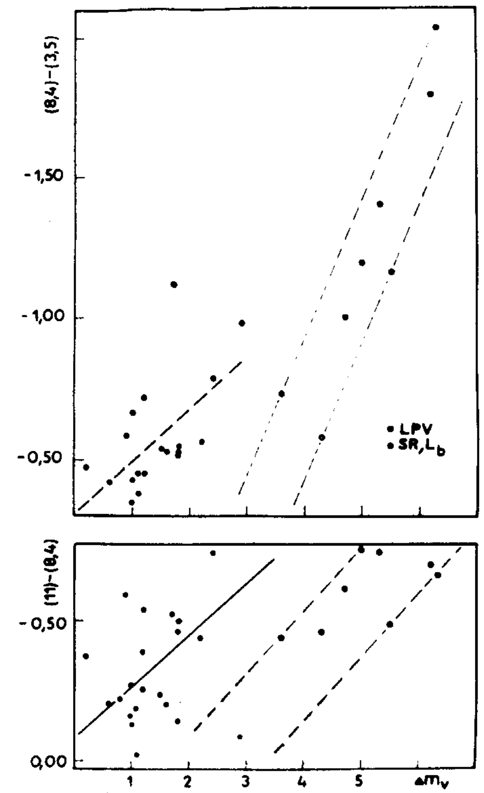

Fig.2. Same as Fig.1. for carbon stars.

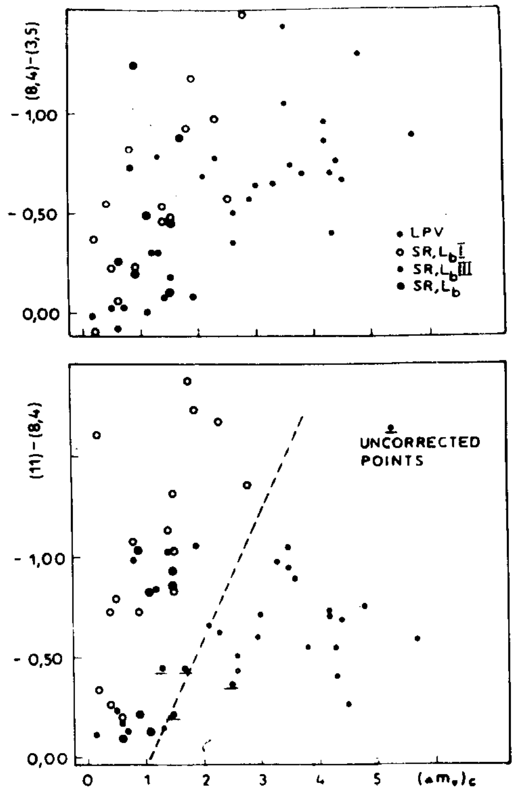

Fig.3. Plots of infrared color indices against the corrected visual light amplitudes for M type stars.

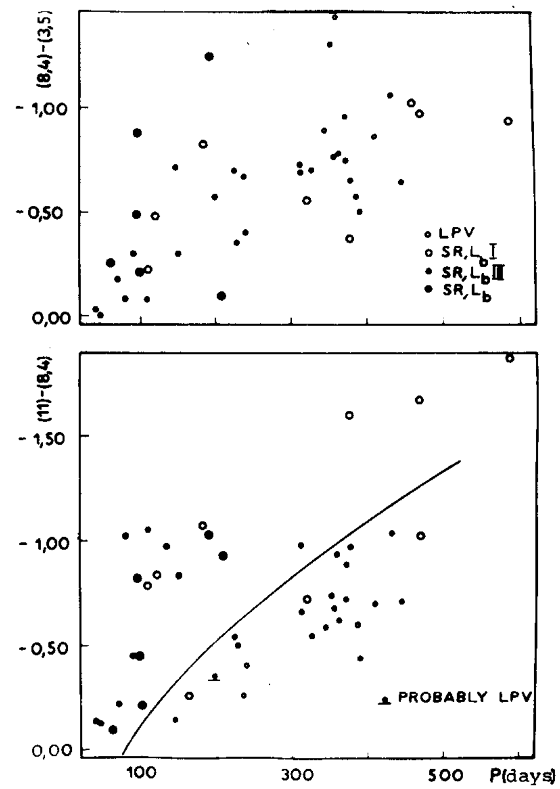

Fig.4. Relation between infrared color indices and light periods for variable stars of spectral type M.

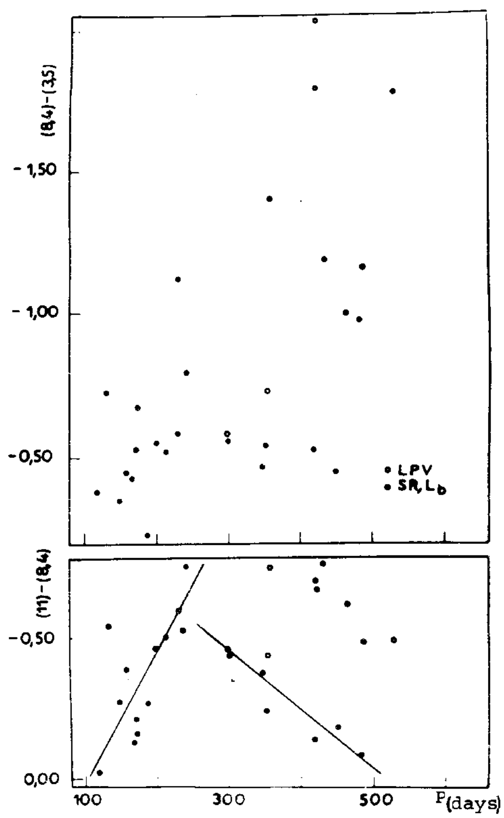

Fig.5. Same as Fig.4. for carbon stars.

COMMISSION 27 OF THE I. A. U.
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REVISED ELEMENTS OF ECLIPSING STARS

V787 Cygni:	Min.= J.D. 241 6457.424 + $1^{d}.5285151 \cdot E$
	Observations from 1904 to 1973, period constant.
RV Piscium:	Min.I = J.D. 242 4381.480 } $+0^{d}.55399145 \cdot E$
	Min.II= J.D. 242 4381.757 }
	Observations from 1925 to 1973, period constant.
XZ Ursae Maioris:	Min.= J.D. 244 0725.476 + $1^{d}.2223092 \cdot E$
	Observations from 1899 to 1974, period nearly constant.
BE Vulpeculae:	Mean elements
	Min. = J.D. 242 6144.489 + $1^{d}.5520487 \cdot E$
	Instantaneous elements
(1)	Min. = J.D. 242 6144.490 + $1^{d}.552050 \cdot E$
(2)	Min. = J.D. 243 0698.203 + $1.5520442 \cdot E$
(3)	Min. = J.D. 243 5340.373 + $1.552052 \cdot E$
(4)	Min. = J.D. 244 0111.381 + $1.552044 \cdot E$
	Observations from 1930 to 1974, period insignificantly variable.

PAUL AHNERT

Sonneberg Observatory

PHOTOGRAPHIC MINIMA OF ECLIPSING STARS

BX And	Min. = J.D. 244 2369.411,	O-C = $-0\overset{d}{.}001$		n= 12
WW Cnc	2152.379,	O-C = -0.003		n= 10
ZZ Cyg	1987.401,	O-C = -0.011		n= 8
		$O-C_A$= 0.000	1)	
V787 Cyg	1922.487,	O-C = +0.042		n= 13
		$O-C_A$= +0.001	2)	
	1948.468,	O-C = +0.038		n= 15
		$O-C_A$= -0.002	2)	
TZ Dra	2184.450,	O-C = +0.007		n= 12
UV Leo	2450.495,	O-C = +0.009		n= 12
		$O-C_A$= +0.001	3)	
U Peg	2359.398,	O-C = +0.007		n= 12
DI Peg	1983.349,	O-C = -0.008		n= 14
		$O-C_A$= 0.000	4)	
RV Psc	1988.433,	O-C = -0.015		n= 8
		O-C = -0.003	2)	
BU Vul	1960.471,	O-C = +0.007		n= 9

C has been computed with the elements from Rocznik (Kraków), C_A were computed with the elements of the author: 1) MVS vol.6,p.67, 2) unpubl., 3) MVS vol.6, p.100, 4) MVS vol.6, p. 158.

PAUL AHNERT

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INFORMATION BULLETIN ON VARIABLE STARS
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Budapest
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FURTHER OBSERVATIONS OF UV CETI

Over the period 21st September - 23rd October 1974 the flare star UV Ceti [RA = $01^h37^m12^s$, declination $-18^o08'$(1966.0), visual magnitude 12.9, spectral type dM5.5e] was observed at Boyden Observatory with the 41cm Nishimura Reflector. The observations were made using a standard Johnson B. filter with a solid carbon-dioxide cooled EMI 6256A photomultiplier tube.
The table gives details of the observations over a total monitoring tome of 68^h38^m.
The level of activity over the period was quite high, thirty-one definite flares being recorded. As the table indicates there were others which were uncertain due to unfavourable observing conditions. Of particular interest is the extremely intense flare peaking at $21^h16^m12^s$ Universal Time on 22nd September. This is the largest flare ever recorded at the Observatory, with a $\frac{I_{o+f}-I_o}{I_o}$ value of approximately 420. The flares showed the typical characteristic flash phase followed by a gradual decline of UV Ceti type flare stars. They are similar to those recorded previously from UV Ceti by Jarrett and Eksteen.

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Republic of South Africa.

References:

1. Jarrett A.H. and Eksteen J.P. 1969, I.B.V.S. No.349
2. Jarrett A.H. and Eksteen J.P. 1969, I.B.V.S. No.406
3. Jarrett A.H. and Eksteen J.P. 1970, I.B.V.S. No.412
4. Jarrett A.H. and Eksteen J.P. 1970, I.B.V.S. No.434
5. Jarrett A.H. and Eksteen J.P. 1970, MNASSA, 29, p.115.

FLARE SUMMARY FOR UV CETI (September-October 1974)

Date	Total hours	Rise	U.T. max.	Ends	Comments	$\frac{I_{o+f}-I_o}{I_o}$
Sept. 21-22	7^h06^m	$21^h41^m16^s$	$21^h41^m17^s$	$21^h41^m20^s$	End was possibly at 41^m40^s. Spike? Noise?	0.46 ± 0.15
		21 42 01	21 42 03	21 42 14	Flare. May be doubtful as dark reading was rather high.	0.62 ± 0.15
		21 44 22	21 44 29	21 45 05	Small flare. Star drifted out of diaphragm at max, but brought back in immediately!	0.46 ± 0.15
		00 38 40	00 38 47	-	Flare	$\geqslant 1 \pm 0.12$
		00 59 20	00 59 22	01 00 36	Small flare	0.67 ± 0.21
		02 06 36	02 07 12	02 08 48	Flare	1.34 ± 0.22
Monitoring Times: (UT)		$21^h09^m00^s$ - $23^h46^m00^s$; 23 51 30 - 00 38 48; 00 56 48 - 03 02 00				
Sept. 22-23	6^h07^m	$21^h14^m42^s$	$21^h14^m58^s$	-	Flare	1.29 ± 0.24
		21 15 41	21 16 12	$00^h00^m00^s$ (approximately)	Enormous Flare	420 ± 80
		21 32 14	21 32 25	22 06 00	Flare	11.8
		23 02 30	23 03 26	23 15 00	Slow flare	$\geqslant 2.2$
Monitoring Times (UT):		$20^h48^m00^s$-$23^h42^m00^s$; 23 49 00 -03 02 00 (dawn)				
Sept. 23-24	0^h25^m	$22^h02^m02^s$	$22^h02^m04^s$	$22^h02^m50^s$	Possibly a flare as observations were moonlit cloud patches	0.56 ± 0.07
Monitoring Times (UT):		$21^h39^m06^s$- $22^h04^m12^s$				
Sept. 24-25	02^h43^m	$21^h41^m45^s$	$21^h41^m48^s$	$21^h43^m48^s$	Flare	1.71 ± 0.43
		00 05 35	00 05 42	00 06 06	Flare? Observed through variable clouds	0.38 ± 0.17
Monitoring Times (UT):		$20^h59^m30^s$- $22^h17^m54^s$; 23 40 48 - 01 04 54				
Sept. 25-26	2^h43^m	No clear cut flares				
Monitoring Times (UT):		$00^h12^m48^s$- $01^h19^m36^s$; 01 29 00 - 03 00 06				
Sept. 26-27	1^h49^m	No clear cut flares				
Monitoring Times (UT):		$01^h13^m48^s$- $03^h02^m30^s$ (dawn)				
Oct. 2-3	0^h43^m	$21^h48^m06^s$	$21^h48^m48^s$	$21^h50^m06^s$	Slow flare, moonlit cloud at time of observation	1.06 ± 0.16

FLARE SUMMARY FOR UV CETI (September-October 1974) (cont.)

Date	Total hours	Rise	U.T. max.	Ends	Comments	$\frac{I_{o+f}-I_o}{I_o}$
Oct. 2-3	0^h43^m	$21^h53^m42^s$	$21^h53^m48^s$	$21^h54^m06^s$	Small flare	0.56±0.16
Monitoring Times (UT): $21^h19^m48^s$- $22^h02^m36^s$ (all in moonlight. Signals were noisy)						
Oct. 6-7	5^h37^m	$21^h53^m14^s$	$21^h53^m29^s$	$21^h53^m43^s$	Precursor Spike	2.78±0.15
		Obscured by preceding feature	21 54 10	21 57 42	Flare	1.46±0.15
		21 54 17	21 54 27	21 54 45	Spike	5.05±0.15
		22 54 12	22 54 22	-	Flare.Max.lost.	11.5 ±0.14
		-	22 54 40	23 20 00	Flare.Max.lost.	14.5 ±2.4
		01 08 54	01 08 56	01 10 00	Flare	0.60±0.28
		01 43 18	01 43 42	01 44 06	Flare?	0.50±0.28
		02 03 02	02 03 08	02 04 12	Flare	1.00±0.31
		02 04 40	02 04 57	02 05 12	Flare	1.44±0.31
Monitoring Times (UT): $21^h02^m00^s$- $21^h46^m36^s$; 21 52 30 - 23 40 48; 23 53 18 - 02 50 42						
Oct. 8-9	4^h52^m	$21^h19^m54^s$	$21^h19^m56^s$	$21^h21^m12^s$	Flare?varying clouds	1.28±0.29
		23 14 29	23 14 34	23 15 00	Flare?Troublesome clouds.	0.38±0.18
		00 17 15	00 17 19	00 19 00	Flare.	0.60±0.19
Monitoring Times (UT): $21^h09^m42^s$- $22^h39^m12^s$; 22 45 18 - 01 47 18; 01 53 06 - 02 13 54						
Oct. 9-10	5^h01^m	$22^h34^m24^s$	$22^h34^m39^s$	$22^h34^m54^s$	Flare.End uncertain as telescope in contact with pier	0.95±0.22
		01 55 20	01 55 27	01 55 42	Flare.	1.79±0.32
Monitoring Times (UT): $21^h45^m42^s$- $22^h34^m54^s$; 22 38 12 - 02 49 42						
Oct. 10-11	5^h43^m	$21^h06^m06^s$	$21^h06^m13^s$	$21^h07^m30^s$	Flare	1.03±0.27
		22 07 46	22 07 48	22 08 06	Flare	0.37±0.21
		23 30 30	23 30 36	23 31 00	Flare? Noisy signal	0.44±0.21
		00 27 54	00 28 18	00 30 24	Flare	1.74±0.21
		00 47 49	00 47 56	00 49 30	Flare	1.45±0.36
		01 06 00	01 06 06	01 06 42	Flare? Noisy signal	0.38±0.28
Monitoring Times (UT): $20^h50^m30^s$- $22^h31^m30^s$; 22 36 00 - 02 38 18						
Oct. 11-12	5^h28^m	$21^h17^m21^s$	$21^h17^m23^s$	$21^h18^m00^s$	Flare?Variable thin clouds	0.62±0.23
		22 42 43	22 43 16	22 49 48	Flare	12.55±0.21
Monitoring Times (UT): $21^h00^m36^s$- $22^h27^m24^s$; 22 35 30 - 02 37 00						

FLARE SUMMARY FOR UV CETI (September-October 1974) (cont.)

Date	Total hours	Rise	U.T. max.	Ends	Comments	$\frac{I_{o+f}-I_o}{I_o}$
Oct. 12-13	5^h28^m	$21^h23^m42^s$	$21^h23^m50^s$	$21^h26^m00^s$	Flare	1.00±0.23
		22 59 48	23 00 05	23 05 00	Flare complex	2.12±0.24
		00 15 48	00 16 07	-	First spike over slow flare	1.53±0.24
		-	00 16 42	-	Second Max.	1.79±0.24
		-	00 18 54	00 20 00	Third Feature, Noisy signal	0.47±0.24
		01 32 24	01 32 33	01 35 36	Flare	1.73±0.27
Monitoring Times (UT):		$21^h01^m36^s$ - $22^h23^m36^s$				
		22 29 54 - 02 35 36				
Oct. 15-16	2^h09^m	$01^h11^m30^s$	$01^h11^m36^s$	$01^h13^m24^s$	Flare? Noisy signal. Varying thin clouds.	1.42±0.30
Monitoring Times (UT):		$22^h58^m00^s$ - $23^h25^m42^s$				
		23 50 06 - 01 31 25				
Oct. 16-17	3^h55^m	$00^h20^m42^s$	$00^h20^m52^s$	$00^h21^m42^s$	Flare.	1.00±0.30
		00 57 48	00 58 00	00 59 30	Flare? Very noisy signal	0.58±0.37
		01 23 06	01 23 23	01 24 12	Flare	1.40±0.24
Monitoring Times (UT):		$22^h34^m24^s$ - $02^h29^m12^s$				
Oct. 17-18	2^h22^m	$23^h06^m24^s$	$23^h06^m42^s$	$23^h08^m48^s$	Flare	1.00±0.28
Monitoring Times (UT):		$21^h19^m00^s$ - $21^h41^m00^s$				
		21 47 48 - 22 04 54				
		22 08 54 - 22 47 06				
		22 51 00 - 23 14 54				
		23 23 54 - 00 05 24				
Oct. 18-19	2^h26^m	$23^h47^m45^s$	$23^h47^m47^s$	$23^h48^m24^s$	Flare? Noisy signal	2.00±0.26
Monitoring Times (UT):		$21^h08^m36^s$ - $22^h00^m12^s$				
		22 05 36 - 22 21 18				
		22 37 48 - 23 56 36				
Oct. 21-22	1^h33^m	$22^h11^m17^s$	$22^h11^m18^s$	$22^h11^m40^s$	Small Flare? Noisy signal, thin clouds and moonlight.	0.34±0.17
Monitoring Times (UT):		$21^h24^m42^s$ - $21^h48^m24^s$				
		21 53 42 - 23 03 06				
Oct. 22-23	2^h28^m					
Monitoring Times (UT):		$21^h25^m18^s$ - $21^h44^m24^s$				
		21 50 24 - 23 59 48				

Severe scintillation. No flares apparent.

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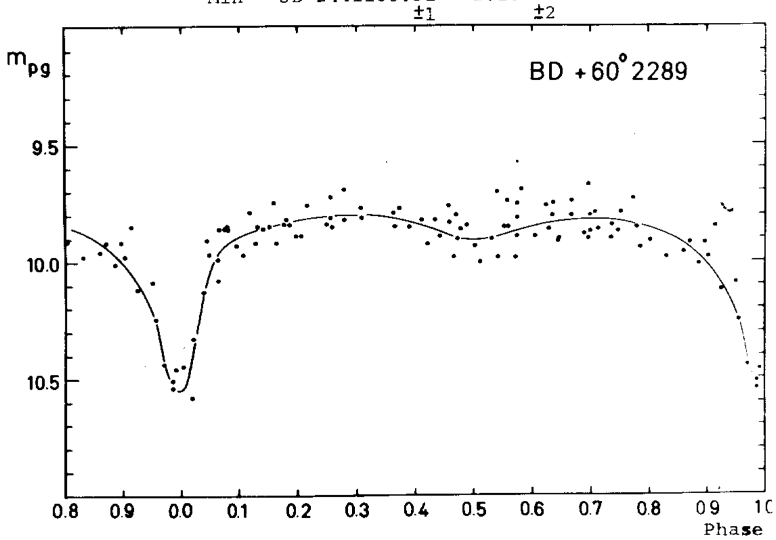
PHOTOGRAPHIC PHOTOMETRY OF BD +60°2289, A NEW BRIGHT ECLIPSING BINARY

During a variable star search in a field of 6 x 6 square degrees centered on μ Cep the star BD +60°2289 was discovered to be a new variable. Its light curve was derived by means of photographic photometry of 101 patrol plates, which have been obtained mainly between May 1969 and July 1971 with the astrograph of Hoher List Observatory (F/5; F= 1500 mm). The photometry was carried out with a Becker iris photometer using 5 suitable nearby standard stars, which have been calibrated with a UBV - sequence in the southern part of the field. This sequence itself had been derived by means of photographic transfer of a photoelectric UBV -sequence in the nearby cluster NGC 7128 (Hoag, A.A.et al. 1961, Publ. US Naval Obs. Vol. 17 part 7). The results of the photometry are given in the Table. The mean error turned out to be $\varepsilon = \pm 0^m.06$.

