developed train of clumps of about a few solar masses, and is situated in the dark dust complex between M42 and M43. The cloud's motion is analysed to be moving at about 2.6 km s^{-1}, and is calculated to transverse the Orion Nebula ~2 pc above from the nebula center, toward the direction of about 60° to the line of sight. This cloud had undergone a tidal splitting about a million years ago and had formed a very thin and long cylindrical core well before being engaged in the collision. General implications of this phenomenon are discussed in relation to star formation mechanisms in the GMC.

[구 IM-04] Turbulent Properties in Two Molecular Clouds: Orion A and ρ Ophiuchus

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Molecular clouds are the sites of stellar birth, and conditions within the clouds control the mode and tempo of star formation. In particular, turbulence largely determines the density and velocity fields, and can affect the gas kinetic temperature as it decays via shocks. However, despite its central role in star formation and many years of study, the properties of turbulence remain poorly understood. As a part of the TRAO key science program, "Mapping turbulent properties of star-forming molecular clouds down to the sonic scale (PI: Jeong-Eun Lee)", we mapped the northern region of the Orion A molecular cloud and the L1688 region of the ρ Ophiuchus molecular cloud in 2 sets of lines (13CO 1-0/C18O 1-0 and HCN 1-0/and HCO+ 1-0) using the Taeduk Radio Astronomy Observatory (TRAO) 14-m telescope. We analyze these maps using a python package 'Turbustat', a toolkit which contains 16 different turbulent statistics. We will present the preliminary results of our TRAO observations and various turbulence statistical analyses.

[구 IM-05] Escape of Lyβfrom Hot and Optically Thick Media

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Symbiotic stars and quasars show strong far UV resonance doublets including O VI 1032 and 1038, which are known to be major coolants of astrophysical plasma with high temperature $T > 10^5$ K. We investigate the transfer of Hα and Lyβ in an emission nebula of temperature $T \sim 10^5$, where n=2 population is significant. Line photons of Hα and Lyβ are transferred in the medium through spatial and frequency diffusion altering their identity according to the branching ratios. We adopt a Monte Carlo technique to describe the transfer of Hα and Lyβ in an emission nebula with a uniform density and a simple geometrical figure. We find that the temperature of the emission nebula is the major controlling parameter to produce a nonnegligible flux of Lyβ. In particular, when T exceeds 10^5 K the number flux ratio may reach ~ 25% with line center optical depth of a few. We discuss the formation of broad Hα wings from Raman scattering of Lyβ emergent from a hot emission nebula.

[구 IM-06] Early Dynamical Evolution of Star Clusters Near the Galactic Centre

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현재 관측되는 대부분의 성단들은 구형의 구조를 보이는 반면, 별탄생 지역은 구형의 구조와는 다른 프랙털 (fractal) 구조를 보이고 있다. 본 연구에서는 초기에 프랙털 구조를 가지는 성단이 우리 은하 중심부근에서 어떻게 진화하는지 N-body 시뮬레이션을 이용해 연구하였다. 그 결과, 프랙털 구조의 성단이 우리 은하 중심부근의 강력한 조석력장 내에서 살아남기 위해서는 초기 밀도가 높아야 한다는 것을 발견하였다. 성단의 초기 밀도가 높기 때문에 프랙털 구조의 성단은 빠른 역학적 진화를 보이며 구형의 성단으로 진화한다. 플러머 (Plummer) 구조의 성단도 프랙털 구조의 성단과 같이 초기 밀도가 높아야 살아남지만 프랙털 구조보다는 역학적인 진화가 느렸다. 이러한 결과들은 Arches 성단처럼 우리 은하 중심부근에서 관측되는 성단들의 형성과 진화에 제약조건을 줄 수 있을 것으로 예상된다.

천문관측기술

[구 AT-01] New Radome Installation for the

TRAO Radio Telescope(대덕전파천문대 레이돔 교체)

Changhoon Lee[1], Jae Hoon Jung[1], HyunWoo Kang[1], Do-Keung Je[1], Youngung Lee[1], Il-Gyo Jung[1], Young Sik Kim[1], Chang Won Lee[1], Hyun-Goo Kim[1]
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전파망원경 레이돔은 14미터 우주전파망원경을 외부 환경(눈, 비, 바람, 햇빛)으로 부터 보호하여 효율적인 우주전파 관측연구를 수행하는데 필수적인 연구시설이다. 현재 사용 중인 대덕전파천문대 레이돔은 1985년에 설치되어 30년째 사용 중이다. 노후화로 인해 누수가 있으며, 겨울철에는 내부에 빙결이 발생하며, 유지보수가 어려운 상황이다.

본 발표에서는 2016년 12월말부터 2017년 2월 초까지 이루어진 레이돔의 교체과정과 기존 레이돔과 교체된 레이돔의 성능 등을 발표한다.

[구 AT-02] Critical Design Status of the G-CLEF Flexure Control Camera

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The GMT-Consortium Large Earth Finder (G-CLEF) is the very first light instrument of the Giant Magellan Telescope (GMT). The instrument is a fiber feed, optical band echelle spectrograph that is capable of extremely precise radial velocity measurement, and has been being developed through the international consortium consisted of five astronomical institutes including Smithsonian Astrophysical Observatory (SAO), Observatories of the Carnegie Institution of Washington (OCIW), and Korea Astronomy and Space Science Institute (KASI). The Preliminary Design Review (PDR) for the G-CLEF was held in Cambridge, Massachusetts in April 2015. It is scheduled to have Critical Design Review (CDR) in March 2018. Flexure Control Camera (FCC) is one of the KASI's major contributions to the G-CLEF project. In this presentation, we describe the current critical design status, and structural and thermo-elastic analyses results on the G-CLEF FCC.

[구 AT-03] Wide-Field Imaging Telescope-0(WIT0): A New Wide-Field 0.25 m Telescope at McDonald Observatory

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A small wide-field imaging telescope is a powerful instrument to survey the Universe: wide-field image can monitor the variability of many sources at a time, e.g. young stellar objects and active galactic nuclei, and it can be an effective way to locate transient sources without precise positional information such as gravitational wave sources or some gamma-ray bursts. In February 2017, we installed a 0.25 m f/3.6 telescope on the McDonald 0.8 m telescope as a piggyback system. With a 4k X 4k CCD camera, the telescope has a 2.35 X 2.35 deg field-of-view. Currently, it is equipped with Johnson UBVRI filters and 3 narrow-band filters: Hα, OIII and SII. We will present the installation process, and the telescope performance such as detection limit and image quality based on the data from commissioning observations. We will also discuss possible scientific projects with this system.

[구 AT-04] Control Software of SQEUAN (SED camera for the QUasars in EArly uNiverse)

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Spectral energy distribution camera for QUasars in EArly uNiverse (SQUEAN) is a successor of Camera for Quasars in EArly uNiverse (CQUEAN) which was developed by Center for the Exploration of the Origin of the Universe and operated at the 2.1 m Otto Struve Telescope in the McDonald Observatory, USA, since 2010. The software of SQUEAN controls a science camera, a guiding camera, and a filter wheel, and communicates with the telescope control system (TCS). It has been