

A TOPOLOGICAL AND 3D-GEOMETRICAL STUDY ABOUT AN INITIAL SKELETON OF THE 2MASS  
PLEIADES NUCLEUS WITH DR2 DISTANCE

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There are many works about the Pleiades, despite which there are still unknowns about them, including their exact number. The Pleiades are subjected to external and internal forces, which, if identified, can help determine their origin and evolution. Our goal does not pretend to be that ambitious. We will study the issue from a different perspective requiring several phases, being the first the one we will study in this poster. It consists of identifying some subset of their core by imposing geometric restrictions on the “Pleiadest” set contained in Vizier. We will consider only those belonging to 2MASS but using the stellar distances estimated by the DR2. The type of restrictions has a lot to do with the distances between stars (related to gravitational properties). Since we are concerned about the nucleus, the discrimination of stars will also consider high densities in their spatial distribution. After the adoption of such a subset (which is not unique, although it is preferable to take it small and then increase it with more 2MASS and DR2 stars that are not in 2MASS), it will be treated as a three-dimensional point cloud and applied Analysis techniques in Topological Data, in order to probe the topological structure of the nucleus of such an open cluster. This subject will be dealt with from a classical point of view and also from a dual point of view, using a net of points to which null densities are assigned through calculation. These points are also likely to be studied using TDA techniques. The results of both approaches should necessarily coincide for the conclusions to be acceptable. Finally, we will try to relate the astrophysical properties to different topological-geometric elements obtained in the first part. Summing up, the main goal of the poster is the deduction of a primary skeleton for the nucleus of the Pleiades that, on the one hand, adjusts well to astrophysical parameters and, on the other, can be expanded in subsequent studies.

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