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ON THE 1978 AUGUST PECULIAR NOVA IN M 31

To add to the rather scanty data on the nova discovered in M 31 by Dopita et al. (1979) we looked through the plates obtained between August and October 1978 with the 80 cm Schmidt camera of the Radioastrophysical Observatoty, with the 50 cm Maksutov telescope (in Crimea) and the 70 cm reflector of the Sternberg Astronomical Institute. The star was detected on two of the plates: Sept. 4/5, U.T. 23^h50^m, B=18.^m4 and Sept. 5/6, U.T. 0^h52^m, B=19.^m6. The magnitudes of the star have been estimated by comparison with the stars in the nearby association OB 78 (van den Bergh, 1966). No trace of the star could be found on the other plates. The limiting B-magnitudes of the most important of them are 18.^m8 - Aug. 15/16, 18.^m5 - Sept. 6/7 and Sept. 7/8, 19.^m0 - Sept. 25/26, 20.^m0 - Oct. 10/11.

Dopita et al. estimated the brightness of the star on Oct. 5 1978 to be B=19.^m according to their table I. There are, however, some discrepancies between this value and some statements in the text, e.g., that the object was absent on the plates taken in October 1978. It may have been that the limiting magnitudes of the plates were given for October 5 in table I by Dopita et al. Despite these uncertainties it seems to be possible to conclude from all available data that between Sept. 1/2 and Sept. 5/6 the nova was in its early phase of decline. The rate of decline in B-magnitudes was about 0.^m8, and the star can accordingly be classified as very fast nova, a very rare type of novae in M 31. Among all novae studied up to now in M 31 only two - No. 1 and No.2 from Arp's list (1956) are faster. Among the novae known in our Galaxy the Nova Cygni 1975 (V1500 Cyg) possibly was the one most similar to the star discussed here. If we assume that this nova in M 31 was at its maximum (B=16.^m3) on

Sept. 1/2, it fairly well satisfies the relationship between maximum magnitude and the rate of decline, $m_{\max} - \log 100d$, derived for novae in M 31 by Arp (1956).

The brightness of the star on Aug. 27/28 estimated by Dopita et al. might indicate that either the nova was near its maximum for about five days, or it was on Aug. 27/28 in the rising part of the light curve. The fast novae, however, have a very fast rise and sharp maximum. If we assume that the star has undergone a rise of light similar to that of the other fast novae, its maximum magnitude could have been near $B=13^m$. Consequently, the star would have been too bright at its maximum for novae in M 31 and would sharply fall out of the relationship $m_{\max} - \log 100d$.

Thus the 1978 August nova in M 31 seems to be peculiar not only with regard to its spectrum as shown by Dopita et al. but also with regard to its light curve. To get a better idea of the nature of the nova the publishing of more detailed data on the spectrum, including the reliability of the measurements of intensity and wavelengths of emission features of the star would be very desirable. Additional data on the brightness of the star, supposing there are other photographs of M 31 obtained in some observatories during the summer - autumn season of 1978, might be of great importance.

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