

predominantly determined by tenuous but energetic electrons, and that denser and less energetic background electrons do not contribute much to the peak intensity. This finding shows that upper-hybrid fluctuations detected during quiet time are useful not only for the determination of the electron density, but also they contain information on the ambient energetic electron population as well.

## 항성

### [구 ST-01] The Formation Timescale of the Young Open Cluster NGC 2264: Implication on the Lithium Abundance Distribution of Pre-Main Sequence Stars

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The duration of star formation activity is a key to understanding the formation process of star clusters. Although a number of astronomers have attempted to derive the underlying age spread in photometric diagrams with a variety of stellar evolutionary models, the resultant findings are subject to uncertainties due to intrinsic variability of pre-main sequence (PMS) stars, observational errors, difficulties in reddening correction, and systematic differences in adopted stellar evolutionary models. The distribution of Li abundance for PMS stars in a cluster could, on the other hand, provide an alternative way to estimate the age spread. In this study, a total of 134 PMS stars in NGC 2264 are observed with the high resolution multi-object spectrograph Hectochelle attached to the 6.5m Multi Mirror Telescope. We have successfully detected Li  $\lambda$ 6708 resonance doublet for 86 low-mass PMS stars. The Li abundance of the stars is derived from their equivalent width using a curves of growth method. After correction for non-LTE effects, the underlying age spread of 3 – 4 Myr is inferred from the Li abundance distribution of low-mass PMS stars. We suggest that NGC 2264 formed on a timescale shorter than 5 Myr given the presence of embedded populations.

### [구 ST-02] New Photometric System for CN and CH

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During the last decade, there has been a dramatic paradigm shift on the definition of the globular cluster (GC) systems. The decades-long lighter elemental variation issue in GC stars is now considered to be a generic feature of normal GCs in our Galaxy, most likely engraved during the multiple-phase normal GC formation. In this talk, we will introduce the new photometric system, so-called the JWL System, to measure CN and CH abundances in multiple stellar populations in GCs. The utility and the future application of the JWL System will be discussed.

### [구 ST-03] IGRINS Spectral Library

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We present a library of high-resolution (R~45,000) and high signal-to-noise ratio (S/N  $\geq$  200) near-infrared spectra of 147 standard stars. High quality spectra were obtained with Immersion GRating INfrared Spectrograph (IGRINS) covering the full range of H (1.496-1.795  $\mu$ m) and K (2.080-2.460  $\mu$ m) bands. The targets are mainly selected as MK standard stars which have well-defined spectral types and luminosity classes, and cover a wide range of effective temperatures and surface gravities. The spectra were corrected for telluric absorption lines and absolute flux calibrated using Two Micron All Sky Survey (2MASS) photometry. We find new spectral indices in H and K bands and provide their EWs. We describe empirical relations between the measured EWs and stellar atmosphere parameters such as effective temperature and surface gravity.

### [구 ST-04] Low-Resolution Spectroscopy for the Intriguing Globular Cluster NGC 2808 : Chemical abundance patterns among