British Astronomical Association

Variable Star Section Circular

No 81, September 1994

CONTENTS

ISSN 0267-9272

Office: Burlington House,
Piccadilly, London, W1V 9AG

Section Officers

Director	Tristram Brelstaff, 3 Malvern Court, Addington Road, READING, Berks, RG1 5PL Tel: 0734-268981
Section Secretary	Melvyn D Taylor, 17 Cross Lane, WAKEFIELD, West Yorks, WF2 8DA Tel: 0924-374651
Chart Secretary	John Toone, Hillside View, 17 Ashdale Road, Cressage, SHREWSBURY, SY5 6DT Tel: 0952-510794
Computer Secretary	Dave McAdam, 33 Wrekin View, Madeley, TELFORD, Shropshire, TF7 5HZ Tel: 0952-432048 E-mail: DMC@TELF-AST.UKMAIL.NET
Nova/Supernova Secretary	Guy M Hurst, 16 Westminster Close, Kempshott Rise, BASINGSTOKE, Hants, RG22 4PP Tel & Fax: 0256-471074 E-mail: GMH@AST.STAR.RL.AC.UK GMH@GXVG.AST.CAM.AC.UK
Pro-Am Liaison Committee Secretary	Roger D Pickard, 28 Appletons, HADLOW, Kent TN11 0DT Tel: 0732-850663 E-mail: RDP@UK.AC.UKC.STAR KENVAD::RDP
Eclipsing Binary Secretary	See Director
Circulars	See Director

Telephone Alert Numbers

Nova and Supernova Discoveries	First phone Nova/Supernova Secretary. If only answering machine response leave message and then try the following: Denis Buczynski 0524-68530 Glyn Marsh 0772-690502 Martin Mobberley 0245-475297 (w'kdays) 0284-828431 (w'kends)
Variable Star Alerts	Gary Poyner 021-6053716 E-mail: GP@STAR.SR.BHAM.AC.UK

Charges for Section Publications

The following charges are made for the Circulars. These cover one year (4 issues). Make cheques out to the BAA. Send to the Director.

	UK	Europe	Rest of World
BAA Members	£2-50	£3-50	£6-00
Non-Members	£4-50	£5-50	£8-00

The charges for other publications are as follows. Make cheques out to the BAA and please enclose a large SAE with your order.

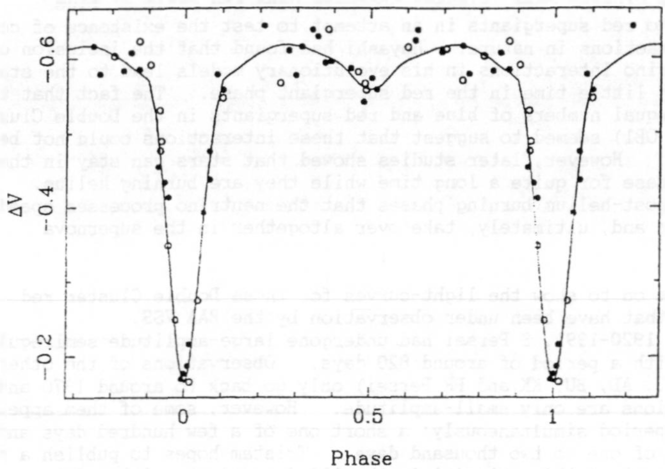
	Order from	Charge
Telescopic Charts	Chart Secretary	30p each
Binocular Charts	Chart Secretary	10p each
Eclipsing Binary Charts	Eclipsing Binary Secretary	10p each
Leaflets	Section Secretary	20p each
Observation Report Forms	Section Secretary	No Charge

Outburst of AG Draconis

Some of you might have noticed that the symbiotic variable (Z And type star) AG Draconis has recently undergone an outburst. For the past few years this star has been oscillating between 9.7 and 9.9V with a period of 300-370 days (R. Luthardt, Mitteilungen ueber Veraenderliche Sterne, 12, No 8, 122-134, 1992). Observations reported to The Astronomer show that in May of this year the star started to brighten, reaching 8.4v on June 19-20. It then faded back to 9.2 by the end of June. According to reports from Melvyn Taylor and Gary Poyner it is still bright, fluctuating between 8.2 and 8.6, as this circular goes to the printers (mid-August). The last comparable outburst of AG Dra occurred in 1980 but there were two minor rises to 9.4 and 9.5 in 1983. Further visual observations would be very useful.

A Photometric Study of the New Eclipsing Binary HD 21155

HD 21155 (= DHK 9) is an 8th-magnitude star that was found to be variable by Daniel Kaiser in 1989. Further work revealed it to be an eclipsing binary with a range of about 0.4v and a period of 3.0452976 days (Kaiser et al, IBVS 3442, 1990). John Watson, of Catsfield, East Sussex has been observing this star photoelectrically since 1991 and in IBVS 4008, he and Chris Lloyd present the accompanying light-curve. John is 80 years old and says that he feels the cold a bit, so he only follows one star at a time. In a letter he writes: "Acquisition of more data would have improved the accuracy but there comes a time when one's patience with bondage to a single star becomes exhausted". A more detailed analysis of these observations has been submitted for publication in the Observatory. This is yet another illustration of how an observer with limited opportunities for observing can still do useful work by concentrating their effort on just one or two stars rather than spreading their effort too thinly.



The Cambridge Variable Star Meeting (continued from VSSC's 79 and 80)

The next talk was given by Tristram Brelstaff and was entitled the Red Supergiant Variables in the Double Cluster. The presence of red stars in the Perseus Double Cluster had been commented on by several observers in the 19th Century but the definitive visual study was carried out by the Reverend Thomas Espin in 1891-1892. He identified 9 red stars using a visual spectroscope attached to his 17-inch reflector. At the time, these were not recognised as supergiant stars because supergiants were not yet known about. It was not until the work of Antonia Maury (published in 1897), who identified a set of stars with unusually narrow spectral lines, and Eijnar Hertzsprung (1905), who showed that these stars were unusually distant, that supergiants were recognised as distinct clss of stars.

In 1926, a spectroscopic survey carried out at Mount Wilson by Walter Adams and co-workers showed that 7 of Espin's red stars had radial velocities and proper motions that were consistent with them being members of the Double Cluster. During the 1940s and 1950s, further spectroscopic studies by Philip Keenan, William Bidelman and Victor Blanco increased the number of known and suspected members to 17 and 7, respectively. Keenan commented on the fact that several of these stars, while obviously associated with the Cluster, were up to 5 degrees away from it, well outside of the accepted bounds of the Cluster. They are now thought to be members of the association of luminous stars, known as Perseus OB1, that surrounds the Double Cluster.

In the 1960s, there was an increase in interest in the Double Cluster red supergiants when they were used to test various theories and models of stellar evolution. They were particularly suitable for this because they were by far the largest grouping of red supergiants in our Galaxy for which the distance was relatively well-determined. In a major photometric study in 1964, Robert Wildey compared their positions on the colour-magnitude diagram with the evolutionary track of a 15.6 solar mass star calculated by Hayashi and co-workers. This track starts out on the main sequence and then moves horizontally across the diagram to end up very close the the position of the Double Cluster red supergiants.

In 1969, in a study of red supergiants in general, but which relied heavily on the Double Cluster ones, Richard Stothers used the ratio of blue supergiants to red supergiants in an attempt to test the existence of certain sub-atomic reactions in nature. Hayashi had found that the inclusion of certain neutrino interactions in his evolutionary models lead to the stars spending very little time in the red supergiant phase. The fact that there were nearly equal numbers of blue and red supergiants in the Double Cluster (and Perseus OB1) seemed to suggest that these interactions could not be taking place. However, later studies showed that stars can stay in the red supergiant phase for quite a long time while they are burning helium. It is only in the post-helium burning phases that the neutrino processes speed up the evolution and, ultimately, take over altogether in the supernova explosion.

Tristram went on to show the light-curves for those Double Cluster red supergiants that have been under observation by the BAA VSS.
In the years 1920-1991, S Persei had undergone large-amplitude semiregular variations with a period of around 820 days. Observations of the other stars (RS, SU, AD, BU, KK and PR Persei) only go back to around 1970 and their variations are only small-amplitude. However, some of them appear to show two period simultaneously: a short one of a few hundred days and a longer one of one to two thousand days. Tristam hopes to publish a more detailed account of this material in the BAA Journal at a later date.

The final speaker of the day was Mike Collins whose subject was Finding Variable Stars on Patrol Plates - Opportunities and Responsibilities. For several years now, Mike has using twin 135mm telephoto lenses to photograph the northern Milky Way as part of the UK Nova Patrol. Originally, his aim was to look for faint novae but he has had no success in this direction (so far). However, during this search he has come across many suspicious objects, each of which he had to check out. Out of a total of 730 such objects, 479 turned out to be known variable stars (either listed in the General Catalogue of Variable Stars or else marked on the AAVSO Variable Star Atlas), 110 were minor planets (the faintest was at magnitude 11.6 when detected) and 141 were previously unknown or else only suspected variables. Most of the new and suspected variable have turned out to be pulsating red giants (Mira star and semiregular variables).

One of the responsibilities of the discoverer of a new variable star is to determine the period of its variation, if it has one. Mike uses the method of least squares to find the values for the epoch of maximum and the period that best fit his observations. He described this process as trying to find the lowest point of a surface shaped like a cow's udder. The trick is to make sure that you go down to the lowest 'teat' rather than one of the higher ones. Mike stressed the importance of giving estimated errors for derived values as this gives other people an idea of how accurate your results are and how long into the future they can be expected to give reliable predictions.

The discoverer of a new variable star also has the opportunity of giving it a temporary designation that will be used until the editors of the GCVS get round to giving it an official name. Mike reviewed some of the methods of forming such temporary designations. In the Astronomer magazine the names are given by Guy Hurst and are based on the star's celestial coordinates. For instance, 'TAV 0723-03' denotes 'The Astronomer Variable at right ascension 07 hours 23 minutes, declination -03 degrees'. Mike added that the prefix 'TASV' ('The Astronomer Suspected Variable') was used to indicate that the discoverer had not quite managed to convince Guy that the star was variable. Another naming method was to use the discoverer's initials followed by a serial number. 'DHK15' is the 15th variable star discovered by Daniel H Kaiser, an American carrying out a sky patrol very similar to Mike's.

Mike went on to describe some of the stars he had found. A fairly typical example is one he found in Cassiopeia in November 1989. Looking back at previous photos of the area showed him that it was probably a Mira star varying from about photovisual magnitude 10 to below 14 with a period of about 244 days. A little research revealed that this star was actually first noticed by the German observer Otto Morgenroth in the 1930s. He had found a photographic range of 13.5 to 16 but was unable to identify the period. As a consequence of Morgenroth's report, the star was included in the New Suspected Variable Star Catalogue and was given the temporary designation NSV 1020. There is still some uncertainity in Mike's mind about the period because Morgenroth reported the star as being bright in both January and July 1936, which would seem to indicate a period shorter than 244 days.

After describing several other stars, Mike said that it would be nice to have more visual observers looking at them. These stars tend to be slightly unpredictable so that, after a few years their cycles often get out of step with the published data. He said that they are like badly behaved geriatrics (red supergiants are old stars) that need social workers (visual observers) to keep an eye on them.

At the end of the day, everyone seemed to agree that the meeting had been a great success (even the VSS Director's wife, who had spent most of the day knitting!). The selection of speakers and topics was well balanced and the meeting appeared to run smoothly from start to finish. Most of the credit for this should go to the meeting organiser, Paul McLaughlin, and his CUAS helpers.

Photoelectric Minima of Eclipsing Binaries, 1992 - 1993

Tristram Brelstaff

The numbers of photoelectric observations received for known and suspected eclipsing binaries in 1992 and 1993, including measures reserved for separate discusssion, are given below.

	Obsns	Timings
J Ells APT (EJ)	2839	23
J E Isles (IS)	11	-
R D Pickard	20	-
K West (WEK)	33	1
Composite timings	-	1
Total	2903	25

The code EJ indicates timings made with the Jack Ells Automatic Photoelectric Telescope operated by M Gough, R D Pickard and J Barry.