Using the 7 Minima fainter than $10^m.3$ the best period was found by least squares fit. The Figure shows the light curve of BD +60°2289 plotted over phase using the derived light elements

$$\text{Min} = \text{JD } 2441130.51 + 2^d.10438 \cdot E$$
$$\pm 1 \qquad\qquad \pm 2$$



The light curve shows that the variable is an eclipsing binary of type "EB" with

$$\text{Max} = 9^{m}.8$$
$$\text{Min I} = 10^{m}.5$$
$$\text{Min II} = 9^{m}.9$$

The scatter of the measurements, which is larger than expected from the above estimates of the error, may be due to a faint unresolved nearby star, disturbing slightly the photographic image of the variable. But it seems more probable, that this large scatter comes from an intrinsic property of the binary itself. This question, however, has to be answered by means of photoelectric investigation.

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JD_{Hel} 2400000 +	m_{pg}	JD_{Hel} 2400000 +	m_{pg}
39388.3774	$9^{m}.86$	40565.4283	$9^{m}.90$
39389.4225	9.80	40714.4922	9.81
39390.3545	9.85	40720.5475	9.84
39391.3663	9.85	40732.5136	9.92
39531.2749	9.91	40739.4409	9.92
39533.2679	10.46	40739.5089	9.89
39534.2763	9.80	40740.4590	9.90
40289.3012	9.85	40740.5500	9.88
40368.5448	9.85	40741.4680	9.92
40381.5210	9.86	40746.5280	9.90
40382.5266	9.74	40749.4620	10.12
40383.5370	10.13	40749.5260	10.25
40418.4670	9.75	40774.4590	9.91
40422.5456	9.81	40775.4563	9.82
40425.5506	10.45	40776.4458	9.87
40426.5507	9.86	40777.4987	9.84
40437.5330	9.67	40780.5467	9.90
40439.4845	9.76	40781.4579	9.85
40439.5776	9.74	40795.5605	9.98
40440.4297	9.86	40797.4648	9.90
40440.5213	9.79	40798.5572	9.81
40441.4131	9.70	40804.4658	10.08
40441.5013	9.69	40916.2948	9.89
40442.5152	9.86	40917.3677	9.86
40443.4381	9.93	40981.3246	9.97
40443.5430	9.85	41070.5608	10.00
40444.5264	10.33	41071.5601	10.51
40445.4167	9.89	41075.5595	10.01
40447.4084	9.85	41098.4976	9.94
40447.5022	9.82	41104.5131	9.91
40464.3867	9.76	41125.4750	9.89
40466.3930	9.82	41125.5243	9.86
40467.5285	10.09	41126.5015	9.93
40475.4390	9.79	41127.5126	9.89
40476.4169	9.84	41130.5065	10.44
40477.5238	9.80	41133.5026	9.92
40485.4941	9.84	41134.5151	9.98
40499.3290	9.99	41136.5318	9.96
40499.5137	9.85	41146.4461	9.98
40500.4082	9.75	41148.4885	9.98
40501.4026	9.97	41149.4907	10.58
40504.3720	9.83	41150.4323	9.98
40508.4004	9.77	41151.5262	10.54
40510.3650	9.77	41153.4429	9.92
40514.3810	9.76	41154.4291	9.85
40514.5143	9.69	41159.5091	9.85
40515.5567	9.73	41161.4474	9.87
40531.3008	9.72	41161.5259	9.84
40531.5265	9.79	41162.4551	9.82
40532.3480	9.79	41164.5128	9.75
40557.4230	9.80		

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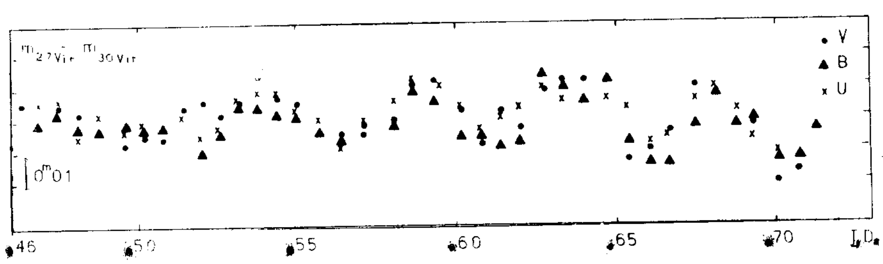
1975 March 27

27 Vir: A POSSIBLE DELTA SCUTI STAR

The star 27 Vir = BS 4824, classified Var? by the Bright Star Catalogue, was observed photoelectrically in UBV system with the 60 cm reflector of Bologna Observatory for 5 hours in the night February 7-8, 1975 using 30 Vir and 31 Vir as comparison stars. The differences of magnitude 27 Vir - 30 Vir are plotted in the figure.

The rapid light variations with P = $0^{d}.05$ having the same amplitude of $0^{m}.02$ in U,B,V and the spectral type A5 suggest that 27 Vir is a δ Scuti variable.



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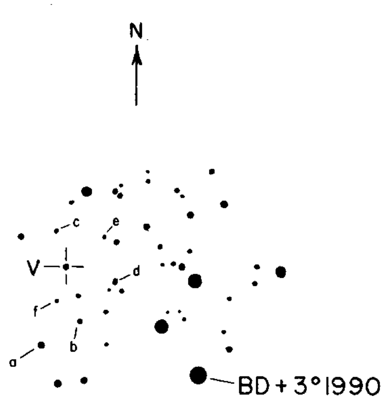
Konkoly Observatory
Budapest
1975 March 28

OKLAHOMA VARIABLE NUMBER 30

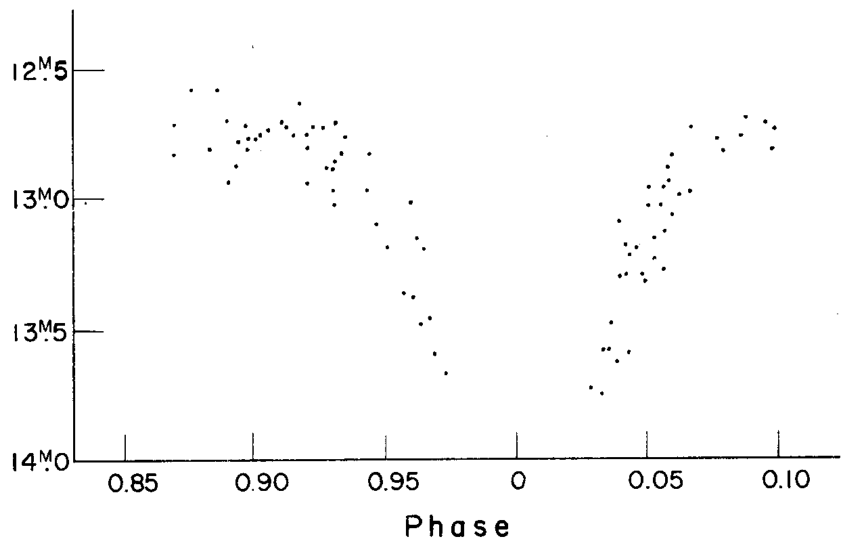
Oklahoma Variable Number 30 was discovered in the 1950's by Professor Balfour S. Whitney at the University of Oklahoma Observatory. It is an eclipsing variable located at $8^h\ 28^m\!.1$,



+3°27'(1950). An unpublished investigation of the period was conducted in 1967 by George F. Baird, Jr.

ELEMENTS: Minimum = $JD_{\odot}2430674.637 + 3^d\!.387024E$

The points on the accompanying light curve were obtained from observations of 15 minima between JD2430674 and JD2437285. These measurements were carried out with a Cuffey Iris Photometer using the comparison stars indicated on the chart whose photographic magnitudes for this investigation have been taken as: $a = 12^m\!.2$; $b = 12^m\!.5$; $c = 12^m\!.8$; $d = 13^m\!.4$; $e = 13^m\!.5$; and $f = 13^m\!.7$.



The range of the variable is from $12^{m}.7$ to some magnitude less than $13^{m}.8$. A plot of the step estimates from 448 plates ranging from January 1942 to June 1962 revealed no secondary minimum in the light curve.

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Budapest
1975 April 1

PHOTOMETRIC OBSERVATIONS OF SUSPECTED SMALL-AMPLITUDE CEPHEIDS

In the course of a search for stable stars in the Cepheid instability strip, Fernie and Hube (1971) found several stars which were slightly variable in brightness. Since these stars lay in or near the instability strip, they were good candidates for small-amplitude Cepheid variables, but Fernie and Hube's observations were too scattered in time to confirm the nature of the variability.

This paper reports on photometric observations of these stars, obtained during a one-week run at Kitt Peak National Observatory. The five stars on the program are listed in Table I. The spectral types and magnitudes are taken either from Fernie and Hube (1971) or from the Catalog of Bright Stars.

Table I

Program and Comparison Stars

Program Star	Comparison Stars Name (Sp.T., m_V or V)	Spectrum	Visual Magnitude	Variability
ε Leo	μ Leo (K2 III, 3.94)	GO II	2.96	variable ?
HD 191010	HD 190788 (K5, 8.26)	G3 Ib	8.6	constant ?
HD 213482	HD 213419 (AO, 8.6)	F8 Ib	8.6	constant ?
HD 239994	HD 214259 (AO, 8.6)	F8 Ib	9.0	Cepheid variable
HD 214847	HD 215177 (AO, 8.7)	GO Ib	8.1	constant

Observations

Photometric observations were obtained with the 41 cm telescope number 3 at Kitt Peak National Observatory during December 9-16,1973. The photometric system consisted of a refrigerated 1P21 photomultiplier tube, a charge-integrating amplifier, and a chart recorder. Measurements were made through KPNO standard UBV filter set number 2, relative to the comparison stars listed in Table I. These measurements were corrected for differential extinction and reduced to the sun, but were left on the instrumental magnitude system. The measurements of ε Leo are slightly less accurate than those of the other stars, because the comparison star is not quite as suitable.

The observations are listed in Table II and are plotted in Figure 1.

Table II

Photometric Observations of Suspected Small-Amplitude Cepheid Variables

ε Leo - μ Leo			HD 191010 - HD 190788		
JD 2440000+	Δm (V)	Δm (B)	JD 2440000+	Δm (V)	Δm (B)
2026.862	-0.908	-1.307	2027.609	+0.270	+1.033
2027.038	-0.914	-1.313	2028.580	+0.25:	+1.055
2027.991	-0.848	-1.276	2029.570	+0.255	+1.032
2029.949	-0.906	-1.31:	2030.567	+0.237	+1.019
2030.922	-0.902	-1.317	2031.576	+0.249	+1.015
2031.900	-0.920	-1.329	2032.571	+0.26:	+1.018
2032.903	-0.927	-1.331			

HD 213482 - HD 213419			HD 239994 - HD 214259		
JD 2440000+	Δm (V)	Δm (B)	JD 2440000+	Δm (V)	Δm (B)
2027.628	-0.684	+0.178	2027.664	+0.689	+1.412
2028.602	-0.686	+0.168	2028.611	+0.626	+1.375
2029.594	-0.692	+0.166	2029.602	+0.872	+1.709
2030.583	-0.700	+0.163	2030.590	+0.667	+1.394
2031.591	-0.697	+0.168	2031.598	+0.660	+1.410
2032.594	-0.688	+0.175	2032.600	+0.873	+1.739

HD 214847 - HD 215177		
JD 2440000+	Δm (V)	Δm (B)
2028.591	-0.541	+0.485
2029.586	-0.531	+0.482
2030.578	-0.537	+0.485
2031.586	-0.528	+0.495
2032.587	-0.534	+0.488

Discussion of Individual Stars

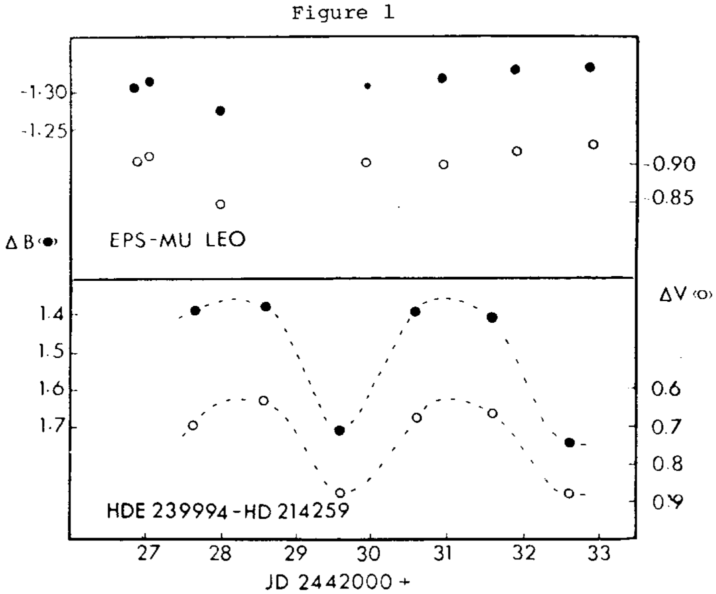
ε Leo: Fernie and Hube (1971) found that this star was variable with a range of $0\overset{m}{.}1$ or more. Significant variations occurred on a time scale of one day. The present observations give similar results, with a time scale of variation of a few days.

ε Leo does not lie in the instability strip if the luminosity class (II) is correct, but may do so if the luminosity class is actually (II-Ib). In this case a pulsation period of a few days would be reasonable. There is no evidence, amid the vast amount of radial velocity data for this star, that ε Leo varies in radial velocity by more than about 2 $km{\cdot}s^{-1}$. Furthermore, the rotational period of a giant star would be much greater than a few days, so that it is unlikely that the variations are due to a rotational phenomenon. The variations may possibly be similar to the irregular variations which are frequently found in K and M giants.

HD 191010: There is no significant variation in brightness during the period of observation, though the scatter is rather larger than might be expected.

HD 213482: The variation in B and V during one week is only $0^m.015$, but may possibly be systematic. If the total range is as great as $0^m.06$, as found by Fernie and Hube (1971), then the "period" would be several weeks. The expected period of a Cepheid variable of spectral type F8Ib would be a week or less.

Figure 1



Photometric observations of ε Leo and HDE 239994. The comparison stars are indicated on the figure. The scale on the left applies to the blue magnitude differences (filled circles) and that on the right applies to the visual magnitude differences (open circles). The dashed lines represent the presumed trend of the observations.

HD 239994: This star is a Cepheid variable with a period of 3 days and ranges in B and V of $0^{m}.4$ and $0^{m}.3$, respectively. Fernie and Hube (1971) found a total range of $0^{m}.2$ in four observations.

HD 214847: The variation, on five consecutive nights, is no more than $0^{m}.01$ in B or V. Fernie and Hube (1971) found a total range of $0^{m}.05$ in four observations. The period of a Cepheid variable of spectral type G0Ib would be about ten days; the present observations do not support the conclusion that this star is a Cepheid variable.

Acknowledgement

I wish to thank Dr.J.D. Fernie for suggesting this project, and for making the individual observations by Fernie and Hube (1971) available to me. I also thank the Director of Kitt Peak National Observatory for the use of facilities there. Mrs.D.L. Harmer, Royal Greenwich Observatory, and Mr.G.C. Aikman, Dominion Astrophysical Observatory, provided unpublished data on the velocity of ε Leo.

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Reference:

Fernie, J.D., and Hube, J.O. (1971), Astrophys.J. 168, 437

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Number 984

Konkoly Observatory
Budapest
1975 April 2

NEW BRIGHT ECLIPSING BINARY

BV 1594 = BD $-8^{\circ}2186$ ($7^{m}.2$) = HD 66094/95 (F5/A2) = Aitken 6526 ($0''.30$)

Min = JD 242 9658.375 + $1^{d}.807\ 805 \cdot E$

Minima	E	O - C
242 9658.379 (S)	0	+0.004
243 0025.382 (S)	204	+0.023
0041.617 (H)	212	-0.013
0267.612 (H)	337	+0.007
1144.447 (S)	822	+0.056
1444.476 (H)	988	-0.010
1847.647 (H)	1211	+0.020
1936.250 (H)	1260	+0.041
2594.307 (H)	1624	+0.057
2834.641 (S)	1757	-0.047
2897.993 (H)	1792	-0.011
2939.553 (S)	1815	+0.012
3239.632 (S)	1981	-0.005
3326.398 (H)	2029	-0.013
3651.834 (H)	2209	+0.018
3664.493 (H)	2216	+0.022
8820.312	5068	-0.019
8849.249	5084	-0.007
9525.386	5458	+0.011
244 1711.004	6667	-0.007

(S) = Sonneberg, H. Gessner; (H) = Harvard, M. Wälder
Ampl. $0^{m}.5$, EA Without remarkable secondary minimum.

W. STROHMEIER
Remeis-Observatory
Bamberg

COMMISSION 27 OF THE I. A. U.
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Number 985

Konkoly Observatory
Budapest
1975 April 12

NEW VARIABLE STARS IN THE FIELD OF M 16 - M 17

Eight years ago the writer noticed the marked increase of the number of Mira type variables when a field of stars is observed in infrared radiation (Maffei, 1967). At that time he also observed some differences in the behaviour of a few variable stars of different type when blue-infrared comparison was made.

This finding was based on the photographs of stars fields just a few square degrees wide, and the Mira stars involved were only fifteen.

In order to begin again the research on a statistical ground the writer started a systematic photographic search and observation of variable stars, in blue and infrared radiation, in 5 fields of some 25 square degrees each, at different galactic longitudes. The collection of the plates was effected with the two Schmidt telescopes of the Osservatorio Astrofisico of Asiago (mainly with the 90/65 cm telescope) beginning from the summer of 1967. 103a-O (without filter) and I-N (hypers.) + RG5 were used.

The examination of the first of these fields, centred on $\alpha=18^h14^m_{.}7$ $\delta=-14^{\circ}50'$ (1900.0), containing the objects M 16 and M 17, has led to the discovery of 198 new variable stars, almost all visible on the infrared plates only. The plates were compared by means of the blink microscope of the Asiago Observatory. This operation was based on four pairs selected from 50 plates. A comparable number of plates obtained in blue light yields only 2 new variables.

The main characteristics of the 198 variables are listed in Table I. The variables have been arranged in order of discovery. This numeration, characterized by the prefix M, will be continued in the remaining fields. The lack of some numbers is due to the exclusion of a few variables, not confirmed during the investigation following the discovery. The identification charts, light curves and a detailed account will be published, in a short time, in a more extensive work.

Table I

Var. N.	A.R. (1950.0)	Dec.	m_{ir}		Type	P	E 24......
M 1	$18^h7^m14^s$	$-15°14'38"$	11.7	15.4	M	193^d	40814
M 2	6 48	14 56 13	14.8	16.2	M or SR	320::	
M 3	6 1	14 9 4	13.2	15.7	M	237	41110
M 4	8 8	14 26 43	13.8	16.1	SR:	390:	40404
M 5	8 10	14 23 50	15.6	16.5			
M 6	12 8	15 49 17	15.4	16.2	SR:	350::	
M 7	14 9	15 19 27	11.2	15.7	M	280	41198
M 8	9 26	14 25 26	12.4	16.0	M	460	41048:
M 9	16 17	14 48 59	13.1	16.1	M	486:	40072:
M 10	22 30	15 33 43	13.1	16.2	M	417	39758
M 12	13 1	19 39 48	11.2	15.1	M	334	41260:
M 13	13 29	12 46 42	14.7	16.1	M or SR	288:	40810
M 14	17 14	12 45 21	13.9	16.2	M or SR		
M 15	26 31	15 9 59	14.3	16.2	M	362	39746
M 16	10 41	16 14 44	8.4	11.0	M	279	40784
M 17	8 52	15 9 41	11.7	15.9	M	510	40520:
M 18	11 32	15 32 0	12.0	15.8	M	394	41220
M 19	7 6	14 21 21	14.5	16.2	M or SR		
M 20	6 38	14 8 25	14.2	16.1	SR::	375::	41246::
M 21	11 16	15 7 27	14.8	16.2			
M 22	12 12	14 8 48	13.0	16.0	M:	400:	41040:
M 23	24 30	16 17 32	14.2	16.9	SR::	366::	39680::
M 24	27 6	15 20 43	14.0	15.8			
M 25	12 38	12 58 32	14.3	16.1	M	247	41143
M 26	24 23	15 51 28	13.5	17.1	M	444	41118
M 27	18 37	13 13 19	15.4	16.4	L:		
M 28	18 48	12 44 24	14.7	16.3			
M 29	14 40	17 43 26	13.3	16.0	M::	450::	39748
M 30	5 30	15 24 32	14.0	15.9	SR	270:	41164
M 31	5 43	15 8 8	13.7	16.0	RV::		
M 32	5 48	15 10 8	13.9	16.2	M	270	41178
M 33	7 32	15 23 2	13.2	15.9	M	338:	
M 34	8 10	15 36 37	12.8	15.9	M	202	41096
M 35	15 35	17 26 51	15.5	16.2			
M 36	15 54	17 45 7	12.3	15.6	M or SR	396::	
M 37	16 33	17 49 6	12.3	15.8	SR::	135::	41138:
M 38	9 33	15 46 10	12.9	15.9	M	336	40806
M 39	9 25	15 48 11	12.3	15.3	M	204	40804
M 40	9 5	15 40 12	13.0	16.2	M	531	41128
M 41	9 28	15 23 29	13.8	16.4	SR::		
M 42	7 37	15 8 35	13.6	16.4	M	482	41226
M 43	7 14	14 49 58	12.6	15.7	M	478	40816
M 45	9 15	14 55 37	12.6	16.2	M	285	40762:
M 46	11 6	15 22 54	14.2	16.0			
M 47	18 48	17 33 33	12.3	15.0	M	208	41144
M 48	18 28	16 44 23	12.0	15.6	M		
M 49	9 17	14 45 33	14.6	16.5	M	210:	40840:
M 50	7 47	13 52 1	11.8	15.6	M	434	40032
M 51	11 50	15 4 51	14.8	16.2			
M 52	21 15	17 5 18	14.1	15.8	M or SR	390::	
M 53	21 31	17 5 36	13.8	16.3			
M 54	21 45	17 6 45	12.8	15.8	M::	290::	
M 55	13 54	15 10 39	11.4	13.6	SR:	490:	40836:

Table I (cont.)

