

Speaker: Dr. Zachary Slepian, University of Florida, Department of Astronomy

Title: Is Nature Its Own Mirror? Parity-Violation with Galaxy Quartets in the Sloan Digital Sky Survey

Abstract:

Recently we have shown that the galaxy 4-point correlation function, which measures an excess of quartets of galaxies over random, is sensitive to parity violation in our universe's large-scale structure. It is fundamentally 3D and thus has a handedness even after averaging over orientations, in contrast to galaxy pair and triplet correlations. With this new observable we have detected parity violation at high statistical significance using the largest currently available sample, the SDSS Baryon Oscillation Spectroscopic Survey's roughly 1 M galaxies. If confirmed by upcoming sky surveys such as DESI this would indicate new physics operant in the Universe's earliest moments. In this talk I will discuss this result and the many systematics tests performed to test its robustness, as well as prospects for the future.