A colon (':') following a timing indicates that it is uncertain either because the observations show large scatter or else because the rising or fading limb was poorly covered.

The O-C values in the table below are relative to the linear elements given in the 4th Edition of the GCVS.

Observed Minima:

Star	Epoch	JD Hel (244...)	O-C (d)	No	Observer	Notes
AN And	3970	8877.3955	-0.0095	52	EJ(pe)	
	4104.5	9310.4268:	-0.0069:	84	EJ(pe)	
AR Aur	2678	9309.4408	-0.0678	78	EJ(pe)	
44i Boo	33246.5	8756.4681	0.0365	54	EJ(pe)	
	33515.5	8828.5103	0.0362	68	EJ(pe)	
RZ Cas	4754	8882.5206	0.0101	43	EJ(pe)	
	5125.5	9326.5530	0.0082	86	EJ(pe)	
TV Cas	2386	8927.3180:	0.0115:	7	EJ(pe)	
YZ Cas	4497	8822.5201	-0.0080	52	EJ(pe)	
CW Cep	4966	8926.3323	-0.0265	46	EJ(pe)	
GK Cep	10828	8831.4746	0.0603	70	EJ(pe)	
NN Cep	2334	9311.492:	0.005:	60	EJ(pe)	

V1143 Cyg	928	9303.3787	-0.0129	23	WEK(pe)
V1425 Cyg	6817	8938.4717	0.0055	84	EJ(pe)
V1898 Cyg	1115	9332.2516:	-0.0729:	67	EJ(pe)
AI Dra	4813	9061.5355	0.0138	77	EJ(pe)
AR Lac	3639	8810.4756:	-0.0725:	71	EJ(pe)
SZ Psc	3324	8923.561:	-0.571:	84	2(pe) *
	3414	9280.4823:	-0.5709:	80	EJ(pe)
HU Tau	3714.5	8913.4650	0.0179	60	EJ(pe)
	3734	8953.5579	0.0129	43	EJ(pe)
W UMa	9893	9066.3938	-0.0204	59	EJ(pe)
	9893.5	9066.5610	-0.0200	62	EJ(pe)
AW UMa	9955	9032.3486:	-0.0069	25	EJ(pe)
	10044	9071.3879	-0.0145	69	EJ(pe)

Notes:

SZ Psc. The timing on 8923 is a composite timing derived from 49 observations by EJ on 8923, 33 by EJ on 8919, 1 by IS on 8812 and 1 by IS on 8844.

Observation Totals for 1993
From data compiled by Melvyn Taylor

As of the end of June 1994, the grand total of observations for 1993 stood at 30426. This excludes observations of eclipsing binaries, which will be dealt with separately, and observations from a few observers who had not yet sent them in.

The leading observer in 1993 was again Gary Poyner with well over 3000, followed by Shaun Albrighton, John Day, Mike Gainsford and Bill Worraker, each with over 2000, Tony Markham and Melvyn Taylor, with over 1500, and Len Brundle with over 1000. About 49 observers contributed.

The following lists give the numbers of observations made of each of the stars on the Telescopic and Binocular Programs. The layout has been changed from that used in previous years. The stars are grouped according to their variability type. This should make it easier for observers to judge which stars are under-observed and so help them in selecting stars to add to their personal observing programs. The columns show, from left to right, the star name, the variability type, the number of observations, and the program under which the star is listed ('T' - Telescopic, 'B' - Binocular). The totals listed here were compiled before all of the observations had been received and so may not add up to exactly the grand total given above.

Dwarf Novae

SS	Cyg	UGSS	357	T
Z	Cam	UGZ	297	T
RX	And	UGZ	286	T
UV	Per	UGSS	266	T
TZ	Per	UGZ	260	T
AY	Lyr	UGSU	244	T
AB	Dra	UGZ	233	T
AH	Her	UGZ	232	T
SU	UMa	UGSU	227	T
CH	UMa	UGSS	205	T
WZ	Sge	UGSU+E	200	T
SW	UMa	UGSS	186	T
RU	Peg	UGSS	180	T
U	Gem	UGSS+E	177	T
SS	Aur	UGSS	175	T
IR	Gem	UGSU	172	T
X	Leo	UGSS	134	T
CZ	Ori	UGSS	110	T
CN	Ori	UGZ	84	T
UU	Aql	UGSS	81	T
VY	Aqr	UGSU	61	T

Novae

T	CrB	Nr	379	T
N1992	Cyg	N	219	T
PU	Vul	Nc	185	T
GK	Per	Na+Xp	168	T
RS	Oph	Nr	165	T
HR	Del	Nb	129	T
N1993	Aql	N	121	T
AG	Peg	Nc	116	B
N1993	Cas	N	97	T
HM	Sge	Nc+M	70	T
V603	Aql	Na+E+X	69	T
V1329	Cyg	E+Nc	49	T
V1016	Cyg	Nc+M	42	T

R Coronae Borealis Stars

R	CrB	RCB	1118	T
XX	Cam	RCB?	229	T
UV	Cas	RCB	214	T
SU	Tau	RCB	177	T
V482	Cyg	RCB	162	T
SV	Sge	RCB	158	T

Blue Irregular Variables

X	Per	GCas+Xp	295	B
Gamma	Cas	GCas	241	T
BU	Tau	GCas	115	B
AB	Aur	Ina	96	B
P	Cyg	SDor	68	B
BN	Gem	GCas	58	B
V1294	Aql	GCas	58	B
V2048	Oph	GCas+UV?	43	B

Symbiotic Variables

CH	Cyg	ZAnd+SR	440	B
EG	And	ZAnd	149	B
CI	Cyg	EA+ZAnd	135	T
AG	Dra	ZAnd	115	T
AX	Per	ZAnd	106	T
BF	Cyg	ZAnd	97	T
Z	And	ZAnd	90	T
YY	Her	ZAnd	74	T
V443	Her	ZAnd	69	T
TX	CVn	ZAnd	60	T
NQ	Gem	SR+ZAnd	60	B
UV	Aur	M	58	T
QW	Sge	ZAnd	57	T
FG	Ser	ZAnd	27	T
BX	Mon	Unique	18	T
FR	Sct	ZAnd	17	T
SS	Lep	ZAnd	11	B
Hen1341	Oph	ZAnd?	1	T
RW	Hya	ZAnd	1	T
AS245	Sgr	ZAnd?	1	T
AS289	Ser	ZAnd?	0	T

Extragalactic Objects

SN1993J	UMa	SN	199	T
Mark421	UMa	BLLac	143	T
NGC4151	CVn	Gal	90	T
3C273	Vir	QSO	48	T

Mira Stars

Chi	Cyg	M	142	T
V	Cyg	M	96	T
R	Cyg	M	95	T
U	Ori	M	92	T
V	CrB	M	85	T
W	CrB	M	82	T
Omicron	Cet	M	80	T
S	Cyg	M	76	T
W	And	M	72	T
X	Oph	M	71	B
T	UMa	M	70	T
SU	Lac	M	68	T
S	CrB	M	67	T
R	And	M	66	T
V	Cam	M	60	T
X	Cam	M	57	T
R	Aql	M	56	T
RU	Her	M	53	T
R	Ser	M	51	T
RW	And	M	47	T
SS	Her	M	40	T
U	CVn	M	30	T
W	Lyn	M	27	T
T	Dra	M	23	T
S	Cas	M	22	T
T	Cas	M	22	T
R	Hya	M	20	T

Mira Stars (cont)

R Aqr	M	19	T
X Lyn	M	17	T
R Com	M	17	T
RS Leo	M	16	T
SU Cnc	M	16	T
RT CVn	M	0	T

RV Tauri Stars

R Sct	RVa	464	T
AC Her	RVa	284	T
U Mon	RVb	170	T
V Vul	RVa	54	T
RV Tau	RVb	43	T

Semiregular Variables

W Cyg	SRb	357	T
V465 Cas	SRb	284	B
AF Cyg	SRb	272	B
Rho Cas	SRd	255	T
Mu Cep	SRc	245	B
EU Del	SRb	219	B
RY Dra	SRb?	206	B
V CVn	SRa	203	B
UU Aur	SRb	196	B
U Del	SRb	195	B
AR Cep	SRb	189	B
R Lyr	SRb	182	B
RY UMa	SRb	178	B
X Her	SRb	172	B
UX Dra	SRa?	168	B
RS Cnc	SRc	163	B
VW UMa	SR	158	B
VY UMa	Lb	155	B
OP Her	SRb	154	B
Z UMa	SRb	147	B
V973 Cyg	SRb	147	B
V UMi	SRb	146	B
g Her	SRb	134	B
TU CVn	SRb	125	B
X Cnc	SRb	121	B
Y CVn	SRb	118	B
RU Cep	SRd	116	B
RW Cep	SRd	115	B
V450 Aql	SRb	113	B
W Cep	SRc	110	B
V1293 Aql	SRb	108	B
TX Dra	SRb	106	B
AH Dra	SRb	105	B
ST UMa	SRb	102	B
XY Lyr	Lc	101	B
V460 Cyg	SRb	91	B
BQ Gem	SRb	82	B
AT Dra	Lb	81	B
Y Lyn	SRc	79	B
WZ Cas	SRb	79	B
SV Lyn	SRb	77	B
VW Dra	SRd?	75	B
GO Peg	Lb	75	B
V Aql	SRb	75	B
UW Her	SRb	74	B
SS Cep	SRb	73	B
U Cam	SRb	73	B
IQ Her	SRb	73	B
BU Gem	Lc	72	B
ST Cam	SRb	72	B
CK Ori	SR?	71	B
TV UMa	SRb	71	B
S Per	SRc	68	T
WY Gem	Lc+E?	67	B
RX Boo	SRb	67	B
U Boo	SRb	64	T
V391 Cas	Lb	64	B
IS Gem	SRc	61	B
W Boo	SRb?	61	B
Y Tau	SRb	61	B
TV Gem	SRc	60	B
BQ Ori	SR	57	B
ST Her	SRb	56	B
RS Per	SRc	55	T
BU Per	SRc	55	T
UV Cam	SRb	54	B
ZZ Cam	Lb	54	B
UW Dra	Lb	54	B
TU Gem	SRb	54	B
RR CrB	SRb	54	B
SW CrB	SRb	53	B
SX Lac	SRd	53	B
Psi1 Aur	Lc	53	B
SU Per	SRc	51	B
PR Per	Lc	51	B
AD Per	SRc	51	B
V Boo	SRa	50	T
U LMi	SRa	49	T
W Ori	SRb	44	B
RX Lep	SRb	44	B
KK Per	Lc	43	B
RY Leo	SRb	41	T
UW Aql	Lc	41	T
FZ Cep	SR	41	B
TT Tau	SRb	40	B
V393 Cas	SRa	40	B
BL Ori	Lb	40	B
RY Cam	SRb	39	B
RU Cyg	SRa	39	B
Z Psc	SRb	36	B
SS Vir	SRa	36	B
BI Cyg	Lc	35	T
BC Cyg	SRc	35	T
S Sct	SRb	34	B
DW Gem	Lb	32	B
TV Psc	SR	32	B
W Tri	SRc	32	B
RV Boo	SRb	32	B
RW Boo	SRb	31	B
DM Cep	Lb	30	B
BZ And	Lb	28	B

Semiregular Variables (cont)

V566 Her	SRb	27	B
AQ And	SR	27	B
SW Vir	SRb	27	B
V Ari	SRb	26	B
RV Mon	SRb	25	B
CE Tau	SRc	24	B
SX Mon	SR	23	B
W CMa	Lb	23	B
TX Psc	Lb	21	B
RT Cnc	SRb	19	B
W LMi	SRd	16	T
SU And	Lc	16	B
BK Vir	SRb	14	B
SX Her	SRd	11	B
RS And	SRa	10	B
TZ And	SRb	9	B
TT Cyg	SRb	6	B
U Hya	SRb	3	B
RW Vir	Lb	3	B
RX Vir	SRd?	2	B
RV Cyg	SRb	1	B

DY Per. A new RCB star?

