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We present the results of a search for Very Low-Luminosity Objects (VeLLOs) in the Gould Belt (GB) clouds using infrared and sub-millimeter (sub-mm) data from 1.25 to 850 μm and our N2H+ (J = 1-0) observations. We modified the criteria by Dunham et al. to select the VeLLOs in the GB clouds, finding 95 VeLLO candidates, 79 of which are newly identified in this study. Out of 95 sources, 44 were detected in both sub-mm continuum and N2H+ emission and were classified as Group A (the VeLLOs), and 51 sources detected in either sub-mm emission or N2H+ emission were classified with Group B as candidate VeLLOs. We find that these VeLLOs and the candidates are forming in environments different from those of the likely VeLLOs. Seventy-eight sources are embedded within their molecular clouds, and thus are likely VeLLOs forming in a dense environment. The remaining 17 sources are located in low-level extinction regions (Av < 1) connected to the clouds, and can be either background sources or candidate substellar objects forming in an isolated mode. The VeLLOs and the candidates are likely more luminous and their envelopes tend to be more massive in denser environments. The VeLLOs and the candidates are more populous in the clouds where more YSOs form, indicating that they form in a manner similar to that of normal YSOs. The bolometric luminosities and temperatures of the VeLLOs are compared to predictions of episodic accretion models, showing that the low luminosities for most VeLLOs can be well explained by their status in the quiescent phases of a cycle of episodic mass accretion.

[구 IM-06] A High-Velocity Cloud Impact Forming a Supershell in the Milky Way

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We report the discovery of a kiloparsec-size supershell in the outskirts of the Milky Way with the compact high-velocity cloud, HVC 040+01−282 (hereafter, CHVC040), at its geometrical center using the "Inner-Galaxy Arecibo L-band Feed Array" HI 21 cm survey data. Supershells are large gaseous shells, which could be produced by one of most energetic activities with an explosion energy more than 3 x 1052 erg. The most promising origin is the explosion of multiple supernovae in OB associations, or alternatively, the impact of HVCs falling into the Galactic disk. We found the association between CHVC040 and the Galactic supershell by analysis of their morphological and physical properties. Our results imply that some compact HVCs can survive their trip through the Galactic halo and inject energy and momentum into the Milky Way disk.

[구 IM-07] A Study of Galactic Ring Shaped H II Regions : Searching for Possible Sites of Sequential and Spontaneous Star Formation

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The molecular gas surrounding an H II region is thought to be a place where star formation can be induced. Such triggered star formation can arise form the overpressurization of existing density enhancements or thought the collapse of a swept up layers of material. In this talk, We will discuss the results of a study of star-formation activity associated with the outer Galaxy ring-shaped H II regions KR 7, KR 81, KR 120 and KR 140 using archival Spitzer and WISE data along with the JHK observations.

We used CO data cubes from the FCRAO and TRAO in order to define extent of the molecular cloud associated each HII region. Using the infrared data sets, We identified and classified YSO populations within each molecular cloud using measures such as the class I/II ratio and YSO spatial density. Along with this, one of the main question in the study of star formation is how protostar accrete material from their parent

molecular clouds and observations of infall motions are needed to provide direct evidence for accretion. Combining our observation of the YSO population distribution with time scales associated with YSO evolution and HII expansion, we investigated the possible significance of triggered star formation in the molecular cloud surrounding each region.

[구 IM-08] The distribution of the molecular hydrogen in the Milky way

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We present the far-ultraviolet fluorescent molecular hydrogen (H_2) emission map observed with FIMS/SPEAR for ~76% of the sky. The fluorescent H_2 emission is found to be saturated by strong dust extinction at the optically thick, Galactic plane region. However, the extinction-corrected intensity of fluorescent H_2 emission is found to have strong linear correlations with the well-known tracers of the cold interstellar medium, such as the E(B-V) color excess, neutral hydrogen column density N(HI), Hα emission, and CO J=1→0 emission. The all-sky molecular hydrogen column density map is also obtained using a photodissociation region model. We also derive the gas-to-dust ratio, hydrogen molecular fraction (f_{H2}), and CO-to-H_2 conversion factor (X_{CO}) of the diffuse interstellar medium. The gas-to-dust ratio is consistent with the standard value 5.8×10^{21} atoms cm^{-2} mag^{-1}, and the X_{CO} tends to increase with E(B-V), but converges to the Galactic mean value 1.8×10^{20} cm^{-2} K^{-1} km^{-1} s at optically thick regions with E(B-V)>2.0.

[구 IM-09] Radiative Transfer Model of Dust Attenuation Curves in Clumpy, Galactic Environments

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The attenuation of starlight by dust in galactic environments is investigated through models of radiative transfer in a spherical, clumpy interstellar medium (ISM). We show that the attenuation curves are primarily determined by the wavelength dependence of absorption rather than by the underlying extinction (absorption+scattering) curve; the observationally derived attenuation curves cannot constrain a unique extinction curve unless the absorption or scattering efficiency is specified. Attenuation curves consistent with the Calzetti curve are found by assuming the silicate-carbonaceous dust model for the Milky Way (MW), but with the 2175Å bump suppressed or absent. The discrepancy between our results and previous work that claimed the Small Magellanic Cloud dust to be the origin of the Calzetti curve is ascribed to the difference in adopted albedos; we use the theoretically calculated albedos whereas the previous ones adopted empirically derived albedos from observations of reflection nebulae. It is found that the model attenuation curves calculated with the MW dust are well represented by a modified Calzetti curve with a varying slope and UV bump strength. The strong correlation between the slope and UV bump strength, as found in star-forming galaxies at $0.5 < z < 2.0$, is well reproduced if the abundance of the UV bump carriers is assumed to be 30-40% of that of the MW-dust; radiative transfer effects lead to shallower attenuation curves with weaker UV bumps as the ISM is more clumpy and dustier. We also argue that some of local starburst galaxies have a UV bump in their attenuation curves, albeit very weak.

[구 IM-10] Hydrodynamic simulations in the Galactic Center : Tilted HI disk

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Previous HI survey data have shown that the central HI gas in the Milky Way that resides within ~1.5 kpc of the Galactic Centre (GC) is tilted by ~15° with respect to the Galactic plane. Although several models, such as a tilted disk model, have been suggested to interpret the observed morphology of the HI layer, it is still unknown what causes and how it preserves its tilted structure. We study the behavior of a gas disk near the GC using an N-body / SPH code. Our galaxy model includes four components; nuclear bulge, bulge, disk and halo. We construct a HI model whose radius is 1.3 kpc, scale height is 100 pc and mass is 3.6×10^6 $M_\odot$. We also assume that the gas disk is initially tilted 30° with respect to the Galactic plane. Here we report our simulation results and discuss the