the non-magnetic (disk-accreting) cataclysmic variables (dwarf novae and novalike variables) we determine the centroid and width of the emission component and the shape and depth of the absorption component of the C IV P Cygni profile. From these parameters such quantities as the terminal velocity of the wind and the ratio of emission and absorption equivalent widths are calculated. The measured and derived values of these parameters are correlated with the cataclysmic variable subtype, orbital period, inclination, and mass of the white dwarf to study the dependence of the character of these profiles on these parameters and to place observational constraints on models for their formation.

28.06

The Discovery of Superhumps in the Dwarf Nova T Leonis

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Two channel high speed photometry was obtained on the McDonald Observatory 0.8m reflector during the 1987 January supermaximum of the dwarf nova T Leonis. Superhumps were discovered and observed for three days following the decline from maximum light, having an approximate period of $P_{rh} = 89$ minutes, about 5% greater than the orbital period $P_{orb} = 84.7$ minutes (Shafer and Szody 1984, Ap. J., 276, 305). T Leo has the smallest mass ratio $q = M_1/M_2 = 1.4$ of the dwarf novae observed to develop superhumps during outburst and is reclassified as the newest member of the SU UMa subclass of dwarf novae. The figure below shows two well pronounced superhumps over a period that spans nearly two complete orbital cycles. The unfiltered data have a 3 second temporal resolution and reveal quasi-periodic flickering as well.

28.07

Recent Mass Loss from the White-Dwarf Nucleus of EGB 6

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EGB 6 is a very large ($11' \times 13'$) planetary nebula of low surface brightness whose central star, 0950+139, is a hot DA white dwarf. The nucleus shows strong emission lines of H, He, [O III], and [Ne III], which do not arise in the old, faint shell, but instead are confined to an unresolved nebular core component of newly ejected matter.

Model-atmosphere fitting of the hydrogen absorption wings yields a stellar $T_\text{eff} \approx 70,000$ K and $\log g \approx 7.5$, placing the central star near the hot extreme of the known sequence of DA white dwarfs. Analysis of the line spectrum of the unresolved central nebula indicates a very high density ($N_e \geq 10^5 \text{cm}^{-3}$), and a very small nebular mass (a few times $10^{-10}$ to $10^{-9} M_\sun$), with a physical extent of order 10 AU. The expansion velocity of the nebula, ~50 km s$^{-1}$, is much lower than the white dwarf’s escape velocity, but is near that for red giants.

These results imply that the star, which much earlier had ejected the large planetary- nebula shell, has very recently undergone a second, late episode of mass loss. We explore the possibilities that the white dwarf is currently losing mass (for which we can suggest no physical mechanism), or that it lost mass during a recent thermal pulse, during which it temporarily expanded to red-giant dimensions.

28.08

Hunting for Faint New Galactic Wolf-Rayet Stars, SS 433s and Magnetic Cataclysmic Binaries

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We are digitizing and electronically "blinking" broadband-narrowband HeII 4686 UK Schmidt plates covering the Southern Milky Way from Carina to the Galactic Center. Wolf-Rayet stars, magnetized cataclysmic binaries and SS 433s should be detectable as HeII-bright objects. In a nine square degree field in Carina (with $10^\circ \times 6^\circ$ stars at B < 18.5) we have recovered all but the brightest (B < 10) or most crowded Wolf-Rayet stars. One hundred candidates were spectrographically examined at CTIO and eight faint new Wolf-Rayet stars were found. No cataclysmics or SS 433s were detected.

28.09

V471 Tauri: The Oldest and Nearest Old Nova?

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IUET High Resolution SWP and LWP spectra of the Hyades, eclipsing-spectroscopic, (K2V+DA2) pre-cataclysmic, close binary V471 Tauri reveal very high velocity, cool, expanding gas (Fe II, Si II, C II, Mg II, O I) in the line of sight to the binary system with an expansion velocity of ~1200 km/sec. There is no variation of the co-added absorption feature with orbital phase and its equivalent width is $\approx 350$ mA with FWHM $= 30$ km/s. The absorption appears in 7 lines of the Fe II cv1 multiplet (2855-2617Aa), coadded in velocity space for each of the 11 LWP images around the orbit, in coadded LWP velocity plots of Mg II, Mn II, Cr II as well as in SWP plots of C II, Si II (1260) and O I (1302), coadded in velocity space. This feature very likely has an origin distinct from the persistent lower velocity (~500, 260 km/sec) absorption components of the K2V star discovered by Mullan et al. (1988, ESA SP281, p.378; Ap.J.Lett.,submitted) and from the narrow coadded feature of C II, Si II and O I, at ~500 km/sec discovered by Bruhweiler and Sion (1986, Ap.J. Letters, 202, L45). The large expansion velocity suggests the possibility of its association with an ancient nova outburst. The thermonuclear outburst could have been triggered by the accretion of wind/flare material by the white dwarf. From our observed wind mass loss rate ($2 \times 10^{-11} M_\sun$/yr; Mullan et al.), we estimate an accretion rate by the white dwarf of $4 \times 10^{-13} M_\sun$/yr. A nova was recorded within 1° of V471 Tauri's position by Chinese observers in 396 A.D. Further observations in other wavelength regions including deep CCD imaging and direct photography are strongly urged. If confirmed, then V471 Tauri would be the nearest and the earliest old nova to be recovered. Implications are discussed.

This research was supported by NASA grant NAGS-343 and in part by NSF grant AST88-02868, both to Villanova University.