properties associated with the inner and outer halos of the Milky Way, as identified by metal-poor stars from the Sloan Digital Sky Survey. In particular, using carbon-enhance metal-poor (CEMP) giants, we first map out the fractions of CEMP-no stars (without strongly enhanced neutron-capture elements) and CEMP-s stars (with a large enhancement of s-process elements) in the inner- and outer-halo populations, separated by their spatial distribution of carbonicity ([C/Fe]). The CEMP-no and CEMP-s objects are classified by their different levels of absolute carbon abundances, A(C). We investigate characteristics of rotational velocity and orbital eccentricity for these sub-classes within the halo populations. Distinct kinematic features and fractions between CEMP-no and CEMP-s stars identified in each halo region will provide important clues on the origin of the dichotomy of the Galactic halo.

[포IM-06] Gemini Observations of Planetary Nebula Candidates toward the Galactic Center

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We present high-resolution near infrared (IR) spectra of two candidate planetary nebulae (PNe) that were serendipitously found toward the Galactic center (GC). Our spectra obtained using GNIRS on Gemini North reveal strong Br γ and He I recombination lines. In one of the targets, we confidently detect Pa δ emission. Based on Br γ and Pa δ lines, we estimate a foreground reddening to be Av=27 mag, which confidently puts this object at the GC distance. Along with the presence of highly excited emission lines such as [S IV], [Ne III], [Ne V], and [O IV] detected in the mid-IR spectra from the Spitzer Space Telescope, and the extended emission in the Pa α narrow-band image from the Hubble Space Telescope, this makes it the first spectroscopically confirmed PN in the GC.

[포IM-07] Correlation between Magnetic-field directions and intensity gradients in Orion A region

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Magnetic fields play an important role in star-forming processes by regulating gravitational collapse. In filamentary structures of star-forming regions, magnetic fields are likely to be aligned with minor axes of filamentary molecular clouds because matter freely moves along magnetic field lines. Orion A region, one of the well-known high-mass star forming regions, has long filament structure. In order to study magnetic field directions with respect to the filamentary structure in Orion A, we have analyzed 850 μm dust polarization observations obtained with the James Clerk Maxwell Telescope (JCMT). We found tight correlation of dust intensity gradients and magnetic field directions. It was estimated that 81% of magnetic field segments are aligned with density gradients within 40 degree. In conclusion, we confirmed most of magnetic field segments are perpendicular to the major axis of the filament in Orion A.

천문우주관측기술

[포AT-01] Automation of Kyung Hee Astronomical Observatory 76 cm Telescope

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We plan to automatize the operation of Kyung Hee Astronomical Observatory (KHAO) 76 cm Telescope by adapting KAOS30 (KHU Automatic Observing Software for McDonald 30 inch Telescope). The software is developed to improve the efficiency of the observation system for monitoring transients and variable sources. It has installed and operated at McDonald 30 inch telescope since 2017 August. KAOS76 (KHU Automatic Observing Software for KHAO 76 cm Telescope) consists of four packages: Telescope Control Package (TCP), Data Acquisition Package (DAP), Auto Focus Package (AFP), and Script Mode Package (SMP). Most of the packages can be configured by minimized modifications of the codes because it includes common libraries for FLI instruments and also ASCOM standard. TCP, DAP, and AFP control astronomical devices. SMP supports automatic observing in a script mode. TCP of KAOS76 can communicate with the TCS via ASCOM. Also, KAOS76 has an extra function to compensate the misalignment of the polar axis. In this poster, we show the current status of the