

a general purpose high dispersion instrument that is fiber-fed and capable of extremely precise radial velocity measurements. G-CLEF has undergone a preliminary design review in April 2015 and is now entering final design phase and construction. G-CLEF has been designed to measure the mass of Earth-analogue exoplanets and to make critical observations in near-field and high-Z cosmology. We describe the G-CLEF instrument and several key science missions that shaped the development of G-CLEF. First light on the GMT is scheduled for late 2020.

[초 IT-05] Young Open Clusters: Their Uses in Star Formation Studies

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Open clusters are one of stellar systems consisting of a few hundreds to thousands of stars. The cluster members are, in general, believed to be a coeval stellar population at the same distance, and therefore they have almost the same properties in chemical composition and kinematics. Owing to these advantages, the clusters are utilized in many astronomy studies, such as the calibrations of distance and stellar age scales, assessments of stellar evolution theories, and the chemical evolution of the Galactic disk. Young open clusters are, inter alia, superb objects to study star formation process as most of stars are known to be formed in clusters. In this talk, I will review the uses of these young open clusters in star formation studies based on the ongoing work of our research group on the stellar initial mass function, an age spread problem, mass accretion rate of pre-main sequence stars, and a feedback of high-mass stars on surroundings.

외부은하 / 은하단

[박 GC-01] Selection of High Redshift Quasars with Multi-wavelength Data

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High redshift quasars ($z > 5$) hold keys to understanding the evolution of the universe in its early stage. Yet, the number of high redshift quasars uncovered from previous studies is

relatively small (70 or so), and are concentrated mostly in a limited redshift range ($z \sim 6$). To understand the early mass growth of supermassive black holes and the final stage of the cosmic reionization, it is important to find a statistically meaningful sample of quasars with various physical properties. Here we present a survey for high redshift quasars at $5 < z < 7$. Through color selection techniques using multi-wavelength data, we found quasar candidates and carried out imaging follow-up observations to reduce contaminants. After optical spectroscopy, we discovered eight new quasars. We obtained near-infrared spectra for 3 of these 8 quasars, measured their physical properties such as black hole masses and Eddington ratios, and found that the high redshift quasars we discovered are growing via accretion more vigorous than those of their lower redshift counterparts. We estimated the quasar number densities from our discoveries and compared them to those expected from the quasar luminosity functions in literature. In contrast to the observed number density of quasars at $z \sim 5$, which agrees with literature, the observed number density at $z \sim 7$ shows values lower than what is expected, even after considering an extrapolated number density evolution. We conclude that the quasar number density at $z \sim 7$ declines toward higher redshift, more steeply than the empirically expected evolution.

[구 GC-02] Mapping the Polarization of the Radio-Loud Lyman Alpha Nebula B3 J2330+3927

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Ly α nebulae, or "Ly α blobs", are extended (~ 100 kpc), bright ($L[\text{Ly}\alpha] \sim 1044$ erg/s) clouds of Ly α -emitting gas. The origin of the Ly α emission remains unknown, but recent theoretical work suggests that measuring the polarization could discriminate among powering mechanisms. We will discuss current status of Ly α polarization observations at high-redshift and our on-going survey program. We will present the first narrow-band, imaging polarimetry of a Ly α blob, B3 J2330+3927 at $z=3.09$, with an embedded, radio-loud AGN (C. You et al. in prep.). The AGN lies near the blob's Ly α emission peak and its