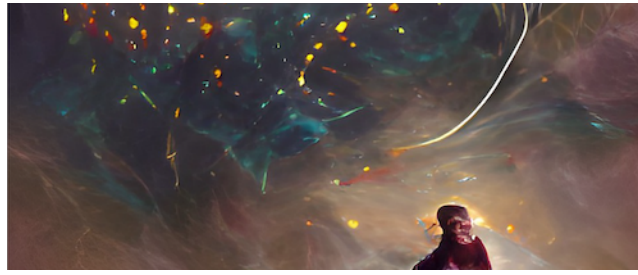


Cosmic Cartography 2022: Exploring the Cosmic Web and Large-Scale Structure



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Chrono-Cosmographic Analysis of the Cosmic Web with TARDIS

Tuesday, 8 March 2022 09:30 (30 minutes)

Recent Lyman- α forest tomography measurements of the intergalactic medium (IGM) have revealed a wealth of cosmic structures at high redshift ($z \sim 2.5$), including detection of large voids and protoclusters. In this talk, I will discuss ongoing work on the Tomographic Absorption Reconstruction and Density Inference Scheme (TARDIS), a chrono-cosmographic analysis tool for understanding the formation and evolution of these observed structures. We use maximum likelihood techniques with a fast non-linear gravitational model to reconstruct the initial density field of the observed regions. This allows us to not only accurately reconstruct the cosmic web at $z=2.5$ from the observed Lyman-alpha forest, but also to track the trajectories of coeval $z = 2.5$ galaxies to their $z = 0$ cosmic web environments and shed new insight in galaxy formation and evolution. I will also highlight a recent application of this technique to the COSMOS field as part of the CLAMATO survey.

Presenter: HOROWITZ, Benjamin (Princeton University)

Session Classification: Day 2 Morning