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Impact of clusters' connectivity on their evolution and gas accretion

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Matter distribution around clusters is highly anisotropic from their being the nodes of the cosmic web.The number of filaments they are connected to, i.e., their connectivity, should reflect the level of anisotropy in the matter distribution and must be, in principle, related to their physical properties.
In this presentation, I will first address the influence of the local connectivity of clusters on cluster properties, by using the hydrodynamical simulation IllustrisTNG.The mass of clusters mainly influences the geometry of the matter distribution: massive halos are significantly more connected to the cosmic web than low-mass ones. Beyond the mass-driven effect, cluster connectivity appears to trace different dynamical state with different accretion histories.
Secondly, I will focus on gas distribution in the same simulated cluster sample. Whereas hot plasma is virialised inside clusters, the warm hot inter-galactic medium (WHIM) is accumulating and slowly infalling at cluster peripheries. Inside clusters, hot gas traces cluster structural properties, such as substructure fraction and elliptical shape. In contrast, WHIM gas outside clusters follows the DM distribution by tracing cosmic filament patterns. Finally, these numerical predictions are compared to soft X-ray observations.

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Classification de Session: Présentations