

The Interplay between Filaments and Massive Star Formation

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The process of accretion is crucial to any theory of massive star formation. In this contribution I will use cutting edge AREPO simulations to show how a network of filaments that thread molecular clouds channel mass towards central proto-stars for accretion. The filaments fragment when they obtain the critical mass-to-length ratio but lower density filaments still contribute to the star formation process as accretion streams. Massive stars are most likely to form at the junctions of such filaments. As a percentage, only a small fraction of the critical filament network is in such junctions providing another explanation why massive star formation is rare. On a larger scale I will also present simulations showing the filamentary morphology of molecular clouds formed in the disc of spiral galaxies. Once again the intersection of such filaments is likely to play a role in massive star formation, as we find that it is at these intersections that the most massive, densest clouds are formed. These represent the perfect conditions for the formation of massive star clusters.

Filaments