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STAR FORMATION

3D SIMULATIONS OF THE BEEHIVE PROPLYD

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Some star formation regions, like the Orion nebula, have stars of different masses, from massive stars, responsible for strong ionizing winds and HII regions, to low-mass stars, which spend a long time in the protostellar phase, and are frequently associated with protostellar disks and jets. Massive O or B stars emit a great deal of UV radiation, able to dissociate the hydrogen molecule (FUV radiation, energies between 6-13 eV), to ionize the atomic hydrogen (EUV radiation, energies greater than 13.6 eV) and heat the gas. Around these stars, a large and hot ($10^4 K$) region is formed, known as HII region. T-Tauri stars inside HII regions produce a type of young stellar object, a proplyd, described with accuracy in O'Dell et al. (1993). Proplyds exhibit a cometary shape from which we can distinguish a central low-mass star with an accretion disk, an ionization front, a photodissociation region and, sometimes, an external bow shock and a protostellar jet. Its morphological characteristics depends on the distance between the low-mass star and the source of the ionizing radiation. The Beehive, a giant proplyd in Orion Nebula, has attracted attention due to its exotic system of rings coaxial to the HH540 jet's axis. Bally et al. (2005) suggested that the rings are perturbations due to the crossing of the ionization front by the jet. In this work, we test this hypothesis making 3D hydrodynamic numerical simulations over an adaptive grid, using the Yguazú-A code (Raga et al., 2000), properly adapted for the Beehive conditions. Our results show that the jet causes a perturbation in the ionization front of the proplyd, but is necessary to adjust carefully some parameters of the jet like its velocity and ejection frequency in order to have the results matching the observations.

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THE NATURE OF X-RAY SOURCES ASSOCIATED TO YOUNG CLUSTERS AROUND SH2-296

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Aiming to unravel the star formation activity in the Canis Major R1 (CMaR1), we have studied the young (< 5 Myr) clusters associated to the arc-shaped ionized nebula Sh2-296. Based on our X-ray data complemented by optical and near-IR data, we discovered, near to GU CMa, a stellar cluster that is older by at least a few Myr than the previously known cluster, around Z CMa, where star formation is still very active. Multi-object optical spectroscopy of our X-ray sources nearby Z CMa was performed with *Gemini* telescopes to confirm the existence of a mixed population from both older and younger clusters around the edge of Sh2-296. In the present work we show the results for optical counterparts candidates of 45 X-ray sources. Spectral type determination was based on comparison with standard spectra library and fitting the continuum and TiO bands. Typical features of young stars were inspected to confirm the nature of the sample that is mainly classified as T Tauri stars (TTs), since their spectra show the Li I line, one of the indicators of youth. The equivalent width of $H\alpha$ measured at 10% of the total flux was used to separate Classical TTs (CTTs) from weak-line TTs (WTTs). Among 51 optical counterparts candidates, 38 are young stars: 24% of them are classified as CTTs and 76% are WTTs. However the present results correspond to a small fraction (~15%) of the entire sample of X-ray sources we have detected. Aiming a more representative set of spectra, additional GMOS observations have been performed, as well as another ongoing project (see Santos-Silva et al.) dedicated to studying of the X-ray properties.

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