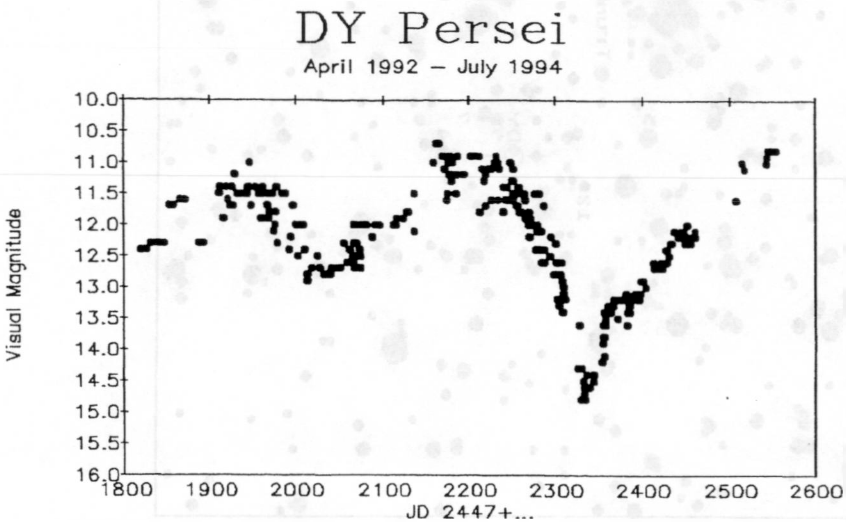
DY Per was first brought to our attention in 1992 by Dr Andrejs Alksnis of Latvia, who made a request (through Guy Hurst and 'TA') for observations in order to monitor the stars irregular light cycle.

The light variations are rather interesting. The star displays two distinct patterns. One, a long period cyclic variation of some 792d with an amplitude of 1.3V, and secondly deep fades with amplitudes in excess of four magnitudes. Four of these deep fades have been observed since 1975, the most recent occurring during 1992-3. The three prior to the most recent were examined from patrol plates, and were extremely difficult to reduce an accurate amplitude from due to the presence of a close 13.8 companion star located about 15 arcsec WSW from DY Per. The image would have undoubtedly been merged on the Sonnerberg patrol plates measured by Alksnis, and the magnitude greatly overestimated while DY Per was near minimum light. As far as I am aware, this recent decline is the first to have been observed visually.

Unusually for a carbon star the colour has been seen to get bluer whilst the star is faint. This is thought to be caused by the presence of a faint blue companion which dominates the blue light when at or near minimum light, although observation has yet to confirm this. The spectral class for DY Per is however R8, which has been recognised in RCB stars before.

The field for DY Per lies very close to the open cluster Trumpler 2, and is very easy to locate. The presence of the cluster being a bonus for the observer. As mentioned above, the proximity of a close 13.8 mag star makes observation difficult when faint. It is therefore recommended that when observing at this stage in it's light cycle, a note stating whether both stars have been seen should accompany the observation. The 'TA' charts included here were created by Guy Hurst from GSC downloads.

Observations of DY Per are still required by Dr Alksnis and his colleagues. At the moment I am storing observations in a database, and reporting to Guy Hurst monthly, who in turn passes them on to Latvia. The visual plot accompanying this article was produced from 317 visual observations which were reported to me by the following observers. Two thirds of these observations are BAAVSS.



BAAVSS:	John Day, Gary Poyner, Bill Worraker
VVS (Belgium)	Tonny Vanmunster
VSOLJ (Japan)	M. Nakatani, S. Takahashi, M. Koshiro

Also M. Westlund (Swe) & J. Pietz (Ger)

If any VSS observer wants to add DY Per to their observing programme, (or already observes it) I would be very happy to hear from them.

Considering the rarity of RCB stars in the night sky, DY Per is obviously an important object in need of further close monitoring, and one in which VSS observers can take an active role in proving or disproving it's suspected RCB nature. Maybe it will warrant inclusion into the BAAVSS main programme sometime in the near future.

Gary Poyner

Ref:

Alksnis & Jumike. Light variations of the carbon star DY Per. Russian publication.

DY Per b

02h 31.7m +55 56' (1950)

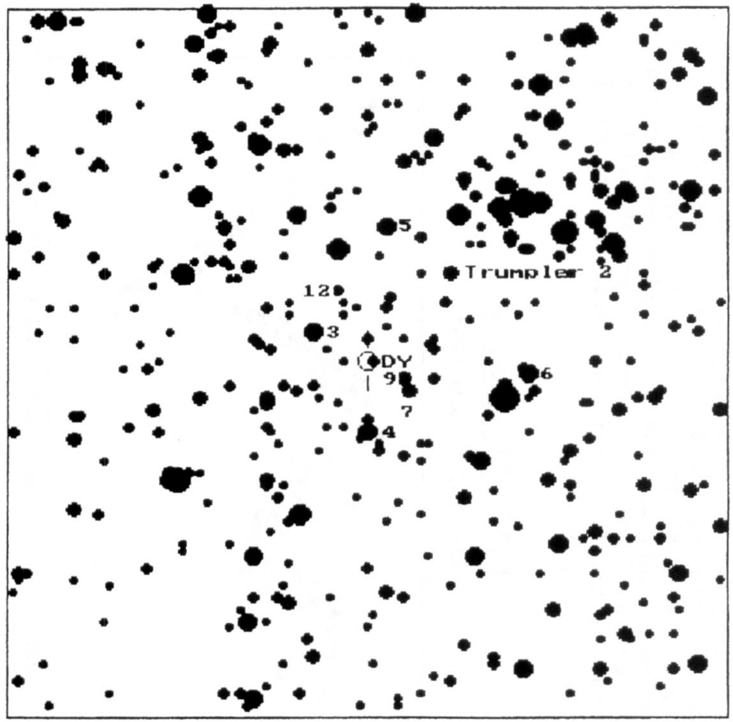
Range: 10.4 - 15.4V

Chart size: 60' S at top

3	9.56
4	9.68
5	10.09
6	10.42
7	11.07
9	11.18
12	11.68

Seq: TA920424

Carbon Star



DY Per c

Carbon Star

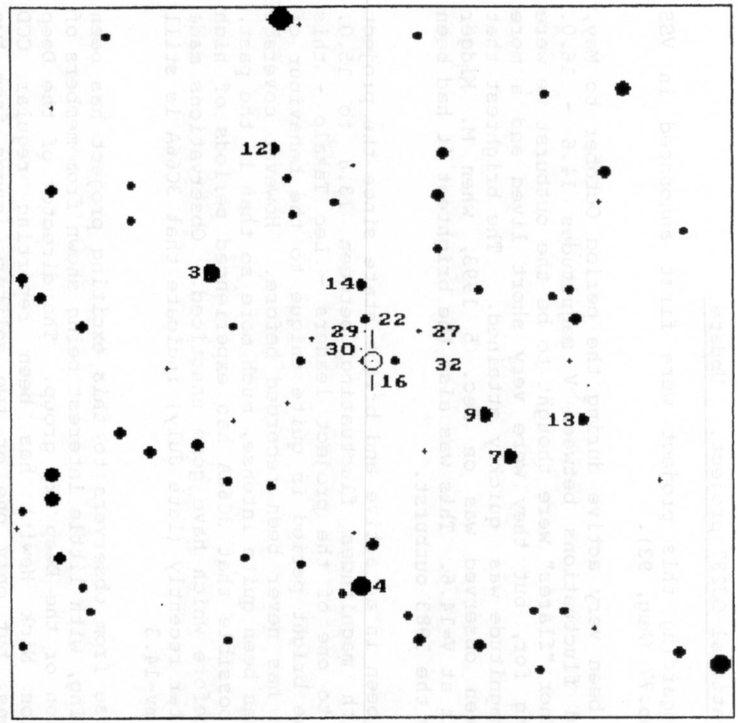
02h 31.7m +55 56′ (1950)

Range: 10.4 - 15.4V

Chart size: 20′ S at top

3	9.56
4	9.68
7	11.07
9	11.18
12	11.68
13	11.88
14	12.10
16	12.56
22	13.44
27	14.25
29	14.54
30	15.08
32	16.04

Seq: TA930207



The International OJ287 project. Update.

Details regarding this project were first announced in VSS circular No.77 (Aug, 93).

OJ287 has been very active during the period October to May, with rapid fluctuations between V magnitudes 14.6 - 16.0. Several minor "flares" were thought to be the outburst we were all waiting for, but they were very short lived and a more "normal" magnitude was quickly attained. The brightest that it has been observed was on Dec. 5 1993, when M. Kidger recorded it at V=14.6. This was also the brightest it had been seen since the 1983 outburst.

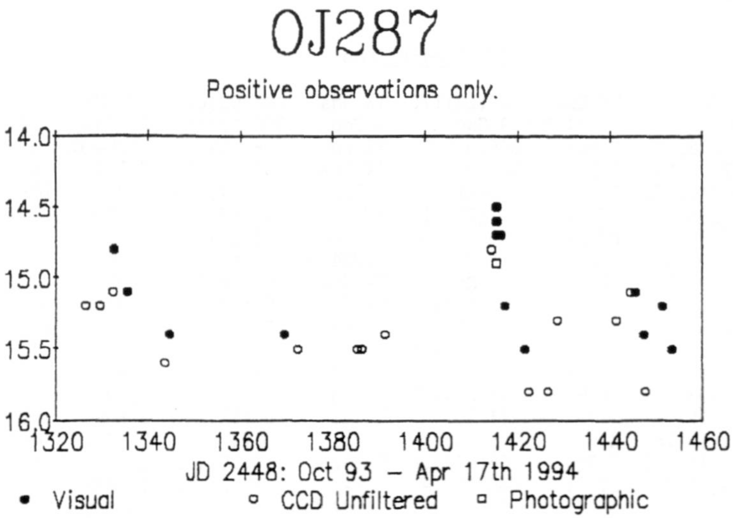
3C66A has been in an active and bright state since the project began, with magnitudes fluctuating between 13.8 to 15.0. According to one of the project leaders - Leo Takalo - this long active bright period is quite unique to the behaviour of 3C66A, and has never been recorded before. However coverage recently has been quite intense, much more so than in the past, so it is possible that 3C66A has experienced periods of high activity before which have gone unnoticed. Observations made by the writer recently (late July) indicate that 3C66A is still bright at mv=14.3

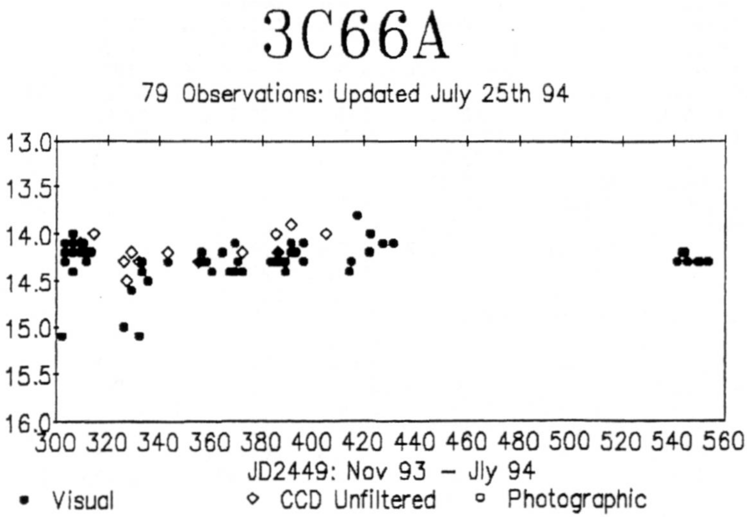
The response from observers to this exciting project has been disappointing, with little interest being shown from members of this section or the Deep Sky group. The director of the Deep Sky Section Nick Hewitt has been reporting regular CCD observations, but only one or two solitary images from two other observers - Strange & Arbour have been received. Also only one photographic observation has been received. What makes this so annoying is that the DSS run an Active Galaxy programme! By far the most prolific observations have been reported from VSS visual observers Day, Hurst, Poyner & Worraker. Observations have also been received from Europe & Scandinavia. I am sure that more members of this section could provide valuable observations of these two objects. OJ287 is, I know quite faint, but when in outburst it can reach magnitude 12.0! 3C66A is certainly within the range of a 25cm telescope, and even a 20cm will show it under the most ideal of conditions.

