

FURTHER EVOLUTION OF V 1016 CYGNI, 1974-77

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SUMMARY:

V 1016 Cygni is a peculiar variable star, whose brightness increased from about 16 mag in 1963 (previously it was known to have a LPV spectrum) to about 11 mag in 1967. Since then it has been nearly constant at maximum. Our last photometric observations, from May to August 1977, indicate that the star is still in its protracted maximum at a constant brightness. We have measured $B = 11.1$ and $V = 10.8$ (± 0.2 mag s.e.).

The spectrum is very rich of nebular forbidden lines, resembling that of a planetary nebula with very high density. Its evolution has shown a steady increase of the excitation stage, while low-excitation lines, like $[\text{FeII}]$ and $\text{OI } 8446 \text{ \AA}$, were still present. The spectrograms obtained in 1976 and 1977 in the wavelength range 3580-10900 \AA , show a further increase of the degree of excitation, as deduced from the strengthening of the following emissions relative to nearby lines :

HeII (I.P.54 eV)	4199, 4541, 4686 \AA
$[\text{ArV}]$ (I.P.60 eV)	6435, 7006
$[\text{CaVI}]$ (I.P.84 eV)	5460
$[\text{FeVII}]$ (I.P.109 eV)	3587, 3758, 4893, 4944, 5721, 6085

The properties of V 1016 Cyg can be explained with a double star model (Mammano and Ciatti, *Astron.Astrophys.*39,405;1975). The long period variable, still indicated from TiO and VO bands, and infrared variability with $P=450^d$, is ejecting mass at a rate of $10^{-5} M_{\odot}/\text{year}$. The resulting nebula is excited by a very hot companion, which is responsible for the outburst. An evolution toward some kind of compact planetary nebula is suggested.