

### A STUDY OF THE OPTICAL NEBULA AROUND THE WOLF-RAYET STAR $\theta$ MUS

Guillermo Giménez de Castro<sup>1,2</sup>, and  
Virpi Niemelä<sup>3,4,5,6</sup>

The optical nebula around the Wolf-Rayet star  $\theta$  Mus = HD 113904 has a considerable angular extension ( $\sim 2^\circ$ ). This nebula is seen surrounding the star as an arc structure, which is located inside a neutral hydrogen bubble (Cappa de Nicolau & Niemela, AJ 89, 1398, 1984).

With the aim of studying the morphology of the optical nebula, we have obtained  $30' \times 30'$  CCD images with the Schmidt telescope at CTIO, Chile, through narrow-band filters centered in the nebular emission lines of  $H\alpha$  and [O III]. Our [O III] images show a striking filamentary structure and furthermore, they appear spatially detached from the  $H\alpha$  images.

Physical conditions of the nebula were analyzed by means of long slit spectra obtained with the 2.15-m telescope at CASLEO, San Juan, and the 1.5-m telescope at Bosque Alegre, Córdoba, in the spectral range  $\lambda \sim 3300 \text{ \AA}$  to  $7300 \text{ \AA}$ .

With the [S II] and  $H\alpha$  line fluxes obtained from the long slit spectra, we have constructed diagnostic diagrams (eg., Sabbadin et al., A&A 60, 147, 1977) which compare the line ratios observed in Planetary Nebula, Supernova Remnants (SNR) and H II regions. Our results place the optical nebula surrounding  $\theta$  Mus in the limit between SNR and H II regions.

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<sup>1</sup>Instituto de Astronomía y Física del Espacio  
Buenos Aires, Argentina

<sup>2</sup>Fellow of CONICET, Argentina

<sup>3</sup>Observatorio Astronómico, La Plata, Argentina

<sup>4</sup>Member of Carrera del Investigador, CIC, Prov. de Buenos Aires, Argentina

<sup>5</sup>Visiting Astronomer, CASLEO, operated under agreement between CONICET and the National Universities of La Plata, Córdoba and San Juan, Argentina

<sup>6</sup>Visiting Astronomer, CTIO, NOAO, operated by AURA, Inc. under contract with NSF, USA

### CCD PHOTOMETRY OF CEPHEID VARIABLES IN THE FIELD OF THE YOUNG LMC CLUSTER NGC 1866

Matías Gómez<sup>1</sup>, Wolfgang Gieren<sup>1</sup>,  
Leopoldo Infante<sup>1</sup>, Gisela Hertling<sup>1</sup>,  
Thomas J. Moffett<sup>2</sup>, and Thomas G. Barnes<sup>3</sup>

We present accurate BVRI light curves of seven Cepheid variables in the field of the young, populous LMC cluster NGC 1866 which are based on CCD photometry obtained at Las Campanas Observatory. For one of the variables, HV12199, we combine our new photometric data with radial velocity data from the literature to derive its distance and mean radius with the visual surface brightness method. Using the metallicity determination for the cluster recently obtained by Hilker et al. (1995), we find a metallicity-corrected distance of 54.2 kpc and a mean radius of 30.2 solar radii for the Cepheid variable. This distance which corresponds to a true modulus of 18.68 mag, and its mean radial velocity (Welch et al. 1991) suggest that HV12199 is a cluster member.

A full study of the Cepheid variables in this Cepheid-rich cluster will be carried out when further photometric and radial velocity data for all the variables become available (observational programs in progress).

Hilker, M., Richtler, T., & Gieren, W. 1995, A&A 294, 648.

Welch, D.L., Mateo, M., Côté, P., Fischer, P., & Madore, B.F. 1991, AJ 101, 490.

<sup>1</sup>Pontificia Universidad Católica de Chile. Departamento de Astronomía y Astrofísica, Chile

<sup>2</sup>Physics Department. Purdue University, USA

<sup>3</sup>Astronomy Department. The University of Texas at Austin, USA

### SOME RESULTS OF THERMAL INSTABILITY IN ASTROPHYSICAL PLASMAS

Denise R. Gonçalves<sup>1</sup>, Vera Jatenco-Pereira<sup>1</sup>, and  
Reuven Opher<sup>1</sup>

The presence of Alfvén waves and the effects of their damping in different astrophysical ambients have been our object of study. The motivation for it, is the fact that these waves play an important role in the transition region, corona and solar wind (Belcher & Davis 1971; Hollweg 1990; Jatenco-

<sup>1</sup>Instituto Astronômico e Geofísico, Universidade de São Paulo, Brazil