Var. N.	A.R. (1950.0)	Dec.	m_{ir}		Type	P	E 24......
M 56	$18^h12^m11^s$	-14°34'39"	13.0	15.5	SR	210^d:	
M 57	22 16	16 38 7	11.6	15.2	M:	442::	41214
M 58	23 55	16 23 34	14.7	17.2	M:	298	41100
M 59	24 48	16 23 50	13.8	17.6	M	405:	41152:
M 60	24 54	16 9 2	11.2	15.4	M	312:	41162
M 61	23 44	15 52 30	14.2	17.3	M	290	39745
M 62	12 31	13 9 51	12.8	16.2	M::	500:	41066::
M 63	24 23	15 34 19	14.0	16.4	M	384:	40754
M 64	25 14	15 56 45	13.5	17.0	UG or RW		
M 65	26 20	15 39 41	15.6	17.2	M	250::	41238::
M 66	25 27	15 27 47	12.9	15.9	M	313	40055
M 67	25 50	15 24 52	12.6	15.3	M	298	40458
M 68	25 39	15 21 22	13.7	16.4	M	315	39740:
M 69	23 17	14 49 5	12.1	14.7	SRc		
M 70	13 31	12 45 6	14.9	16.1	L:		
M 71	22 9	14 19 56	12.2	15.9	M::	522::	41142
M 72	24 8	14 43 41	7.6	11.6	M	400	39758
M 73	25 5	14 50 35	12.5	16.8	M	322	40478:
M 74	25 29	15 7 58	12.8	16.4	M	310	40082
M 75	25 44	14 58 17	13.2	16.0	M	319:	39749
M 76	27 59	15 39 37	12.8	16.2	M:		41164
M 77	28 44	15 29 8	10.0	15.5	M	468	41158
M 78	28 33	15 20 31	12.1	15.6	M	428::	40137::
M 79	26 10	14 45 52	12.0	15.4	M	312	39720
M 80	26 3	14 31 20	12.1	15.4	M	477	40804
M 81	17 10	12 37 35	12.4	15.9	M	310	40826
M 82	17 48	12 9 59	13.8	15.8	M:	304	39730
M 83	21 23	13 17 35	14.5	16.0	L:		
M 84	27 23	14 27 22	11.4	15.0	M	302	41100
M 85	27 53	14 54 53	11.3	14.1	M	264	41170
M 86	13 52	16 53 20	12.6	15.5	SR::	365:	
M 87	24 60	13 45 3	12.9	13.9	L:		
M 88	14 39	17 33 13	14.9	16.0	SR:		39744
M 89	8 13	16 13 40	13.4	15.2	M or SR	360::	
M 90	5 34	15 35 37	11.2	16.0	M	256	40860
M 91	5 38	15 34 20	15.4	16.3			
M 92	5 44	15 4 30	12.0	14.0	R CB:		
M 93	8 31	15 38 12	14.4	16.3	SR or M	210	41222
M 94	8 41	15 45 1	14.2	16.7	SR:	320::	
M 95	9 2	15 40 58	13.1	16.0	M	396	40790
M 96	16 33	17 47 6	13.8	15.8	M::	400::	39750::
M 97	17 2	17 44 28	12.9	15.4	M::	450::	40424::
M 98	8 57	15 38 5	13.4	16.4	M	465:	40928::
M 99	17 24	14 52 9	14.0	16.1			
M100	6 27	14 38 44	14.5	16.6	M or SR		
M101	5 21	14 34 49	10.9	15.9	M	358	41244
M102	5 3	14 31 52	14.0	16.4	M::	360::	40860::
M103	5 35	14 18 37	14.3	16.4	M or SR	400::	41136
M104	6 44	14 27 14	14.5	16.0	SR		
M105	7 8	14 51 52	12.2	15.4	M	316	40410
M106	8 48	14 47 49	11.7	15.4	M	434	41092
M107	9 42	15 21 46	14.5	16.2	SR:		
M108	18 14	17 7 46	13.7	16.3	M or SR		

Table I (cont.)

Var. N.	A.R. (1950.0)	Dec.	m_{ir}		Type	P	E 24......
M 109	$18^h20^m12^s$	-17°22'43"	13.3	14.8	M or SR		
M 110	14 5	15 54 30	13.1	16.2	M::	365::	41224
M 111	19 6	16 35 35	14.8	16.4			
M 112	21 24	17 9 0	13.3	15.8	M or SR	390::	41144::
M 113	22 11	17 5 42	14.6	16.0			
M 114	14 45	15 3 35	11.2	12.1	E		
M 116	8 27	13 36 22	14.3	16.4	M or SR		
M 117	11 56	14 9 7	11.6	14.7	M	213	40808
M 118	18 31	15 43 10	14.5	16.1	M or SR		
M 119	21 34	16 11 47	13.8	17.2	M	608	39734
M 120	22 46	16 35 33	11.2	15.3	M	379	41247
M 121	16 45	14 40 48	11.6	12.7	M:	226:	41124
M 122	15 49	14 46 2	12.0	15.1	M:	388	41100
M 123	23 54	15 59 23	14.7	17.2	M	374	37556
M 124	24 59	16 24 3	14.4	17.4	M	410::	40432::
M 125	25 2	16 23 30	16.1	17.4			
M 126	25 26	16 23 9	13.2	16.6	M:	510::	41092:
M 127	25 45	16 5 25	15.0	16.9	M or SR		41186
M 128	24 2	15 42 17	14.1	17.4	SR:	227::	39722
M 129	13 58	13 15 45	11.7	16.2	M	450	40844
M 131	12 38	12 51 21	13.9	16.2	M or SR		
M 132	13 44	12 43 22	14.8	16.6			
M 134	26 31	15 49 31	11.5	15.4	M	450	39712
M 135	26 40	15 50 43	11.7	15.2	M	716	40394
M 136	27 10	15 30 35	15.0	17.0	M or SR		
M 137	27 22	15 29 29	14.6	17.2	SR::		
M 138	22 49	14 44 49	12.7	15.3	SR	400::	39684::
M 139	17 28	13 10 38	14.3	16.0		380::	
M 140	17 11	13 11 0	12.9	16.0	M	506	40448
M 141	15 25	12 11 35	12.0	15.8	M	407	41058
M 142	15 26	12 28 18	12.3	15.8	M	420	41220:
M 143	16 34	12 25 7	12.1	15.8	M	410	40424
M 144	16 49	12 35 47	13.6	15.9	SRc:		
M 145	25 42	14 58 31	13.9	16.0	M	366	41164
M 146	25 26	14 14 20	11.3	15.2	M	378	41098
M 147	20 27	13 3 12	14.4	16.4	SR:	486::	40020::
M 148	17 56	12 30 5	13.9	15.8	M	259:	40798:
M 149	21 34	12 53 49	10.4	15.4	M:	600:	40388::
M 150	25 21	13 46 30	14.4	15.8			
M 151	26 50	14 2 21	12.2	15.6	M	468	41104
M 152	27 8	14 12 16	13.5	16.1	M	416::	41064::
M 153	27 46	14 18 28	14.0	15.6	M	354:	41214:
M 154	27 38	14 23 41	12.9	15.4	M	405	41120:
M 156	9 28	15 5 50	11.6	12.7	EA		
M 159	18 54	13 2 10	14.1	15.5	EA		
M 161	14 24	17 35 16	15.3	15.9			
M 162	8 20	16 4 9	14.7	16.5	SR::		
M 163	6 17	15 51 53	13.2	16.4	M	288	41238
M 164	6 32	15 20 7	10.1	13.4	M	239	41214
M 165	6 14	15 19 8	13.0	15.7			
M 166	7 32	15 32 39	15.2	16.4			
M 167	8 20	15 46 5	14.8	16.3	SR::	330::	
M 168	16 39	17 49 57	12.4	15.6	M	286:	39720

Table I (cont.)

Var. N.	A.R. (1950.0)	Dec.	m_{ir}		Type	P	E 24......
M 169	$18^h17^m\ 4^s$	$-17^\circ32'54''$	14.7	16.0	L:		
M 170	15 59	17 19 45	14.1	16.0			
M 172	5 45	14 48 5	14.5	16.7			
M 173	5 11	14 44 38	14.0	16.3	M or SR		
M 174	6 23	14 30 20	15.0	16.2			
M 175	13 51	15 52 13	13.8	15.0			
M 176	10 2	14 47 4	14.2	16.0	M or SR	200::	41190:
M 177	7 37	14 26 43	13.1	16.3		218	39720
M 178	13 15	14 59 54	14.4	16.5	SR:	280::	
M 179	12 46	15 6 35	15.1	16.4	M:	298::	39738
M 180	13 10	15 19 6	12.5	15.9	M	458	41104
M 181	12 34	14 3 7	14.5	16.4	M or SR		
M 182	14 51	14 36 8	13.7	16.4	L:		
M 183	22 54	16 13 32	16.0	16.8			
M 184	22 17	16 12 19	16.2	17.2			
M 185	21 49	16 10 51	15.5	17.2	M::	268:	40800
M 186	13 56	13 42 22	15.3	16.4			
M 187	22 10	15 42 49	14.3	16.8	M:: SR::	400::	41152
M 188	23 0	15 33 55	14.4	16.7	M:	416	41240
M 189	15 9	13 6 4	13.8	16.0	M	290	41192
M 190	17 49	13 34 10	12.8	15.0	M	190	41160
M 192	25 37	15 8 25	13.8	16.8	M:	418:	40849:
M 193	25 21	15 16 34	13.6	16.4	M	478::	41164
M 194	14 47	12 40 29	13.2	15.4	M or SR	700::	
M 195	16 1	12 25 0	11.9	16.0			
M 196	16 24	12 36 13	13.6	16.0			
M 197	17 57	12 54 12	13.0	15.8	M	400	41186
M 198	26 11	14 48 56	12.5	16.1	M	335:	37558
M 199	27 2	14 59 56	14.1	15.8	M	330	39720
M 200	28 50	15 14 24	12.0	15.8	M	448::	37870:
M 201	26 48	14 48 11	14.4	16.0	M	318	41168
M 202	27 25	14 33 31	11.0	14.9	M	400	39758:
M 203	20 21	12 39 32	14.6	16.1	SR	400	
M 204	24 45	13 40 44	12.3	15.6	M	376	37570
M 205	27 24	14 23 39	12.9	15.5	M	301:	41126:
M 206	28 34	14 45 58	12.7	15.9	M:	460::	39690:
M 207	10 8	14 55 19	13.3	16.6	M	480	40756
M 208	27 6	14 44 52	12.9	14.6	SR::		

Of the 198 new variables, 108 have been classified as Mira type stars and 25 as SR. Before this research only 31 variables were known in the field. From this number we have excluded 52 variables of RWn type, found by Walker (1961) in the cluster M 16, fainter than m_{pg}= =20 and therefore below the limit magnitude of our research. Those of Mira type were 7, all discovered by the writer, with the same infrared technique.

This result confirms the very strong increase of the number of Mira type stars when the observations are made by means of infrared technique. Moreover the most frequent period of these new infrared

Miras is some 100 days longer than that of the known Mira stars, in the direction of the galactic centre. This is shown in Fig. 1, where the histogram constructed with the periods of the new Miras is compared with that obtained by Romano and Di Tullio (1970) for the Miras in the zone of the galactic centre given in GCVS.

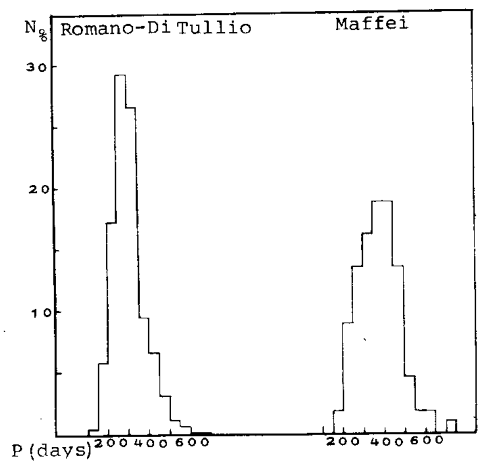

Fig.1 Number of Mira variable stars (normalized at $\Sigma N = 100$) as function of the length of the period. Left: the results of Romano and Di Tullio, for the region of the galactic centre; right: present results.

The increase of the period's length proves that the rise in number of Mira stars must be mainly due to physical effect and not only to the diminished effect of the interstellar absorption by using infrared technique. In other words, while, till now, the blue variable stars have been favoured by the photographic or photoelectric (U,B,V) techniques of observation, the study of the Mira stars can start to advance toward a reasonable completeness only at present, through these infrared observations, which favour the stars which are redder, cooler, imbedded in circumstellar envelopes, etc.

Other prospects appear from the study of the light curves in the infrared. The first result on this subject will be published in the next issue of the IBVS.

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References:
G.Romano and G.Di Tullio (1970) - Mem.SAIt vol.41,p.495
P. Maffei (1967) - Astrophys.J. vol.147, p.802
M.F. Walker (1961) - Astrophys.J. vol.133, p. 438

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BLUE-INFRARED BEHAVIOUR OF SOME VARIABLES OF MIRA TYPE

During the study of the new infrared variables found by the writer in the field of M 16 - M 17 (Maffei, 1975) , a new phenomenon has been discovered: some stars are variable if observed in infrared radiation and constant in blue light.

The following variables showed this behaviour: M 137, M 190, V 1975 Sgr, M 246 and M 238. M 137, V 1975 Sgr and M 238 may be SR, the remaining two of Mira type. The variables M 246 and M 238 are situated in a field centred on γ Cygni, which at present is still being studied by the writer in collaboration with Miss Brunella D'Onofrio.

The Fig. 1, 2 and 3 reproduce the light curves in blue (m_{pg}) and infrared (m_{ir}) radiation for the variables: M 190, V 1975 Sgr and M 246. All the plates (103a-O and I-N (hypers.) + RG 5, respectively) have been collected with the 65/90 cm Schmidt telescope of the Osservatorio Astrofisico of Asiago. The coincidence of the infrared image with the blue one has been tested by means of the positive-negative method.

In order to explain this behaviour one needs multicolour observations connected with spectroscopic researches. Now we believe that the most obvious explanation is the coexistence of an infrared variable star of Mira or SR type with a blue companion. It is interesting to remember that the existence of blue-infrared binary stars has been recently suggested by Humphreys and Ney (1974).

The percentage of the long period variables with this behaviour appears to be not negligible. Only 9 of the Mira or SR infrared variables observed in the field of M 16 - M 17, were visible also in blue light; three of these proved to be constant.

For the near future the writer hopes to reach a statistically significant result by means of researches in four other stellar fields that he began in 1967 and that are still in progress.

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References:
R.M. Humphreys and E.P. Ney (1974) - Astrophys.J. vol.190 p.339
P. Maffei (1975) - I.B.V.S. No.985

Figure 1

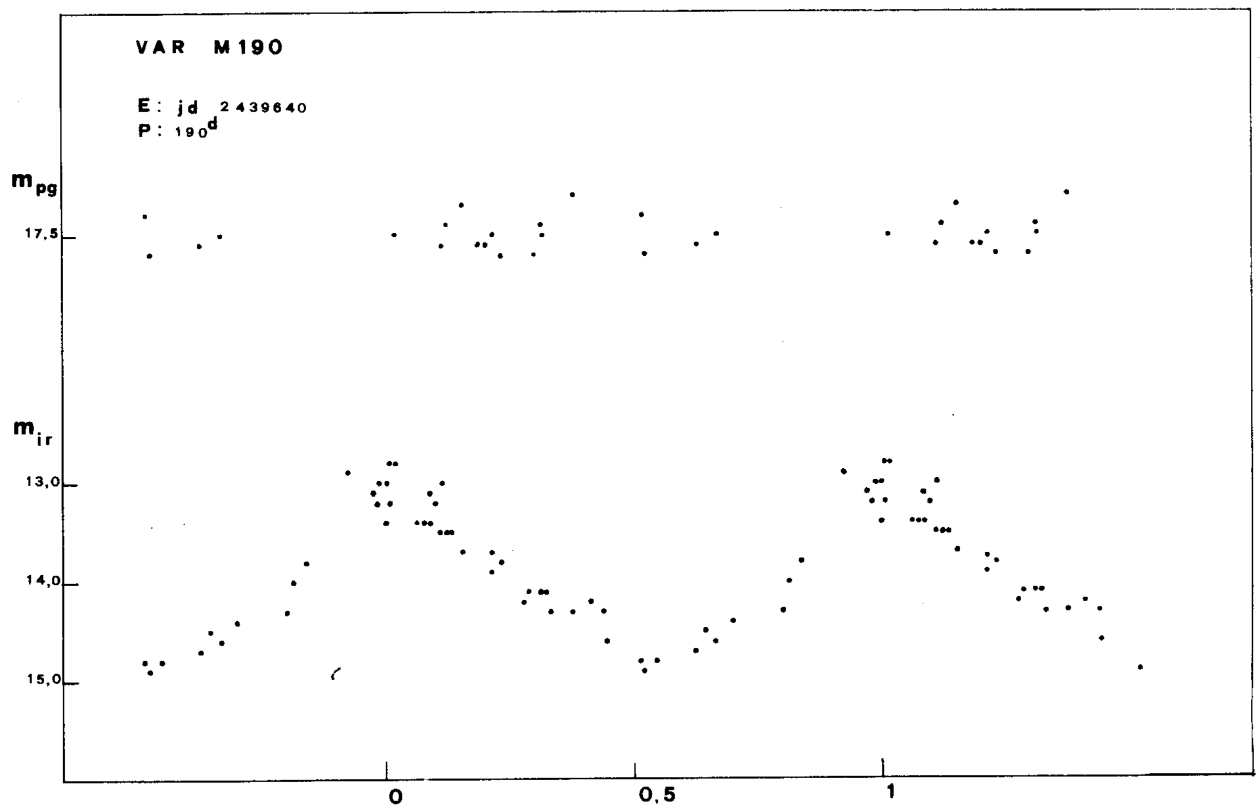
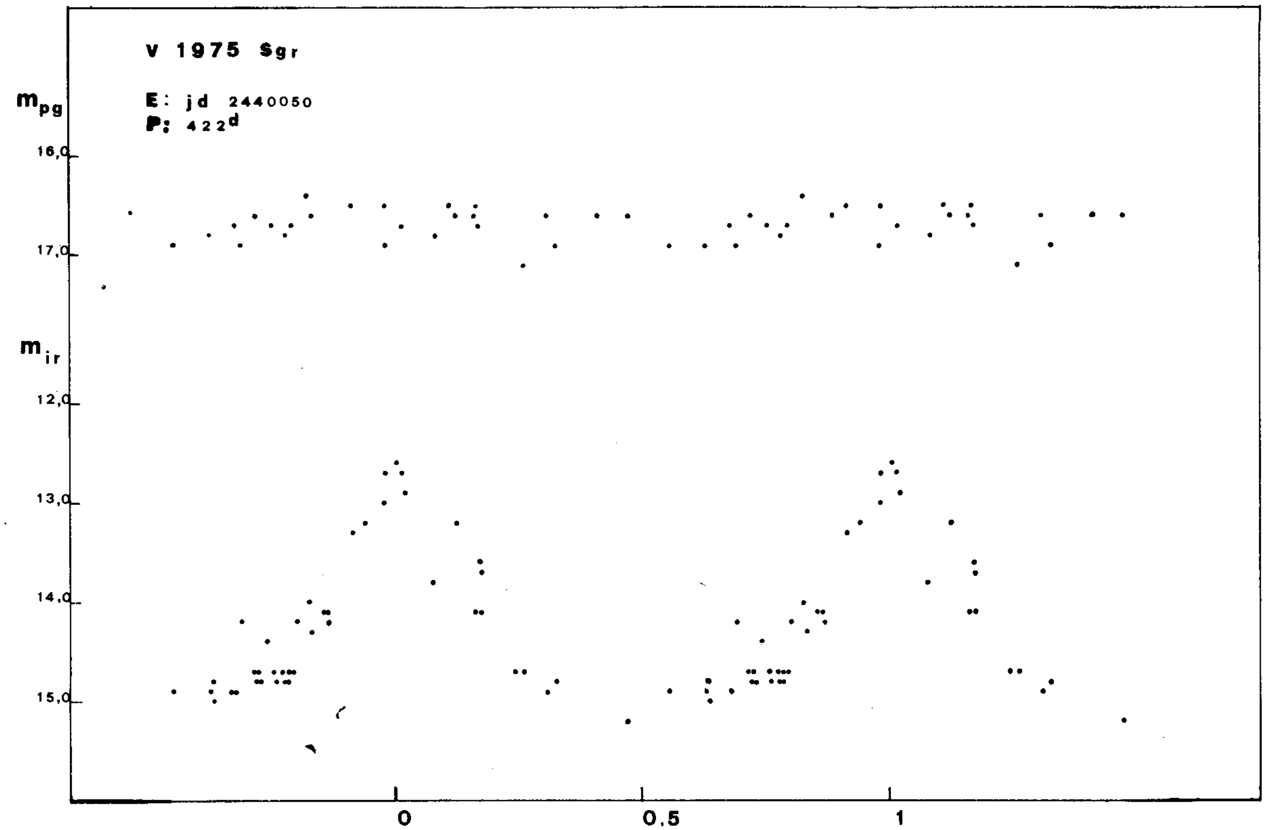


