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accretion, and multiplicity. On the other side, such surveys determine the shape and the low-mass limit of the Initial Mass Function (IMF), which are fundamental constraints on star formation theory.

SONYC, short for "Substellar Objects in Nearby Young Clusters", is an ongoing project to provide a census of the substellar population in nearby star forming regions. We have conducted deep optical and near-infrared photometry, combined with proper motions, and followed by extensive spectroscopic follow-up campaigns with Subaru and VLT, in which we have obtained more than 700 spectra of candidate objects in NGC1333, ρ Ophiuchi, Chamaeleon-I, Upper Sco, and Lupus-3. We have identified and characterized more than 60 new substellar objects, among them a handful of objects with masses close to, or below the Deuterium burning limit. Thanks to the SONYC survey and the efforts of other groups, the substellar IMF is now well characterized down to $\sim 5-10 M_J$, and we find that the ratio of the number of stars with respect to brown dwarfs lies between 2 ad 6. Another important piece of information for the star formation theories is that, down to $\sim 5 M_J$, the free-floating objects with planetary masses are 20–50 times less numerous than stars, so that their total contribution to the mass budget of the clusters can be neglected.

In this contribution we will present the status of the SONYC survey, discuss its main results, and focus on the latest findings in NGC1333, Lupus-3 and Upper-Sco.

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A SURVEY OF EXTENDED H_2 EMISSION TOWARDS A SAMPLE OF MASSIVE YSOS

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Very few massive stars in early formation stages were clearly identified in the Milky Way and moreover, the processes of formation of such objects lacks of observational evidences. Two theories predict the formation of massive star: *i*) by merging of low mass stars or *ii*) by an accretion disk. One of the most prominent evidences for the accretion scenario is the presence of bipolar outflows associated to the central sources. Those structures were found on both intermediate and low-mass YSOs, but there are no evidences for associations with MYSOs. Based on that, a survey was designed to investigate the earliest stages of massive star formation through the molecular hydrogen transition at 2.12 μm. A sample of $\sim$ 300 MYSOs candidates was selected from the Red MSX Source program and the sources were observed with the IR cameras Spartan (SOAR, Chile) and WIRCam (CFHT, Hawaii). Extended H_2 emission was found toward 55% of the sample and 30% of the positive detections (50 sources) have bipolar morphology, suggesting collimated outflows. These results support the accretion scenario, since the merging of low mass stars would not produce jet-like structures.

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STUDY OF TRIGGERED STAR FORMATION IN A BRIGHT-RIMMED CLOUD

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Bright-rimmed clouds (BRCs) are small and dense molecular clouds located in the periphery of the evolved HII regions. The illumination of these dark clumps by nearby OB stars might be responsible for triggered collapse and subsequent star formation through the mechanism known as radiation-driven implosion (RDI). We carried out a multi-wavelength study of a BRC located in the periphery of the evolved HII region G52.85-0.55. From the evaluation of the pressure balance between the ionized gas located at the illuminated border of the clump and the molecular gas, we show that shocks are being driven in the external layers of the BRC. On the other hand the pressure balance suggests that the birth of young stellar objects embedded in the BRC could have been initiated by the RDI mechanism.

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