

Progenitor Study of Milky-Way-Like Galaxies over the Cosmic High Noon

Takahiro Morishita¹, Takashi Ichikawa¹, Masafumi Noguchi¹ and Masayuki Akiyama¹

¹ *Astronomical Institute, Tohoku University, Aramaki, Aoba, Sendai 980-8578, Japan*

Abstract

In this study we utilize the *HST*/WFC3 and ACS multi-band imaging data taken in CANDELS and 3D-HST surveys to trace the average properties of the progenitors of the Milky Way (MWs) and massive galaxy (MGs) at $0.5 \leq z \leq 3.0$ based on constant number densities. After careful data reduction and stacking analysis, we conduct the radially resolved SED fitting to see the radial profiles of stellar mass and rest-frame color. We find that MWs evolve the mass profiles in self-similar way, while MGs in inside-out where they obtain $\sim 80\%$ of the total mass at outer (> 2.5 kpc) radii. The radial color profiles show that the quenching depends on the distance from its center, which suggests several quenching mechanisms such as morphological quenching and suppression of gas infall into the center. Further effort is made, based on the derived average profile and its dispersion, to evaluate the morphological varieties and their evolution for the first time. By comparing them with the observed star formation rates and color profiles, the results are consistently explained by the star formation activities and manifestation of the Hubble sequence at $z \sim 1$.