If you feel that you would like to take part in this project please let me know. It is very important that observations are reported to me regularly. I usually e-mail reports through Starlink direct to Finland on a weekly basis, where they are entered into the ever growing database. It must be stressed that observations which are made and are not reported to me will not be included in this database, and are of little value to this current project.

The two plots displayed here show how both objects have been behaving during the past months. For OJ287, only positive observations have been plotted.

Gary Poyner
67 Ellerton Rd
Kingstanding
Birmingham B44 OQE





Eclipsing Binary Predictions

The following predictions are calculated for an observer at 53 degrees north, 1.5 degrees west but should be usable for observers throughout the British Isles. The times of mid-eclipse appear in parentheses with the start and end times of visibility on either side. The times are hours GMAT, that is UT-12h. 'D' and 'L' are used to indicate where daylight and low altitude, respectively, prevent part of the eclipse from being visible. Charts for all of the stars included in these predictions (17 in all - see VSSC 80 for a list) are available from the Director at 10p each (please enclose a large SAE).

The Predictions

1994 Oct 1 Sat
- Z Dra D07(05)07
- Z Vul D07(08)13
- U Cep D07(11)16
- SS Cet L09(13)17D

1994 Oct 2 Sun
- U Sge D06(07)13
- SW Cyg D06(07)13
- RZ Cas D06(09)11
- RW Gem L10(06)12
- Z Dra 11(14)16

1994 Oct 3 Mon
- TW Dra D06(07)12
- Z Per D06(08)13
- ST Per 07(11)15
- RZ Cas 11(13)16
- RW Tau 13(17)17D
- Z Vul 14(19)14L
- TX UMa 16(21)17D

1994 Oct 4 Tue
- S Equ D06(12)13L
- SS Cet L09(12)17
- Y Psc 11(16)16L
- RZ Cas 16(18)17D

1994 Oct 5 Wed
- Z Dra D06(07)09
- U Sge 10(16)13L

1994 Oct 6 Thu
- ST Per D06(03)07
- TW Dra D06(03)08
- Z Vul D06(06)11
- Z Per D06(10)14
- U Cep D06(11)16
- RW Tau L07(12)17
- Z Dra 13(15)17D
- SW Cyg 15(21)17D
- X Tri 17(19)17D

1994 Oct 7 Fri
- SS Cet L09(12)16
- X Tri 16(19)17D

1994 Oct 8 Sat
- RZ Cas D06(08)10
- Y Psc D06(10)15
- Z Vul 11(17)13L
- ST Per 14(18)17D
- X Tri 15(18)17D
- TW Dra 17(22)17D

1994 Oct 9 Sun
- U Sge D06(01)07
- Z Dra D06(08)11
- Z Per 06(11)16
- RW Tau L07(06)11
- RZ Cas 10(13)15
- X Tri 15(17)17D

1994 Oct 10 Mon
- SS Cet L08(11)16
- X Tri 14(17)17D
- Z Dra 15(17)17D
- RZ Cas 15(17)17D
- RW Gem 16(21)17D

1994 Oct 11 Tue
- Z Vul D06(04)09
- S Equ D06(08)13L
- ST Per D06(10)14
- SW Cyg D06(11)17
- U Cep D06(11)15
- TW Dra 12(17)17D
- X Tri 13(16)17D

1994 Oct 12 Wed
- Y Psc D06(05)09
- U Sge D06(10)12L
- Z Per 08(12)17
- X Tri 13(15)17D

1994 Oct 13 Thu
- Z Dra 08(10)13
- SS Cet L08(10)15
- Z Vul 09(15)13L
- X Tri 12(14)17
- RW Gem 12(18)17D

1994 Oct 14 Fri
- RZ Cas D06(07)10
- TW Dra 08(13)17D
- X Tri 11(14)16
- RW Tau 14(19)17D
- Z Dra 16(19)17D

1994 Oct 15 Sat
- Z Per 09(14)17D
- RZ Cas 10(12)15
- X Tri 11(13)16

1994 Oct 16 Sun
- SW Cyg D06(00)06
- Z Vul D06(02)07
- TX UMa D06(03)07
- U Cep D06(10)15
- SS Cet L08(10)14
- RW Gem L09(14)17D
- X Tri 10(12)15
- ST Per 13(17)17D
- RZ Cas 14(17)17D

1994 Oct 17 Mon
- TW Dra D06(08)13
- RW Tau 09(14)17D
- X Tri 09(12)14
- Z Dra 10(12)14

1994 Oct 18 Tue
- S Equ D06(05)11
- Z Vul 07(12)13L
- X Tri 09(11)14
- Z Per 10(15)17D
- U Cep 17(22)17D

1994 Oct 19 Wed
- TX UMa D06(04)07L
- U Sge D06(05)10
- ST Per D06(08)12
- SS Cet L08(09)14
- X Tri 08(10)13
- RW Gem L09(11)16
- Y Psc 13(17)15L

1994 Oct 20 Thu
- TW Dra D06(03)08
- Z Dra D06(05)07
- RZ Cas D06(07)09
- RW Tau L07(08)13
- X Tri 07(10)12
- SW Cyg 08(14)17L

1994 Oct 21 Fri
- U Cep D06(10)15
- X Tri 07(09)11
- RZ Cas 09(12)14
- S Equ 11(16)12L
- Z Dra 11(14)16
- Z Per 12(16)18D

1994 Oct 22 Sat
- TX UMa D06(06)07L
- X Tri 06(08)11
- SS Cet L08(08)13
- U Sge 08(14)12L
- RW Gem L09(08)13
- TX UMa L10(06)10
- RZ Cas 14(16)18D

1994 Oct 23 Sun
- X Tri D06(08)10
- Z Vul D06(10)12L
- RW Tau L06(03)07
- Y Psc 07(12)15L
- U Cep 17(22)18D

1994 Oct 24 Mon
- Z Dra D06(07)09
- X Tri D06(07)09
- ST Per 11(16)18D
- Z Per 13(18)18D

1994 Oct 25 Tue
- S Equ D06(02)08
- SW Cyg D06(04)10
- X Tri D06(06)09
- TX UMa D06(07)07L
- SS Cet L07(08)12
- RW Gem L09(05)10
- TX UMa L10(07)12
- Z Dra 13(15)18D
- TW Dra 13(18)18D
- RW Tau 16(21)18D

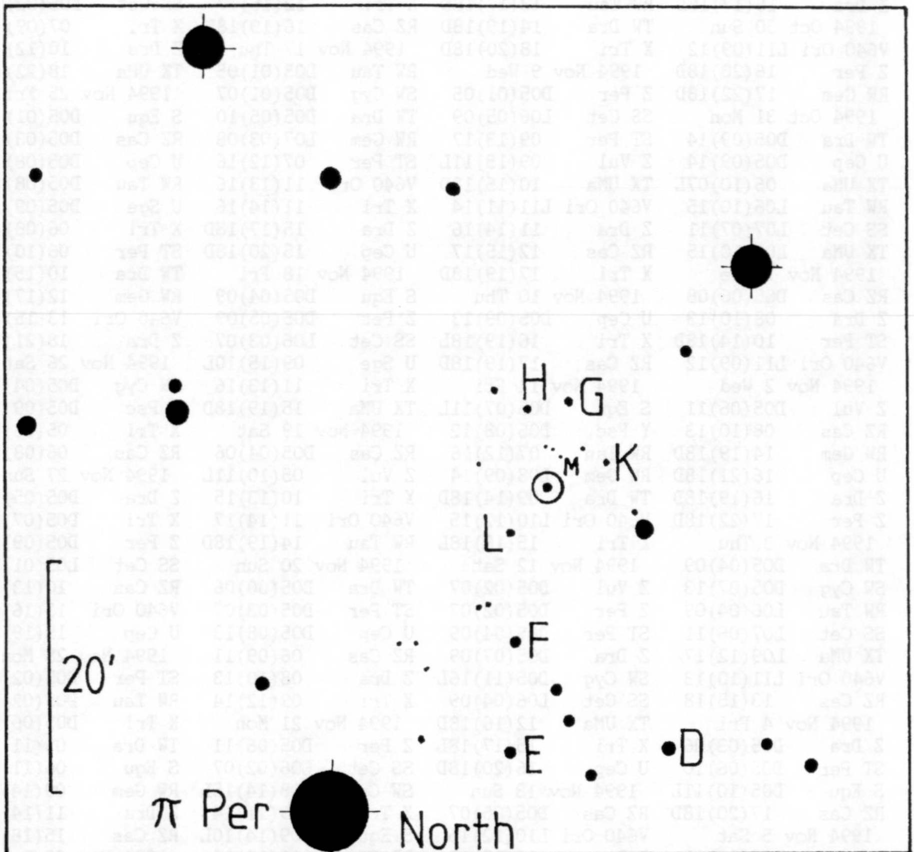
1994 Oct 26 Wed
- X Tri D06(06)08
- RZ Cas D06(06)09
- U Cep D06(10)14

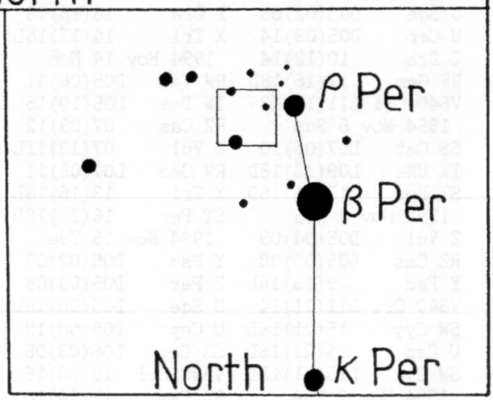
1994 Oct 27 Thu
- X Tri D06(05)07
- Y Psc D06(06)11
- ST Per D06(07)11
- RZ Cas 09(11)13
- Z Per 14(19)18D

1994 Oct 28 Fri
- X Tri D06(04)07
- Z Vul D06(08)12L
- TX UMa D06(09)07L
- Z Dra 06(09)11
- SS Cet L07(07)12
- S Equ 07(13)12L
- TW Dra 08(14)18D
- TX UMa L09(09)14
- RW Tau 11(15)18D
- RZ Cas 13(16)18D
- U Cep 17(21)18D

