X42a   GALAXY CRUISE: Morphological classification with deep learning

Rhythm Shimakawa, Masayuki Tanaka, Kumiko Usuda-Sato (NAOJ), GALAXY CRUISE team

We report an initial result of GALAXY CRUISE morphological classification with deep learning for a million galaxies at z=0.01–0.3 in the Hyper Suprime-Cam Strategic Program (HSC-SSP PDR3) and Legacy Archive (HSCLA2016). We performed spiral classification for a million bright galaxies, followed by pure spiral and ring-ish classification, based on the 1st season catalog of GALAXY CRUISE. We found that most of the pure spiral galaxies are located on the star-forming main sequence, while ring-ish spirals (and ringed galaxies) are significantly scattered on the mass–SFR plane. We also detected a clear trend of morphological segregation of galaxies in cluster environments as reported in our previous study (Shimakawa et al. 2022 PASJ). Furthermore, we present a preliminary result of ongoing studies and discuss possible future applications with deep learning techniques by combining the use of the GALAXY CRUISE catalog and the HSC imaging data.