

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



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### **Nuw Cosmology beyond the average from one-point statistics**

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Nonlinear gravitational collapse shaped the cosmic web and created a plethora of different density environments. To realise the full potential of galaxy surveys, we need to dissect different densities that are lumped together in 2-point statistics. This is particularly important for LCDM extensions including massive neutrinos, dark energy and modified gravity. I will show how to extract information from the one-point statistics of matter densities and galaxy survey observables. We showed that using the lensing PDF jointly with the 2pt correlation can improve parameter constraints on extended models by 40% when combined with Planck. We also developed a bias model for the galaxy PDF that is compatible with 2pt correlations and can extract density-split statistics from galaxy surveys.

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