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Based on the 850 μm dust continuum data from James Clerk Maxwell Telescope (JCMT)/SCUBA-2, we compare overall properties of Planck Galactic Cold Clumps (PGCCs) in the λ Orionis cloud with PGCCs in other molecular clouds, Orion A and Orion B. The Orion A and Orion B clouds are well known active star-forming region, while, λ Orionis cloud has a different environment associating with prominent OB associations and a giant H II region. PGCCs in the λ Orionis cloud have higher dust temperatures (Td～16.08 K) and lower values of dust emissivity (β～1.65) than Orion A and Orion B clouds. In addition, we found the lowest detection rate (16 %, 8 out of 50) of PGCCs at 850 μm in the λ Orionis cloud while among three regions; Orion A and Orion B clouds show much higher detection rates of ～ 76 % (23 out of 30) and 56 % (9 out of 16), respectively. The detected 8 PGCCs in the λ Orionis cloud have substructures and we identified 15 cores. The cores also show much lower median values of size (～0.08 pc), column density (～), number density (～), and mass (～) compared with other cores in the Orion A and Orion B clouds. These core properties in the λ Orionis cloud can be attributed to the compression and external heating by the nearby H II region, which may prevent the PGCCs from forming gravitationally bound structures and eventually disperse them. These results well present the negative stellar feedback to core formation.

[구 IM-03] Upgraded TRAO and its performance

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TRAO has been newly equipped with a multi-beam receiver system, 16 pixel MMIC preamplifiers in a 4x4 array, a FFT spectrometer, and new control computer systems. In our new receiver systems one can make simultaneous observations with two molecular lines maximum 15 GHz apart with a spectral band width of 60 MHz. Typical system temperatures are about 160 – 200 K at 86 ~ 100 KHz and 400 – 500 K at 115 GHz in the dry weather. The new systems using On-The-Fly mode were found to be very efficient in making quick and sensitive maps of large clouds with a high velocity resolution (~0.04 km/s at 100 GHz). TRAO now calls for proposals for 2016 and 2017 observing season for everybody. In the talk we will introduce the current status of TRAO upgrade and its scientific preliminary results.

[구 IM-04] Filaments and Dense Cores in Perseus Molecular Cloud

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How dense cores and filaments in molecular clouds form is one of key questions in star formation. To challenge this issue we started to make a systematic mapping survey of nearby molecular clouds in various environments with TRAO 14m telescope equipped with 16 beam array, in high (N_2H^+, HCO^+ 1-0) and low ($C^{18}O$, ^{13}CO 1-0) density tracers (TRAO Multi-beam Legacy Survey of Nearby Filamentary Molecular Clouds, PI: C. W. Lee). We pursue to dynamically and chemically understand how filaments, dense cores, and stars form under different environments.
We have performed On-The-Fly (OTF) mapping observations toward L1251, southern part of Perseus molecular cloud, and Serpens main molecular cloud from January to May, 2016. In total, ~3.5 square degree area map of ^{13}CO and $C^{18}O$ was simultaneously obtained with S/N of >10 in a velocity resolution of ~0.2 km/s. Dense core regions of ~1.7 square degree area where $C^{18}O$ 1-0 line is strongly detected were also mapped in N_2H^+ 1-0 and HCO^+ 1-0. The L1251 and Perseus MC are known to be low- to intermediate-mass star-forming clouds, while the Serpens MC is an active low-mass star-forming cloud. The observed molecular filaments will help to understand how the filaments, cores and eventually stars form in a low- and/or intermediate-mass star-forming environment. In this talk, I'll give a brief report on the observation and show preliminary results of Perseus MC.

[박 IM-05] A Search for Very Low-luminosity Objects in Gould Belt Clouds

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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