Figure 2



V 1975 Sgr
E: jd 2440050
P: 422d
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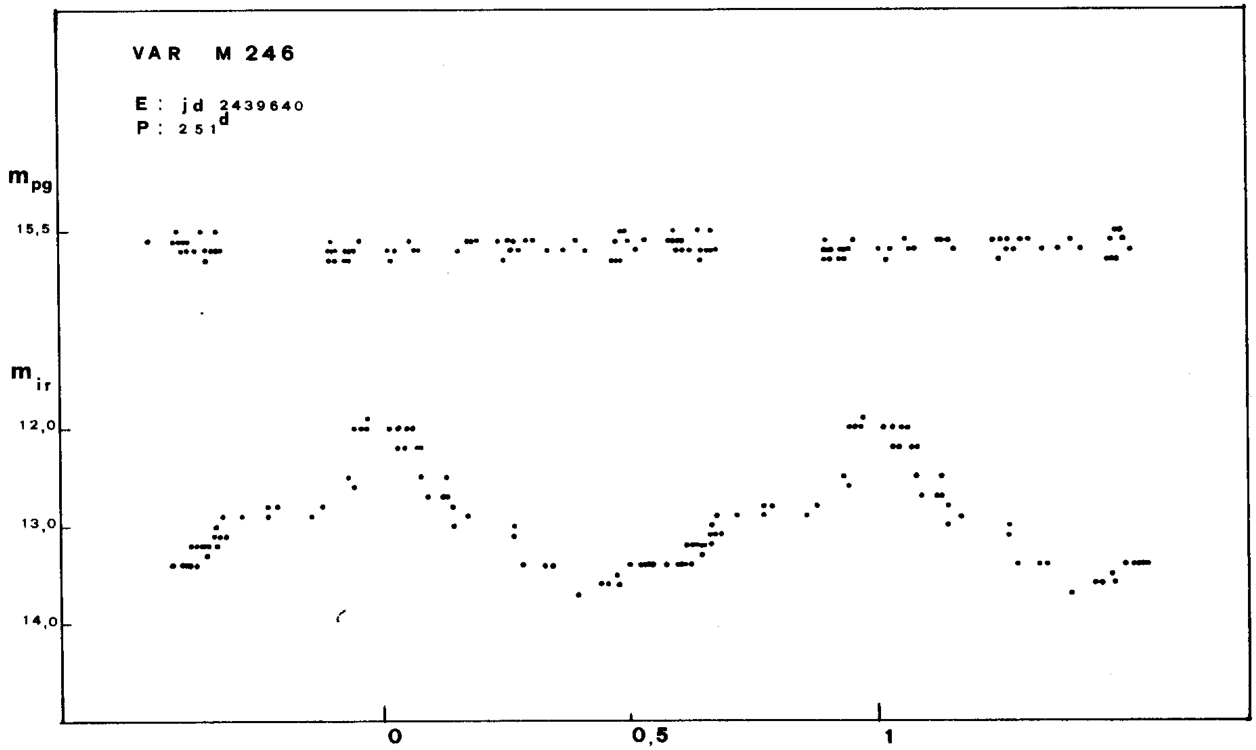
1

Figure 3



COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 987

Konkoly Observatory
Budapest
1975 April 13

NOTE ON THE RRab STAR AT ANDROMEDAE

This star was studied by Tchumak [1] about ten years ago. Using visual and photographic observations he arrived at the conclusion that the star had Blažko-effect. He determined a secondary period of 82.75 days from the phase oscillations of the observed maxima.

In order to investigate the suspected light curve variation, almost one thousand photoelectric observations were obtained in yellow and blue light with the 24 in. and 20 in. telescopes of the Konkoly Observatory between August 17, 1974 and January 20, 1975. As comparison star we used BD +42°4739 (V=9.465 and B-V=+0.372 s. Sturch [2]).

From our photoelectric observations no significant variations have been found in phase or height of the 13 observed maxima. In addition, our B and V observations are in very good agreement with the observations obtained by Fitch et al. [3] in 1965.

In the first two columns of the Table the times of the observed maxima and the O-C values are given, using the elements:

$$2442343^{d}.4204 + 0^{d}.61691469 \cdot E$$

In the third and fourth columns the heights of the maxima relative to the comparison star are listed in B and V light, respectively.

J.D.max.hel.	O-C	ΔM_V	ΔM_B	J.D.max.hel.	O-C	ΔM_V	ΔM_B
2442277.4110	+0.0005	0.96	0.99	2442367.4810	+0.0009	-	-
304.5565	+0.0017	0.98	1.01	369.3290	-0.0018	0.96	0.99
307.6405:	+0.0012:	-	-	403.2644:	+0.0033:	0.96:	0.98:
309.4887	-0.0014	0.95	0.99	422.3849	-0.0006	0.99	1.01
319.3592	-0.0015	0.98:	1.00:	424.2338	-0.0024:	0.99	1.01
343.4205	+0.0001	1.00	1.02	432.2550	-0.0011	0.98	1.00
361.3110	+0.0001	0.98	1.00				

K. OLÁH
Konkoly Observatory

[1] O.V. Tchumak, 1965, Peremenny Zvezdy 15, 569.
[2] C. Sturch, 1966, Ap.J. 143.774. and J.Kim,C.Sturch,1967,PASP 79.72
[3] W.S. Fitch, W.Z. Wisniewski and H.L. Johnson, 1967, Comm.Lunar and Planetary Laboratory No.71,Vol.5,Part 2.

ERRATA CORRIGE

In the IBVS No 974 owing to a misprint the mean error of the colour of the comparison star of Nova RS Ophiuchi is given uncorrectly:

Instead of

$$B - V = + 1^m.25 \pm 0^m.23$$

must be read

$$B - V = + 1^m.25 \pm 0^m.03$$

P. TEMPESTI

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 988

Konkoly Observatory
Budapest
1975 April 14

υ^1 Ori A - A NEW ECLIPSING BINARY IN THE TRAPEZIUM*

A UBV photometry of the eclipsing binary BM Ori = υ^1Ori B has been made during the 1973/74 season on La Silla (Chile), using a Rakoš area scanner (Rakoš 1970) attached to the ESO 50 cm reflector. The amplitude and the direction of the scans were chosen to include all four brighter Trapezium stars in order to use three of them as comparison stars for the variable. The daily means of the magnitude differences between the Trapezium stars show a rms scatter of $0^m.013$ in all three filters for A-C and $0^m.023$, $0^m.028$, and $0^m.034$ in ΔV, ΔB, and ΔU for D-C. The scatter is caused by systematic errors due to irregular slit motion, imperfections of the telescope, and nebular background. The rms scatter of the colour indices is considerably smaller because usually corresponding profiles were obtained without changing the telescope setting:

σ (Δ(B-V)) = $0^m.008$ for A-C and $0^m.011$ for D-C

σ (Δ(U-B)) = $0^m.008$ for A-C and $0^m.015$ for D-C.

Within the expected precision, the averages of the scanner observations do agree well with those obtained with normal photometers (Table 1). The observations labeled "60 cm Tel" were made in 1974 Nov. on La Silla using the excellent 60 cm reflector of the Astronomical Institute of the Ruhr-University Bochum with an 8 sec of arc diaphragm. No significant variation of the magnitude differences has been detected during the observing period of several months.

On 1973 Oct. 10/11, however, υ^1Ori A (= HD 37020, the preceding star) was about one magnitude fainter than usual. The change was very obvious to the direct view through the control eyepiece and from the CRT display of the intensity profile, since normally υ^1Ori A and D are almost equal in brightness. Although a constant phase in the minimum was suspected from the first reduction of the observations, from a new analysis a continuous light variation seems

*Based on observations made at the European Southern Observatory to be a little more probable (Fig.1). In Table 1 the V difference of $2^{m}.676$ corresponds only to the central part of the minimum, whereas the colour indices are averages of all observations of that night. The changes in the colour indices are only marginal, they do not exceed two times the mean error of one daily mean and could be due to systematic errors.

On 1974 Nov. 07/08 the very last part of another minimum was detected visually and confirmed with the scanner on La Silla. As the star was normal the night before, the total duration of the eclipse must have been less than one day. On 1974 Apr. 25/26-i.e. exactly in the middle between the two other events - an additional minimum was suspected from visual observations with the 60 cm refractor in Hamburg-Bergedorf under very unfavourable conditions.

These three minima lead to a first estimate of the period of $P_1 = 196.25 \pm 0.1$ days or an integer fraction thereof. Although the relatively short duration of the minimum ($D \lesssim 24$ h) suggests a shorter period, 49.06 d ($=P_1/4$) and all periods shorter than 39.25 d ($=P_1/5$) can be excluded because they would have been detected during my observations. A longer period would explain the fact of the late discovery and the absence of significant RV variations in the observations of Struve and Titus (1944) which cover a time span of 6 weeks.

The amplitude of the minimum is too large to be explained by an eclipse of stars of almost equal luminosity and size. Probably, the secondary is a pre-main-sequence star with a low surface brightness. As it is possibly an object similar to the secondary of BM Ori (see Huang 1975 for further references), detailed observations are highly desirable. The long period and the duration of the minimum require observations from different longitudes in order to get a complete light curve of the next event. Assuming a period of 196.25 days, the next minimum will occur on 1975 May 23.0, but will hardly be visible. The next observable minimum will be on 1975 Dec. 05.3.

Table 1

Magnitude differences υ^1Ori A minus C

Reference/Instrument	ΔV	$\Delta(B-V)$	$\Delta(U-B)$
Sharpless 1952	1.61	0.00	+0.05
Johnson+Borgmann 1962	1.59	+0.01	+0.07
Walker 1969	1.597	+0.042	+0.085
60 cm Tel	1.628	+0.010	+0.055
scanner (mean of 24 nights)	1.638	-0.007	+0.069
scanner 1973 Oct. 10/11	2.676	+0.009	+0.082

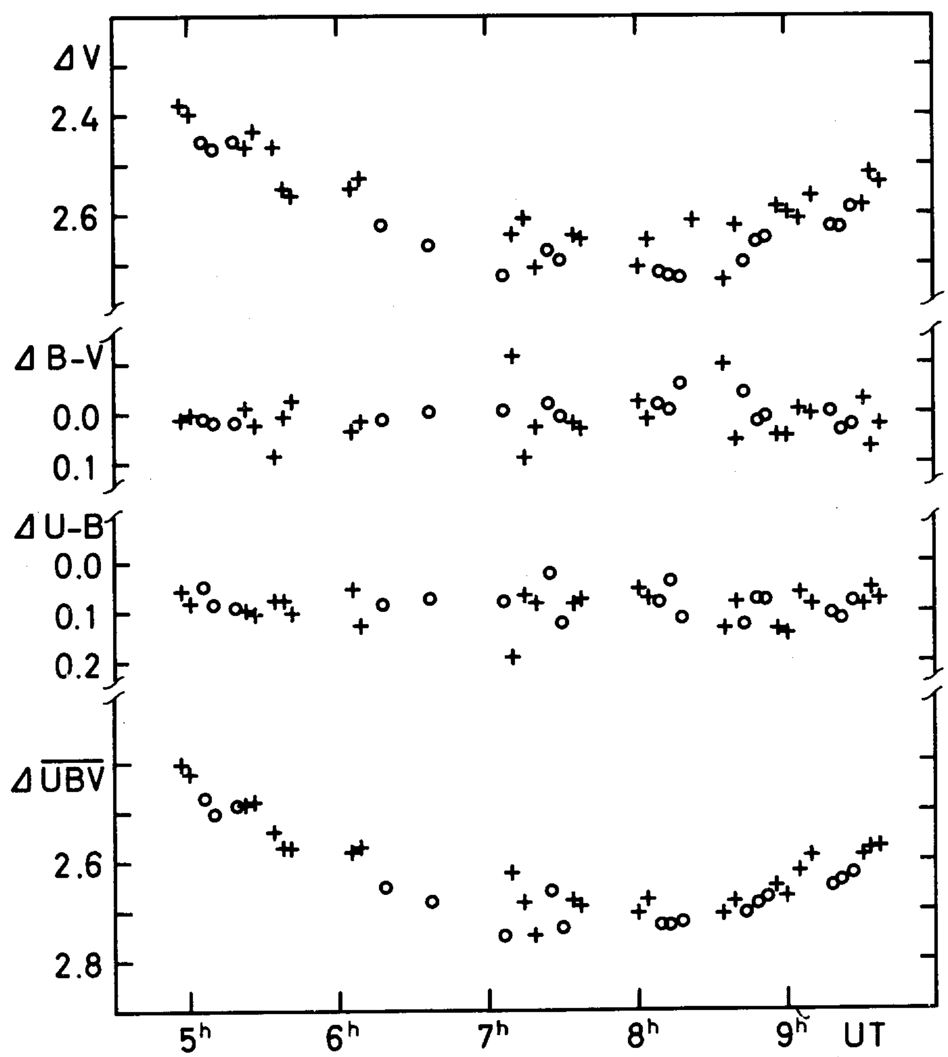


Fig. 1: Magnitude and colour differences ϑ^1 Ori A–C on 1973 Oct 11. $\Delta\overline{UBV} = (\Delta U + \Delta B + \Delta V)/3$. Position angle of scanning direction: ∘ 170° + 350°.

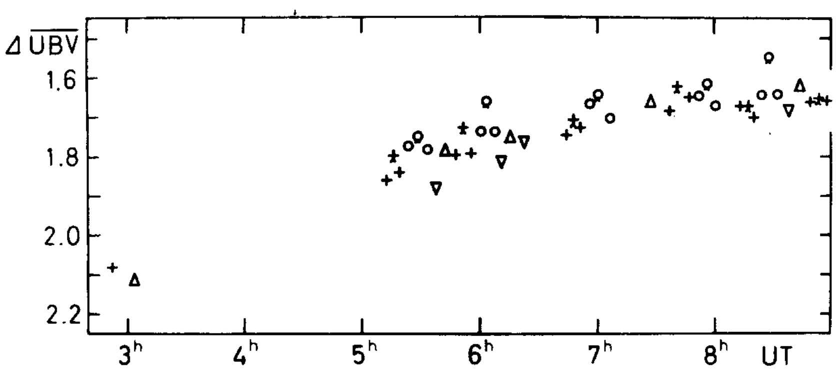


Fig. 2: Magnitude differences ϑ^1 Ori A-C on 1974 Nov 08
Position angle of scanning direction: ∘ 170° ♀ 175°
+ 350° + 355° ∇ 90° Δ 270°.

ECKMAR LOHSEN
D 205 Hamburg 80
Hamburger Sternwarte

References:

Su-Shu Huang 1975 Astrophys.J. 195, 127

H.L. Johnson and J. Borgmann 1962 Bull.Astron.Inst.Netherlands 17, 115

K.D. Rakoš 1970 Ann.Univ.Stw.Wien Vol.29.,Nr.2, p.137

S. Sharpless 1952 Astrophys.J. 116, 251

O. Struve and J. Titus 1944 Astrophys.J. 99, 84

M.F. Walker 1969 Astrophys.J. 155, 447

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 989

Konkoly Observatory
Budapest
1975 April 15

A NOTE ON V Cr A AND W Men

It is well known that V Cr A and W Men belong to the class of the R Cr B stars. The values in Table 1 are quoted from the "General Catalogue of Variable Stars" (Kukarkin et al., 1969).

Table 1

	Max. (1)	Min. (1)	Ampl.
V Cr A	9.4	<14.0	>4.6
W Men	13.8	16.0	2.2

(1) Photographic magnitude, Max=maximum light, Min=minimum, Ampl.=maximum amplitude of the light variation.

The purpose of this note is to show that, according to our observations, these stars have larger light variations than it was previously suspected.

While a UBV-photoelectric photometry program on R Cr B was being developed in July and August 1974, the star V Cr A was not seen visually with the 154 centimeter reflector of the Bosque Alegre Field Station which means that it was fainter than visual magnitude 16.5. As its spectral type is R 0 (Kukarkin et al.,op. cit.), its colour index ought to be around 1.1 magnitudes (Mendoza and Johnson, 1965), and so its visual magnitude at maximum light approximately equal to 8.3 from which a light variation larger than 8 magnitudes is derived.

In the same way, the variable W Men is not seen on a blue plate taken (on its field) on October 20, 1974*. The magnitude limit on this plate being around 18.3, the light variation of W Men must be larger than 4,5 magnitudes.

Two other well studied stars of the R Cr B-type, R Cr B itself and RY Sgr, have light variations of 9 and 7.5 magnitudes,respectively. These values are quite similar to those found for V Cr A and W Men. If we assume that in these four stars the physical and geometrical conditions in which the absorbing clouds are condensed are nearly the same, their similar light variations (the largest ones) imply that the maximum amount of matter they eject is almost the same.

L.A. MILONE

References:
Kukarkin, B.V.,Kholopov, P.N., et al.1969, General Catalogue of Variable Stars (Moscow).
Mendoza V.,E.E., and Johnson, H. 1965, Ap.J , 141, 161

* Dr.C.U. Cesco was requested to obtain this plate with the Yale-Columbia double astrograph of the astronomical observatory in "El Leoncito", San Juan, Argentina. We express our sincere thanks for his kind cooperation.

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 990

Konkoly Observatory
Budapest
1975 April 16

ON THE PERIOD VARIATION AND BLAŽKO EFFECT OF XZ CYGNI

Between April 16, 1972 - October 17, 1974, 2870 B.V. photoelectric observations were made on XZ Cygni with the 50 cm reflector at the Astronomical Observatory of the University of Cluj-Napoca (Romania).

Table 1 shows the moments of 38 maxima and the corresponding O-C differences calculated with the elements

$$\text{Max.hel.} = \text{J.D. } 2441453.3856+0^{d}_{.}4664731\cdot E \quad (1)$$

Using the maxima from Table 1, as well as those published by Kunchev (1974), we listed the normal maxima in Table 2 where the O-C differences were calculated with the linear elements from GCVS (1969). Using the normal maxima published by Lange and Gusev (1972) and those from Table 2, we drew up Fig.1 which shows the variation of the O-C values versus the number of main cycle E. It is obvious that, after 1965, a real and very rapid decrease of the fundamental pulsation period of XZ Cygni has occurred. Assuming that the period decrease is proportional to the time, there results a decrease rate of the order of 1.32×10^{-5} days per year. This decrease can be explained on the basis of the star evolution during the instability strip crossing (Kukarkin, 1974), or may be caused by the mass loss which might be significant in the RR Lyrae phase (Laskarides, 1974). Wesselink (1974) shows that theoretical calculations predict the existence of the variables evolving towards the red edge of the instability strip if their period is increasing. This does not necessitate that XZ Cygni, whose period decreases, evolves towards the blue edge of the instability strip.

Figs.1 and 2 show the variation of the O-C differences versus E for the years 1971-1972 and 1973-1974, respectively. The 1971 maxima were visually observed by Bogdanov (1972). The upper part of Fig.3 represents the height variation of the maximum versus E. All the O-C values shown in Figs.2 and 3 where calculated by means of the elements (1).

