

Properties of the Orion Molecular Cloud

Hyeong-Sik Yun¹, Jeong-Eun Lee¹, Yunhee Choi¹, Seokho Lee¹, Minhoo Choi², Hyunwoo Kang², Ken'ichi Tatematsu³, Stella S. R. Offner⁴, Brandt A. L. Gaches⁴, Mark H. Heyer⁴, Neal J. Evans II⁵, and Yao-Lun Yang⁵,

¹*Kyung Hee University, Republic of Korea*, ²*Korea Astronomy and Space Science Institute, Republic of Korea*, ³*National Astronomical Observatory of Japan, Japan*, ⁴*University of Massachusetts, Amherst, USA*, ⁵*University of Texas, Austin, USA*

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 TRA0 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 TRA0 data with other molecular line maps (¹³CO 1-0, C¹⁸O 1-0, CS 1-0, N₂H⁺ 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

Yunhee Choi¹, Jeong-Eun Lee¹, Edwin A. Bergin², Geoffrey A. Blake³, A. C. Adwin Boogert⁴, James Di Francesco^{5,6}, Neal J. Evans II⁷, Klaus M. Pontoppidan⁸, and Annelia I. Sargent³

¹*Kyung Hee University, Korea*, ²*University of Michigan, USA*, ³*California Institute of Technology, USA*, ⁴*NASA Ames Research Center, USA*, ⁵*National Research Council, Canada*, ⁶*University of Victoria, Canada*, ⁷*University of Texas at Austin, USA*, ⁸*Space Telescope Science Institute, USA*

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

Jae In Jung¹, Deokkeun An¹, Young Sun Lee², Soo-Chang Rey², Jae-Woo Lee³, Young-Wook Lee⁴, Jaehyon Rhee⁵

¹*Department of Science Education, Ewha Womans University, 52 Ewhayeodae-gil, Seodaemun-gu, Seoul 03760, Korea*

²*Department of Astronomy & Space Science, Chungnam National University, Daejeon 34134, Korea*

³*Department of Astronomy and Space Science, Sejong University, Seoul 143-747, Korea*

⁴*Center for Galaxy Evolution Research, Yonsei University, Seoul 120-749, Korea*

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 ($[\alpha/\text{Fe}]$).

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

Yeseul Lim¹, Deokkeun An²

¹*Department of Science Education, Ewha Womans University, 52 Ewhayeodae-gil, Seodaemun-gu, Seoul 03760, Korea*, ²*Department of Science Education, Ewha Womans University, 52 Ewhayeodae-gil, Seodaemun-gu, Seoul 03760, Korea* deokkeun@ewha.ac.kr