that recur with a period of $2.4 \times 10^3$. The variations are most probable due to the heated hemisphere of a low-mass, main-sequence companion of the very hot (Teff = 100,000 K) primary star. All of the observations are consistent with a binary system containing an 0.6 M$_\odot$ primary and a df companion of 0.1-0.3 M$_\odot$; the companion is too close to the primary that its facing hemisphere is heated to about 20,000 K.

No evidence for mass transfer has been observed; thus the central star of Abell 41 is the detached binary with the shortest known orbital period. Loss of angular momentum through gravitational radiation, however, will be sufficient to bring the main-sequence secondary star into contact with its critical Roche surface in less than $10^7$ years, initiating mass transfer and cataclysmic activity. The existence of Abell 41 provides strong support for the suggestion that all cataclysmic variables are descended from wide binaries that have suffered catastrophic angular-momentum loss through ejection of a planetary nebula.

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45.03 **Eclipsing Symbiotic Stars**, R. E. STENCEL, NASA.

The idea that symbiotic stars are binary in nature, given their combination of cool giant plus hot nebula spectra, is not new. Evidence, however, that a significant number may be eclipsing systems, reflects recent developments in UV spectroscopy. Eclipses offer an additional, crucial constraint in attempting to unravel the mystery surrounding these objects.

Although CI Cyg and AR Pav were suspected to be eclipsing systems on the basis of their optical light variations, UV spectra unexplored until 1975. For CI Cyg, the warm (90,000 K) intercombination lines showed deep eclipses while the hot (> 100,000 K) resonance lines did not. AR Pav, with its deep optical eclipses, reportedly shows no eclipse variations in the UV! I will summarize new UV observations obtained during the autumn 1982 eclipse of CI Cyg, and examine the discrepancy between these two symbiotics.

At least four additional objects have shown some evidence for eclipse-like effects: EG And, AX Per, SY Mus and 8 Aqr. As time permits, these will be summarized and relevant new data examined. As we recognize increasing evidence of eclipsing systems, the implausible grows for the presence of very large scale structures (> 0.001 pc) as part of the binary interaction in these long period systems.


Photometry and polarimetry of the eclipsing binary W Corvi (PK 358) were done during six nights in 1981-82. The unequal eclipse depths ($\Delta m = 0.4$) is confirmed, but unlike previous photographic and photoelectric studies, the maxima outside of eclipse are found to be equal, and the eclipses seem shallower. The new ephemeris requires no period change over 50 years ($P \approx 10^{10}$ sec/year). The polarimetry shows no significant variation.

Interest in this star arises from its short period, indicative of a contact system, yet unequal eclipse depths characteristic of a large difference in temperature, hence poor thermal contact. Lucy and Wilson (Ap. J. 231, 502, 1979) have suggested this star to be caught in a state of marginal thermal contact as it undergoes thermal relaxation oscillations (TRO). Solutions to the light curve yield a difference in temperature of almost 1000 K, a system only marginally in contact ($f = 0.03$), and a large mass ratio ($q = 0.92$). These results will be discussed in terms of the TRO theory vs. the contact discontinuity theory (ODC).

We thank Dr. R. E. Wilson for the use of his binary star light curve computer program.


The 1982-1984 primary eclipse of the enigmatic 27-year binary star ε Aur (PK 1a + 7) is now well underway. The ingress phase of the eclipse, which lasts approximately 150 days, is being observed over a broad range in wavelengths, from the far ultraviolet to the thermal infrared. In this paper we will give a preliminary report on work underway with the International Ultraviolet Explorer (UV spectroscopy) and the KPMO 40-foot Transform Spectrometer (IR spectroscopy), as well as coordinated IR photometry from the Nauna Kea Observatory. This work is supported in part by NASA Grant NAG 5-146 to the University of Hawaii.

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45.06 **A Photometric and UV Spectroscopic Study of the Remarkable G8 III-IV + sdOB Eclipsing Binary PF Aqr**

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PF Aqr (HD 31537) is an unique eclipsing binary which consists of a chromospherically active G8 III-IV star and a hot sdOB subdwarf component in a 9.2 day orbit. Photoelectric photometry obtained during 1975 by Danzko et al. (MNRAS 181, 139, 1977) and by Doreen and Guinan during 1977-78 reveal, in addition to the sharp primary minimum due to the total eclipse of the hot component, a large amplitude (0.35 mag in UV) photometric "distortion" wave which are common in the chromospherically active RS CVn variables. If the photometric wave of PF Aqr is attributed to the presence of an uneven distribution of subluminous regions ("starspots") over the surface of the cool star, then in the case of RS CVn stars, modeling indicates that about 40% of the star is covered with spots having temperatures about 500 K cooler than its photosphere. UV observations of the system obtained by Guinan and Sion with the IUE satellite during the total occultation of the subdwarf by the G8 star and also outside of eclipse, permit the ultraviolet spectrum of each star to be measured. An analysis of the UV spectrum of the hot star indicates that it is a sdOB star with T$_{eff}$ = 40000 K and log g = 6. The UV spectra of the G8 III-IV star alone (during the eclipse of the sd star), reveal the presence of a composite region emission lines such as C IV, He II and NV and chromo-

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