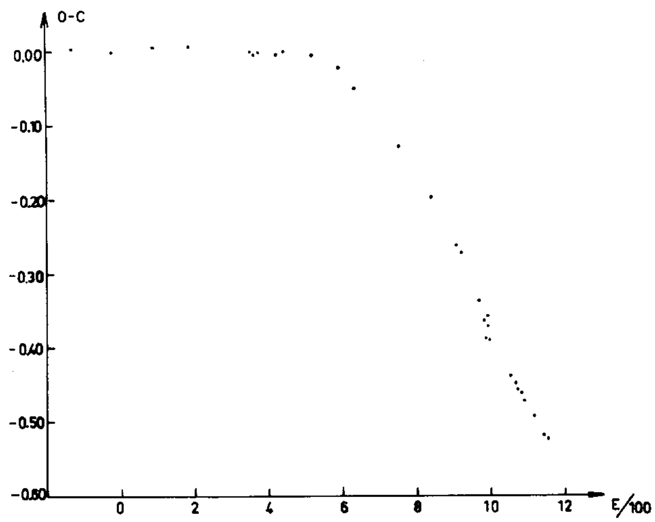

O-C
0,00
-0.10
-0.20
-0.30
-0.40
-0.50
-0.60
0
2
4
6
8
10
12
E/100

Fig. 1

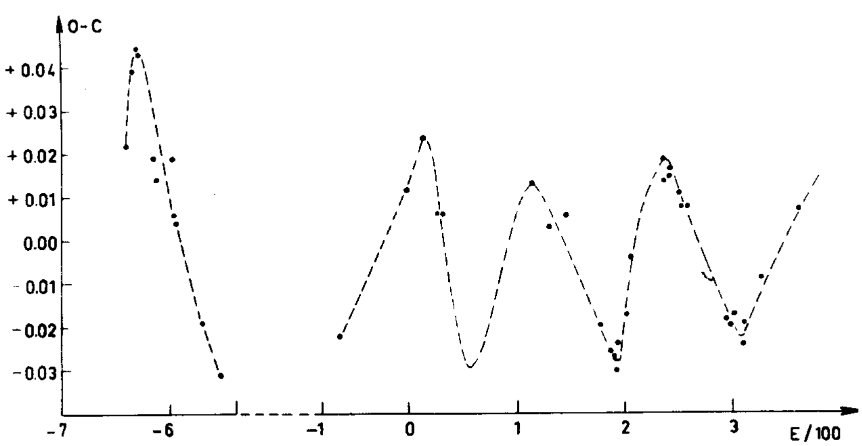

O-C
+ 0.04
+ 0.03
+ 0.02
+ 0.01
0.00
- 0.01
-0.02
-0.03
-7
-6
-1
0
1
2
3
E/100

Fig. 2

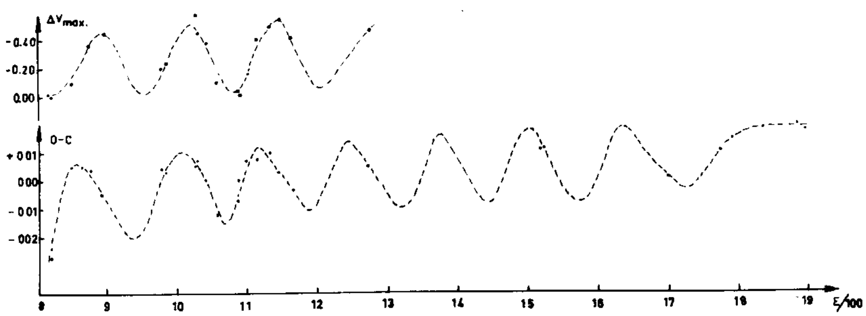


Fig. 3

Table 1

Max.hel. JD 2400000+	O-C	Max.hel. JD 2400000+	O-C	Max.hel. JD 2400000+	O-C
41424.4425	-0.0218	41856.4236	+0.0052	41982.3762	+0.0101
453.3970	+0.0114	862.4865	+0.0040	988.4330	+0.0028
461.3390	+0.0234	869.4750	-0.0046	997.2900	-0.0032
467.3858	+0.0060	910.5330	+0.0038	42047.2115	+0.0056
468.3187	+0.0060	913.3310	+0.0029	161.5030	+0.0112
507.5088	+0.0124	932.4585	+0.0050	162.4362	+0.0115
515.4295	+0.0030	933.3933	+0.0069	245.4580	+0.0011
522.4295	+0.0059	939.4507	+0.0001	280.4533	+0.0109
544.3180	-0.0298	947.3688	-0.0118	288.3865	+0.0141
622.2557	+0.0068	960.4355	-0.0064	308.4492	+0.0184
834.4698	-0.0243	962.3077	+0.0000	331.3068	+0.0188
835.3993	-0.0278	967.4460	+0.0070	338.3025	+0.0174
849.4265	+0.0052	974.4430	+0.0070		

Table 2

Max.hel. JD 2400000+	O-C	E	No. max.	Max.hel. JD 2400000+	O-C	E	No. max.
41461.3221	-0.3415	9704	5	41932.4553	-0.4531	10715	6
522.4183	-0.3672	9835	5	962.3088	-0.4607	10778	4
544.3247	-0.3900	9882	5	988.4332	-0.4647	10834	3
565.3515	-0.3592	9927	5	42047.2115	-0.4753	10960	1
573.2650	-0.3776	9944	5	162.4362	-0.4956	11207	2
599.3781	-0.3929	10000	5	280.4531	-0.5232	11460	3
849.4138	-0.4435	10537	6	333.3074	-0.5260	11569	3

The analysis of these diagrams shows that:

(a) There is not an exact reproduction of the secondary cycle. An average period $\Pi = 58\overset{d}{.}15$ can be inferred.

(b) An increase of the secondary period Π corresponds to a decrease of the fundamental period P, like in the case of RW Draconis.

(c) The ΔV_{max} curve is shifted by 0.19 of the secondary cycle as compared with the O-C curve.

(d) The amplitude of the O-C diagram decreased from 1971 till 1974. This phenomenon might go on, like in the case of RW Draconis and RR Lyrae, up to the minimum (or "disappearance") of the Blažko effect and, after that, there might occur a new amplitude increase of this effect. The explanation of the "disappearance" in 1963 of the Blažko effect of the RR Lyrae was given by Zaikova et al.(1973).

For the study of the evolution of these effects and more detailed investigations of XZ Cygni pulsations, simultaneous photoelectric and spectrophotometric observations are necessary.

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References:

Bogdanov, M.B. 1972, The Variable Stars, Suppl.1,5,309 (Russ)
Kukarkin, B.V., et al. 1969 General Catalogue of Var.Stars.,Moscow
Kukarkin, B.V. 1974, RR Lyrae and W Virginis Type Stars.,Preprint, Symposium IAU No.67., Moscow
Kunchev, P. 1974, I.B.V.S. No.927
Lange, G.A., Gusev, P.P. 1972, The Variable Stars.,Suppl.1,5,333 (Russ)
Laskarides, P.G. 1974, Astrophys.Space Sci. 27, 2, 485
Wesselink, A.J. 1974, Astron.Astrophys. 36, 163
Zaikova, L.P.,Lysova, L.E., Romanov, Yu.S., Tsessevich, V.P., Shakoon, L.J. 1973, Astron. Circ. 787, 4,(Russ)

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 991

Konkoly Observatory
Budapest
1975 April 24

V 450 Lyr

V 450 Lyr = GR 250 was discovered by Romano (I.B.V.S. No.645, 1972). The discoverer classified the star to RR Lyrae type.
I examined the star on 97 sky patrol plates of Sonneberg Observatory (JD 2438370 - 41984) and confirmed the RR Lyrae type. 12 maxima were obtained and the following elements:

$$\text{Max. hel.} = \text{JD } 2438370.285 + 0^{d}.5046104 \cdot E$$

RRab; M-m = $0^{p}.15$

Observed maxima

JD 24...	E	O-C	JD 24...	E	O-C
38370.287	0	-0.018	38937.503	1124	+0.036
558.506	373	+ .002	940.505	1130	+ .010
559.503	375	- .011	941.506	1132	+ .002
613.516	482	+ .009	39702.441	2640	- .015
652.349	559	- .013	704.481	2644	+ .006
695.247	644	- .007	41984.305	7162	.000

DL Sge

DL Sge = BD +18°3960 (9,5) = Wr 111 was discovered by Weber (I.B.V.S. No.6, 1962). The discoverer classified the star as an eclipsing binary with the following preliminary elements:

$$\text{Min. hel.} = \text{JD } 2437099.465 + 0^{d}.8573 \cdot E \quad (11^{m}.9 - 12^{m}.8)$$

On 501 sky patrol plates of Sonneberg Observatory I examined the light variations (JD 2426089 - 42009) and obtained the improved elements:

$$\text{Min. hel.} = \text{JD } 2426089.553 + 0^{d}.8572706 \cdot E$$

EA; $11^{m}.40 - 12^{m}.22 / 11^{m}.5$pg; D=$0^{p}.22$

64 observed minima and further particulars will be published in "Mitteilungen der Bruno-H.-Bürgel Sternwarte Hartha, Heft 8".

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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 992

Konkoly Observatory
Budapest
1975 April 25

OBSERVATIONS OF 26, 27 AND 28 CMa

In an attempt to learn a bit more about their variability 27 and 28 CMa were observed by the author on 11 nights in January 1970 with the 6" Zeiss telescope on La Silla Mountain. 26 CMa was used as a comparison star together with HD 55857. But both comparison stars proved to be variables themselves. One of them, HD 55857 turned out - as already reported in IBVS No 807 - to be a β CMa with a period of only 2^h40^m and an amplitude $\leq 0^m.02$ in V. Corrected for the corresponding small fluctuations, the deflection curves for that star differed so very little among themselves that it seemed safe to conclude from them that the average brightness of HD 55857 did not suffer night to night variations and that it could be used as a standard for the evaluation of the three other stars' brightnesses and their variations. This was actually done and the magnitude $6^m.11$ adopted for $m_{HD\ 55857}$ in accordance with the value given by Cousins and Stoy (1).

The comparison with the deflection curves of the three other stars gave the following results.

1. 26 CMa (≡ HD 55522, $\alpha_{1900}= 7^h08^m07^s$, $\delta_{1900}=-25^o47'$, m=5.86, S=B 3) *

No significant variation could be seen in the course of the 5^h- 6^h runs that were made on the star, but there were definite changes from one night to another in the difference Δm(HD 55522-HD 55857) as illustrated by Figure 1. The dots representing these differences lie satisfactorily on a sine curve with period P = $2^d.68$ and amplitude $\Delta m=0^m.037$.

Since no star in the spectral range B 0 - B 3 is known to pulsate with such a long period, it seems plausible to admit that we are dealing with a spectroscopic binary, in which case the photometric period just given has to be doubled to yield the orbital period $P_{orb}= 5^d.36$. Spectroscopic observations are needed to check this point.

* The data within brackets are taken from the "Catalogue of Bright Stars" 3d edition, 1964.

2. 27 CMa (≡ HD 56014, $\alpha_{1900}=7^h10^m11^s$, $\delta_{1900}=-26^\circ11'$, m=4,42, S= B 3 III pe)

The star is classified as a unique variable under the name EW CMa in volume I of the 3[d] edition of the G.C.V.S. and an extensive bibliographical note is devoted to it on p. 417 ** of that volume.

The first aim of our photometric investigation was to find out whether the short period $0^d.261975$ discovered in the RV variations by Ringuelet-Kaswalder (2) and which could be traced back - though with a considerably reduced amplitude - in our own RV measurements of December 1969 and January 1970 (see Table 1 and Figure 2) would also be detectable in the brightness variation. The result of this investigation was negative; the shots made on the star in one and the same night showed nothing but an irregular scatter of a few thousands of a magnitude around a mean that stayed stable, at $1^m.46$ below HD 55857, over the whole observation campaign. Putting as already mentioned $\bar{m}_{HD\ 55857}=6^m.11$ we thus find $m_{27\ CMa}=4^m.65$.

This value is exactly the one which the G.C.V.S. mentions for the minimum observed brightness of the star, its maximum being $4^m.3$.

Table 1

RV's of 27 CMa

Date	JD -2440000	RV km/sec	phase	Date	JD -2440000	RV km/sec	phase
1969				1969			
Dec 21	$576^d.7102$	- 32.0	.711	Dec 28	$583^d.8416$	- 33.9	.933
22	77.8457	- 35.0	.045	29	84.8298	- 36.6	.705
23	78.7930	- 37.5	.611	30	85.8513	- 31.0	.604
24	79.7500	- 29.0	.314	1970			
25	80.8347	- 27.1	.455	Jan 21	607.5356	- 25.0	.665
26	81.8359	- 34.0	.277		.7209	- 15.5	.372
27	82.8416	- 33.2	.115		.8682	- 12.4:	.118
				22	08.5503	- 22.1	.538
					.7175	- 16.5	.177

Phases are for period $0^d.261975$ and origin JD $2440576^d.0000$

3. 28 CMa (≡ ω CMa=HD 56139, $\alpha_{1900}=7^h10^m45^s$, $\delta_{1900}=-26^\circ36'$, m=3.83, S=B 3 IVe)

The star is classified in the G.C.V.S. (1969) as of type Ia, with observed brightness limits $3^m.82$ and $4^m.04$ in V.

Besides the eleven nights on La Silla in 1970, fractions of five more nights were devoted to it in March 1973 at Boyden, where the star was observed photometrically with the 60" telescope.

**It is somewhat misleading that the reference numbers ≤[0596] there given do not correspond to those of the "Bibliography" beginning p.A.42 of that volume, but do refer to those of the "Literature" beginning p.365 of the 2[d] Supplement to the 2[d] edition (1967) of the G.C.V.S.

Its magnitude, averaged over the night, and derived from its difference with the average magnitude $6^m.11$ of HD 55857 varied as Table 2 shows

Table 2

Night-averages of $m_{28\ CMa}$

Date	m	Date	m
1970 Jan 4/5	3.62	1970 Jan 16/17	3.64
5/6	3.62	22/23	3.64
6/7	3.63	24/25	3.66
9/10	3.63	1973 Mar 15/16	4.15
10/11	3.60	20/21	4.17
12/13	3.63	21/22	4.17
13/14	3.63	22/23	4.18
14/15	3.65	30/31	4.18

So, the limits of the brightness variation given in the G.C.V.S. are to be widered seriously. But not only the night average changed slightly from one night to the next; there were also slight changes visible in the course of the 6^h runs on some nights. They suggested variations with a characteristic interval of 20^h-22^h, but efforts to find a real period of that order remained unsuccessful. It is perhaps not out of order to reproduce here the results of RV observations made with the 152 cm telescope on two other nights in January 1970 on La Silla - and reported already elsewhere (3) - since they too indicate a rather quick variation.

Table 3

RV's of 28 CMa

Date	U.T.	JD	RV_{absor} km/sec	RV_{em} km/sec
1970 Jan 21	0^h52^m	2 440607^d.5398	+34	+21.5
	5 32	.7341	+41	- 9.7
	8 51	.8730	+39	+17.1
22	1 15	08.5557	+12	+26.8
	5 13	.7217	+11	+28.0
	5 58	.7522	+21	+23.1

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Naamsestraat 61

B-3000 Leuven, Belgium

References:

(1) A.W.J. Cousins and R.H. Stoy, Royal Obs.Bull. No 64, 1963
(2) A.E. Ringuelet-Kaswalder, Ap.J. 135, 755, 1962
(3) A. Van Hoof, Mededelingen v.d.Kon.Acad.v.Wet.Lett. en Sch.K. v. Belgie, XXXV, No 4, 1973

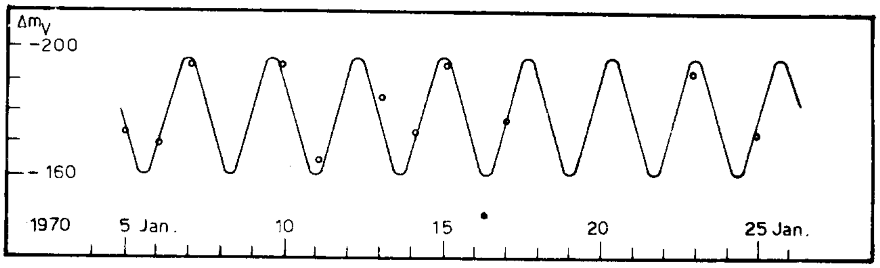

Δm_V
-200
-160
1970
5 Jan.
10
15
20
25 Jan.

Fig. 1

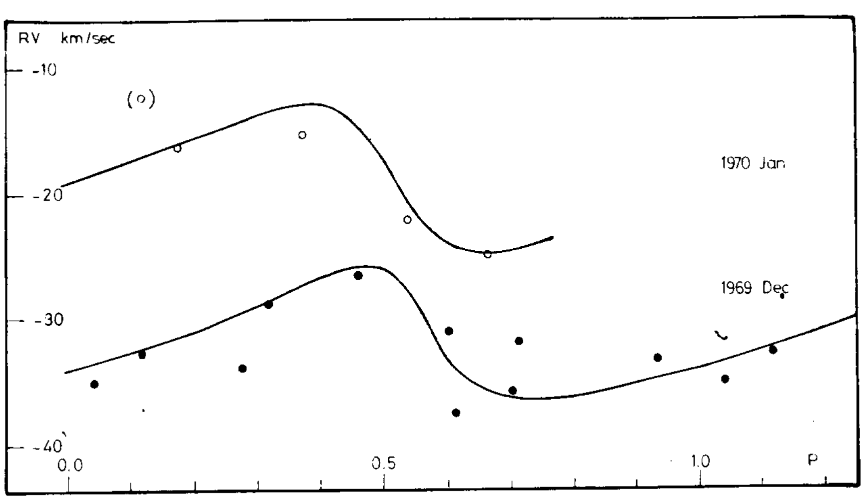

RV km/sec
-10
-20
-30
-40
1970 Jan
1969 Dec
0.0
0.5
1.0
P

Fig. 2

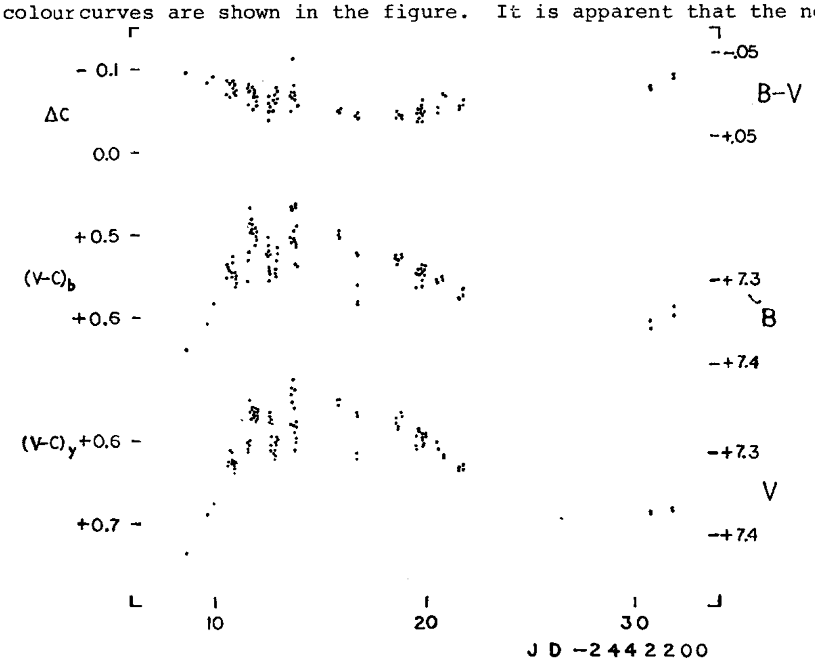
COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 993

Konkoly Observatory
Budapest
1975 April 28

HD 163868, A NEW BRIGHT SOUTHERN VARIABLE

In his study of the light curve of V453 Sco, Gaposchkin (1938) used HD 163868 as one of several comparison stars. The present author observed V453 Sco at Cerro Tololo in 1974 using HD 163868 as a check star. Comparison with HD 163274, which Woodward and Koch (1975) show to be constant in light, clearly shows HD 163868 to be variable.

The yellow and blue observations, on the natural instrumental system, are presented in Tables Ia and Ib, each observation being an 8-sec. integration with a 1P21 photometer on the Yale 1-m or the Lowell 61-cm reflectors. Only a few violet observations were obtained and these are not listed. The differential yellow and blue light and colour curves are shown in the figure. It is apparent that the new



Differential light and colour curves for HD 163868 variable is reddest when it is brightest. If the variation is periodic, a lower limit of 20 days is indicated, but there is also a possibility of light variation on the time scale of several hours.

On two nights HD 163868 was standardized using 7 stars from the Cousins, Lake, Stoy (1966) list. The V amplitude is at least $0^m.18$. B-V ranges from +0.02 to -0.04, and the average U-B is -0.73. A standard reddening law suggests HD 163868 to be a B1 V, B2 III or B4 Ia object. The spectral type of the star is B5 Ve, so that there is a small discrepancy between the spectrographic and photometric parameters. This could be due to the line emission.