1994 Oct 29 Sat	
X Tri	D06(04)06
U Sge	D06(08)11L
SW Cyg	12(18)17L
Z Dra	15(17)18D
1994 Oct 30 Sun	
V640 Ori	L11(09)12
Z Per	16(20)18D
RW Gem	17(22)18D
1994 Oct 31 Mon	
TW Dra	D05(09)14
U Cep	D05(09)14
TX UMa	06(10)07L
RW Tau	L06(10)15
SS Cet	L07(07)11
TX UMa	L09(10)15
1994 Nov 1 Tue	
RZ Cas	D05(06)08
Z Dra	08(10)13
ST Per	10(14)18D
V640 Ori	L11(09)12
1994 Nov 2 Wed	
Z Vul	D05(06)11
RZ Cas	08(10)13
RW Gem	14(19)18D
U Cep	16(21)18D
Z Dra	16(19)18D
Z Per	17(22)18D
1994 Nov 3 Thu	
TW Dra	D05(04)09
SW Cyg	D05(07)13
RW Tau	L06(04)09
SS Cet	L07(06)11
TX UMa	L09(12)17
V640 Ori	L11(10)13
RZ Cas	13(15)18
1994 Nov 4 Fri	
Z Dra	D05(03)06
ST Per	D05(06)10
S Equ	D05(10)11L
RZ Cas	17(20)18D
1994 Nov 5 Sat	
U Sge	D05(02)08
U Cep	D05(09)14
Z Dra	10(12)14
RW Gem	11(16)18D
V640 Ori	L11(10)13
1994 Nov 6 Sun	
SS Cet	L07(05)10
TX UMa	L09(13)18D
ST Per	17(21)18D
1994 Nov 7 Mon	
Z Vul	D05(04)09
RZ Cas	D05(05)08
Y Psc	09(13)14L
V640 Ori	L11(11)14
SW Cyg	15(21)16L
U Cep	16(21)18D
SW Cyg	L18(21)18D
1994 Nov 8 Tue	
Z Dra	D05(05)08
U Sge	06(11)11L
RZ Cas	07(10)12
RW Gem	L08(13)18
RW Tau	13(17)18D
TW Dra	14(19)18D
X Tri	18(20)18D
1994 Nov 9 Wed	
Z Per	D05(01)05
SS Cet	L06(05)09
ST Per	09(13)17
Z Vul	09(15)11L
TX UMa	10(15)18D
V640 Ori	L11(11)14
Z Dra	11(14)16
RZ Cas	12(15)17
X Tri	17(19)18D
1994 Nov 10 Thu	
U Cep	D05(09)13
X Tri	16(19)18L
RZ Cas	17(19)18D
1994 Nov 11 Fri	
S Equ	D05(07)11L
Y Psc	D05(08)12
RW Tau	07(12)16
RW Gem	L08(09)14
TW Dra	09(14)18D
V640 Ori	L10(12)15
X Tri	15(18)18L
1994 Nov 12 Sat	
Z Vul	D05(02)07
Z Per	D05(02)07
ST Per	D05(04)09
Z Dra	D05(07)09
SW Cyg	D05(11)16L
SS Cet	L06(04)09
TX UMa	12(16)18D
X Tri	15(17)18L
U Cep	16(20)18D
1994 Nov 13 Sun	
RZ Cas	D05(05)07
V640 Ori	L10(12)15
Z Dra	13(15)18
X Tri	14(17)18L
1994 Nov 14 Mon	
RW Tau	D05(06)11
TW Dra	D05(10)15
RZ Cas	07(09)12
Z Vul	07(13)11L
RW Gem	L07(06)11
X Tri	13(16)18L
ST Per	16(20)18D
1994 Nov 15 Tue	
Y Psc	D05(02)07
Z Per	D05(03)08
U Sge	D05(06)10L
U Cep	D05(08)13
SS Cet	L06(03)08
V640 Ori	10(13)16
RZ Cas	12(14)16
X Tri	13(15)18L
TX UMa	13(18)18D
1994 Nov 16 Wed	
Z Dra	06(09)11
X Tri	12(15)17
RZ Cas	16(19)18D
1994 Nov 17 Thu	
RW Tau	D05(01)05
SW Cyg	D05(01)07
TW Dra	D05(05)10
RW Gem	L07(03)08
ST Per	07(12)16
V640 Ori	11(13)16
X Tri	11(14)16
Z Dra	15(17)18D
U Cep	15(20)18D
1994 Nov 18 Fri	
S Equ	D05(04)09
Z Per	D05(05)09
SS Cet	L06(03)07
U Sge	09(15)10L
X Tri	11(13)16
TX UMa	15(19)18D
1994 Nov 19 Sat	
RZ Cas	D05(04)06
Z Vul	05(10)11L
X Tri	10(13)15
V640 Ori	11(14)17
RW Tau	14(19)18D
1994 Nov 20 Sun	
TW Dra	D05(00)06
ST Per	D05(03)07
U Cep	D05(08)13
RZ Cas	06(09)11
Z Dra	08(10)13
X Tri	09(12)14
1994 Nov 21 Mon	
Z Per	D05(06)11
SS Cet	L06(02)07
SW Cyg	08(14)15L
X Tri	09(11)14
S Equ	09(14)10L
RZ Cas	11(13)16
V640 Ori	12(14)17
TX UMa	16(21)18D
Z Dra	17(19)18D
SW Cyg	L17(14)18D
1994 Nov 22 Tue	
U Sge	D05(00)06
X Tri	08(10)13
RW Tau	09(13)18
Y Psc	10(15)13L
ST Per	15(19)18D
TW Dra	15(20)18D
U Cep	15(20)18D
RW Gem	15(20)18D
RZ Cas	16(18)18D
1994 Nov 23 Wed	
Z Dra	D05(04)06
X Tri	07(10)12
V640 Ori	12(15)17
1994 Nov 24 Thu	
Z Per	D05(07)12
Z Vul	D05(08)10L
SS Cet	L05(02)06
X Tri	07(09)12
Z Dra	10(12)14
TX UMa	18(22)18D
1994 Nov 25 Fri	
S Equ	D05(01)06
RZ Cas	D05(03)06
U Cep	D05(08)12
RW Tau	D05(08)13
U Sge	D05(09)10L
X Tri	06(08)11
ST Per	06(10)14
TW Dra	10(15)18D
RW Gem	12(17)18D
V640 Ori	13(15)17L
Z Dra	18(21)18D
1994 Nov 26 Sat	
SW Cyg	D05(04)10
Y Psc	D05(09)13L
X Tri	05(08)10
RZ Cas	06(08)11
1994 Nov 27 Sun	
Z Dra	D05(05)08
X Tri	D05(07)10
Z Per	D05(09)13
SS Cet	L05(01)06
RZ Cas	10(13)15
V640 Ori	13(16)17L
U Cep	15(19)19D
1994 Nov 28 Mon	
ST Per	D05(02)06
RW Tau	D05(02)07
X Tri	D05(06)09
TW Dra	05(11)16
S Equ	06(11)10L
RW Gem	09(14)19D
Z Dra	11(14)16
RZ Cas	15(18)19D
1994 Nov 29 Tue	
X Tri	D05(06)08
Z Vul	D05(06)10L
V640 Ori	14(16)17L
1994 Nov 30 Wed	
Y Psc	D05(04)08
X Tri	D05(05)07
U Cep	D05(07)12
Z Per	05(10)15
SW Cyg	12(18)14L
ST Per	13(17)19D
RW Tau	16(21)19D
SW Cyg	L16(18)19D
1994 Dec 1 Thu	
RZ Cas	D05(03)05
X Tri	D05(04)07
TW Dra	D05(06)11
Z Dra	D05(07)09

ST PERSEI





<u>ST Per:</u> 9.52 (9.62) 11.40V
(Has 12th-mag companion at 11.6")
EA D = 8.3h d = 0.9h
Min = 2447958.359 +
2.648358xE (SAC 63)

(1950) 02h 56.9m +39° 00'
(2000) 03 00.1 +39 12

Preliminary Sequence:

D = 9.4	H = 10.7
E = 9.8	K = 10.8
F = 10.0	L = 11.1
G = 10.3	M = 11.6

T.Brelstaff 1994 Mar 12

RW Gem L06(11)16
V640 Ori 14(17)17L

1994 Dec 2 Fri

U Sge D05(03)09
X Tri D05(04)06
RZ Cas 05(08)10
Z Dra 13(16)18
U Cep 14(19)19D

1994 Dec 3 Sat

X Tri D05(03)05
ST Per D05(09)13
Z Per 07(11)16
RZ Cas 10(12)15
RW Tau 11(15)19L
V640 Ori 15(17)17L

1994 Dec 4 Sun

TW Dra D05(01)06
Z Vul D05(04)09
RW Gem L06(07)13
TX UMa L07(03)08
RZ Cas 15(17)19D

1994 Dec 5 Mon

U Cep D05(07)12
SW Cyg D05(08)14
S Equ D05(08)09L
Z Dra 06(09)11
U Sge 07(12)09L
V640 Ori 15(18)17L

1994 Dec 6 Tue

RW Tau 05(10)14
Z Per 08(13)18
Z Dra 15(17)19D
TW Dra 16(21)19D

1994 Dec 7 Wed

RW Gem L06(04)09
TX UMa L07(05)09
Y Psc 12(16)12L
U Cep 14(19)19D
V640 Ori 16(18)17L

1994 Dec 8 Thu

RZ Cas D05(07)09
ST Per 12(16)19L

1994 Dec 9 Fri

Z Vul D05(02)07
RW Tau D05(04)09
Z Dra 08(10)13
Z Per 09(14)19D
RZ Cas 09(12)14
TW Dra 11(16)19D
SW Cyg L16(21)19D
V640 Ori 16(19)17L

1994 Dec 10 Sat

U Cep D05(07)11
RW Gem L06(01)06
TX UMa L07(06)11
RZ Cas 14(16)19D
Z Dra 17(19)19D

1994 Dec 11 Sun

ST Per D05(08)12
Y Psc 06(11)12L
Z Vul 07(13)09L
RW Tau 18(23)18L
RZ Cas 19(21)19D

1994 Dec 12 Mon

Z Dra D05(04)06
S Equ D05(05)09L
U Sge D05(07)08L
TW Dra 06(11)16
Z Per 11(15)19L
U Cep 14(18)19D
RW Gem 17(22)19D

1994 Dec 13 Tue

TX UMa L06(08)12
Z Dra 10(12)15
Z Vul L19(24)19D

1994 Dec 14 Wed

Z Vul D05(00)05
RZ Cas D05(06)09
SW Cyg 05(11)14L
RW Tau 12(17)18L
SW Cyg L15(11)17
Z Dra 18(21)19D

1994 Dec 15 Thu

Y Psc D05(05)10
U Cep D05(06)11
TW Dra D05(07)12
RZ Cas 09(11)14
Z Per 12(17)19L
RW Gem 13(19)19D
X Tri 16(18)16L

1994 Dec 16 Fri

Z Dra D05(05)08
Z Vul 05(10)09L
TX UMa L06(09)14
ST Per 11(15)18L
RZ Cas 13(16)18
X Tri 15(17)16L

1994 Dec 17 Sat

RW Tau 07(12)16
Z Dra 12(14)16
U Cep 13(18)19D
X Tri 14(17)16L
RZ Cas 18(20)19D

1994 Dec 18 Sun

TW Dra D05(02)07
RW Gem 10(15)19D
Z Per 13(18)18L
X Tri 14(16)16L
Z Vul L18(21)19D
SW Cyg 19(25)19D

1994 Dec 19 Mon

SW Cyg D05(01)07
U Sge D05(01)07
S Equ D05(02)07
ST Per D05(06)10
TX UMa L06(11)15
X Tri 13(15)15L

1994 Dec 20 Tue

RZ Cas D05(06)08
U Cep D05(06)11
RW Tau D05(06)11
Z Dra D05(07)09
X Tri 12(15)15L
TW Dra 16(21)19D

1994 Dec 21 Wed

Z Vul D05(08)08L
RW Gem 07(12)17
RZ Cas 08(11)13
X Tri 11(14)15L
Z Dra 13(16)18
Z Per 15(19)18L
ST Per 18(22)18L

1994 Dec 22 Thu

U Sge D05(10)08L
S Equ 07(12)08L
TX UMa 07(12)17
X Tri 11(13)15L
RZ Cas 13(15)18
U Cep 13(18)19D

1994 Dec 23 Fri

RW Tau D05(00)05
SW Cyg 09(15)13L
X Tri 10(13)15
TW Dra 12(17)19D
SW Cyg L15(15)19D
RZ Cas 18(20)19D
Z Vul L18(19)19D

1994 Dec 24 Sat

RW Gem D05(09)14
Z Dra 06(09)11
ST Per 09(13)17
X Tri 09(12)14
Z Per 16(21)18L

1994 Dec 25 Sun

U Cep D05(06)10
X Tri 09(11)14
TX UMa 09(14)18
RW Tau 14(19)17L
Z Dra 15(17)19D
U Sge L18(19)19D

1994 Dec 26 Mon

RZ Cas D05(05)08
Z Vul D05(06)08L
TW Dra 07(12)17
Y Psc 08(12)11L
X Tri 08(11)13

1994 Dec 27 Tue

ST Per D05(05)09
RW Gem D05(06)11
X Tri 07(10)12
RZ Cas 08(10)12
U Cep 13(17)19D
Z Per 17(22)18L

1994 Dec 28 Wed

SW Cyg D05(04)10
X Tri 07(09)12
Z Dra 08(11)13
RW Tau 09(13)17L
TX UMa 10(15)19D
RZ Cas 12(15)17
Z Vul L18(17)19D

1994 Dec 29 Thu

U Sge D05(04)07L
TW Dra D05(08)13
S Equ D05(09)08L
X Tri 06(08)11
ST Per 16(20)17L
Z Dra 17(19)19D
RZ Cas 17(19)19D

1994 Dec 30 Fri

RW Gem D05(02)08
U Cep D05(05)10
Y Psc D05(07)10L
X Tri 05(08)10

1994 Dec 31 Sat

Z Dra D05(04)06
Z Vul D05(04)08L
X Tri D05(07)10
RW Tau D05(08)12
TX UMa 12(17)19D

Summaries of Information Bulletins on Variable Stars Nos 4007 to 4039

4007 *Photoelectric Intermediate Band Photometry of SN 1993J (Pressberger & Maitzen, 1994)*

4008 *A New Photometric Study of the Eclipsing Binary HD 21155 (Watson & Lloyd, 1994)* - See article elsewhere.

