

## Part 3. Massive Stars and 30 Doradus

### Section B. Poster Papers



Karen Vanlandingham and Anne Cowley comparing Tempe with Victoria during the reception.

## Discovery of a Stellar Association Surrounding the Massive Binary Sk-67°105 in the Large Magellanic Cloud

P. G. Ostrov<sup>1</sup>, V. S. Niemela<sup>1,2</sup> and N. I. Morrell<sup>3</sup>

*La Plata Observatory, Paseo del Bosque s/n, (1900) La Plata, Argentina*

### 1. Introduction

Sk-67°105, a luminous O4f type stars in the Large Magellanic Cloud, is the exiting star of the H II region N 50 (DEM 193). Niemela & Morrell (1986) found this hot star to be a massive short period double lined spectroscopic binary. Because luminous OB stars are usually found in young stellar groups, we have searched for such an aggregate in the vicinity of Sk-67°105.

Here we report, as a result of our search, the discovery of a new OB association in the LMC. We also find that Sk-67°105 is the most luminous star of a small compact cluster inside this OB association.

### 2. Observations and Results

Our observations were acquired with the 2.15m telescope at *Complejo Astronómico El Leoncito* (CASLEO), San Juan, Argentina. Direct images of the field surrounding Sk-67°105 were obtained with a 1024 × 1024 pixel TeK CCD detector through Johnson *B* and *V* filters during two observing runs:

- 1993 October: ~ 4' × 4' field with a scale of 0.54'' pixel<sup>-1</sup> (after binning)
- 1997 November: circular field of 9' diameter using a focal reducer producing a scale of 0.81'' pixel<sup>-1</sup>.

The images were processed using DAOPHOT (Stetson 1987).

In Figure 1 we show the colour-magnitude diagram (CMD) based on the photometric frames obtained in 1997. This diagram reveals the presence of an OB association within the field, with Sk-67°105 as its most notorious member.

In our higher spatial resolution 1993 images Sk-67°105 appears with several fainter very close companions. Profile fitting photometry carried out with DAOPHOT reveals the existence in this compact star cluster of at least 8 stars (detected both in *B* and *V* filters) inside a circle of 10'' radius surrounding Sk-67°105.

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<sup>1</sup>Visiting astronomer, CASLEO, operated under agreement between CONICET, SeCyT, and the Universities of La Plata, Córdoba and San Juan, Argentina

<sup>2</sup>Member of Carrera del Investigador, CIC, Prov. Buenos Aires, Argentina

<sup>2</sup>Member of Carrera del Investigador, CONICET, Argentina

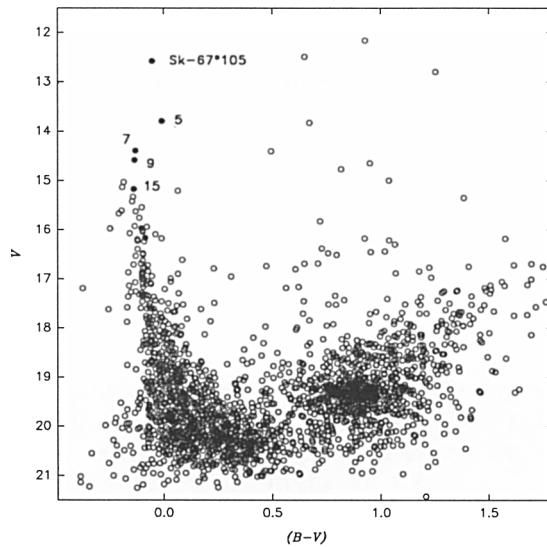


Figure 1. CMD of stars in a  $9'$  diameter field near Sk- $67^\circ$  105. The filled symbols represent stars with known spectral types. An OB association is apparent in this CMD.

In 1998 February, we obtained spectra of some of the brightest and bluest stars in the field of the new OB Association. These data were acquired using the Boller & Chivens Cassegrain spectrograph on the 2.15 m telescope at CASLEO, with a PM  $512 \times 512$  pixel CCD as detector. The spectra were processed and analyzed using IRAF routines. Spectral types for the observed stars were determined following Walborn & Fitzpatrick (1990). Magnitudes, colors, spectral types and radial velocities are listed in Table 1.

Table 1. Spectrophotometric data for stars in the new OB association.

ID	V	B-V	Sp.T.	R.V. ( $\text{km s}^{-1}$ )
5	13.80	-0.01	B5 III	$+311 \pm 16$
7	14.40	-0.13	B0.5 II-III	$+299 \pm 24$
9	14.58	-0.13	B0.5 III	$+296 \pm 15$
15	15.17	-0.14	O7 V	$+330 \pm 14$
41	16.16	-0.08	B1 IV-V (e?)	$+317 \pm 21$

## References

- Niemela, V. S., & Morrell, N. I. 1986, *ApJ*, 310, 715  
 Stetson, P. B. 1987, *PASP*, 99, 191  
 Walborn, N.R., & Fitzpatrick, E. 1990, *PASP*, 102, 379