Until more observations are obtained, conjecture about the mechanism of variation is premature.

I am grateful to CTIO for telescope time and for excellent help from several night assistants.

EDITH JONES WOODWARD
William Paterson College,
Wayne,New Jersey, U.S.A.

References:

Cousins, A.W.J., Lake, R., and Stoy, R.H. (1966) Royal Obs. Bull 121, E3-55.
Gaposchkin, S. (1938) Harvard Bull, 909, 20.
Woodward, E.J., and Koch, R.H. (1975) (in press).

TABLE Ia. Yellow observations of HD 163868

JD(hel.) 2442000+	V-C	JD(hel.) 2442000+	V-C	JD(hel.) 2442000+	V-C	JD(hel.) 2442000+	V-C	JD(hel.) 2442000+	V-C
208.5856	+.735	211.7248	+.571	212.6074	+.606	213.8005	+.577	219.7564	+.591
209.6077	.688	.7288	.562	.6311	.577	.8326	.582	.7565	.598
209.9052	.674	.7347	.559	.6774	.594	.8366	.601	.7579	.604
210.5474	.623	.7545	.562	.7157	.593	213.8690	.595	.7580	.597
.5612	.624	.7741	.568	.7462	.611	215.8358	.548	.8023	.594
.6064	.629	.7984	.567	.7589	.612	.8360	.543	.8024	.590
.6647	.625	.8173	.562	.7810	.617	215.8378	.555	.8232	.595
.7425	.610	.8233	.568	.7976	.622	216.6811	.569	.8233	.605
.7897	.611	.8300	.569	.8302	.606	.6813	.566	.8750	.593
.8238	.621	.8512	.572	.8346	.610	.7098	.622	219.8751	.590
.8373	.628	.8540	.568	.8622	.600	216.7100	.616	220.5413	.609
.8460	.626	.8692	.565	.8664	.603	218.5551	.570	.5414	.602
.8946	.638	.8734	.574	.8943	.598	.5553	.577	.8630	.621
.9036	.633	.8793	.560	212.9275	.595	.5556	.571	220.8636	.621
.9151	.630	.8972	.570	213.5268	.553	.5559	.578	221.5670	.630
.9217	.627	.9056	.573	.5490	.578	.6707	.585	.5671	.632
210.9290	.627	.9120	.564	.5885	.535	.6708	.582	.7409	.628
211.5055	.613	.9174	.562	.6164	.543	.8561	.569	221.7410	.633
.5378	.608	211.9224	.561	.6408	.579	218.8563	.566	230.6860	.686
.5605	.602	212.5370	.572	.6710	.525	219.5203	.593	230.6862	.686
.5882	.605	.5409	.565	.7275	.610	.5205	.604	231.8419	.683
.6144	.598	.5546	.571	.7493	.588	.5206	.608	231.8420	.681
.6548	.550	.5679	.577	.7759	.537	.6523	.587		
211.7087	.564	212.6033	.575	213.7793	.558	219.6524	.584		

TABLE Ib. Blue observations of HD 163868

JD(hel.) 2442000+	V-C	JD(hel.) 2442000+	V-C	JD(hel.) 2442000+	V-C	JD(hel.) 2442000+	V-C	JD(hel.) 2442000+	V-C
208.5858	+.637	211.7250	+.497	212.6076	+.554	213.8007	+.512	219.7567	+.540
209.6080	.604	.7291	.480	.6313	.522	.8328	.512	.7581	.539
209.9054	.581	.7348	.480	.6775	.522	.8368	.535	.7582	.534
210.5475	.550	.7547	.486	.7160	.541	213.8692	.538	.7583	.545
.5615	.535	.7743	.491	.7464	.539	215.8366	.495	.7583	.539
.6066	.541	.7985	.492	.7592	.547	.8370	.502	.8025	.543
.6649	.539	.8175	.494	.7812	.545	215.8372	.502	.8026	.543
.7427	.542	.8234	.495	.7977	.549	216.6817	.520	.8234	.560
.7899	.524	.8303	.493	.8304	.545	.6819	.523	.8235	.554
.8240	.533	.8514	.497	.8348	.542	.7103	.560	.8752	.548
.8375	.549	.8542	.513	.8624	.529	.7107	.579	219.8760	.537
.8462	.546	.8694	.498	.8667	.532	216.7109	.582	220.5416	.553
.8948	.563	.8736	.501	.8945	.522	218.5564	.524	.5418	.555
.9039	.552	.8795	.501	212.9278	.515	.5567	.527	.8638	.543
.9154	.557	.8974	.497	213.5269	.502	.6712	.536	220.8640	.552
.9218	.551	.9058	.504	.5491	.509	.6714	.536	221.5674	.576
210.9291	.552	.9122	.495	.5887	.467	.6716	.528	.5676	.576
211.5058	.555	.9176	.489	.6166	.469	.8565	.526	.7412	.564
.5380	.530	211.9225	.496	.6410	.504	218.8567	.523	221.7414	.572
.5606	.528	212.5372	.519	.6712	.467	219.5213	.547	230.6864	.602
.5884	.520	.5412	.524	.7277	.494	.5214	.563	230.6866	.612
.6155	.521	.5548	.502	.7495	.506	.6527	.547	231.8422	.594
.6550	.466	.5682	.519	.7760	.462	.6534	.542	231.8423	.584
211.7089	.484	212.6035	.512	213.7795	.487	219.7566	.543		

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 994

Konkoly Observatory
Budapest
1975 May 2

Veröffentlichungen der Remeis-Sternwarte Bamberg
Astronomisches Institut der Universität Erlangen-Nürnberg
Band X, Nr. 115

NEW FAINT SOUTHERN VARIABLE STARS

On sky patrol plates (red and blue) taken at the Southern Station of the University of Florida, Gainesville and the Remeis-Sternwarte, Bamberg, at the Mount John Observatory, New Zealand, the 20 stars of the following list were found to be variable (17 new stars and 3 stars listed already in the Catalogue of Suspected Variable Stars, CSV).

The brightness of these stars were obtained from the Harvard-Groningen-Atlas, Selected Areas (edition 1965 by A. Brun and H.Vehrenberg).

Finding charts are 1° in declination and south is up.

BV-Nr.	RA 1900.0	Decl. 1900.0	max. brightness pg	Ampl. pg	Type	Remarks
BV 1622 Hya	$14^h26^m58^s$	$-26^{\circ}19'.3$	$12^m.8$	$0^m.5$	EA	1
	=CSV 7139 = S 6580					
BV 1623 Lib	14 30 24	-23 55.7	12.5	0.9	EA	2
BV 1624 Lib	14 48 45	-15 12.8	13.0	0.9		3
BV 1625 Lib	14 59 04	-17 01.6	12.5	1.1	EA	4
BV 1626 Lib	=CoD $-26^{\circ}10719$ (10^m)			0.9		5
BV 1627 Lib	15 09 06	-14 56.0	12.8	1.0	EA	6
	=CSV 2300 = HV 8693					
BV 1628 Lup	15 14 34	-52 44.2	11.7	0.6	EA	7
BV 1629 Sco	16 05 02	-16 20.3	13.6	0.6	L	8
	=CSV 2595 = Ross 174					
BV 1630 Sco	=BD $-15^{\circ}4276$ ($9^m.5$)			0.6	L	9
BV 1631 Ser	17 35 37	-13 29.0	12.8	0.6	L	10
BV 1632 Ser	17 56 23	-15 31.6	12.5	0.7	EA	11
BV 1633 Tel	18 19 10	-49 11.1	12.4	0.6*		12
BV 1634 Sgr	18 38 06	-17 18.8	12.6	0.8		13
BV 1635 Sct	18 38 40	-06 44.6	13.1	0.9*		14
BV 1636 Sgr	19 14 59	-12 02.9	13.0	0.7	L	15
BV 1637 Sgr	19 22 28	-15 51.4	13.1	0.9*	L	16
BV 1638 Aql	19 38 40	-11 33.7	10.8	0.7	L	17
BV 1639 Sgr	19 48 24	-18 56.0	12.9	0.7		18
BV 1640 Cap	20 12 00	-11 16.2	11.9	0.9	EA	19
BV 1641 Cap	20 31 54	-15 58.0	12.3	0.9	L	20

*= Amplitude until plate limit.

Remarks:

1 Few minima, not enough for a period

2 Few minima, not enough for a period

3 More minima than maxima, and values between

4 Few minima, not enough for a period

5 Few good maxima

6 BV 1627 Lib = CSV 2300 = HV 8693

With these minima the following primary period was found:

$$\text{Min} = \text{JD } 243\ 8906.350 + 1^{d}.130\ 47 \cdot E$$

Minima		E	O - C
243 8855.507	(1/2)	-45	+0.028
8906.355		0	+0.005
8940.265		30	+0.001
9270.353		322	-0.008
9287.307		337	-0.011
244 1755.182	(1/2)	2520	+0.048
2136.110		2857	+0.007

Amplitude $1^{m}.0$; without a secondary minimum, EA type.

7 Only 5 minima in 139 plates

8 Many maxima and minima, rather difficult

9 Many maxima and minima

10 Many maxima and minima

11 Only 2 minima in 50 plates

12 Several maxima, minima below plate limit, rather difficult

13 Few good maxima

14 Several maxima, minima below plate limit

15 Many maxima and minima, and values between

16 Maxima and minima, and values between

17 Many maxima and minima, and values between

18 More minima, rather difficult

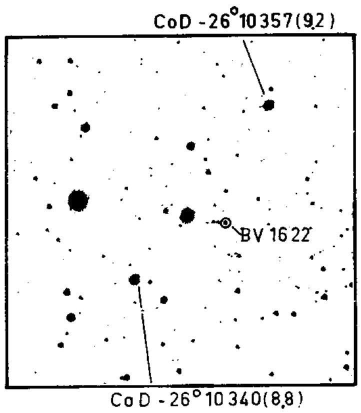
19 Very few minima, not enough for a period

20 Many maxima and minima, and values between

The above 20 variable stars were found whilst on a short stay at the Remeis-Sternwarte Bamberg. I would like to thank the Director, Prof.Dr.W.Strohmeier and Mr.R.Knigge of the Remeis-Sternwarte for their most valuable assistance in the preparation of this paper.Also thanks to Mr.M.Clark for taken the plates.

B.S. CARTER
Remeis-Sternwarte Bamberg
and South African Astronomical
Observatory Cape Town.

3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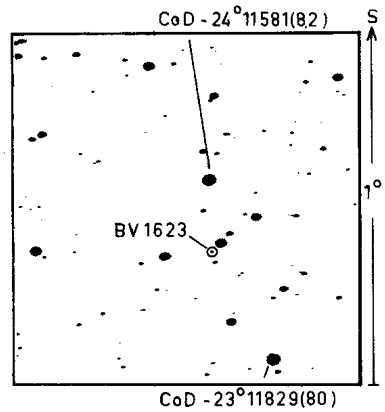
CoD -26°10340(8.8)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S
1°
BV 1623
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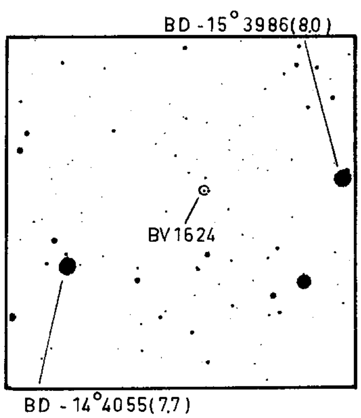
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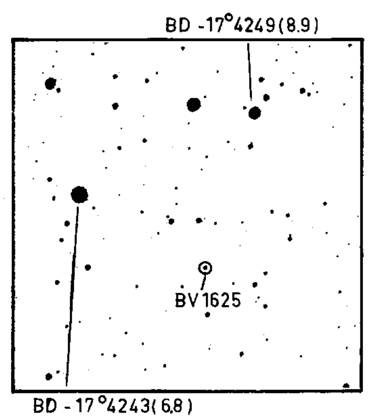
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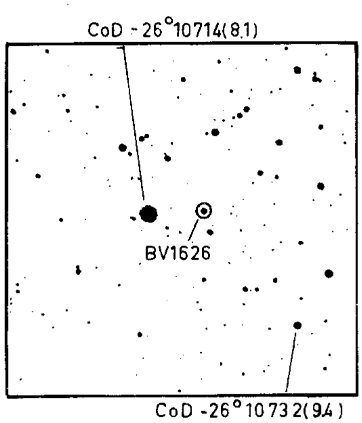
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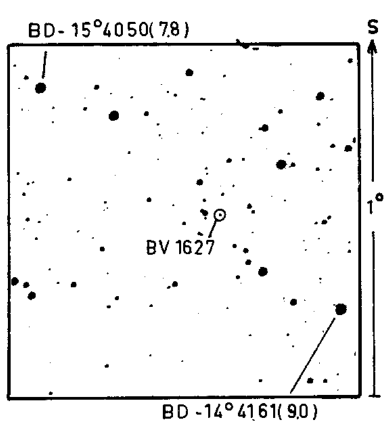
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S
1°
BV 1627
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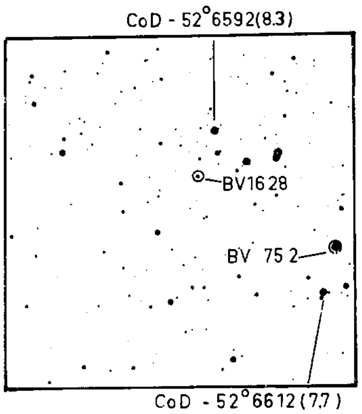
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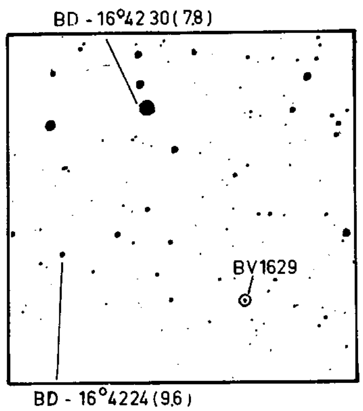
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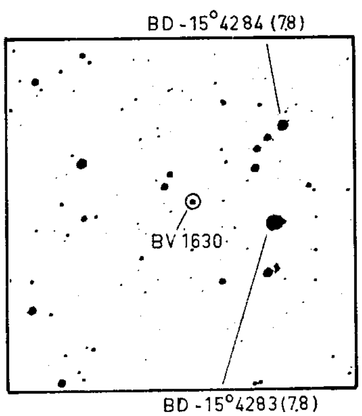
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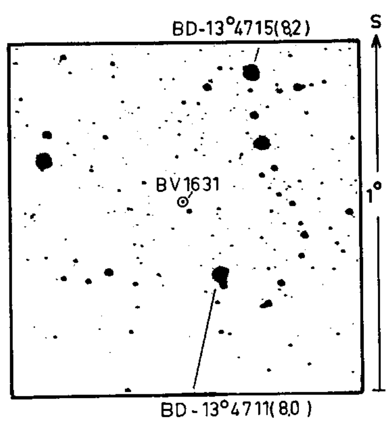
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S
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1°
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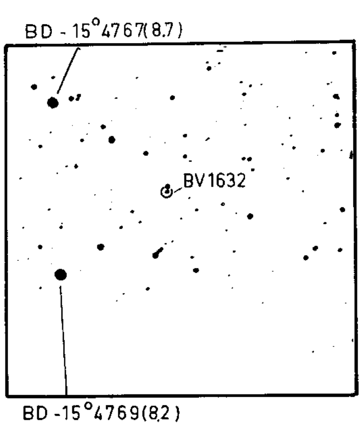
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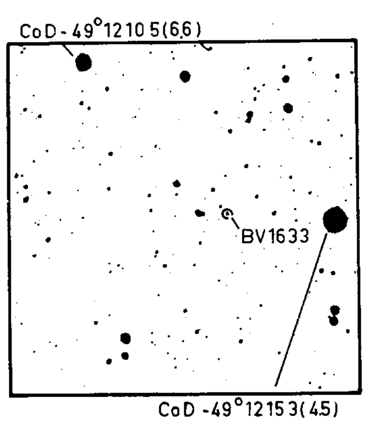
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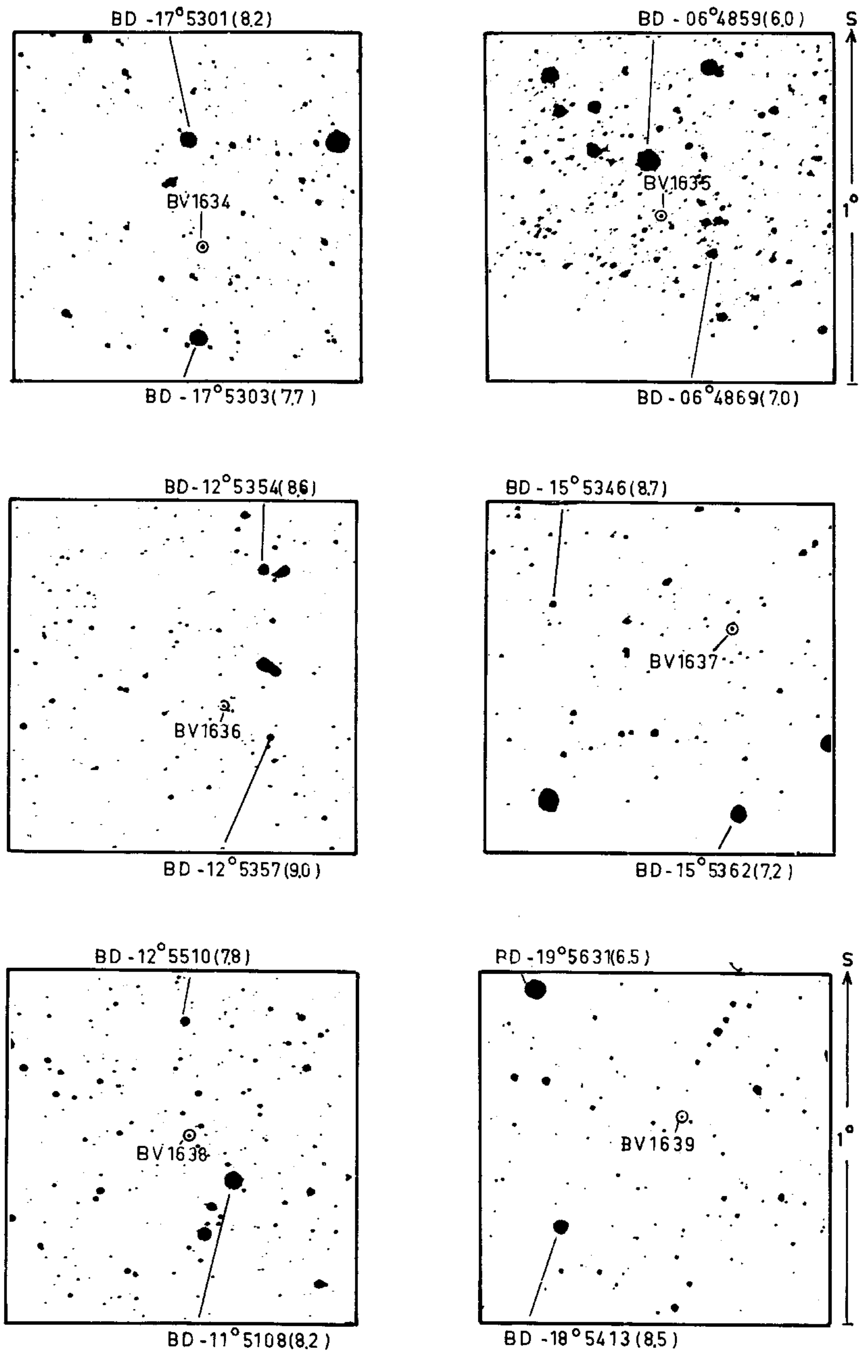
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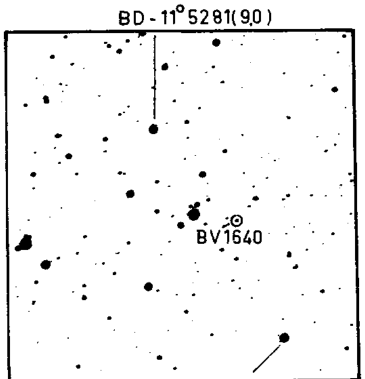
S
1°
BD-12°5354(8.6)
BV1636
BD -12°5357(9.0)
BD - 15°5346(8.7)
BV1637
BD-15°5362(7.2)
BD -12°5510(7.8)
BV1638
BD -11°5108(8.2)
BD -19°5631(6.5)
BV1639
BD -18°5413(8.5)
S
1°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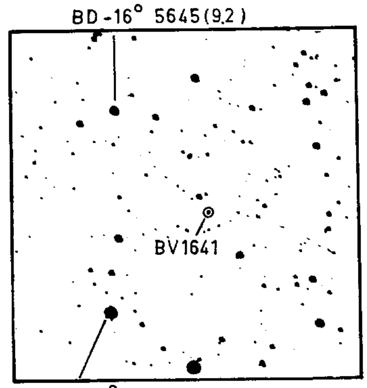
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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 995

Konkoly Observatory
Budapest
1975 May 5

PROPOSED GROUND-BASE OBSERVATIONS OF UV CETI
FLARE STARS IN COORDINATION WITH THE MIT/SAS-C SATELLITE

This notice is to alert ground-based observers (both optical and radio) to the upcoming MIT/SAS-C satellite observations of UV Ceti flare stars. The satellite is tentatively scheduled to observe flare stars in the X-ray region of the spectrum during the period November 26 - December 10, 1975. We plan to observe the flare stars, UV Ceti, YZ CMi and AD Leo during this period and we are asking for the participation of ground-based observers in this program.

