

Massive stars in the W33 giant molecular complex

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Rich in HII regions, giant molecular clouds are natural laboratories to study massive stars and sequential star formation. The Galactic star forming complex W33 is located at $l \approx -12.8^\circ$ and at a distance of 2.4 kpc, has a size of ~ 10 pc and a total mass of $(\sim 0.8 - \sim 8.0) \times 10^5 M_\odot$. The integrated radio and IR luminosity of W33 - when combined with the direct detection of methanol masers, the protostellar object W33A, and protocluster embedded within the radio source W33 main - mark the region out as a site of vigorous ongoing star formation. In order to assess the long term star formation history, we performed an infrared spectroscopic search for massive stars, detecting for the first time fourteen early-type stars, including one WN6 star and four O4-7 stars. The distribution of spectral types suggests that this population formed during the last $\sim 2-4$ Myr, while the absence of red supergiants precludes extensive star formation at ages 6-30 Myr. This activity appears distributed throughout the region and does not appear to have yielded the dense stellar clusters that characterize other star forming complexes such as Carina and G305. Instead, we anticipate that W33 will eventually evolve into a loose stellar aggregate, with Cyg OB2 serving as a useful, albeit richer and more massive, comparator. Given recent distance estimates, and despite a remarkably similar stellar population, the rich cluster Cl 1813-178 located on the north-west edge of W33 does not appear to be physically associated with W33.

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