“Neutrinos, Quintessence and Structure Formation in the Universe”

Marilena Loverde, Stony Brook University

The large-scale structure of our universe (the distribution of galaxies on very large-scales for instance) contains a wealth of information about the origin, evolution, and matter content of the universe. Extracting this information relies crucially on understanding how galaxies and other biased objects trace the large-scale matter distribution. In a universe such as our own, with both cold dark matter and massive neutrinos, or in alternative cosmologies with clustered quintessence, this problem is much more complicated. I will discuss new tools that my group has developed to study gravitational evolution in cosmologies with multiple fluids, the novel signatures we have identified including a new probe of neutrino mass, and the broader implications for models of large-scale structure.