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A BRIGHT NEBULAR VARIABLE IN TAURUS

The variability of DHK 3 (BD +22° 909, HD 243750, IRC 20186, sp. M7) at RA $5^h\ 24^m\ 17.0^s$, Dec. +23° 03' 55.4" (1950), was discovered by Kaiser (1987), who noted changes from 9.0 - 10.0 m_v. I have now estimated DHK 3 on 702 Harvard blue plates of the AC and Damon series, spanning the years 1899-1952 and 1967-1988.

The plate estimates were made using a step sequence. The comparison star magnitudes were later estimated using a graded series of stellar images to compare the sequence stars with photoelectric B magnitudes in the cluster NGC 2129 (Hoag et al. 1961). An improved finding chart (Figure 1) includes fainter stars than the chart which appeared in the discovery report.

The light curve (Figure 2) shows irregular variations with a range from 10.5 - 13.0 m_b. DHK 3 normally remains near 11.0 m_b with variations of $0\overset{m}{.}5$ - $1\overset{m}{.}0$. The mean magnitude sometimes declines by $0\overset{m}{.}5$ - $1\overset{m}{.}0$ for intervals of 1000 - 3000 days. Recently (JD 2445000 - 47000) the variable has exhibited a series of deep minima. DHK 3 can vary by $0\overset{m}{.}5$ in as little as 5 days, and one series of plates exposed on the same night showed the variable brightening by $0\overset{m}{.}5$ in 4 - 5 hours.

No luminous nebulosity is associated with the star's image on the Palomar Observatory Sky Survey, but it does lie near the edge of a region of dark clouds. Based on the irregular and rapid light variations, late

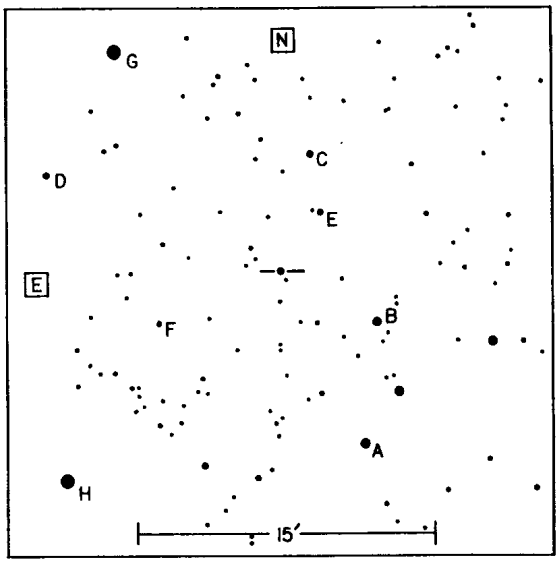

Figure 1. Finding chart for DHK 3 based on yellow-light photo. Faintest stars are ~14^{m}. Estimated blue magnitudes of the comparison stars are:

A = 10^{m}.6:	C = 11.5	E = 12.6
B = 11.0	D = 12.3	F = 13.0

G = BD +23° 916, SAO 077187 H = BD +22° 912, SAO 077189

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spectral type, and proximity to dark nebulae, DHK 3 appears to be a variable of type Insb as defined by Kholopov et al. (1985).

DHK 3 should be examined for T Tauri spectral features. With a maximum of about 9^{m}.5 V, this star might add to the very small number of bright T Tauri stars (see Weaver and Hobson 1988).

While making the estimates, I became dissatisfied with comparison star A (BD +22° 907, SAO 077178), which may vary by $\pm$0^{m}.1. The spectral type is M0, so it could well be slightly variable. It is equally likely, however, that slight variation of the image of a star this red could

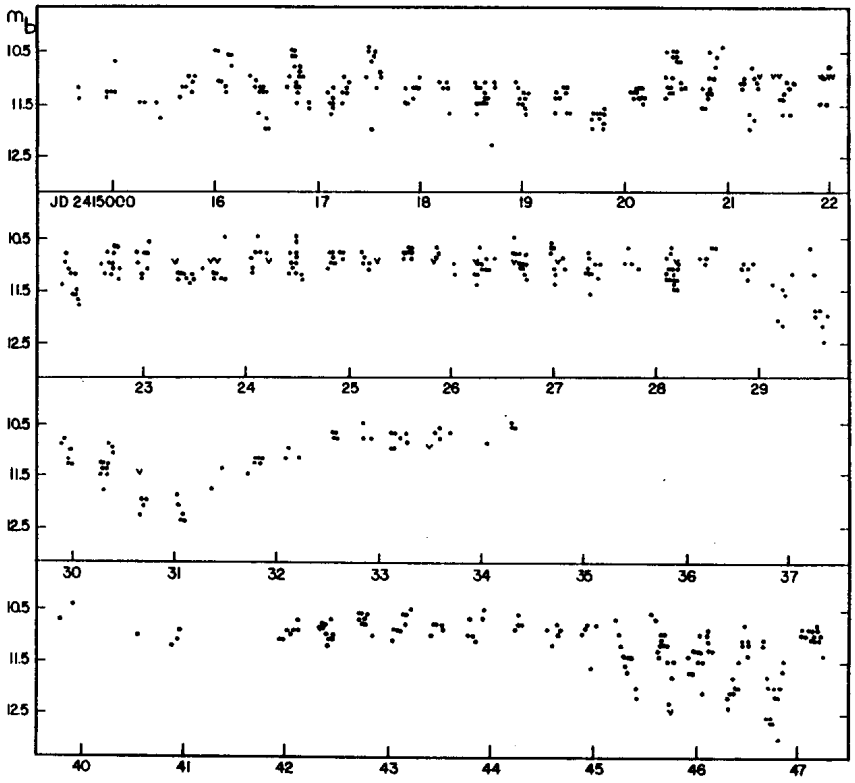

Figure 2. DHK 3 light curve, Harvard blue plates, 1899-1952, 1967-1988.

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result from different lenses, photographic emulsions, and exposure times used during the 89-year span of the plate collection. When the problem with this comparison star became apparent, I replaced it with a star of similar brightness that lies outside the limits of the finding chart.

I wish to thank Martha Hazen, curator of the Harvard Photographic Plate Collection, for access to this invaluable astronomical resource, and Martin Burkhead, Indiana University Astronomy Department, for

examining the variable on the Palomar Observatory Sky Survey and checking the literature on this star. Daniel H. Kaiser, the discoverer, provided the photograph on which the improved finding chart is based.

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