4009 *Times of Minima of Nine Eclipsing Binaries (Lacy & Fox, 1994)*

4010 *New Photometric Variable Stars in the Field of Southern Open Clusters (Piatti & Claria, 1994)*

4011 *Differential BV Photometry of the EW Variable NSV 7457 Her (Diethelm, 1994)* - Confirms conclusions of Vandenbroere (see IBVS 3946)

4012 *Photometry of KR Aurigae 1985-1988 (Popov et al, 1994)* - Prototype 'anti dwarf nova'. Mostly at mag 13 but two fades to below 15 recorded in 1985-86 and 1988

4013 *Discovery of 6.2-minute Oscillations in the Ap Sr Star HD 86181 (Kurtz & Martinez, 1994)* - Microvariability

4014 *Transient Period found in the BY Dra Variable OU Geminorum (McKenzie & Herr, 1994)*

4015 *EP And = NSV 598 (Manek, 1994)* - Mag 12 W UMa type eclipsing binary

4016 *EK Lac = NSV 14025 (Manek, 1994)* - Mag 12 eclipsing binary

4017 *IX And = NSV 372 (Manek, 1994)* - Mag 11 red irregular variable

4018 *Times of Minimum of Eclipsing Binaries in and near Centaurus (Wolf & Ratzlaff, 1994)*

4019 *Observations of a Symbiotic Nova in Sagittarius (Grebel et al, 1994)* - Discovered at mag 11 by Wakuda in March 1994. Spectrum similar to PU Vul 8 years after rise. Has been bright since March 1993 but not shown on plates going back to 1888. At min fainter than mag 21.5.

4020 *Positions of Variable Stars in Plaut's Field 1 (Antipin et al, 1994)* - 38 faint variables in Lib and Sco

4021 *Positions of Variable Stars in Plaut's Field 2 (Antipin et al, 1994)* - 86 faint variables in Oph

4022 *Further Confirmation that the Be Star 27 CMa is a Beta Cep Variable (Balona & Krisciunas, 1994)* - Microvariability

4023 *The Observations of Superhumps in T Leonis (Kunjaya et al, 1994)* - CCD light-curve obtained on 1994 Apr 4 during superoutburst of this SU UMa type dwarf nova. Shows 86.4 minute superhump period.

4024 *The Variability of HD 162211 = 87 Herculis between 1984 and 1993 (Skiff & Lockwood, 1994)* - K2III giant faded by 0.04V over several years

4025 *UBV Photometry of CH Cygni in 1993: Increasing Activity (Panov & Stegert, 1994)* - Range 7.69 - 8.06V in 1993. Discuss recent brightening in terms of triple star model with periods of 756 days and 14.5 years. Flickering of up to 0.14 in V on 1993 Aug 22 and 23.

4026 *FG Sge: Rise from Minimum (Simon, 1994)* - CCD photometry in 1992-1993. Derives mag of 12.81V for close companion star. Mags for FG alone range from 13.09 to 10.81V

4027 *Times of Minimum for some Eclipsing Binaries (Muyesseroglu & Selam, 1994)*

4028 *Further Photometry of Alpha Ori and Gamma Ori (Krisciunas, 1994)* - Alpha Ori mags range 0.58 - 0.89V in 1992 Nov to 1994 Apr. 61 nightly means for Gamma Ori since 1986 give 1.63V with a SD of 0.03V. Suggests Gamma is a small amplitude variable

4029 *IQ Cyg = V1290 Cyg (Manek, 1994)* - Carbon star Mira var, max 14.4p.

4030 *Positions for Stars in the Fields of UX Antliae and UW Centauri (Skiff, 1994)*

4031 *V1177 Cyg = NSV 12848 (Manek, 1994)* - Fast irregular variable (type Is), 15.4p max

4032 *The Variability of W134 (Koch et al, 1994)* - 12.5 mag pre-main sequence binary, member of NGC 2264, near S Mon, amp 0.35V

4033 *IO Delphini - Closely Related to WZ Sagittae? (Richter & Brauer, 1994)* - Poss UG star, max 15.5p in 1966 was found by Richter (1970). New search of Sonneberg confirms 1966 outburst and reveals poss one in 1940 at mag 18p. 1966 fade similar to WZ Sge stars

4034 *Near-infrared Photometry for the Be Star MX Per (Xiao-zhen Guo & Jun-jie Wang, 1994)* - Small amp Be star

4035 *Rapid Spectral Variations of the Be Star Gamma Cas (Xiao-zhen Guo et al, 1994)*

4036 *UBV Light Curve of RT And for 1992 (Dapergolas et al, 1994)* - Mag 9, RS CVn type eclipsing binary, light-curve that varies from year to year.

4037 *Improved Astrometry for Variable Stars (Morel, 1994)* - GSC identifications for 45 stars

4038 *Call for Observations of BH Cas (Metcalf, 1994)* - Mag 12.5p, found var by Beljawsky (1931), Kukarkin (1938) suggested W UMa type, Ahnert & Hoffmeister (1943) found not var. CCD photometry by Metcalf shows star is var.

4039 *Times of Light Maximum of VZ Cancri: 1994 Season (Arellano Ferro et al, 1994)* - Bright, large amp Delta Sct star, range 7.18 - 7.91V

Recent Papers on Variable Stars

The Discovery of Unusual Eclipses in the Light-curves of the Classical Novae DO Aquilae and V849 Ophiuchi (Shafter et al, Publ. Astron. Soc. Pacific, 105, 853-858, 1993) - CCD photometry reveals asymmetric eclipses, amp 0.5 mag and period 0.1677624d in DO Aql, 1 mag and 0.1727553d in V849 Oph, two old novae at minumum.

The Structure of the Remnant of HR Delphini (Slavin et al, Mon. Not. Roy. Astron. Soc, 266, L55-59, 1994) - Narrow-band CCD imaging. Remnant is bipolar in [OIII] and ringlike in Halpha/[NII] emission. Morphology may be result of common envelope phase (two stars in one atmosphere) during nova outburst. Derive distance of 1.1 +/-0.1 kpc.

Evolution of the Symbiotic Binary System AG Pegasi: the Slowest Classical Nova Eruption ever Recorded (Kenyon et al, Astron. J., 106, 1573-1598, 1993) - Analyse new and old photometric and spectroscopic data on this slow nova eruption (ongoing since 1850!). Recent changes in UV continuum and wind from the hot component has allowed a more detailed analysis. The system consists of a M3 giant (2.5 solar masses) and a white dwarf (0.6 solar masses), both embedded in a dense nebula which is ionised by radiation from the white dwarf. In 1850-1950 the white dwarf probably contracted at roughly constant luminosity but in the past 5 years it has faded by a factor of 4. This has resulted in a corresponding decrease in the ionisation of the nebula, the ionisation of the surface of the red giant and the strength of the stellar wind. The white dwarf may now be evolving along the constant radius part of the white dwarf cooling curve.

The Onset of the Wolf-Rayet Wind Outflow and the Nature of the Hot Component of the Symbiotic Nova PU Vulpeculae (Sion et al, Astron. J., 106, 2118-2125, 1993) - UV spectroscopy, find evidence for WR-like stellar wind from the bloated, contracting white dwarf component. Derive (for white dwarf) temp 25000 - 35000K, radius 5-30 solar radii (!), mass loss over 10^5 solar masses per year.

New Observations of SS Cygni: Detection of Total Eclipses (Voloshina & Lyutyi, Astron. Zhurnal, 37, 61-71, 1993) - UBV photometry reveals 0.05V-deep eclipses, P=0.2751302d, which are only present at min just before and just after outbursts. Probably eclipse of hot spot on accretion disc.

The Accretion Disk Limit Cycle Model: Toward an Understanding of the Long-term Behaviour of SS Cygni (Cannizo, Astrophys. J., 419, 318-336, 1993) - Investigates how secular changes in parameters to model influence properties of the light-curve such as the tendency for long and short maxima to alternate and the strong correlation between outburst recurrence time and the ratio of number of long to number of short outbursts. The latter was found using AAVSO observations.

Superhumps in Cataclysmic Variables: I T Leonis (Lem et al, Publ. Astron. Soc. Pacific, 105, 1120-1126, 1993) - Photometry of 1993 supermax. Find superhump period of 86.7 mins. Also analyse data from 1987 supermax when superhump period slowly decreased at -0.6 min per mag as the star faded (typical for SU UMa stars). Also report sudden short rise at end of supermax. This did not show superhumps - maybe a normal max triggered by the supermax?

The 1992 Outburst of the SU Ursae Majoris Type Dwarf Nova HV Virginis (Leibowitz et al, Astrophys. J., 421, 771-778, 1994) -Photometry on 14 nights during 1992 outburst. Superhump period decreased during fade (85 mins near max, 83 mins near min).

The Dwarf Nova CZ Orionis in Outburst (Spogli & Claudi, Astron. Astrophys., 281, 808-810, 1994) - Radial velocity variations indicate 0.2147d orbital period.

Long-term Variations in Dust Production in R Coronae Borealis (Clayton et al, Publ. Astron. Soc. Pacific, 105, 832-835, 1993) -Analyse AAVSO light-curve since 1853. Time of fades are random. Find semiperiodicity in alternation of times of high and low activity with timescale of a few years. This timescale agrees with that for variations in dust production show by IR photometry. Could be due to solar-cycle type variations in magnetic field or else to variations in the strength of the pulsations.

On the Absolute Magnitude of V482 Cygni, an R Coronae Borealis Star (Rao & Lambert, Publ. Astron. Soc. Pacific, 105, 574-577, 1993) - Has been suggested that this star is member of a quadruple including a K5III star. This would imply it was relatively close. However, Rao and Lambert find that radial velocities and interstellar line strengths indicate V482 is much more distant with Mv about -5.

The Optical and Near Infrared Variability of Eta Carinae: A Binary Luminous Blue Variable (van Genderen et al, Astron. Astrophys., 283, 98-110, 1994) - Analyse observations made over past few decades. Slow brightening 1935-1992 probably due to thinning of circumstellar clouds rather than change in the star. S Dor type outbursts of 0.1-0.2 mags seen at 1-3 year intervals. In UV, fades at intervals of 52.4d (or 104.8d). Some of these fades are missing so they could be due to eclipses by variable outer layers of the S Dor type star or else by clumpy circumstellar gas clouds. Other star may be an early B type main-sequence star.

Evidence for the Violent Ejection of Nebulae from Massive Stars (Hutsemekers, Astron. Astrophys., 281, L81-L84, 1994) - Systematic search for nebulae around luminous blue variables (LBVs, S Dor stars). Finds strong correlation between mass of nebula and luminosity of star. The fact that not all LBVs have nebulae suggests that the nebulae formed by episodic mass loss.

