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The Cosmological Preference for Negative Neutrino Mass

Wednesday 14 May 2025 09:00 (23 minutes)

Cosmological measurement of the absolute mass scale of neutrinos is a long-anticipated product of ongoing and upcoming cosmological surveys. The recent release of baryon acoustic oscillation (BAO) data from DESI, when combined with observations of the cosmic microwave background (CMB), has pushed our precision toward the level necessary to detect the cosmological impact of neutrino mass. However, analysis of these datasets has led to surprising results. The upper limit on the sum of neutrino masses is tighter than anticipated, and in fact the cosmological measurements favor a negative sum of neutrino masses. I will discuss how this inference shows a preference for excess cosmological clustering. I will show how excess clustering might be explained by models of new physics which have not yet been ruled out by other observations, and which in many cases make new predictions that can be observationally tested with near-future data.

Presenter: MEYERS, Joel (Southern Methodist University) **Session Classification:** Wednesday Morning Session 1