Stellar formation in NGC 2366: Searching for clusters and associations using unsupervised algorithms

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Abstract / Using the amazing resolution power of the Hubble Space Telescope (HST), we investigated the characteristics of the young stellar population in the spiral galaxy NGC 2366. In particular, we focused our attention in its hierarchical clustering distributions and the properties of the groups. As this galaxy shows a prominent He blue sequence, we analysed this populations and used it to show the spatial distribution of the stellar formation over time.

The galaxy was observed in two bands by the HST covering almost the central an intermediate parts of NGC 2366 with includes all the mayor stellar formation regions. HST data allowed to select the blue and young stars and therefore select the young population. Then, through the path linkage criterion (PLC), we found 487 young star groups and estimated their fundamental parameters, such as their stellar densities, sizes, number of members, and luminosity function (LF) slopes. We also performed a fractal analysis to determine the clustering properties of this population. We built a stellar density map and dendrograms corresponding to the galactic young population to detect large structures and depict their main characteristics.

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