tuations were interpreted as a dust cloud passing in front of the orbit of the central binary star (Costero et al. 1986, RevMexAA, 13, 149), they were periodic and developed a secondary minimum while the primary one faded, until the variations ceased. For several years it remained nearly constant, until the star was reported to vary again by Kohoutek (1991, IBVS 3584) and Kohoutek, Mantegazza, & Hainaut (1992, IBVS 3694), who published light curves showing ΔV of less than 0.2 mag, at phases between 0.42 and 0.53, computed with the orbital ephemerides given by Méndez et al. (1982).

We report observations of V651 Mon obtained at the Observatorio Astronómico Nacional at San Pedro Mártir, México, during April and May, 1992. Our observations indicate a broader and deeper "occultation" (so called following R. Méndez's suggestion during this meeting), centred at approximately phase 0.3. The corresponding *B-V* values are compatible with the occultation being caused by a dust cloud. These and additional observations will be published later in this Journal.

HIGH RESOLUTION TIME-RESOLVED UCLES SPECTROSCOPY OF AE AQR

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The secondary stars in cataclysmic variables have not yet been properly obtained. This is due to the fact that their spectrum is heavily veiled by a strong blue continuum arising from the accretion disc. However the advent of new digital detectors and high resolution spectrographs now make possible a more complete investigation. We have observed AE Aqr, an 11th magnitude cataclysmic variable, with the UCL echelle spectrograph (UCLES) at the Anglo Australian Telescope. The profile of individual absorption lines is clearly visible, and it has been possible to measure the rotational profile of AE Aqr B as a function of orbital phase. We are at a preliminary stage of the reduction, but it is clear from the initial analysis that it is possible to map the surface of the secondary star, and to correct the radial velocity curve for the effects that distort the absorption lines, due to the heating of the surface of the secondary pointing towards the accretion disc and white dwarf. We expect to conclude the analysis soon.

MODELING PHOTOIONIZED ASTROPHYSICAL NEBULAE

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Classic physical diagnostics of astrophysical nebulae are based on selected temperature and density sensitive forbidden line ratios. With such gas density and temperature determination, chemical abundances of relevant elements are determined.

We have developed an alternative method that simultaneously determines the gas physical conditions, chemical abundances as well as the characteristics of the ionizing source. This method uses the photoionization code CLOUDY (Ferland 1991, OSU Internal Report 91-01). This code is used with the unconstrained minimization routine POWELL (Press et al. 1986, Numerical Recipes, Cambridge University Press).

The function to be minimized is $X = Q + aR$, where Q is defined as a function of indices that are sensitive to physical conditions, a is a constant and R, defined as

$$R = \frac{\sum_i \mid (f_i^0 - f_i^0)/f_i^0 \mid (f_i^0)^\alpha}{\sum_i (f_i^0)^\alpha}$$

is the relative residual weighted by the α momentum of the observed line fluxes.

We have found that the function Q has better sensitivity for finding the physical parameters while the function R is only able to set the chemical abundances. We have concluded that modeling using just function R may lead to physically unacceptable configuration.

Tests showing the performance of the model with synthetic data under controlled conditions are presented.

ON THE SPECTRUM OF BL 3–14

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Bl 3–14 is an object with Hα in emission, which has been classified as a planetary nebula (Perek & Kohoutek 1967, Catalogue of Galactic Planetary Nebulae), as a symbiotic star (Allen 1984, Proc.Astron.Soc.Aust., 5, 367) and, recently, as a possible planetary nebula (Acker et al. 1992, The Strasbourg-ESO Catalogue of Galactic Planetary Nebulae). Its spectrum is presented and discussed. It is shown that the object is not a planetary nebula.