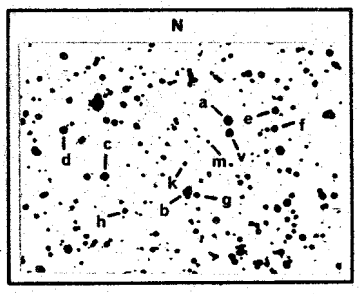
COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 500

Konkoly Observatory
Budapest
1970 December 28

A NEW LARGE AMPLITUDE ECLIPSING STAR

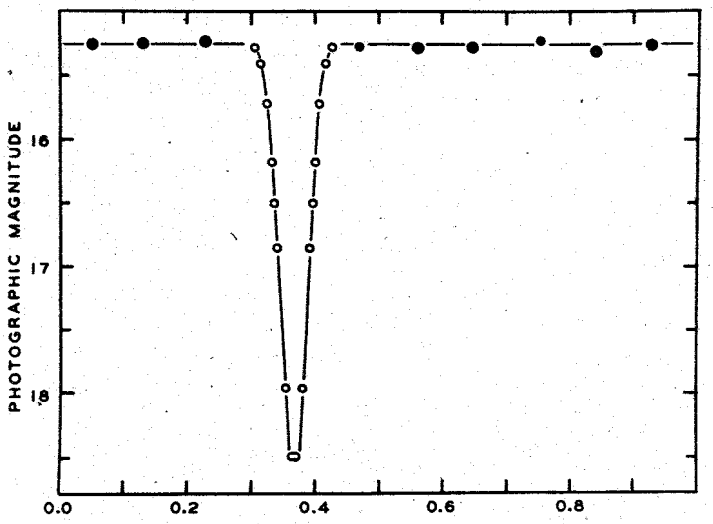
In 1966, while examining variables in the Scutum Star Cloud, V.M. Swain discovered this eclipsing binary at $18^h43^m11^s$, $-5°49'.1$ (1900). It is identified as v in Fig.1, where the comparison stars are also marked: a = 14.87, b = 15.01, c = 15.60, d = 15.79, e = 16.52, f = 17.08, g = 17.74, h = 18.03, k = 18.30, m = 18.53.



Though of photographic magnitude 15.3 at maximum, this star faded below the limit of the 110 24-inch Bruce plates she inspected. In the autumn of 1966, Evered Kreimer obtained 13 useable negatives during two minima with a cold-emulsion camera and a 12.5-inch reflector, which he has described (1). Though the images of the variable were very weak at mid-minimum, they indicated a range of about three magnitudes and confirmed the period of 4.1 days.

Fortunately, this star was visible near mid-minimum on four of 50 plates taken by A.Sandage with the 48-inch Palomar Schmidt and made available to M.Harwood. From this latter material, the minimum magnitude of the eclipsing binary was determined to be 18.5, from the Kron Harwood (2) and the photometric standards for NGC 6712 given by Sandage and Smith (3).

Since 10-minute exposures were used by Kreimer and Sandage, little smearing of the light curve during primary eclipse should be present. However, the Bruce exposures were several times longer and were given half weight in forming the normal points of primary eclipse ($\bar{h}$ = 0.3060 to $\bar{h}$ = 0.4284 in Table I); it was also necessary to subtract 0.13 magnitude from these estimates to remove a systematic difference. The Kreimer results were not used at all to form the light curve, since his exposures were on panchromatic film instead of a blue-sensitive emulsion.



The points in Fig.2 denote the following: large dots, the average of more than five estimates; small dots, the average of five or fewer estimates; open circles, normal points from the reflected observations. These data are summarized in Table I, where $\underline{n}$ indicates the number of estimates and $\bar{\phi}$ the mean phase computed from $\bar{\phi} = p^{-1}$ (JD - 2420000).

Table I.

$\bar{\phi}$	m	n	$\bar{\phi}$	m	n
.0513	15.25	24	.3542/.3802	17.96	3
.1307	15.24	9	.3645/.3699	18.49	3
.2594	15.23	13	.4701	15.27	5
.3060/.4284	15.28	5	.5615	15.28	22
.3165/.4179	15.41	2	.6473	15.28	18
.3261/.4083	15.72	5	.7554	15.22	4
.3328/.4016	16.18	3	.8419	15.30	24
.3376/.3968	16.51	5	.9276	15.26	8
.3412/.3932	16.86	5			

The eclipses last $0^{p}.144 = 14^{h}.2$ and are total with a duration of $0^{p}.016 = 1^{h}.6$. The mean light durve during primary eclipse was fitted to the individual observations to obtain the four normal times of minima in Table II. The first two

Table II.

JD Hel.	E	O-C
2 428 198.598	-636	$+^{d}.001$
28 894.378	-487	-.003
35 284.072	+1065	+.001
39 401.140	+2065	+.001

are from Bruce plates, the third from 48-inch Schmidt plates, and the last from Kreimer's negatives. The following elements were derived:

JD min. hel. = 2430899.394 + $4^{d}.117068$ E.

L.J. ROBINSON
M. HARWOOD
V.M. SWAIN

Cambridge, Mass. USA

(1) John H.Mallas and Evered Kreimer, Sky and Telescope 33, 285, 1967.
(2) Margaret Harwood, Leiden Annals XXI, 387, 1962.
(3) Allan Sandage and Lewis L. Smith, ApJ 144, 886, 1966.