Z110a PFS Galaxy Evolution Survey. II: Opening New Windows of Galaxy Formation Study — Large-Scale Interplay between Galaxies and the IGM —

Masami Ouchi (U. Tokyo) on Behalf of the PFS Galaxy Evolution Survey Team

Following the overview talk of the PFS galaxy evolution survey, we present the study of large-scale interplay between galaxies and the IGM, one of the key science drivers in the PFS galaxy evolution survey. We suggest to observe 24k galaxies galaxies at $z > 2$ acting as background probes of intervening absorbing gas, and to generate a 3D HI map ($2.1 < z < 2.5$) with an effective resolution of 3 comoving Mpc (cMpc) that will resolve filamentary structure and identify proto-clusters. We also plan to obtain a large sample of 19k Lyα emitters (LAEs) up to $z = 7$, beyond the scale of average-size ionized bubbles (> 100 cMpc), while drilling to the limits of the high-redshift and low-mass ends. The PFS 3D HI map and the LAE sample will allow cross-correlation between gas (HI, metals) and galaxies (+AGN) and reveal the large-scale interplay between galaxies and the IGM via gas and radiation exchange at $z \sim 2$ and 7 that includes physical process of cosmic reionization, thus opening new windows in such studies.