

COMMISSION 27 OF THE I. A. U.
 INFORMATION BULLETIN ON VARIABLE STARS
 Number 2729

Konkoly Observatory
 Budapest
 24 May 1985
 HU ISSN 0374 - 0676

A CEPHEID-LIKE VARIABLE IN THE ANDROMEDA GALAXY WITH AN
 EXTREMELY LONG PERIOD

Hubble (1929) indicated H19 as the brightest variable in M31 with a period of 5 years and an unstable light curve varying from cycle to cycle.

The magnitudes of H19 were measured on 16 B plates taken with the 2m RCC telescope of Rozhen Observatory. Our observations are given in Table I. Hubble's magnitude scale m_{pg} was transformed into the B system using the formula $m_{pg} + 1.3 = B$. (It is supposed that H19 does not change its mean magnitude). By a computer period-finding programme we obtained a period $P = 1846$ d. This value confirms Hubble's period. Figure 1 shows the light curve of H19. Our observations are drawn by circles and those by Hubble by dots. The large dispersion of the light curve can be explained in terms of variations of the light curve from epoch to epoch as one can see in Hubble's Figure 4 (1929). The absolute magnitude of H19 is $M_B \leq -7.7$.

Table I. Photometry of H19

JD 244 0000+	B	JD 244 0000+	B
4528.43	16.73	5557.6	17.7:
4530.42	16.82	5622.33	17.65
4883.42	16.86	5622.34	17.4
5283.4	17.45	5622.36	17.4
5287.31	17.5	5623.33	17.4
5288.33	17.5	5624.33	17.4
5296.39	17.5	5702.21	17.3
5297.31	17.45	5998.42	17.35
5348.31	17.5		

A similar variable in M31 is H42 with $P = 176.7^d$. Ivanov and Kourtev (1985) obtained the period of H42 to be constant but the light curve was unstable.

The flat-topped light curves of H19 and H42 remind of the variable S Vul. The luminosity of this variable coincides with the value predicted by the period - luminosity relation. However, there are variations in the light curve of S Vul (Beyer, 1930) similar to those in H19 and H42.

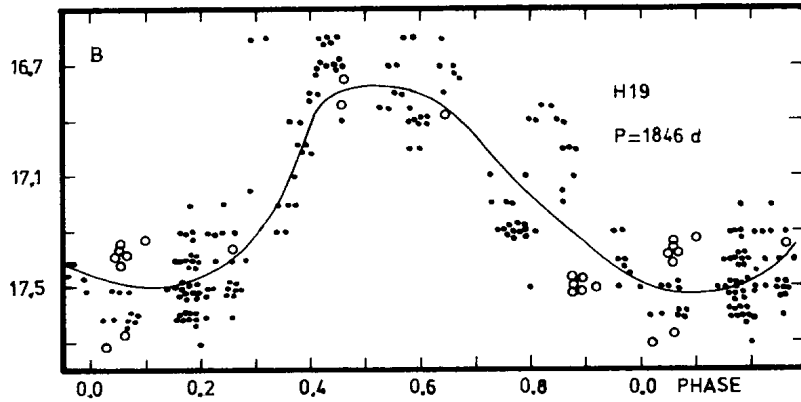


Figure 1

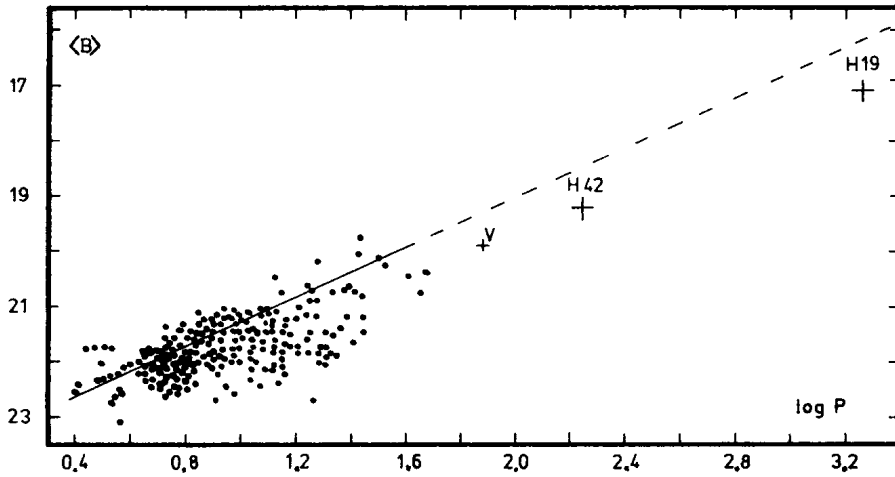


Figure 2

H19 is located in a group of stars which is not indicated as an OB association by Van den Bergh (1964). The location of H42 is at the outer edge of the arm which consists of older stars (Ivanov, 1985). Neither H19, nor H42 belong to young star complexes with active process of star formation.

Both H19 and H42 lie 0.5^m below the straight line of the period - luminosity relation (Figure 2). This fact can be explained by the absorption in the M31 galaxy. A possible cepheid with a period of 75 days and an amplitude $A_B \sim 0.5^m$ is marked by V in Figure 2.

We suppose that both H19 and H42 are cepheid-like variables. These stars are similar to the classical cepheids by their luminosity but they differ from them, as regards the shape and instability of their light curves and probably their age.

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