[구LT-05] Stellar Population and Galaxy Formation in the GMT era

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One of the primary goals in the 21C astronomy is understanding how galaxies form and evolve in photometric, chemical and kinematic aspects. One approach toward this goal is to look at the details of stellar populations in nearby galaxies in the time domain. Current technologies based on HST or 10m-class ground-based telescopes provided exciting but tantalizing results from resolved galaxies in the Local Group to giant elliptical galaxies in Virgo or beyond. The advent of GMT will expand the current horizon. I present a list of challenging projects on stellar population that can be carried out in the GMT era,

[구LT-06] Globular Clusters with Multiple Populations as Primordial Galaxy Building Blocks

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In the current LCDM hierarchical merging paradigm, a galaxy like the Milky Way formed by numerous mergers of ancient subsystems. Most of the relics of these building blocks, however, are yet to be discovered or identified. Here we show that about 25% of the Milky Way globular clusters have characteristics of the remaining cores of these early building blocks. They are clearly distinct from other normal globular clusters in (1) the presence of extended horizontal-branch and multiple stellar populations, (2) mass (brightness), (3) mass-to-luminosity ratio, (4) metallicity distribution function, and (5) most importantly in orbital kinematics. The use of large ground based telescopes, such as GMT, will undoubtedly help to clarify and further investigate this possibility in the Local Group, Fornax, and beyond. Some of the future observational projects with GMT are suggested.