

suggested from the optical region studies by Wright and collaborators. UV spectra are proving powerful tools since the hot dwarf out of eclipse provides a bright continuum for the strong resonance lines of O I, C II, C IV, Si II, Fe II and Mg II to reveal mass streaming and concentrations along the line of sight, with modest exposures. Phase dependent variations have been found, and we expect that full phase coverage will help in modeling the flow origin and geometry. Eclipse observations used in consort with the out-of-eclipse observations provide new information of the excitation of the circumstellar nebulae and mass streaming between the components. We will present profiles and integrated fluxes at various phases to demonstrate these concepts.

*Guest Observer, IUE satellite.

32.07 Moderate Resolution McGraw-Hill Scanner Observations of Symbiotic and Related Stars, W. BLAIR, Univ. of Michigan, R. STENFEL, JILA, U. of Colo. & NBS, W. FEIBELMAN and A. MICHALITSIANOS, NASA-Goddard. - The Mark 2 scanner on the McGraw-Hill 1.3 meter telescope at Kitt Peak has proven to be an exceptional instrument for various kinds of stellar observations. The instrument possesses numerous advantages over photographic spectroscopy for faint emission line objects, such as symbiotic stars ($V \sim 12$). Use of the scanner, in combination with IUE observations, enables us to obtain absolute flux calibrated observations and spectral coverage between 1200 Å to 7500 Å. This extended wavelength region opens up new diagnostic possibilities, for effective temperature determinations and for use of line pairs to delimit electron densities. The short integration times enable us to also search for suspected variability in lines, such as in IC 4997. High signal to noise permits searches for the so-called Ca X feature near 8500 Å in symbiotics. Further, the numerical format permits experiments such as RS CVn starspot spectra to be derived by differencing photometric wave maximum and wave minimum spectra. Results obtained to date include: a short period binary model for the eruptive symbiotic object HM Sge; egress observations of the eclipsing symbiotic CI Cyg; a survey of northern symbiotic objects; variations in the spectrum of CH Cyg (in collaboration with B. Bopp and S. Smith); RS CVn starspot spectra (in collaboration with D. Hall and R. Hohlfield), and other interesting results. We will display these and other spectra as final reductions warrant.

32.08 V 356 Sagittarii: Energy Distribution and FUV Emission Lines, Mirek J. Plavec and Jan J. Dobias, Univ. of Calif., Los Angeles. - The Algol system V 356 Sgr deserves special attention, since it is probably at the very end of its mass transfer phase. We obtained IUE observations at both eclipses (phases 0.02 and 0.50) and at phase 0.34, as well as numerous scans with the Lick IDS scanner (mostly taken by R. S. Stone). The system is fairly strongly reddened, $E(B-V) = 0.27$. The energy distribution of the cooler component is well fitted by an interpolated Kurucz model for $T_{\text{eff}} = 9,250$ K, $\log g = 2.85$, while the hotter component is matched by $T_{\text{eff}} = 18,000$ K and $\log g = 4.25$. The corresponding spectral types, A1.5 II and B3 V agree with Popper's values (1955, ApJ 121, 55).

IUE spectrum taken at the primary (total) eclipse shows strong emission lines of N V doublet at 124 nm,

Si IV doublet near 140 nm, and much weaker C IV doublet at 155 nm and Si III at 130 nm. These emission lines came as a surprise, since no emission are observed in the optical spectrum. Although the corresponding high dispersion spectrum is unfortunately too weak to be sure, it appears that the emission lines do not have the P Cygni profiles we found in β Lyrae or KX Andromedae, and which we believe are associated with accretion at high rates (cf. Plavec in Plavec, Popper, Ulrich (ed.): "Close Binary Stars: Observations and Interpretation", Reidel 1980, p. 251). Rather, they seem to show a broad double emission with a broad central absorption, like the circumstellar rings of the RW Tauri type. Therefore the hot plasma may be associated with the circumstellar ring proposed by Wilson and Caldwell (1978, ApJ 221, 917). Weakness of the C lines relative to N V may indicate that the circumstellar material was formerly processed by the CNO bi-cycle. Outside totality, the emissions are replaced by broad deep absorptions. This investigation is supported by grants from NSF and NASA.

32.09 Discovery of a Hotter Companion of the B8Ia Supergiant μ Sagittarii, Mirek J. Plavec and Janet L. Weiland, Univ. of Calif., Los Angeles. - The single-line spectroscopic binary μ Sagittarii has an unusually large mass function $f(m) = 2.67 M_{\odot}$, which warrants search for a fairly massive companion. IUE spectra have been combined with Lick IDS scans (mostly obtained by R. S. Stone) to find the energy distribution between 110 - 680 nm. Excess flux shortward of about 160 nm and certain absorption lines detected with Copernicus (in collaboration with R. S. Polidan) indicated the presence of a star hotter than the observed B8Ia primary. Plavec's prediction of an eclipse of this component (1979: IAU Circ. 3333 and IBVS No. 1598) was confirmed by IUE (Guinan and Sion) and Copernicus observations. Assuming that the eclipse is total, the two spectra can be separated and matched by interpolated Kurucz models as follows: cooler star, $T_{\text{eff}} = 11,000$ K, $\log g = 2.0$ (B8Ia), hotter star, $T_{\text{eff}} = 18,500$ K, $\log g = 4.5$ (= B3 V). More data is needed to confirm these values. The ratio of radii is about 5.1 : 1, ratio of luminosities 3.3 : 1. In the optical region, the hotter component is about 2.5 mag. fainter than the supergiant. With the period of 180.2 days, only one primary eclipse is now observable each year, in August/September. Its duration is uncertain and may be 10 - 20 days. An atmospheric eclipse may precede it, in which case we will be able to probe the stellar wind of the B8Ia supergiant -- a unique opportunity. Our Lick scans confirm the quasi-periodic light fluctuations (oscillations?) found by Guinan and Dorren (private communication); the amplitude in V may be about 0.1 mag. Reddening is fairly strong, $E(B-V) = 0.30$. Using Hutchings' absolute visual magnitude $M_V = -8.1$ mag, we find a distance of 1.6 kpc. - This investigation is part of a project supported by grants from NSF and NASA; the assistance of the NASA-IUE staff is deeply appreciated.

32.10 Multi-epoch VLA mapping of Changes in the Intensity and Polarization Structure of the SS433 Radio Source, R.M. HJELLMING, NRAO, and K.J. JOHNSTON, NRL. - VLA observations of SS433 at 1465, 4885, and 15035 MHz made at seven epochs between 1979 Sept. 8 and 1980 June 20 show structures with size scales between 0.1" and 5" which change significantly on time scales of 1-2 weeks.