Any ground-based, optical observers, who would be interested in cooperating in this program, should write to:

Dr. Thomas J. Moffett
Department of Astronomy
The University of Texas at Austin
Austin, Texas 78712 U.S.A.

After 1 August 1975, my address will be:

Department of Physics
Purdue University
West Lafayette, Indiana 47907 U.S.A.

Radio observers should contact:

Dr. Carol Jo Crannell
NASA
Goddard Space Flight Center
Code 682
Greenbelt, Maryland 20771 U.S.A.

We will then keep you posted, by means of status reports, regarding the details of the program. Details of the observing schedule are not currently available due to uncertainties in the satelllite's launch time and achieved orbit etc.

The University of Texas at Austin
and
McDonald Observatory

THOMAS J. MOFFETT

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 996

Konkoly Observatory
Budapest
1975 May 7

FLARE-UPS IN STARS OF THE PLEIADES FIELD

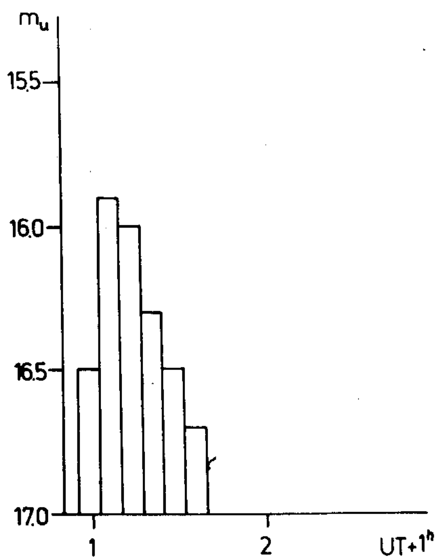
In course of searching for flares in the Pleiades five new flares were observed during 7.6 hours of effective observational time in the period from September 7, 1974 to March 18, 1975. Among the stars flared up four new flare stars were discovered. The observations were made with the 24/36/72 inch Schmidt-telescope of the Konkoly Observatory on Kodak 103a-O plates through a UG_1 - 2 mm thick - filter. The exposure time was 7 or 10 minutes. The informations about our flares are summarized in the table.
Figures Nos. 1-5 show the brightness of the flares plotted against time.

Table

No.	Design.	RA 1900	D 1900	m_U	$m_{U_{min}}$	Date
1	K31	$3^h47^m\!.1$	$+24^o47'$	0,8	16,7	Nov. 9, 1974
2	K32	3 49,9	24 35	≥1,8	≥16,8	Nov. 9, 1974
3	K33	3 41,2	22 20	1,3	16,5	Nov.10, 1974
4	K34	3 41,9	23 01	2,3	17,6	Nov.10, 1974
5	K35=B363	3 41,3	23 31	≥4,3	≥18	Nov.10, 1974

G. SZÉCSÉNYI-NAGY
Konkoly Observatory
Budapest, Hungary.

No. 1. 9. 11. 1974.



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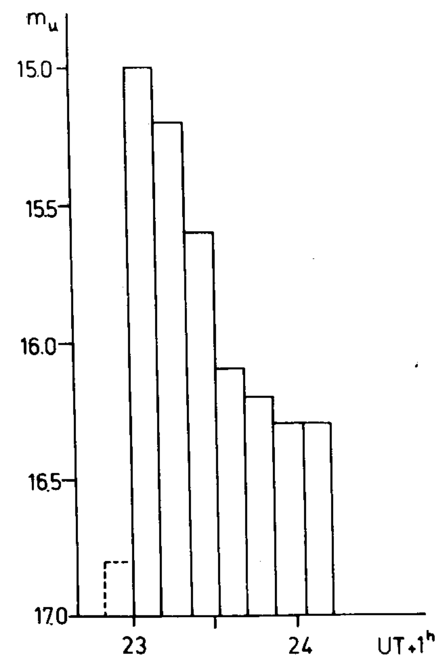
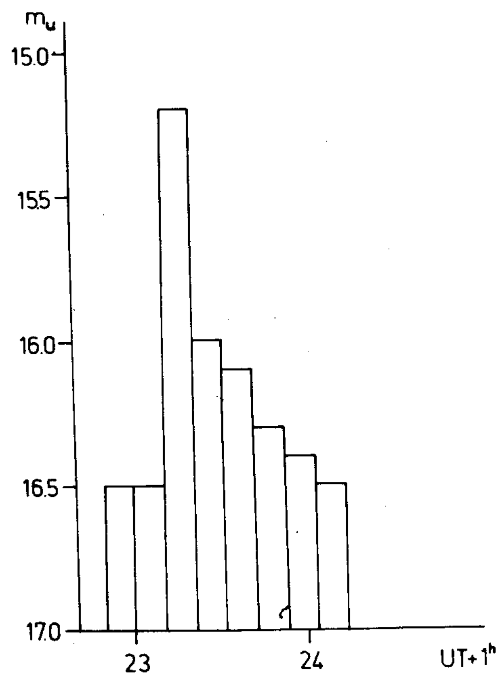


No. 3. 9. 11. 1974.



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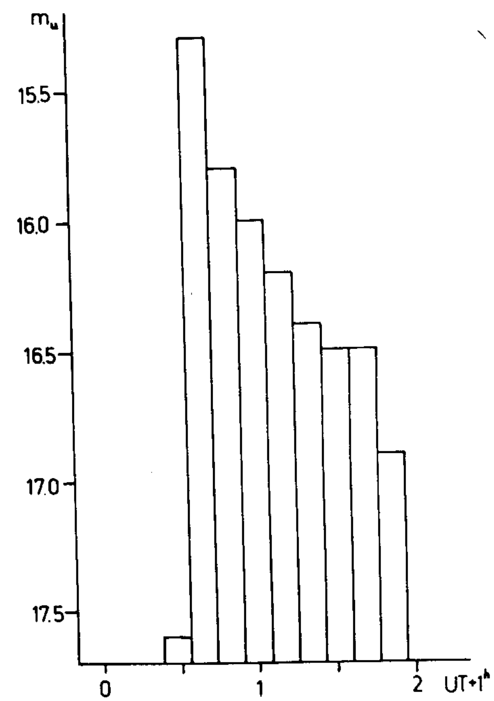

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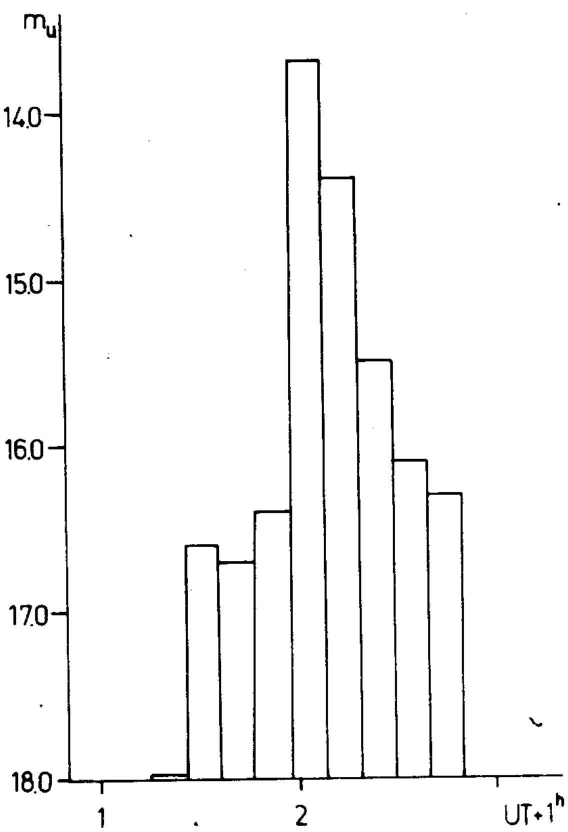

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 997

Konkoly Observatory
Budapest
1975 May 13

OPTICAL OBSERVATIONS OF UV CETI FLARE STARS SIMULTANEOUS WITH RADIO COVERAGE

During January and February 1974, extensive radio observations of the flare stars, YZ CMi, AD Leo, Wolf 424AB, and CN Leo were obtained by Steven R. Spangler using the 1000 ft. radio telescope at Arecibo, Puerto. In this same period, simultaneous high-time-resolution optical coverage was provided at McDonald Observatory. A discussion of the flare events, observed in common at both stations, is given by Spangler and Moffett (1975). This report gives only the optical results obtained at McDonald. Since the optical coverage was incompleted, due to weather conditions, we urge other optical observers to communicate any data which they may have acquired during this observing interval.

INSTRUMENTATION

The optical observations were obtained with a high-speed-pulse-counting photometer attached to either the 91- or 76-cm reflector at McDonald Observatory. The basic instrument is described by Nather and Warner (1971).

Due to scheduling difficulties, several different photomultiplier tubes had to be used during the course of the program (RCA 1P21, RCA 4516, Amperex 56DVP, and a FW-130). The standard PMT used in the system is the 56 DVP, which is very similar to the others used except for the FW-130, which has an S-20 photocathode. This unfortunate circumstance means that the observations are not entirely homogeneous. Since the instrumental system employing the FW-130 is not well defined, certain flare parameters have been omitted for event detected using that system.

OBSERVATIONS

The reduction methods and notation used are described by Moffett (1974). The four flare stars were observed for a total of 102.47 hours, during which, 119 flares were detected.

Tables 1-4 give the coverage intervals together with the telescope and filter used in the monitoring. Tables 5-8 give the optical flare parameters for the flares detected on each star. The last column (Notes) states the photomultiplier in use at the time. Table 9 provides a summary of the observations. The flare frequency given is just a mean without consideration of flare amplitude, detection effects etc.

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and
McDonald Observatory

THOMAS J. MOFFETT

References:

Nather,R.E., and Warner,B. 1971, M.N.R.A.S., 152, 209
Moffett,T.J. 1974, Ap.J.Suppl., 29, No. 273
Spangler,S.R., and Moffett,T.J. 1975, Ap.J., (in press)

Table 1

Coverage of YZ Canis Minoris

Date (UT)	From (UT)	To (UT)	ΔT (s)	Tel. (cm)	Filter(s)
1974 January 15	03 08 01	03 33 28	1527	76	U
(2442062.5)	03 33 43	05 31 43	7080	76	U
1974 January 16 (2442063.5)	02 42 37	05 31 39	10142	76	U
1974 January 17 (2442064.5)	02 38 11	05 31 09	10378	76	U
1974 January 18 (2442065.5)	02 21 57	03 16 41	3284	76	C
1974 January 20	02 12 08	02 28 32	984	76	U
(2442067.5)	02 34 04	03 54 40	4836	76	U
	03 56 18	05 05 52	4174	76	U
	05 07 01	05 30 25	1404	76	U

Table 1 (Continued)

1974 January 21	02 30 38	02 54 06	1408	76	C	
(2442068.5)	02 55 48	04 02 24	4176	76	U	
	04 05 31	05 29 33	5042	76	U	
1974 January 26	02 14 50	02 27 40	707	91	C	
(2442073.5)	03 00 30	04 17 30	4623	91	C	
	04 18 30	05 03 56	2726	91	C	
1974 January 28	02 47 22	03 44 32	3440	91	C	
(2442075.5)	03 46 10	03 51 10	306	91	C	
	03 52 00	05 12 10	4864	91	U	
1974 January 29	02 26 44	03 59 44	5592	91	U	
(2442076.5)	04 00 02	05 10 22	4284	91	U	
1974 January 30	02 51 45	05 34 05	9760	91	U	
(2442077.5)						
1974 January 31	02 09 15	03 45 55	5832	91	U	
(2442078.5)	04 08 08	05 16 08	4254	91	U	
1974 February 01	02 53 24	03 53 46	3622	91	C	
(2442079.5)	03 54 39	05 21 21	5202	91	C	
1974 February 16	01 45 20	02 31 00	2740	91	u	(S-20)
(2442094.5)	02 39 19	03 21 39	2540	91	u	(S-20)
1974 February 17	02 13 10	03 24 45	4295	91	v	(S-20)
(2442095.5)						
1974 February 19	01 52 08	03 15 48	5020	91	B	(S-20)
(2442097.5)						
1974 February 20	02 08 39	03 18 52	4213	91	B	(S-20)
(2442098.5)						
1974 February 22	01 51 02	03 00 06	4144	91	B	(S-20)
(2442100.5)						

Table 2

Coverage of CN Leo

1974 January 27	10 05 45	10 29 39	834	91	C
(2442074.5)	10 45 32	11 50 08	3876	91	C
1974 January 28	10 26 13	11 51 34	5121	91	C
(2442075.5)					
1974 January 30	10 05 51	11 01 08	3317	91	C
(2442077.5)	11 02 39	11 32 31	1792	91	C
1974 January 31	05 32 00	06 28 10	3374	91	C
(2442078.5)	06 31 41	07 42 11	4234	91	C

Table 3

Coverage of AD Leonis

Date (UT)	From(UT)	To(UT)	ΔT(s)	Tel. (cm)	Filter(s)
1974 January 15 (2442062.5)	06 03 02	08 22 58	8396	76	U
1974 January 16 (2442063.5)	05 39 57	08 31 31	10294	76	U
1974 January 17 (2442064.5)	05 38 14	08 42 02	11028	76	U
1974 January 18 (2442065.5)	08 05 17	08 31 39	1582	76	U
1974 January 20 (2442067.5)	05 35 50	08 27 20	10290	76	U
1974 January 21 (2442068.5)	05 38 38	07 41 12	7354	76	U
	07 41 56	08 27 22	2726	76	U
1974 January 26 (2442073.5)	05 12 58	05 58 18	2718	91	C
	06 02 07	06 37 07	2108	91	C
1974 January 28 (2442075.5)	05 25 00	05 46 10	1281	91	U
	06 01 45	06 10 15	515	91	U
1974 January 29 (2442076.5)	05 18 18	06 29 58	4336	91	U
	06 30 40	07 44 20	4464	91	U
1974 January 30 (2442077.5)	05 39 18	07 14 10	5692	91	U
1974 February 01 (2442079.5)	05 25 11	07 39 11	8058	91	U
1974 February 16 (2442094.5)	03 29 00	04 32 15	3795	91	u (S-20)
	04 32 47	06 03 57	5470	91	u (S-20)
1974 February 17 (2442095.5)	03 33 07	05 15 46	6159	91	v (S-20)
	05 16 33	06 24 43	4090	91	v (S-20)
1974 February 19 (2442097.5)	03 23 21	05 02 15	5934	91	B (S-20)
	05 04 54	06 19 03	4449	91	B (S-20)
1974 February 20 (2442098.5)	03 24 24	05 04 34	6010	91	C (S-20)
	05 07 33	05 49 43	2530	91	C (S-20)
	05 50 22	06 14 04	1422	91	C (S-20)

Table 4

Coverage of Wolf 424 AB

Date (UT)	From (UT)	To (UT)	ΔT (s)	Tel. (cm)	Filter(s)
1974 January 16 (2442063.5)	09 21 09	11 05 39	6270	76	C
1974 January 17 (2442064.5)	08 55 29	09 56 35	3666	76	C
	09 57 15	11 07 44	4229	76	C
1974 January 18 (2442065.5)	08 38 02	11 00 53	8571	76	C
1974 January 20 (2442067.5)	08 33 11	09 26 10	3179	76	C
	09 27 26	11 16 44	6558	76	C
1974 January 21 (2442068.5)	08 33 09	09 04 17	1868	76	C
	09 04 23	09 36 18	1915	76	C
	09 36 56	10 20 22	2606	76	C
1974 January 29 (2442076.5)	08 10 07	08 47 47	2266	91	U
	08 48 11	09 49 11	3680	91	C
1974 January 30 (2442077.5)	07 56 44	09 09 44	4388	91	U
	09 12 11	10 00 31	2915	91	C
1974 January 31 (2442078.5)	07 48 34	10 01 54	7992	91	U
1974 February 01 (2442079.5)	07 51 36	09 59 16	7820	91	C
1974 February 16 (2442094.5)	06 27 23	06 44 41	1038	91	u (S-20)
	07 01 33	08 24 38	4985	91	u (S-20)
1974 February 17 (2442095.5)	06 40 27	07 42 11	3704	91	v (S-20)
	07 44 23	08 25 33	2470	91	v (S-20)
1974 February 19 (2442097.5)	06 30 07	08 16 17	6370	91	B (S-20)
1974 February 22 (2442100.5)	06 10 00	07 26 00	4560	91	B (S-20)
	07 28 56	08 02 39	2023	91	B (S-20)

Table 5

Flare Parameters for YZ CMi

Flare No.	HJD (MAX) 2440000.+	RISE (s)	DECAY (s)	F	I_{max}	σ/I_o	E.D. (s)	log E (ergs)	NOTES
1	2062.71737	30	406	U	1.5	.11	73.6	30.44	1P21, spike
2	2063.64372	15	158	U	0.6	.11	19.2	29.85	56DVP, spike, double peak
3	2063.66689	136	178	U	0.5	.11	11.4	29.63	56DVP
4	2063.68955	30	99	U	0.9	.11	24.8	29.96	56DVP, spike
5	2063.71990	125	354	U	0.6	.11	45.9	30.23	56DVP
6AP	2064.69071	36	198	U	0.5	.07	5.7	29.33	56DVP, spike
6BP	2064.69474	150	627	U	0.3	.07	36.9	30.14	56DVP, slow
6C	2064.70326	31	996	U	0.9	.07	114.7	30.63	56DVP
7A	2067.63097	128	284	U	0.9	.15	71.6	30.43	56DVP
7B	2067.64130	108	102	U	0.9	.15	73.6	30.44	56DVP, double peak
7C	2067.64401	72	166	U	0.6	.15	31.4	30.07	56DVP
7D	2067.65100	278	266	U	0.6	.15	76.8	30.46	56DVP, slow
8A	2067.67554	12	20	U	1.6	.08	12.2	29.66	56DVP, spike
8B	2067.68800	447	273	U	0.4	.08	176.3	30.82	56DVP, slow
8C	2067.70545	391	213	U	0.5	.08	56.2	30.32	56DVP, slow
9	2068.63998	14	110	U	0.6	.09	9.1	29.53	56DVP, spike
10A	2068.65926	8	70	U	0.9	.09	14.2	29.72	56DVP, spike
10B	2068.66055	42	498	U	0.8	.09	53.4	30.30	56DVP
10C	2068.67292	32	250	U	0.8	.09	60.8	30.35	56DVP, multi-peak?
11AP	2068.67844	18	142	U	0.4	.08	15.9	29.77	56DVP
11B	2068.68587	120	440	U	1.8	.08	261.4	30.99	56DVP, multi-peak?
11C	2068.70205	12	144	U	2.4	.08	63.1	30.37	56DVP, spike
11D	2068.71135	12	92	U	2.1	.08	27.9	30.02	56DVP, spike

Table 5 (Continued)

11E	2068.71552	10	16	U	0.6	.08	4.7	29.24	56DVP, spike
11F	2068.71930	51	175	U	0.4	.08	27.2	30.01	56DVP
12	2073.66493	140	93	C	0.1	.02	5.1	30.55	RCA4516
13A	2076.61319	--	1220	U	0.5	.06	>175.2	> 30.81	RCA4516, missed start
13B	2076.62752	18	738	U	0.5	.06	49.4	30.26	RCA4516
13C	2076.63768	14	110	U	0.3	.06	6.4	29.38	RCA4516
14A	2077.63530	77	649	U	0.3	.07	49.3	30.26	RCA4516
14B	2077.64319	33	745	U	0.6	.07	43.8	30.21	RCA4516, spike
14C	2077.65610	74	1496	U	0.3	.07	87.0	30.51	RCA4516
14D	2077.67441	60	212	U	0.3	.07	16.9	29.80	RCA4516
14E	2077.69200	52	960	U	0.3	.07	72.5	30.43	RCA4516
14F	2077.70334	20	938	U	0.7	.07	48.0	30.25	RCA4516, spike
14G	2077.72501	66	260	U	0.7	.07	33.0	30.9	RCA 4516, multi-peak
15AP	2078.68731	42	318	U	0.3	.06	27.8	30.01	56DVP
15B	2078.69---	--	---	U	---	.06	>15.2	>29.75	56DVP, missed start
15C	2078.69400	24	886	U	0.3	.06	72.1	30.43	56DVP, slow

