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SPECTRUM OF THE RECENT NOVAE :
NOVA ANDROMEDAE 1986 AND NOVA CENTAURI 1986

Spectrum of two recent galactic novae, Nova Andromedae 1986 and Nova Centauri 1986 were recorded during their decline from maximum light with the 102-cm telescope of Vainu Bappu Observatory, Kavalur.

1. Nova Andromedae 1986 was discovered by M. Suzuki (1986) on December 5.44 UT when it was at a magnitude $m_{pv} = 8.0$. The position of the nova matches with a star of $m_{pg} = 17.8$ on the Palomar blue sky survey plates (King 1986). Spectroscopic confirmation of the nova was made by Kosai (1986).

A single spectrogram was obtained on December 16.59 UT (8 days after the maximum) at a mean dispersion of 129 \AA/mm covering the wavelength range 3500A - 6600A. At the time of the observations, the nova was around $V = 7.3$, one magnitude below maximum (IAU Circular 4286). The spectrum is characterised by the presence of broad, strong emission lines superposed over moderately strong continuum. Balmer lines of hydrogen are strong and visible up to H11. Other emission lines are those of HeI (RMT 11, 14, 18), TiII (13, 19), CaII (H and K), NaI (D1 and D2), SiII (2,5), FeII (27, 28, 37, 38, 42, 46, 48, 49, 74), NII (3, 5, 8, 28) and OI (9, 10, 15, 16, 18). Weak emissions of forbidden lines at $\lambda 5577$ and 6300 of [OI] are also present. Forbidden lines of [NII] at $\lambda 6548$ and 6584 may be blended with H_{α} . The $\lambda'4640'$ complex of NIII and NII is fairly developed. The mean of the full width at the base of the Balmer emissions is 2176 ± 219 km/sec.

All the emissions particularly Balmer and FeII lines exhibit P Cygni like profiles. The mean radial velocity of the blue shifted absorption is -1230 ± 17 km/sec. A second blue shifted absorption which is stronger than the first is also exhibited by most of the Balmer lines at a radial velocity -2300 ± 80 km/sec. Interstellar absorption of CaII H and K at radial velocities -21.9 km/sec and -12.7 km/sec, respectively are also present.

The emission at H_{α} comprises of multiple components. Four distinct components could be seen on our plate. A spectrum recorded on December 16.55 UT in the near infrared shows strong emissions due to OI at λ 8446 and 7774 . Faint emissions of OI at λ 7254, 7246 and HeI 7065 are also present.

Photometric observations (from IAU Circulars 4281, 4286) show that the nova faded by two magnitudes in fifteen days and can be classified as a fast Nova.

2. Nova Centauri 1986 was discovered by McNaught (1986) on November 22.7 UT at $m_{pv} = 5.6$. He identified the prenova on UK Schmidt B and J plates and found that it varied between 18 and 20 magnitudes during 1974-78. After the outburst it was a naked eye object around December 23 ($m_{pv} \sim 4.8$).

The spectrograms were obtained on December 16.0 and 17.0 UT when the nova was around $V = 5.7$ (IAU Circular 4284). The spectrum consists of strong emissions at H_{α} and H_{β} . FeII emissions at λ 4924, 5018, 5169, 5234, 5317 and OI (9, 10) are strong. Other emissions include FeII (38, 40, 46, 48, 55), SiII (2, 5), NII (3, 6, 8, 9) and NaI (D lines). Forbidden lines of only [OI] λ 5578 and 6300 could be identified. The mean of full width at the base of the Balmer and strong FeII emissions is 1472 ± 197 km/sec.

Balmer lines and strong FeII lines show blue shifted absorption components with a mean radial velocity -915 ± 40 km/sec (principal absorption system). A diffuse enhanced absorption at a mean radial velocity -1975 ± 40 km/sec is also present. H_{α} emission shows multiple components and flat-topped profile. The λ '4640' complex is fairly strong.

The light fluctuation of the nova even around maximum was very rapid (IAU Circulars).

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References:

- King, D.L., 1986, IAU Circ. No. 4286.
Kosai, H., 1986, IAU Circ, No. 4281.
McNaught, R., 1986, AAVSO Alert Notice, No. 88.
Suzuki, M., 1986, IAU Circ. No. 4281.