

# B-supergiants in IC1613: testing low-Z massive star physics and evolution

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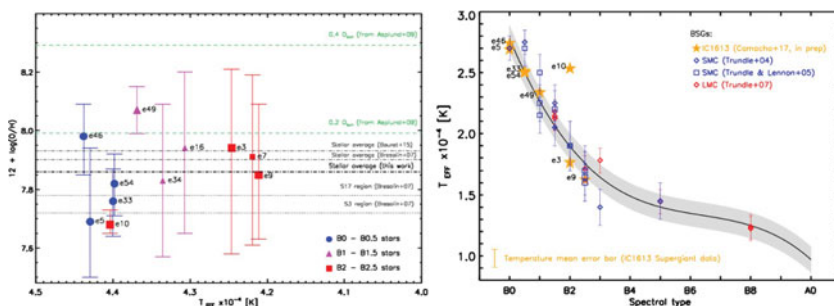
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**Abstract.** The physical processes taking place in massive stars during their life and death are highly dependent on the metallicity ( $Z$ ) of their parent cloud. Observations of these stars in low- $Z$  nearby galaxies are crucial to understand these processes. IC1613 is the nearest Local Group galaxy with ongoing star formation and O-abundance lower than the SMC, although UV spectroscopy suggests it is not so metal poor. We performed a spectral analysis of early B-type stars in the galaxy, obtaining physical parameters and abundances. Our results confirm the low O-abundance of IC1613.

**Keywords.** IC1613, massive stars, galaxy, abundances, metallicity

We have studied 11 early B-type stars in IC1613. We performed high quality spectral analysis of the data, using a non-classical automatic analysis method (GPMC, Urbaneja in prep.) and an optimized grid of 800 FASTWIND models. We obtained 11 physical parameters and abundances simultaneously ( $T_{\text{eff}}$ ,  $\log g$ ,  $He$ ,  $\xi$ ,  $\beta$ ,  $\dot{M}$ , O, N, C, Mg, and Si). From this analysis, we draw three main **conclusions: a)** We recover an average O-abundance of  $12 + \log(O/H) = 7.86 \pm 0.12$ , in agreement with other stellar and nebular studies in the galaxy (as shown in Fig. 1-left), and confirm the low O-abundance of IC1613. **b)** The derived  $T_{\text{eff}}$  of our supergiant sample are consistent with the Markova & Puls (2008, A&A, 478, 823)  $T_{\text{eff}}$ -scale for Galactic B-type supergiants (See Fig.1-right). This rather suggests there is not a significant effect of metallicity on the effective temperature for B-supergiants. **c)** Comparing the resulting abundances with the predictions of evolutionary models (Brott *et al.*, 2011, A&A, 530, A115), the low metallicity seems to favor high initial rotational velocities, although present  $V_{\text{sin}i}$  values are lower than predicted.



**Figure 1. LEFT:** Stellar O-abundances in IC1613 derived in this work. Other stellar and nebular studies are also included. **RIGHT:** Temperature scale for Galactic B-supergiants (B-SG) derived by Markova & Puls, together with the B-SG  $T_{\text{eff}}$ 's derived in this work (orange stars).