COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 1089

Konkoly Observatory
Budapest
1976 February 1

PHOTOELECTRIC R,I OBSERVATIONS OF NOVA CYGNI 1975

While observing with the Bochum 61 cm telescope at La Silla (E.S.O.) Chile on the night of August 29, 1975, Dr. H.W.Duerbeck called the attention of one of us (P.S.T.) to an I.A.U. telegram about the discovery of a Nova in Cygnus. The Nova is actually too far north for observing from La Silla (Geographic Latitude = $-29^{\circ}15'25\overset{''}{.}80$), but considering the fact that we are working in the long wavelength regions of the spectrum and that in these regions the atmospheric extinction is comparatively low, it was decided to observe this object. From August 30.15 UT to September 15.1 UT, with a break on September 10 and 11 UT due to bad weather, the Nova was observed every night. Generally five subsequent observations per night, with integration times of 20 sec, were made.

The Bochum telescope is equipped with a coldbox which is housing an ITT FW 118 photomultiplier. The filters used for the R,I measurements are borrowed from Dr. Westerlund. Together with the ITT-tube they are reproducing Kron's R,I-photometric system very well. In general the method explained by Hardie (1962) is followed in the reductions of our measurements.

Photometric measurements of novae are very filter dependent because of the appearance of strong emission lines after maximum luminosity. Especially in the red region of the spectrum due to the very strong and broad Hα-emission. It is therefore important to mention here the transmission of the red and near-infrared filter used in our photometry. The red filter has an almost constant 82.2% transmittancy from 6100 Å to 7800 Å; outside this region the filter is completely opaque. The near infrared filter has an increase of transmittancy from about 7500 Å to 8500 Å, after which it

remains constant at 90%. The sensitivity of the ITT FW 118 tube determines the cut off on the longer wavelength side of the I measurements.

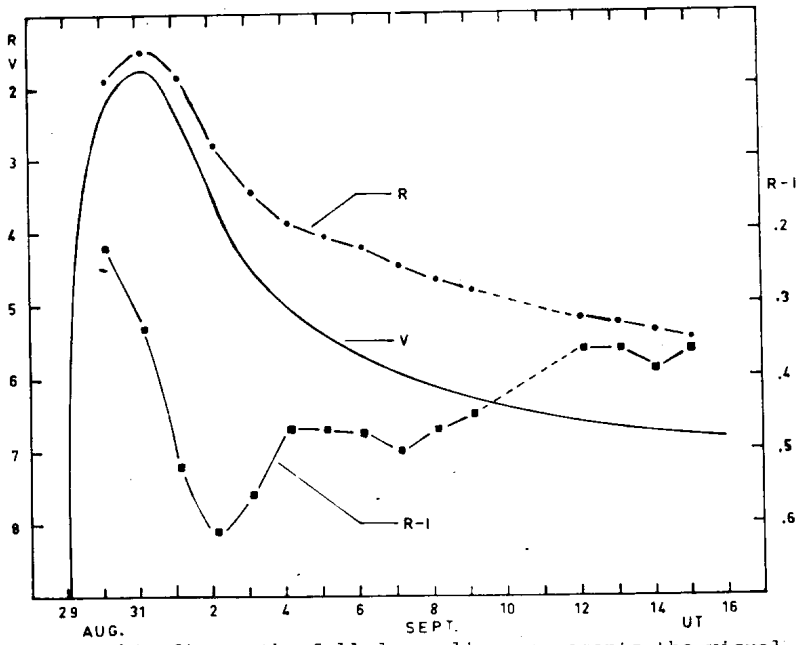
At culmination the Nova is close to the horizon; the value of sec z is then about 4. In our reductions we have therefore taken great care in the determination of the air mass through which the light of the Nova has travelled. The method of correction as suggested by Hardie (1962) for large values of sec z has been followed.

Care has also been taken in the determination of the extinction coefficients. We have taken the weighted mean of these coefficients determined every night for our final reductions, since these mean values are closer to the reality than the nightly ones, especially at La Silla. Kron's standard stars used for the determination of the extinction and transformation coefficients are chosen from Table 5 published by Johnson (1963).

In the table below the results of the reductions of the Nova measurements are given. The last column gives the number of observations of the Nova at the corresponding night. The accuracy of R and R-I, as determined every night from the 4 to 6 measurements, lies between $\pm$ $0^m.01$ and $\pm$ $0^m.02$ (s.d.).

In Figure 1 the R magnitudes are plotted as function of UT. In this figure the compilation of photoelectric visual magnitudes by Woszczyk et al. (1975) is indicated by the full drawn line. It seems that around Sept. 2 UT the Hα-emission begins to appear. The R curve deviates more and more from the V curve as the Hα-emission line becomes stronger. It is not possible to compare our R,I-data with those published in I.A.U.-telegrams, because usually no mention is made about the characteristics of the filters and photomultiplier used by the authors for their R,I-measurements. In Figure 1 the change of the R-I colour-index is also shown as function of UT. During the rise to maximum luminosity the Nova becomes redder, after which the influence of the broad Hα-emission line is more dominant and the R-I values become smaller again.

P.S. THÉ and M. VAN DER KLIS
Astronomical Institute,
University of Amsterdam
European Southern Observatory



In this figure the full drawn line represents the visual photoelectric measurements as compiled by Woszczyk et al.(1975). The R magnitudes and R-I colour-indices are also shown as function of UT.

1975	UT	R	R-I	n
Aug.	30.154	1.91	+ 0.22	4
	31.143	1.50	.33	5
Sept.	1.144	1.84	.52	6
	2.131	2.81	.61	5
	3.127	3.44	.56	5
	4.123	3.87	.47	5
	5.119	4.05	.47	5
	6.113	4.23	.47	5
	7.116	4.48	.50	5
	8.120	4.67	.47	5
	9.108	4.79	.45	5
	12.094	5.18	.36	5
	13.091	5.24	.36	5
	14.090	5.37	.39	5
	15.087	5.48	.36	5

References:

Hardie, R.H., 1962, Photoelectric Reductions in Astronomical Techniques, The University of Chicago Press, ed. W.A. Hiltner, p. 178.

Johnson, H.L., 1963, Photometric Systems in Basic Astronomical Data, The University of Chicago Press, ed. K.Aa. Strand, p. 204.

Woszczyk, A., Krawczyk, S. and Strobel, A., 1975, I.A.U. Information Bulletin on Variable Stars, No. 1072.