

Massive stars in the giant molecular cloud G23.3-0.3 and W41.

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Young massive stars and stellar clusters continuously form in the Galactic disk, generating new HII regions within their natal giant molecular clouds and subsequently enriching the interstellar medium via their winds and supernovae.

Massive stars are among the brightest infrared stars in such regions; their identification permits the characterization of the star formation history of the associated cloud as well as constraining the location of stellar aggregates and hence their occurrence as a function of global environment.

We present a stellar spectroscopic survey in the direction of the giant molecular cloud G23.3-0.3. This complex is located at a distance of ~ 4 -5 kpc, and consists of several HII regions and supernova remnants. We discovered 11 OfK+ stars, one candidate Luminous Blue Variable, several OB stars, and candidate red supergiants. Stars with K-band extinction from ~ 1.3 - 1.9 mag appear to be associated with the GMC G23.3-0.3; O and B-types satisfying this criterion have spectro-photometric distances consistent with that of the giant molecular cloud.

Combining near-IR spectroscopic and photometric data allowed us to characterize the multiple sites of star formation within it. The O-type stars have masses from 25 - 45 Msun, and ages of 5-8 Myr. Two new red supergiants were detected with interstellar extinction typical of the cloud; along with the two RSGs within the cluster GLIMPSE9, they trace an older burst with an age of 20--30 Myr. Massive stars were also detected in the core of three supernova remnants - W41, G22.7-0.2, and G22.7583-0.4917.

A large population of massive stars appears associated with the GMC G23.3-0.3, with the properties inferred for them indicative of an extended history of stars formation.

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