

One of the most unexpected discoveries of our time is the observation of the accelerating expansion of the Universe in 1998. Understanding the origin and nature of dark energy, that contributes about 70% of the total energy density in the universe and causes its accelerated expansion, is one of the greatest challenges of the modern cosmology. In this talk, first, I will briefly discuss that historical observation and different cosmological candidates for dark energy. Next, I will describe the current and future efforts to measure the macroscopic properties of dark energy. In particular, dark energy affects the large scale structure formation in low redshifts and different models leave different signatures which can make them distinguishable. Finally, I will explain how dark energy influences the dark matter clustering and its one-loop power spectrum.