mospheric lines, the farthest *UV* and X rays. These magnetic fields are developed by a dynamo action generated in the interaction between rotation and the depth of the convection zone.

For some years, observations have been carried out at Cerro Tololo and Cerro La Silla Observatories as part of a photometric and spectroscopic program. Of all observed systems, more data related to BD–0°210 and V824 Ara systems is available. For both systems the result of data analysis is consistent with the hypothesis of the existence of colder regions in the photospheric surface. In the case of BD–0°210 it can be inferred that at least two spots account for cold regions distribution.

The filling factor and the estimated temperature for both the still region and the spot are shown in the table below. It was possible to obtain this information by applying the Vogt model for spot temperature determination from *V* and *R* color variation.

System	Still Region T°	Spot Temperature	Filling Factor
BD–0°210	5135	3865	22%
V824 Ara	5485	3515	25%

OPTICAL STUDY OF LMXBs WITH HIGH TEMPORAL RESOLUTION FROM CASLEO. EVIDENCE OF NON-THERMAL FLARES FROM MXB 1735-44

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We present a search for ultrafast optical variability (10^{-7} – 10 s) among some LMXBs using MANIA complex attached to the 2.15-m telescope of CASLEO, Argentina. Two flares of 0.25 s duration were recorded from the MXB 1735–44 X-ray burster. Object brightness increased 15–30 times in 0.05–0.06 s, while these flares also displayed fine structure (time scales 0.005–0.006 s, with a confidence level > 95%). Brightness temperatures were obtained for the non-thermal process during accretion of material onto a compact object.

IDENTIFICATION OF NEW SYMBIOTIC STARS

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We present optical and near infrared spectroscopy of the stars V417 Cen, V704 Cen, RT Cru, H1–25 and NSV 11776 which confirms the symbiotic nature for these systems. The stars RT Cru, H1–25 and NSV 11776 are classified for the first time as symbiotics, while V17 Cen is quoted as yellow symbiotic in Steiner, Cieslinski, & Jablonski (1988, CTIO 25th Aniversary Symposium, ASP Conference Series), and V704 Cen as a possible symbiotic in Allen (1984, Proc. ASA, 5, 369). The stars H1–25 and NSV 11776 were misclassified as planetary nebulae in Perek & Kohoutek (1967, Catalogue of Galactic Planetary Nebulae) and in Steiner et al. (1988), respectively. RT Cru, on the other hand, is classified as IA (i.e., irregular variable with early (O-A) spectral type) in the 4th edition of General Catalogue of Variable Stars (Kholopov et al. 1985).

We have also obtained *UBVRI* photometry and differential fast photometry (1–2 hours of length) in *V* band for some of these objects. The star RT Cru presents flickering with amplitude ~0.03–0.05 mag and timescales of ~10–20 minutes, while the other stars apparently do not show any variations.

Both, spectroscopic and photometric observations were taken at CNPq/Laboratório Nacional de Astrofísica (LNA), Brazil.

FURTHER OCCULTATIONS OF THE CENTRAL STAR IN NGC 2346?

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V651 Mon, the central star of the planetary nebula NGC 2346, is a well known spectroscopic binary with an orbital period of nearly 16 days. It consists of an A-type star and a hot, dense companion (c.f. Méndez & Niemela 1981, ApJ, 250, 240). About ten years ago, the system went into a long series of large optical and infrared variations with a modulation similar to the orbital period (Kohoutek 1982, IBVS 2113; Kohoutek 1983, MNRAS, 204, 92; Méndez, Gathier, & Niemela 1982, A&A, 116, L15; Roth et al. 1984, A&A, 137, L9). These first light fluc-

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

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

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.