Table 6

Flare Parameters for CN Leo

FLARE No.	HJD (MAX) 2440000.+	RISE (s)	DECAY (s)	F	I_{MAX}	σ/I_o	E.D. (s)	Log E (ergs)	NOTES
1	2074.96859	6	19	C	0.9	.06	3.2	28.57	RCA4516, spike
2AP	2075.95064	6	23	C	0.6	.06	3.4	28.60	RCA4516, spike
2BP	2075.95855	22	1213	C	1.5	.06	118.4	30.14	RCA4516
2CP	2075.97280	9	207	C	1.9	.06	---	----	RCA4516, spike
2D	2075.97526	5	---	C	3.1	.06	---	----	RCA4516
3AP	2077.93576	23	254	C	1.8	.07	35.6	29.62	RCA4516, spike
3BP	2077.94159	5	99	C	0.4	.07	6.5	28.88	RCA4516
3CP	2077.95037	15	176	C	0.4	.07	18.0	29.32	RCA4516
3D	2077.95689	14	607	C	10.4	.07	555.9	30.81	RCA4516, double spike
4	2077.96627	--	495	C	0.6	.07	>74.7	>29.94	RCA4516, missed start
5A	2078.80112	11	73	C	0.4	.07	8.0	28.97	56DVP
5B	2078.80436	79	194	C	0.3	.07	10.6	29.09	56DVP
5C	2078.81008	7	68	C	0.2	.07	1.7	28.29	56DVP

Table 7

Flare Parameters for AD Leo

FLARE No.	HJD (MAX) 2440000.+	RISE (s)	DECAY (s)	F	I_{MAX}	σ/I_o	E.D. (s)	Log E (ergs)	NOTES
1AP	2063.76555	220	855	U	0.1	.03	51.2	30.83	56DVP, slow
1B	2063.78088	33	405	U	0.5	.03	24.6	30.51	56DVP, spike
1C	2063.78652	83	334	U	0.1	.03	15.6	30.31	56DVP, slow
1D	2063.79645	124	531	U	0.3	.03	67.3	30.95	56DVP, slow
2	2063.83005	65	169	U	0.1	.03	6.6	29.94	56DVP, slow
3	2063.84715	8	178	U	0.2	.03	9.4	30.09	56DVP, flat top
4	2064.74307	214	606	U	0.2	.03	40.7	30.73	56DVP, slow
5AP	2064.78240	78	194	U	0.1	.03	7.2	29.98	56DVP, slow
5B	2064.78529	43	649	U	0.3	.03	29.7	30.59	56DVP, double peak
5CP	2064.78529	52	259	U	0.1	.03	8.0	30.02	56DVP, complex
5D	2064.82969	55	374	U	0.3	.03	19.2	30.40	56DVP, flat top
5E	2064.84529	42	320	U	0.2	.03	13.4	30.25	56DVP
5F	2064.85530	544	783	U	0.2	.03	91.0	31.08	56DVP, slow complex
6	2065.84356	14	126	U	0.1	.03	2.8	29.57	56DVP, spike
7AP	2067.80047	46	46	U	0.1	.04	2.5	29.52	56DVP
7B	2067.82239	196	484	U	1.6	.04	123.4	31.21	56DVP, double
7C	2067.83025	194	292	U	0.1	.04	26.9	30.55	56DVP, slow
8	2068.75297	6	32	U	0.1	.03	2.5	29.52	56DVP
9	2068.80027	280	1472	U	0.5	.03	122.6	31.21	56DVP, complex
10	2068.83698	58	436	U	0.1	.03	6.9	29.96	56DVP
11A	2076.79435	73	472	U	0.1	.02	16.0	30.32	RCA4516, slow
11B	2076.81294	618	1274	U	0.3	.02	86.0	31.06	RCA4516, complex slow

Table 7 (Continued)

12A	2077.75529	12	1172	U	0.2	.02	22.3	30.47	RCA4516, complex
12B	2077.77330	322	1030	U	0.2	.02	28.3	30.47	RCA4516, multi-peak
13AP	2079.75807	23	216	U	0.2	.02	10.5	30.14	56DVP
13BP	2079.76897	188	1212	U	0.3	.02	41.2	30.74	56DVP
13C	2079.80221	234	1458	U	1.9	.02	507.8	31.83	56DVP, complex, 2 major peaks
14AP	2094.70272	116	476	u	4.1	--	---	----	S-20 PMT
14B	2094.71091	232	2756	u	139.8	--	---	----	S-20 PMT
14C	2094.74327	36	1392	u	5.0	--	---	----	S-20 PMT
15AP	2098.67815	50	1050	C	0.3	--	---	----	S-20 PMT
15B	2098.69348	260	2040	C	1.7	--	---	----	S-20 PMT

Table 8

Flare Parameters for Wolf 424AB

FLARE No.	HJD (MAX) 2440000.+	RISE (s)	DECAY (s)	F	I_{MAX}	σ/I_o	E.D. (s)	Log E (ergs)	NOTES
1	2063.89781	9	198	C	0.2	.02	7.2	29.90	56DVP, double spike
2	2063.95943	17	206	C	0.5	.03	11.8	30.11	56DVP, spike
3AP	2064.88545	6	47	C	0.1	.03	1.0	29.04	56DVP, very small
3B	2064.88741	35	137	C	0.2	.03	6.2	29.83	56DVP, multi-peaked?
4	2064.92707	14	253	C	0.2	.03	14.9	30.21	56DVP, flat top
5	2065.91720	4	242	C	0.2	.03	7.3	29.90	56DVP, double peaked?
6A	2067.87823	3	363	C	0.3	.04	12.6	30.14	56DVP, spike
6B	2067.88680	25	35	C	0.2	.04	2.1	29.36	56DVP
7	2067.93552	10	136	C	0.7	.04	9.4	30.01	56DVP, spike
8	2067.96048	11	14	C	0.2	.04	0.6	28.82	56DVP
9	2068.87063	7	147	C	0.3	.03	4.5	29.69	56DVP, spike
10	2076.86162	54	699	U	1.1	.22	86.2	29.55	RCA4516
11	2076.88768	11	287	C	0.1	.02	5.3	29.77	RCA4516
12	2076.90780	156	156	C	0.1	.02	4.7	29.71	RCA4516, slow
13AP	2077.85407	22	148	U	0.7	.18	37.6	29.19	RCA4516
13B	2077.85671	80	704	U	2.7	.18	347.1	30.16	RCA4516, multi-peak
13C	2077.86504	16	604	U	2.3	.18	109.5	29.66	RCA4516, spike
13D	2077.87296	80	118	U	1.3	.18	17.7	28.87	RCA4516, pure spike
13E	2077.87738	12	374	U	2.0	.18	54.4	29.35	RCA4516, double spike
14	2077.89086	18	56	C	0.1	.03	1.5	29.22	RCA4516, max not well defined
15	2077.89606	5	82	C	0.1	.03	1.4	29.19	RCA4516
16	2077.89951	18	43	C	0.1	.03	1.6	29.25	RCA4516

17	2077.91029	8	14	C	0.2	.03	0.5	28.74	RCA4516, spike
18	2078.83912	22	422	U	3.7	.20	148.9	29.79	56DVP, complex
19A	2078.86473	86	130	U	4.7	.20	85.8	29.55	56DVP, complex spike
19B	2078.86769	16	486	U	3.1	.20	177.9	29.87	56DVP, multi-peak spike
19C	2078.90414	5	249	U	3.4	.20	152.3	29.80	56DVP, multi-peak spike
20	2079.84103	8	56	C	0.2	.02	1.3	29.16	56DVP, spike
21	2079.88198	34	60	C	0.1	.02	2.1	29.36	56DVP
22	2079.90971	10	794	C	0.2	.02	16.0	30.25	56DVP, spike
23	2100.79879	8	10	B	0.1	--	---	---	S-20 PMT, spike
24	2100.79939	2	18	B	0.2	--	---	---	S-20 PMT, spike
25	2100.81671	-	--	B	0.1	--	---	---	S-20 PMT, spike
26	2100.83659	-	--	B	0.1	--	---	---	S-20 PMT, spike
27	2100.83886	-	--	B	0.1	--	---	---	S-20 PMT, spike

Table 9

Summary

STAR	COVERAGE (hr)	No. OF FLARES	FLARES/HR (1/hr)
YZ CMi	36.83	39	1.06
AD Leo	33.53	32	0.95
Wolf 424AB	25.85	35	1.35
CN Leo	6.26	13	2.08
TOTAL	102.47	119	1.16

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1975 May 14

FLARE ACTIVITY OF YZ CMi

The flare star YZ CMi (M_V=11.6, RA=$7^h43^m16^s$ δ=$3^\circ37'12''$,1974) was monitored photoelectrically on 21 October 1974, during a period of simultaneous observations with the ANS Satellite. The star was observed through the U filter of the Johnson and Morgan System. The stellar intensity was measured against the sky-back-ground only, without observing any comparison star. During the observing interval 22^h04^m UT to 23^h33^m UT, one flare was recorded with its maximum at UT $23^h20^m28^s$.

The flare light curve (Fig.1) shows that the flare is a rapid succession of two Oskanyan type I flares. It appears that energy has been added at various times during the development and decay of the flare event (Bopp and Moffett 1973).

Flare characteristics were computed using the techniques and procedure as applied earlier (Oskanyan, 1970; Bhatt and Sinvhal,1971) and are given in Table I. The detailed spectral energy distribution during active state is not exactly known and varies from flare to flare (Moffett and Bopp, 1971). In the computations, it has been assumed that the spectral energy distribution in the U-band is the same during a flare event as in the quiescent state.

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References:

1) Bopp, B.W., Moffett, T.J., 1973, Ap.J.,185,239
2) Bhatt, T.R., Sinvhal, S.D.,1971, I.A.U.Colloquium,15,124.
3) Moffett, T.J., and Bopp, B.W.,1971,Ap.J. (Letters) ,168,L117.
4) Oskanyan, V.S.,1970, I.B.V.S. No.488

Table I

Characteristics of flare on YZ CMi (dM 4.5e)

Date 1974	UT max	Flare duration Before max tb	After max ta	$\frac{X_{fm+s}}{\overline{X}_s}$	Δm_u	$\frac{\sigma}{\overline{X}_s}$	P (min)	F(z)	Energy releas-ed at flare max 10^{29} ergs/s	Total emiss. during the flare up 10^{30}ergs
Oct. 21	$23^h20^m28^s$	0.5^m	4.2^m	1.54	0.47	0.033	.615	1.15	8.9	2.14

Notes 1) Monitoring interval 22^h04^m UT to 23^h33^m UT.

2) Photomultiplier tube used: EMI 6094S thermoelectrically cooled to -20^oC.

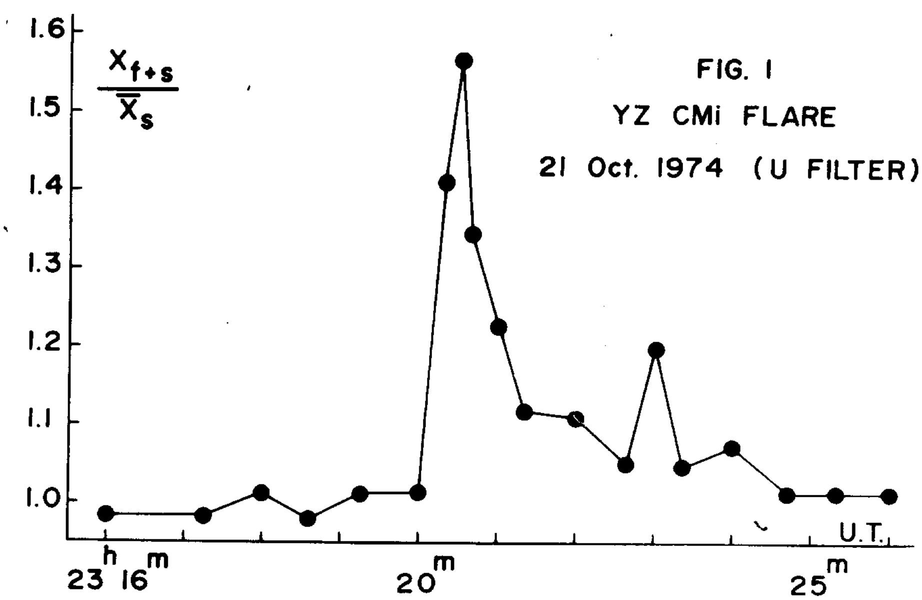

FIG. I
YZ CMi FLARE
21 Oct. 1974 (U FILTER)

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INFORMATION BULLETIN ON VARIABLE STARS
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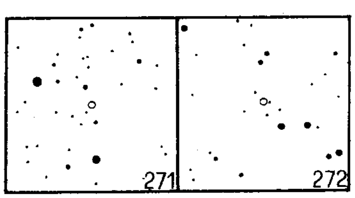
NEW VARIABLE STARS IN PERSEUS

The following new variable stars have been discovered on plates taken with the 40/50/100 cm Schmidt telescope of Asiago centered on Beta Persei:

GR 271: R.A. = $3^h01^m38^s$; D = $+40^\circ53'$ (1950). Irregular red variable. The range is 12.6 - 14.1 mpv.

GR 272: R.A. = $3^h02^m57^s$; D = $+39^\circ03'$ (1950). RR Lyrae star with the period of $0^d.617813$. The light variation is from 15.5 to 16.4 mpv.

Finding charts are given in the Figure. North is on the top and the side is of 15'.



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INFORMATION BULLETIN ON VARIABLE STARS
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UBV AND SPECTRAL DATA ON RV PICTORIS

Photoelectric UBV observations of the eclipsing binary RV Pictoris were made with one of the 16-inch (40 cm) telescopes at the Cerro Tololo Interamerican Observatory (CTIO) on four nights in November and December, 1971, using HD 31507 (CPD $-52^{\circ}603$) as a comparison star; suitable standards were measured to correct for atmospheric extinction and express the results in the UBV system. The uncertainty of an individual observation is estimated to be $0^{m}_{.}015$.The mean values obtained from 17 observations of HD 31507 are:

$$V = 8.048 \quad B-V = 0.000 \quad U-B = -0.019$$

The three light curves were used to determine the time of primary minimum, which combined with that given by Hoffmeister (1942) yielded the following ephemeris:

$$\text{Primary minimum} = \text{JD hel } 2441286.757 + 3^{d}_{.}971780 \text{ E}$$

This is in good agreement with Knipe's determination (Knipe 1969). If the uncertainty in Hoffmeister's minimum is $0^{d}_{.}01$, the uncertainty in the period is $0^{d}_{.}000003$.

The results of the UBV observations are given in Table 1. The heliocentric time corresponds to the V observation, and the phases were calculated with the ephemeris given above.

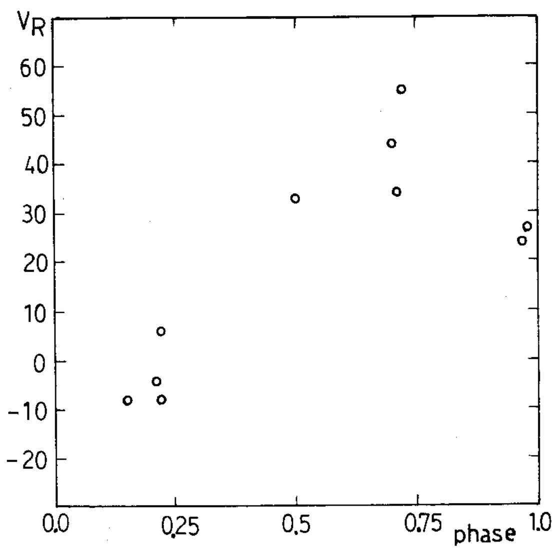
Ten spectrograms of RV Pic were obtained by Virpi Niemelä in November and December 1971 with the CTIO 36-inch (90 cm) and 60-inch (150 cm) telescopes, at dispersions of 125 and 80 Å mm^{-1},respectively. Only the spectrum of the primary component is visible. The spectral type was determined by comparison with spectrograms of standard stars taken by O.H.Levato with the same equipment. The Balmer and metallic lines suggest a type A5 V, while the Ca II K line yields a slightly earlier type, A2 or A3; perhaps this is an indication of very mild metallicity, but a confirmation is desirable.

The radial velocities were measured at La Plata Observatory with a Grant comparator, and they are represented in Figure 1. The scatter is large, but a system velocity of 20 ± 10 km s^{-1} and a semiamplitude K of 25 ± 5 km s^{-1} are suggested.

TABLE 1

Photometric Observations of RV Pictoris

JD hel_V 2441000+	$phase_V$	V	$phase_B$	B	$phase_U$	U
282.599	0.9531	9.953	0.9536	10.071	0.9539	10.179
.609	.9556	9.925	.9561	10.089	.9564	10.145
.617	.9576	10.006	.9579	10.139	.9581	10.198
.627	.9602	10.059	.9604	10.199	.9607	10.263
.702	.9790	10.872	.9793	11.240	.9796	11.363
.713	.9818	11.073	.9821	11.419	.9823	11.509
.722	.9841	11.244	.9842	11.631	.9846	11.766
.729	.9858	11.345	.9863	11.833	.9866	12.014
286.585	.9567	9.963	.9572	10.089	.9577	10.151
.595	.9592	10.038	.9593	10.147	.9595	10.270
.613	.9637	10.165	.9640	10.335	.9645	10.383
.621	.9658	10.254	.9660	10.437	.9665	10.478
.630	.9680	10.333	.9683	10.492	.9685	10.608
.647	.9723	10.508	.9726	10.734	.9728	10.787
.654	.9741	10.615	.9743	10.847	.9746	10.849
.661	.9758	10.713	.9761	10.963	.9763	11.035
.678	.9801	10.949	.9804	11.290	.9809	11.392
.687	.9824	11.143	.9826	11.486	.9829	11.581
.695	.9844	11.268	.9849	11.676	.9851	11.846
.704	.9867	11.457	.9869	11.864	.9872	12.081
.713	.9889	11.565	.9894	12.135	.9897	12.404
.727	.9924	11.777	.9927	12.406	.9930	12.694
.740	.9957	11.969	.9960	12.594	.9962	12.867
.749	.9980	12.005	.9985	12.804	.9987	13.028
.771	.0035	11.983	.0038	12.673	.0039	12.911
.784	.0068	11.804	.0073	12.424	.0074	12.657
.797	.0101	11.599	.0103	12.063	.0106	12.385
.810	.0133	11.393	.0136	11.759	.0141	11.845
287.713	.2407	9.650	.2412	9.763	.2415	9.815
.722	.2430	9.645	.2435	9.787	.2436	9.813
.733	.2457	9.644	.2460	9.784	.2462	9.807
288.590	.4615	9.690	.4618	9.794	.4620	9.815
.599	.4638	9.697	.4643	9.806	.4648	9.864
.618	.4686	9.689	.4691	9.804	.4698	9.837
.632	.4721	9.680	.4723	9.794	.4728	9.834
.643	.4749	9.691	.4751	9.792	.4754	9.828
.662	.4796	9.702	.4801	9.806	.4804	9.877
.673	.4824	9.711	.4827	9.790	.4832	9.821
.683	.4849	9.713	.4852	9.791	.4857	9.846
.695	.4879	9.710	.4882	9.802	.4889	9.832
.719	.4940	9.725	.4942	9.816	.4947	9.860
.731	.4970	9.743	.4971	9.805	.4975	9.859



RV Pictoris - Heliocentric Radial Velocities, km s^{-1}.

The scarcity of the observations does not permit a detailed analysis of the system; yet it is possible to make some rough calculations.

Knowledge of K and the period allows us to estimate the mass function, if we assume a circular orbit; we find $f(\mathfrak{M}) = 0.0064$. If we adopt $2.2\mathfrak{M}_\odot$ for the mass of the primary and suppose that the inclination is 90°, we get a value of $0.35\mathfrak{M}_\odot$ for the mass of the secondary.

The depths of the primary eclipse are $2^m\!.45$ in V, $3^m\!.07$ in B and $3^m\!.24$ in U (assuming constant brightness outside of eclipse). This imposes an upper limit to the depths of the secondary eclipse, even in the most favourable case of total eclipses and equal stellar radii the secondary eclipse cannot be deeper than $0^m\!.12$ in V, $0^m\!.07$ in B and $0^m\!.06$ in U. This is very near the observed values (in fact, Knipe (1969) gives $0^m\!.15$ in V for the secondary minimum); so we can safely conclude that both stars are approximately of the same size, and that the eclipses are almost total. It is thus very simple to obtain the difference in absolute visual magnitude between the components of the system as about $2^m\!.3$. Remembering the low mass of the secondary component, obtained on the assumption that the hotter star is on the main sequence, we see that we can place RV Pictoris in the selected group of Algol systems that have a subgiant component which is overluminous by more than 5 magnitudes (see e.g. Plavec 1973).

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References:

Hoffmeister, C. 1942, Astr.Nachr. 273, 88
Knipe, G.F.G. 1969, Rep.Obs.Johannesburg, Circ., 7, 198
Plavec, M. 1973, I.A.U. Symposium No 51, p.225