

# The Stellar Content of H72.97-69.39, a Potential Super Star Cluster in the Making

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## Abstract

Young massive clusters and super star clusters (SSCs) represent an extreme mode of star formation. Far-infrared imaging of the Magellanic Clouds has identified one potential embedded SSC, HSO BMHERICC J72.971176-69.391112 (H72.97-69.39 in short), in the southwest outskirts of the Large Magellanic Cloud. We present Gemini Flamingos 2 and GSAOI near-infrared imaging of a  $3' \times 3'$  region around H72.97-69.39 in order to characterize the stellar content of the cluster. The stellar content is probed down to  $1.5 M_{\odot}$ . We find substantial dust extinction across the cluster region, extending up to A<sub>K</sub> of 3. Deeply embedded stars are associated with ALMA-detected molecular gas suggesting that star formation is ongoing. The high spatial resolution of the GSAOI data allows identification of the central massive object associated with the  $^{13}\text{CO}$  ALMA observations and detection of fainter low-mass stars around the H30 $\alpha$  ALMA source. The morphology of the molecular gas and the nebulosity from adjacent star formation suggest they have interacted covering a region of several parsecs. The total stellar content in the cluster is estimated from the intermediate- and high-mass stellar content to be at least  $10,000 M_{\odot}$ , less than R136 with up to  $100,000 M_{\odot}$  within 4.7 pc radius, but places it in the regime of an SSC. Based on the extinction determination of individual stars we estimate a molecular gas mass in the vicinity of H72.97-69.39 of  $6600 M_{\odot}$ , suggesting more star formation can be expected.