

The stellar content of NGC 2363 and its surroundings

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Abstract. A detailed study of the stellar content of the giant H II region NGC 2363 and its surroundings in the Magellanic galaxy NGC 2366 is undertaken to understand the starburst phenomenon.

Discussion

The highest surface brightness H II region in the sky, NGC 2363, is located at the southern end of the bar in the nearby Magellanic galaxy NGC 2366. Its unusual combination of kinematical features (Roy *et al.* 1992) make it the archetype of a whole class of small but powerful young starbursts with blowout-like properties. In order to understand the star formation process in starbursts, we have gathered an extensive dataset of images with *HST*-WFPC2 and *CFHT*-MONICA, as well as UV spectra (*HST*-FOS and -STIS) of NGC 2363 and its surroundings.

Two star clusters are responsible for the ionization of NGC 2363 (Figure 1). Wolf-Rayet stars are known to be present in cluster B (Drissen *et al.* 1993) Indeed, our narrow-band (F469N) images reveal the presence of three individual

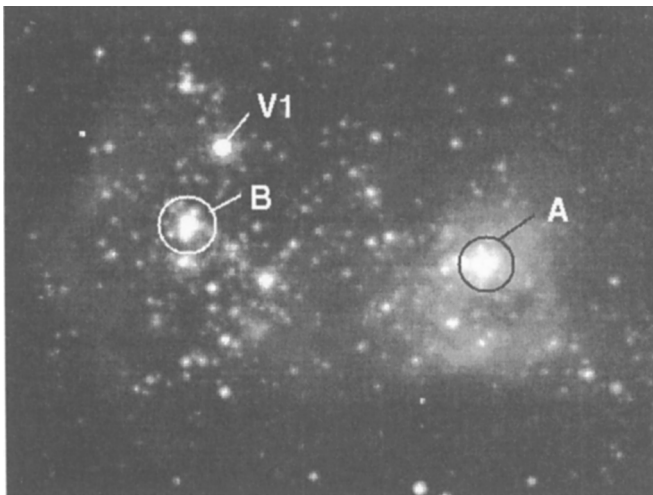


Figure 1. *HST*-WFPC2 *V* image of NGC 2363, showing the clusters A and B, as well as the erupting LBV V1. The field is $10'' \times 8''$ (170×140 pc). North is up, East to the left.

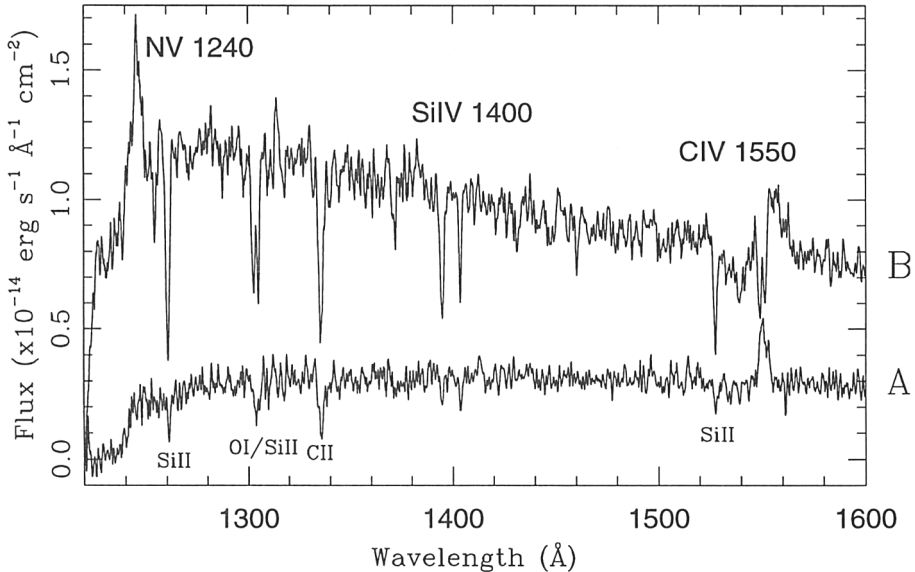


Figure 2. *HST*-FOS spectrograms of clusters A and B in NGC 2363. The spectrum of cluster A is flat and contains only interstellar narrow absorption features and the *nebular* C IV λ 1550 emission line. Prominent P-Cygni profiles of N V λ 1240 and C IV λ 1550 are seen in the spectrum of cluster B, typical of massive stars with strong winds.

WR stars within 0'3 of its core. The presence of the WR stars, the erupting LBV V1 (Drissen *et al.* 1997) and two massive O-type stars (whose STIS spectra were obtained at the same time as those of V1), the shape of the UV lines in the FOS spectrum (Figure 2) and the expansion velocity of the surrounding bubble, suggest that cluster B is ~ 4 to 6 Myr old. The absence of stellar wind features in the spectrum of knot A, the extreme nebular surface brightness close to its core, and its *IRAS* colors show that knot A is a very young (< 1 Myr) and dense cluster of massive stars still embedded in their natal molecular clouds. The giant H II region located 300 pc to the east of NGC 2363 (NGC 2366-II) is much older than NGC 2363: no WR stars are found, but a dozen red supergiants are detected, suggesting an age of ~ 10 Myr.

It is tempting to suggest that the extended group of stars to the southwest of NGC 2366 is a satellite galaxy and that its passage through the bar has triggered the wave of star formation portrayed by NGC 2366-II and NGC 2363.

References

- Drissen, L., Roy, J.-R., Moffat, A.F.J. 1993, *AJ* 106, 1460
 Drissen, L., Roy, J.-R., Robert, C. 1997, *ApJ* 474, L35
 Roy, J.-R., Aubé, M., McCall, M.L., Dufour, R.J. 1992, *ApJ* 386, 498