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NOTES FROM OBSERVATORIES

Spectrophotometry of Nova Muscae 1983

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Nova Muscae 1983 was discovered by Liller[1] on January 18, when it was of magnitude 7·2. We had the opportunity of obtaining a spectral scan on February 4·89 while carrying out other scheduled observations. The instrument used was the automated spectrum scanner[2] mounted at the Cassegrain focus of the 102-cm reflector of the Kavalur Observatory (latitude $+12° 34'$). A refrigerated EMI 9658 photomultiplier was employed along with a 600 line/mm grating and an exit slit of 40 Å width in the first order.

At the time of observations the nova appeared to be $\sim 11^m$. In this estimate, it is possible that the error can be as high as one magnitude because of large atmospheric extinction (the declination of the nova is $-66° 55'$). Therefore the observations were confined to the region from *Hβ* to *Hα*. Since the data were very noisy, three-point averaging has been done and the reduced spectrum normalized at 5400 Å is shown in Fig. 1. Most of the prominent emission features other than *Hβ* and *Hα* are easily identified as *Fe* II multiplets 42, 46, 47, 49 and 55, even with the poor resolution of 40 Å.

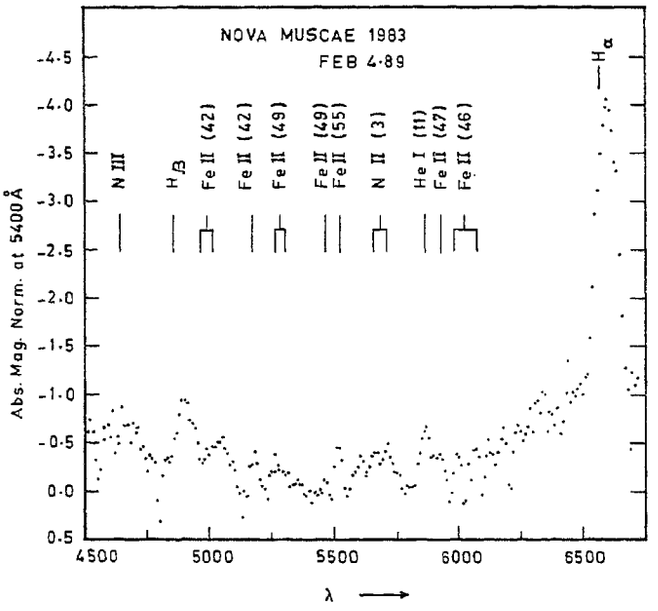

FIG. 1

Spectrophotometric scan of Nova Muscae 1983 taken on 1983 Feb. 4·89. The probable emissions are identified, and multiplet numbers are indicated in parentheses.

The 4640-Å *N* III complex can be recognized and is as strong as *Hβ*. The violet absorption of *Hβ* is clearly seen. The broad features following *Hβ* are of *Fe* II (42) at 4924 Å and 5018 Å. The weak emissions near 5460 Å may be due to *N* II (29) blended with *Fe* II (49) at 5478 Å. Similarly the weak emissions near 5660 and 5710 Å are probably features of *N* II (3) at 5667 and 5710 Å. The emission at 5870 Å may be a blend of *He* I (11) at 5874 Å with *Fe* II (46) and it may have contributions from *N* II (28) as well.

The Balmer decrement *Hα*/*Hβ* has been found to be $3{\cdot}9 \pm 0{\cdot}4$, which corresponds to high optical thickness and high density[3] and indicates that the nova had not yet entered the nebular phase. This is also confirmed by the violet absorption edge of *Hβ* and the absence of forbidden lines.

The spectrum was compared with those of Nova Cygni 1975[4], Nova Persei 1974 and Nova Scuti 1975[5] and with that of Nova Coronae Austrinae 1981[6], and it appears that the nova was in the 'Orion' phase at the time of our observations.

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