On the Binary Nature of Pleione (Luthardt & Menchenkova, Astron. Astrophys., 284, 118-124, 1994) - Find period of 35 years in radial velocity measures. This period matches interval between shell phases. Probably has highly eccentric orbit.

On the Nature of KY Cephei (Hudec & Dedoch, Astron. Astrophys., 282, 452-454, 1994) - Alleged flare star reaching mag 4 but search of 1664 Ondrejov and Sonneberg plates covering 1928-1992 shows no evidence for any flares.

No Fundamental Mode Pulsation in R Leonis? (Tuthill et al, Mon. Not. Roy. Astron. Soc., 266, 745-751, 1994) - Angular diameter measurement of photosphere gives 38 +/-2.5 mas (milliarcsecs). Derive radius of 495x Sun, over twice that predicted if the star was pulsating in fundamental mode. Therefore R Leo is probably pulsating in 1st or higher overtone mode.

Resolution of a Fossil Dust Shell around U Hydrae using Maximum Entropy Image Reconstruction (Waters et al, Astron. Astrophys., 281, L1-L4, 1994) - IRAS data shows detached ring of dust around U Hya. Age about 12000 years. Mass loss rate then must have been $5x10^{-6}$ solar masses per year (25x the present). Conclude that mass loss from carbon stars on the asymptotic giant branch seems to be variable on timescale similar to the thermal pulse timescale.

Structure of the Circumstellar Shell around the Carbon Star S Scuti (Yamamura et al, Publ. Astron. Soc. Japan, 45, 573-585, 1993) - Modelling of CO emmission indicates circumstellar shell formed by extremely high mass-loss phase (at least $1.3x10^{-4}$ solar masses per year) about 10000 years ago.

The Circumstellar Envelope of S Scuti (Groenewegen & de Jong, Astron. Astrophys., 282, 115-122, 1994) - CO emission from circumstellar shell formed in phase of high mass loss which lasted 350-1050 years and ended about 9000 years ago. Derive distance of 460pc and luminosity of 7050x Sun (M = -5).

V487 Cassiopeiae (HD 6474): A UU Herculis Variable in the Galactic Plane? (Zsoldos, Astron. Astrophys., 280, 177-180, 1993) - Small-amp yellow semiregular variable. At least 2 periods: 160.3d + 99.6d, one possibly with variable amp.

The Orbit of VW Cephei AB = Hei 7 (Heintz, Publ. Astron. Soc. Pacific, 105, 586-587, 1993) - Visual and astrometric data gives P = 29.0 years, a = 0.428", parallax = 0.038", masses = 0.8 and 0.3+0.6 solar masses.

WW Andromedae: Photometric and Spectroscopic Solutions for a Peculiar Eclipsing Binary (Olson & Etzel, Astron. J., 106, 759-767, 1993) - Suggest eclipse depth may have changed (as RW Per) . Early visual obs show total eclipses; modern PEP shows they are now only partial.

Further notes on suspected variables

Chris Lloyd

Following the publication of Tony Markham's notes (VSSC 78, 11) on an extensive list of suspected variables gleaned from *The Astronomer* I have consulted the professional literature database to see what further information was available. And generally there is very little. In most cases there is no real photometry, just a single photographic and photovisual magnitude, and an antique spectral classification. Nevertheless a few known variables have come to light and some of the more likely candidates identified.

The origins of suspected variables are extremely varied. Some have a long history, often as a comparison for a known variable, while for others the suspicion is based on a few or perhaps only one photographic or visual observation. In some cases there is no identification, a star apparently appears and is gone in a matter of hours. Some are based solely on a discordant catalogue magnitude. While many suspected variables are of course variable, some are not, and one way or another human error plays a large part in this. These stars can cause serious problems. They create doubt and confusion in comparison sequences and require considerable effort to demonstrate non-variability. Even after a star has been declared constant (at some level) it may still remain 'tainted'. So the discoverer of a suspected variable has a responsibility to the community to ensure the maximum of care and minimum of doubt. In the case of new, large amplitude variables this not such a problem but for the majority it requires independent verification and ultimately some photoelectric measurements. History demonstrates that this usually doesn't happen. While new variables can be reported, there is no mechanism for suspects. They usually leak into the collective consciousness and muddy the waters of variable star works for years. Most of the stars in this list have their origins two decades ago.

Variable stars usually start off as being suspected by someone so some of the stars here will be new variables. The best candidates have been identified but they are probably only suitable for photoelectric photometry. For most stars there is very little information to provide guidance one way or the other. A few of the stars do not have identifications but faint red candidates have been found close to the positions. With the large number of CCD's in amateur hands these would seem to be ideal targets for a few speculative exposures to see if there is any lower level activity. Use a filter!

The comments below follow the ordering of Tony Markham's list and should be read in conjunction with it. Not all of the stars in the original list have been reviewed.

BD+37 443 (And) = SAO 55157

Coord 1950.0 = 01 55 36.62 +38 15 18.5

Coord 2000.0 = 01 58 36.18 +38 29 52.5 K0III, V = 9.7, B–V = 1.2

Variability was reported in IBVS 2325 but the observers later recanted (IBVS 2494) and said it was based on a misidentification. There is no photoelectric photometry.

Suspect in Aquila 19 14 13 +04 39 10

Unremarkable star, GSC0472.02029 mag ~ 13.5, 20 arcsec from the position at 19 16 42.2 +04 44 48 (2000).

Gainsford's suspect in Aries 02 04.5 +10 16

GSC0633.00514 mag 10.8 lies close to the position at 02 07 10.9 +10 30 10 (2000). Does not appear to be in the BD catalogue. Worth looking at with a CCD.

rho (25) Boo = HR 5429 = HD 127665 = SAO 64202 = NSV 6697

Coord 1950.0 = 14 29 40.446 +30 35 24.13

Coord 2000.0 = 14 31 50.096 +30 22 11.19 K3III, V = 3.58, B–V = 1.30

NSV range is 3.56 - 3.63 but the range of recent photoelectric measurements is only half of this. Possible low amplitude variable. Do the visual observations really suggest a larger variation.

BD+49 2165 (CVn) = HD 111572 = NSV 5976 = SAO 44343
Coord 1950.0 = 12 47 20.51 +49 00 43.9
Coord 2000.0 = 12 49 38.13 +48 44 24.2 K1III, V = 6.50, B–V = 1.14
Very little recent published work on this star but it is clearly a good candidate for variability. The two photoelectric measurements are 6.53 and 6.46, which is the range given by NSV. Original report in Bin. Sky Soc. Rep. 2, 53 (1969). Worth following for a season.

Flare object in CMa 6 43.1 –16 45 = HM CMa
Coord 1950.0 = 06 43 06 –16 45.4
Coord 2000.0 = 06 45 20 –16 48.6 M, V ~ 9 - 12
This object is now a recognised flare star and appears as HM CMa in the 67th name-list of variable stars (IBVS 2681).

Verdent's suspect in Cancer 8 38.5 +18 40 = ?
Coord 1950.0 = 08 38 25.5 +18 39 25
Coord 2000.0 = 08 41 16.4 +18 28 41 M?, V = 15.14, B–V = 2.38
This faint star lies close to the position and is a member of Praesepe. Very little is known about it but it is a potential dMe flare star. Worth looking at with a CCD.

tau (5) Cas = HD 223165 = HR 9008 = SAO 35763 = NSV 14707
Coord 1950.0 = 23 44 36.09 +58 22 24.2
Coord 2000.0 = 23 47 03.04 +58 39 04.3 K1III V = 4.87, B–V = 1.11
There is much confusion about the variability of this bright star, which is used as a comparison for rho Cas. The early reports of variation were not confirmed in a review by Henshaw (Light Curve 1, 5 (1976)) and photoelectric measurements by Percy over several years found nothing above the noise, ~ 0.02 mag. Leiker and co-workers (IBVS 3176, 3341) claim to have found ~ 0.1 mag variations but these are unconvincing. Halbedel, having previously found no evidence of variability above σ=0.012 mag (IBVS 3616), now suggests there has been a brightening of ~ 0.04 mag (IBVS 3851) in recent years. It remains to be seen if this is confirmed. Observations of tau Cas are based on only one other comparison star, HR 9010, and until this can be shown to be constant the picture will remain unclear. See the light curve and report in VSSC 77, 3. It was this star that prompted Percy (J. AAVSO 14, 52 (1985) to make his oft quoted comment about stars being tainted by suspicions of variability.

BD+49 4329 = HR 37 = NSV 00021 (Cas)
Coord 1950.0 = 00 02 51.6 +50 14 42
Coord 2000.0 = 00 05 26.7 +50 31 24 G9III, V ~ 8.0, B–V = 1.1
Very little known. Generally at mag ~ 8.0. Alcock found it brightened to about 7.0 and varied rapidly (Sky & Tel. 40, 393 (1970)). NSV refers to Alcock's observations. The star is a late-type giant which is inconsistent with the reported behaviour. Apparently there is a faint companion which could conceivably be the origin of any flares.

BD+60 2217 (Cep) = HD 203265 = SAO 19298 = NSV 13656
Coord 1950.0 = 21 17 17.32 +60 58 21.7
Coord 2000.0 = 21 18 32.45 +61 11 03.4 M3, V ~ 6.7, B–V = 1.5
Originally reported to be variable by Alcock (Bin. Sky Soc. Rep. 1, 51 (1968)). Very little known. Red giant and known as an IR source for some time. Probably worth monitoring photoelectrically for a season.

Nova Cep 1983 22 11 58.03 +56 46 19.9
Coord 1950.0 = 22 11 58 +56 46.3
Coord 2000.0 = 22 13 46 +57 01.2 Nova, V = 7.5...
Despite the few and to some extent contradictory observations (IAU Circ. 3821) this object has entered the literature as a nova (PASP 99, 606 (1987)).

SAO 19521 (Cep) = HD 205938 = BD+67 1329
Coord 1950.0 = 21 34 30.35 +67 59 40.8
Coord 2000.0 = 21 35 25.72 +68 13 08.8 Ap..., V = 7.6, B–V = –0.3
No published reports of any photometry let alone variability. Classified spectroscopically as an Ap star (PASP 78, 550 (1966)) which may suggest variability of at most $\sim$ 0.2 mag over a few days, which is much less than the visual range of over a magnitude. Possible confusion somewhere?

Branchett's suspect in Cepheus 22 17.3 +63 05
GSC4268.00658 mag 9.4, lies within an arcmin of this position at 22 19 01.9 +63 19 42 (2000). It is superimposed on an arc of nebulosity, which may account for the haze reported. Rather curiously it does not appear to be in the BD catalogue.

zeta (64) Cyg = HR 8115 = HD 202109 = BD+29 4348 = SAO 71070
Coord 1950.0 = 21 10 48.357 +30 01 15.50
Coord 2000.0 = 21 12 56.091 +30 13 39.76 G8II, V = 3.20, B–V 1.00
zeta Cyg is a late-type bright giant in an 18 year orbit with a white dwarf (Obs. 112, 168 (1992)). Published photoelectric measurements covering the last 20 years show a range of 3.18 - 3.26 so it is a possible low-amplitude variable but is not generally recognised as such. Could repay a seasons photoelectric monitoring.

BD+47 2801 (Cyg) = HD 181278 = SAO 48299 = IRAS 19161+4751
Coord 1950.0 = 19 16 08.57 +47 51 37.2
Coord 2000.0 = 19 17 32.43 +47 57 06.9 G5, V = 7.7, B–V = 0.4
Nothing known! Late-type giant. IRAS source.

Scovil's suspect in Cygnus 21 40.8 +31 20 = ?
Coord 1950.0 = 21 40 46 +31 13.8
Coord 2000.0 = 21 42 57 +31 27.6 M4e, V $\sim$ 13.5
The closest known object to this position is the dM4e star STHA 191 at mag 13.5, which would seem to be a likely candidate except that it is 6 arcmin south of the position given. Other anonymous $\sim$ 14th mag stars lie close to the position.

