

# MASSIVE STAR FORMATION AND CHEMICAL EVOLUTION IN NGC 1313

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## Summary

The galaxy NGC 1313 is a late-type (almost Magellanic) barred spiral located midway between the Magellanic Clouds but at a distance of about 4.5 Mpc (de Vaucouleurs 1963). A comprehensive imaging and spectrophotometry program has been carried out in order to investigate the peculiar kinematics of NGC 1313 (Marcelin and Athanassoula 1982), as well as to study the relationships between the formation of massive stars and light element chemical abundances in spiral galaxies.

Flux-calibrated H $\alpha$  CCD imaging has been used to study the distribution and rate of present-day massive star formation. Following the techniques of Kennicutt (1983), the total observed H $\alpha$  luminosity of NGC 1313 implies a current formation rate for massive ( $M > 10M_{\odot}$ ) stars of order  $0.1 M_{\odot} \text{ yr}^{-1}$ , or a total star formation rate of around  $0.6 M_{\odot} \text{ yr}^{-1}$ . This is comparable to the past average rate of  $1\text{--}2 M_{\odot} \text{ yr}^{-1}$ . From surface photometry of V, I and H $\alpha$  CCD images, we find that the scale lengths of the old and the younger stellar populations are both very similar to that of the current star formation, each being of order 1.4 kpc.

Pagel *et al.* (1980) concluded that NGC 1313 probably does not have an abundance gradient. We have obtained longslit spectrophotometry of 14 HII regions in the bar, spiral arms and isolated southern regions with the MSSSO 2.3m telescope, and determined their abundances using photoionisation models. Within the inner  $100''$  (2.2 kpc), there is only a weak or zero gradient, while beyond this the spiral structure ceases, and there are indications of a drop in metallicity. Despite its scruffy appearance, star formation in NGC 1313 has proceeded fairly steadily over the disk's lifetime, contributing to at most only a weak abundance gradient.

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## References

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