### Properties of the Orion Molecular Cloud

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Turbulence plays an important role in molecular clouds. However, the properties of turbulence are poorly understood. In order to study the influence of turbulence in molecular clouds, we need to sample the turbulent properties in the full range of scales down to sonic scale. We mapped the 20'×60' area covering the Orion Molecular Cloud (OMC) 1-4 region in HCN 1-0 and HCO+ 1-0 with Taeduk Radio Astronomy Observatory (TRAO) 14-m telescope as part of the TRAO key science program, "Mapping turbulent properties of star-forming molecular clouds down to the sonic scale (PI: Jeong-Eun Lee)". In addition, we combine our TRAO data with other molecular line maps ($^{13}$CO 1-0, C$^{18}$O 1-0, CS 1-0, $N_2H^+$ 1-0) obtained with the Nobeyama Radio Observatory (NRO) 45-m telescope. To analyze these data, we apply statistical methods, the principal component analysis (PCA) and spectral correlation function (SCF), which are known to be useful to study underlying turbulent properties and to quantitatively characterize cloud structure. We will present the preliminary results of observations and analyses.

### [포 IM-09] Infrared Study of a Low-mass Star-forming Region L1251B

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A low-mass star-forming region, L1251B, is an excellent example of a small and nearby group of protostellar objects. L1251B has been mapped spectroscopically with the Infrared Spectrograph (IRS) onboard the Spitzer Space Telescope. IRS has provided mid-IR emission lines (e.g., [Fe II], [Ne II], and ro-vibrational H2) and absorption features of CO2 and H2O ice in studying the physical state of the ionized gas and the material residing in the circumstellar environments. We will present the distribution of outflows and ice components in L1251B.

### [포 IM-10] Medium Resolution Spectroscopy of Red Giant Stars in Omega Centauri

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We present chemical abundances for about 800 red giant stars in Omega Centauri, based on medium-resolution spectra obtained using Hydra multi-fiber spectrograph at the CTIO 4-m telescope. Our sample covers 14.2 < V < 15.0, and is almost unbiased against colors (and therefore metallicity). The metallicity distribution function (MDF) constructed from our data has an overall shape and local peaks that approximately match those for brighter giant stars in Johnson et al.. We also find that more metal-rich cluster members are more concentrated in the cluster center, which is consistent with previous studies. On the other hand, we find no clear evidence for such a spatial dependence with respect to alpha elemental abundance ([α/Fe]).

### [포 IM-11] Calibration of Stellar Isochrones for G- and K-type Dwarfs based on High-Resolution Spectra

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We present a recent progress on calibration of stellar isochrones based on a set of high-resolution spectra for 170 G- and K-type dwarfs in the solar neighborhood. We compare observed magnitudes of these stars in a number of broad passbands [UB(B_T)V(V_T)RIJHK] with model magnitudes generated using ATLAS9 synthetic library at the previously derived set of spectroscopic parameters. We find systematic offsets in colors from these passbands, which are mainly revealed as a function of effective temperature of stars. In order to remove these systematic color mismatches, we derive correction functions and apply them to the model spectra.

### [포 IM-12] Abundant Methanol Ices toward a Massive Young Stellar Object in the Galactic Center

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Methanol ($CH_3OH$) is a key species in the formation of complex organic molecules. We report the first detection of solid $CH_3OH$ in a line of sight toward the Galactic center (GC) region, based on L-band spectra taken with the Subaru telescope, aided by L'-band imaging data and moderate-resolution spectra from NASA/IRTF. It is found toward a background star, ~8000 AU in projected distance from a newly discovered massive young stellar object (YSO). This YSO also exhibits a strong $CO_2$ ice absorption band at ~15 μm in Spitzer/IRS data, which has a prominent long-wavelength wing. It confirms that a high $CH_3OH$ abundance is responsible for the broad 15 μm $CO_2$ ice absorption towards massive YSOs in the GC. Clearly, $CH_3OH$ formation in ices is efficient in the GC region, as it is in star-forming regions in the Galactic disk. We discuss implications of our result on the astrochemical processes in the hostile GC molecular clouds.

### [포 IM-13] FIRST NEAR-INFRARED CIRCULAR POLARIZATION SURVEY

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Polarimetry is an important tool for studying the physical processes in the interstellar medium, including star-forming regions. Polarimetry of young stellar objects and their circumstellar structures provides invaluable information about distributions of matter and configurations of magnetic fields in their environments. However, only a few near-infrared circular polarization (CP) observations were reported so far (before our survey). A systematic near-infrared CP survey has been firstly conducted in various star-forming regions, covering high-mass, intermediate-mass, and low-mass young stellar objects. All the observations were made using the SIRPOL imaging polarimeter on the Infrared Survey Facility (IRSF) 1.4 m telescope at the South African Astronomical Observatory (SAAO). In this presentation, we present the first CP survey results. The polarization patterns, extents, and maximum degrees of circular and linear polarizations are used to determine the prevalence and origin of CP in the star-forming regions. Our results are explained with a combination of circumstellar scattering and dichroic extinction mechanism generating the high degrees of CP in star-forming regions. The universality of the large and extended CPs in star-formaing regions can also be linked with the origin of homochirality of life.

## 항성 및 항성계

### [포 ST-01] A MONTE CARLO STUDY OF FLUX RATIOS OF RAMAN SCATTERED O VI FEATURES AT 6825 Å AND 7082 Å IN SYMBIOTIC STARS

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A symbiotic star is a wide binary system consisting of a hot white dwarf and a mass losing giant, where the giant loses its material in the form of a slow stellar wind resulting in accretion onto the white dwarf through gravitational capture. Symbiotic stars are known to exhibit unique spectral features at 6825 and 7082, which are formed from O VI 1032 and 1038 through Raman