

Talk at Splinter Meeting

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LOBSTAR: UNDERSTANDING THE MASSIVE STELLAR CONTENT OF
YOUNG STAR-FORMING REGIONS

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As a part of the LOBSTAR project (Luci OBServations of STARburst regions), which aims at understanding the stellar content of some of the most massive star-forming regions, we present our result on the high-mass stellar content of W49. The first results show that this region hosts several of the most massive stars in our galaxy. Two most brightest stars, one in the core of the central cluster and one in W49 South, were identified as very massive stars ($M > 100 M_{\odot}$). Their K-band spectra exhibit strong stellar wind features, and they are classified as O2-3.5If* supergiant stars. After comparison to the Geneva evolutionary models, the mass range of W49nr1 was estimated to be between $\sim 100 M_{\odot}$ and $\sim 180 M_{\odot}$. Additionally we find 12 stars with spectral types between O7V and O3V and masses from $25 M_{\odot}$ to $125 M_{\odot}$, respectively.

These results allow us to derive the fundamental parameters of the cluster as well as the total energy output in the form of ionising photons. It enable us to study the feedback effects of this extreme star forming region in great detail. To our surprise, two young stellar objects with infrared excess feature showing CO emission lines in their spectra. It suggests that circumstellar disks can survive even in this extreme environment. Finally the spatial distribution of the massive stars is analysed to discuss the star formation history and identify potential runaway stars. The extreme properties of this region makes it a good template for more extreme star formation outside our galaxy.