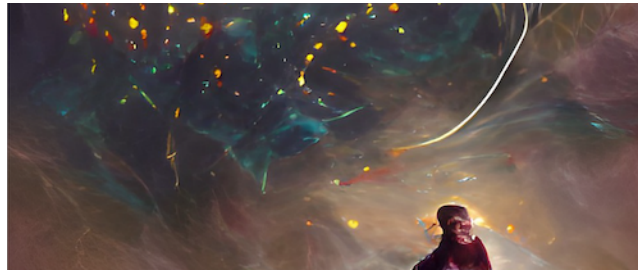


Cosmic Cartography 2022: Exploring the Cosmic Web and Large-Scale Structure



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The caustic web and non-linear constrained Gaussian random fields

Tuesday, 8 March 2022 16:25 (20 minutes)

The cosmic web consists of voids, walls, filaments, and clusters, formed from Gaussian fluctuations. Understanding under what conditions these different structures emerge is central to the study of the large-scale structure. Here, we present a general formalism for setting up Gaussian random initial conditions satisfying non-linear. These allow us to link the non-linear conditions on the eigenvalue and eigenvector fields of the deformation tensor, as specified by caustic skeleton theory, to the current day cosmic web. Applied to cosmological N-body simulations, the proposed techniques pave the way towards a systematic investigation of the evolution of the progenitors of the present-day walls, filaments, clusters, and the embedded galaxies, putting flesh on the bones of the caustic skeleton.

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