

Alicante Survey of Massive Stars in HII regions (A-SMASHER)

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INTRODUCTION: Two main theories exist to explain the formation of massive stars: *MONOLITHIC CORE ACCRETION*; Scaled-up version of classical low-mass formation theories, where very high opacities allow infalling material to overcome the radiation pressure [Krumholz et al. 2009, *Science*, 323, 754] and *COMPETITIVE ACCRETION*; Massive stars are formed in cluster cores, benefiting from the gravitational potential of the whole cluster to accrete more material [Bonnell & Bate 2006, *MNRAS*, 370, 488].

OBJECTIVE: The aim of this survey is the homogeneous characterization of a large sample of HII regions with active star formation in order to detect observational trends supporting the two main models of massive star formation.

METHODOLOGY: The sample was carefully selected from existing radio catalogues and consists of targets that have not been previously studied and contain near infrared point sources consistent with a massive star. We obtained deep near infrared photometry of one hundred such HII regions with WHT/LIRIS and we have carefully analyzed the corresponding color-magnitude diagrams.

RESULTS: An initial separation has been made between regions containing obvious clusters and those that seem to include single sources (about 25%). For this latter subsample, we have already obtained intermediate-resolution spectroscopy with GTC/EMIR, while the clusters will be observed with multi-object configurations. Examples of the preliminary study of four HII regions with single sources can be seen in the poster by **de la Fuente et al.**

CONCLUSIONS: The statistical study of the properties of the populations contained within the HII regions in relation to the physical characteristics of the region itself and Galactic environment will provide novel insights into the conditions leading to (relatively) isolated or clustered massive star formation. Below, we show two examples corresponding to two very different HII regions, one containing a large population of massive stars and the other, only a few members. There are two images for each object: a composite J, H, Ks image, where we can see the stars inside the HII region (left), and the image from WISE enhancing the content of gas (right).

