

# Cosmic Cartography 2022: Exploring the Cosmic Web and Large-Scale Structure



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## Shape and connectivity of clusters: Impact on gas distribution

*Thursday, 10 March 2022 11:40 (20 minutes)*

In this presentation, I will first present the impact of large scale environment on the recent building-up of about 415 clusters of galaxies from the IllustrisTNG simulation. The mass of clusters mainly influences the geometry of the matter distribution: massive halos are significantly more elliptical and more connected to the cosmic web than low-mass ones. Beyond the mass-driven effect, shape and connectivity of clusters appear to trace different dynamical states, and are the sign of different accretion histories. Secondly, I will present the exploration of gas distribution around clusters. Whereas hot plasma is virialised inside clusters, the warm gas is accumulating and slowly infalling at cluster peripheries. Inside clusters, hot gas is well tracing cluster structural properties: center offsets, substructure fractions and elliptical shapes. Outside clusters, we found that warm gas follows the distribution of DM by tracing cosmic filament patterns.

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