From the isotropic to the anisotropic cosmic web

🗓 04.04.2018   🕐 11:00 - 11:30   📍 Hall 1A   🏷 Plenary

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Large deviations theory can be successfully implemented to study the time-evolution of the large-scale structure of the Universe. This approach allows for analytical predictions in the mildly non-linear regime of structure formation, beyond what is commonly achievable via other statistics such as correlation functions.

The idea is to measure the mean cosmic densities within concentric spheres and study their joint statistics.The spherical symmetry then leads to surprisingly accurate predictions where standard calculations of perturbation theory usually break down. I will show results for the one and two-point statistics of the cosmic density field and discuss implications for future large galaxy surveys.