Hosty's suspect in Cygnus 21 27.6 +50 07 = BD+49 3535 = IRAS 21275+5006
Coord 1950.0 = 21 27 34.05 +50 06 59.1
Coord 2000.0 = 21 29 18.45 +50 20 09.9 K2, V = 10.6, B–V = 1.4
The position coincides with BD +49 3535, a late-type giant and IRAS source but practically nothing is known about it. The catalogued magnitude is about a magnitude fainter than found by Hosty but part of this may be due to the different photometric bands used. It might also be variable. Worth following for a season.

BD+15 4264 (Del)
Coord 1950.0 = 20 46 41.20 +16 02 38.9
Coord 2000.0 = 20 49 00.51 +16 13 48.9 G5, V = 10.5, B–V = 1.0
No photometry, nothing known! Late-type giant, possibly a wide binary(?).

BD+18 4586 (Del) = HD 197311 = SAO 106406 = NSV 13242
Coord 1950.0 = 20 40 06.88 +19 12 57.5
Coord 2000.0 = 20 42 22.72 +19 23 45.7 K0, V=7.85, B–V = 1.03
Not variable according to the NSV. A series of photoelectric measurements did not show any variation (IBVS 578) and it was used as a comparison for photoelectric observations of Nova (HR) Del 1967 (PASP 82, 889 (1970). Patrick Moore originally found a range of 7.8 - 8.3 (IBVS 385) but the full supposed visual range is nearly 2 mag. Confusion somewhere?

BD+18 4590 (Del) = HD 197378 = SAO 106417 = IRAS 20405+1900
Coord 1950.0 = 20 40 33.25 +19 00 17.3
Coord 2000.0 = 20 42 49.33 +19 11 07.0 M1, V ~ 8.7, B–V = 1.4
An early M-type giant. Clearly variable by ~0.2 mag from photoelectric measurements, probably an SRb (IBVS 1050) but no recent photometry.

BD+20 4720 (Del) = HD 198239 = SAO 89144 = IRAS 20461+2102
Coord 1950.0 = 20 46 08.89 +21 02 50.9
Coord 2000.0 = 20 48 23.33 +21 13 59.0 K0, V = 7.0, B–V = 0.8
No photometry. Late-type giant. IRAS source.

SAO 78074 (Gem) = HD 42379 = BD+21 1143 = NSV 2859
Coord 1950.0 = 06 08 17.96 +21 34 32.9
Coord 2000.0 = 06 11 18.03 +21 33 50.1 B1II, V = 7.39, B–V = 0.35
Three published photoelectric measurements have a range of 7.37 - 7.42 which is that given in the NSV. Observed as a possible β Cephei variable and found to have a range of 0.04 mag (Ap.J.Suppl. 14, 301 (1967)). The radial velocity is variable. The star is an early-type bright giant or supergiant and micro-variable of some persuasion.

SAO 51657 (Lac) = BD+44 4046
Coord 1950.0 = 22 04 33.47 +45 09 31.9
Coord 2000.0 = 22 06 34.86 +45 24 11.6 K0, V = 9.6, B–V = 1.1
The current catalogue magnitude of this star is 9.6 but there is some doubt about the value handed down from earlier catalogues. Nothing else known! A late-type giant and unlikely flare star. An 8 magnitude flare on the 14th mag companion also seems unlikely.

theta (21) Lyr = HR 7314 = HD 180809 = SAO 68065 = BD+37 3398
Coord 1950.0 = 19 14 37.857 +38 02 37.03
Coord 2000.0 = 19 16 22.002 +38 08 01.18 K0II, V = 4.36, B–V = 1.26
Apart from one value of 4.32 the other 6 published photoelectric measurements show no sign of variability. The star is a secondary spectrophotometric standard. The radial velocity is constant.

Chanal's suspect in Orion = NSV 2229 = V1118 Ori
Coord 1950.0 = 05 32 17 –05 35.6
Coord 2000.0 = 05 34 44 –05 33.7 dMe, V ~ 12 - 17
This star has a history of suspected variability and is now recognised as a flare star. Some references include IBVS 3764, 2681, IAU Circ. 4966, 3942, 3935, 3924.

TASV 030645 Per 03 06 12 +45 45 18 = V409 Per
Coord 1950.0 = 03 06 21 +45 46.7
Coord 2000.0 = 03 09 45 +45 58.1 M?, V ~ 9
Practically nothing known. Probably an SRb. See light curves and report in VSSC 80, 12.

TASV 195819 Sge = BD+19 4242 = HD 189754 = SAO 105545
Coord 1950.0 = 19 58 39.27 +19 51 57.4
Coord 2000.0 = 20 00 51.96 +20 00 17.5 K0, V = 7.8, B–V = 0.2 [?]
No photometry but the colour is inconsistent with the spectral type, which may indicate some variation. It has a composite spectrum, gK + F (A.J. 90, 341 (1985)), but this does not explain the B–V. According to Griffin (Priv. comm.) it is a late-K giant with a B–V ~ 1.2 and probably somewhat brighter than given, perhaps V ~ 7.0. The radial velocity is constant, so it is probably a wide binary in which eclipses would be unlikely. Worth looking at for a season.

Branchett's suspect in Scutum 18 44.2 –05 00
Coord 1950.0 = 18 44 11.7 -04 59 56
Coord 2000.0 = 18 46 51.1 -04 56 38 Nova? (v. fast!)
Entered the literature as the rather questionable Nova Sct 1981 but no other information. Faint red star (GSC5122.00562) mag 13.3 lies ~ 1 arcmin south of the position at 18.46 49.9 -04 57 30 (2000). Worth looking at with a CCD.

SAO 142593 (Sct) = HD 173456 = BD–08 4695
Coord 1950.0 = 18 42 59.41 –08 35 06.1
Coord 2000.0 = 18 45 42.96 -08 31 53.4 K2, V = 8.6, B–V = 1.3
No photometry, late-type giant but practically nothing known. The catalogue magnitude is similar to than seen. The value in the SAOC is probably wrong.

Hosty's suspect in Serpens 18 33.8 +06 00
Faint red star (GSC0458.01225) mag 13.6 lies ~ half an arcmin from this position at 18 36 13.0 +06 02 08 (2000). Worth looking at with a CCD.

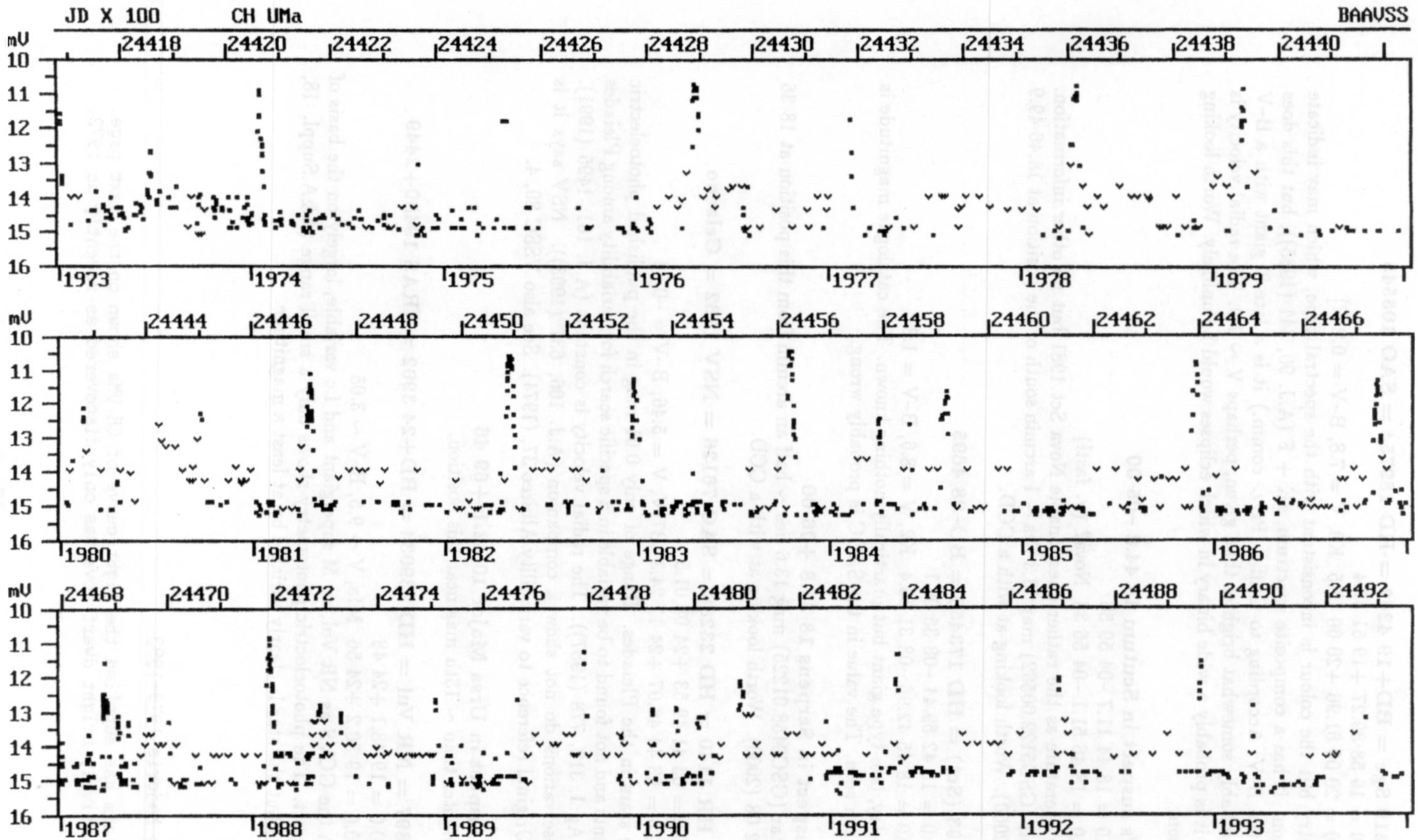
16 Tau = HR 1140 = HD 23288 = SAO 76126 = NSV 1262 = Celaeno
Coord 1950.0 = 03 41 49.53 +24 08 01.5
Coord 2000.0 = 03 44 48.07 +24 17 24.3 B7IV, V = 5.46, B–V = -0.04
One of the stars in the Pleiades. Range of only 0.01 mag in the published photoelectric measurements and not found to be variable in a specific search for variability among Pleiades members (Ap.J. 312, 778 (1987)). The radial velocity is constant (A.J. 101, 1495 (1991). Speckle observations do not show a companion (A.J. 106, 637 (1993)). NSV says it is constant. Original reference to variability Albireo 37, (1974). See also VSSC 80, 4.

Mezosi's suspect in Ursa Major 10 42.1 +69 46
Nothing brighter than ~ 15th mag near this position.

CSV 101897 = NR Vul = HD 339034 = BD+24 3902 = IRAS 19480+2449
Coord 1950.0 = 19 48.1 +24 48
Coord 2000.0 = 19 50.2 +24 56 MIa, V ~ 9.5, B–V ~ 3.05
Appears in the GCVS as NR Vul, an M supergiant and Lc variable, largely on the basis of the TA report. The photoelectric photometry shows only a small range (A&A.Suppl. 18, 169 (1974)) but the star is clearly variable by at least a magnitude.

CH Ursae Majoris 1973-1993

Dave McAdam has supplied the light-curve of CH UMa shown on the next page. This relatively bright dwarf nova was only discovered as recently as 1972.


JD X 100
CH UMa
BAAVSS
mV
24418
24420
24422
24424
24426
24428
24430
24432
24434
24436
24438
24440
1973
1974
1975
1976
1977
1978
1979
24444
24446
24448
24450
24452
24454
24456
24458
24460
24462
24464
24466
1980
1981
1982
1983
1984
1985
1986
24468
24470
24472
24474
24476
24478
24480
24482
24484
24486
24488
24490
24492
1987
1988
1989
1990
1991
1992
1993