

DARK LIGHT

Cosmology with Galaxy Redshift Surveys

Talk Abstract - 06/11/2014

Over the past 15 years a “standard” model of cosmology has been established. Apparently, we live in a low-density Universe with flat geometry, currently dominated by a cosmological constant driving a phase of accelerated expansion. Galaxy redshift surveys are one of the key experimental pillars that contributed to building this overall picture.

Even larger surveys are ongoing or planned, with the goal of understanding the nature of cosmic acceleration, together with the origin of galaxies.

In my talk I will review the most recent advances in studying large-scale structure at $z \sim 1$, focusing on the results from the VIPERS project at the ESO VLT. VIPERS has currently measured around 80,000 redshifts, producing galaxy maps with unprecedented detail at $0.5 < z < 1.2$. Coupled to multi-band photometry, it is providing us not only with independent cosmological measurements when the Universe was about half its current age (as e.g. the power spectrum of fluctuations and the growth rate of structure through Redshift Space Distortions), but also with a representative view of the evolution of galaxies within their large-scale environment at these epochs.

Analysing these and future data sets challenges our ability to keep systematic effects below statistical errors, which are already approaching the percent regime. If time permits, I will briefly touch upon ongoing efforts in this direction, focused to improve modelling of Redshift Space Distortions and obtain robust constraints on possible modifications of gravity.