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분자운의 광대역 분포는 작은 영역에서는 볼 수 없는 독특한 모습을 보여준다. 본 연구는 2010년도 TRAO 관측으로 얻는 외은하면의 $4.3^\circ \times 2^\circ$ 의 광대역 데이터를 사용해서 광대역 분자운 분포의 특성을 분석했다. 광대역 분자운들은 형태학적 특징에 의거해서 네 종류로 분류되었다: chain, twisted filament, speckle, cluster suspect 이들의 특징을 간략히 소개하고 광대역 분자운들을 보는 새 관점으로 분자운 충돌 이론을 소개한다. 그와 함께 광대역 연구의 대표적인 예로 두 전파원을 소개한다. 첫째는 CTB 109 (3C 434.1) 근처 분자운이며, 길다란 CO filament가 포함된다. 둘째는 “집게벌레(S157 ab 포함)”로서 강한 별탄생을 보여주는 특이한 영역으로서 강한 CO emission이 두 개 twisted filament 구조를 보여준다. 연구에는 DRAO HI, IRAS 적외선 자료, DRAO Radio continuum data를 사용했고, CO 자료를 통해서 분자운의 질량과 밀도, 온도 등의 기본 물리량을 계산했다.

[포 IM-08] Tracing the earliest phases of star formation: A pilot survey of Planck Cold Clumps

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We observed 38 Planck Cold Clumps (PCCs) in the $850 \mu\text{m}$ dust continuum emission using the JCMT/SCUBA-2, and detected the emission in 15 clumps containing dense cores. In this poster we present the preliminary results. The PCCs are cold, dense, and thus, they are considered as objects in the early evolutionary stages of star formation. The sources in our sample were selected based on the Purple Mountain Observatory (PMO) 13CO (1-0) integrated intensity maps. In order to examine whether these cores detected in $850 \mu\text{m}$ continuum have potential to be prestellar cores, we compare each core mass estimated from the $850 \mu\text{m}$ continuum with the Virial mass and Bonnor-Ebert (BE) mass calculated from the 13CO (1-0) or C18O (1-0) spectra. By comparing the two column densities from the dust continuum and the 13CO (1-0) or C18O (1-0) line, we also derive the CO

depletion factor, which could be an indicator of core evolution. The moment maps of the 13CO (1-0) line are used to study the physical properties (e.g. kinematics, turbulence) of PCCs. We investigate difference between the sources with and without detectable $850 \mu\text{m}$ emission to study the formation conditions of dense cores.

[포 IM-09] The dynamical evolution of very dense star clusters in a very strong tidal field

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Within 100 pc of the Galactic Centre the tidal field is extremely strong. We investigate the survival of star clusters of different masses in strong tidal fields. We show that dense low-mass clusters are destroyed by strong tidal fields as the tidal fields add energy to the cluster. Only massive clusters (like the Arches) can survive for more than 1-2 Myr in strong tidal fields. Therefore, in Galactic Centre environments only massive young clusters should ever be observed.

천문우주관측기술

[포 AT-01] Final Results of APG-15 5th meeting

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국제전기통신연합 (ITU)에서 주관하여 2015년 11월 2일-27일 스위스 제네바에서 개최되는 WRC-15(세계전파통신회의, World Radiocommunication Conference)회의에서는 28개 의제에 대해서는 의제별 주파수대역별로 국제전파규칙(Radio Regulations)을 개정하게 된다.

WRC-15 본회의에는 200여개 ITU회원국의 국가대표 3,000여명이 모여서 회의를 진행하게 되며, 원활한 회의 진행과 의견 결정을 위하여 각 국가별 제안서 제출은 지양하고, 해당 지역별 국가들의 공동제안서를 중심으로 논의하게 된다. ITU에는 현재 6개의 지역(유럽, 러시아, 아랍, 북남미, 아프리카 및 아태지역) 공동체가 등록되어 있으며, 아태지역은 아태지역 전파통신협의체(Asia-Pacific

Telecommunity)를 구성하여 WRC 의제에 대응하고 있다.

지난 2015년 7월 27일-8월 1일에는 WRC의제에 대한 아태지역의 공동제안서(PACP)를 작성하기 위한 최종 회의(APG-15 5차회의)가 서울 힐튼호텔에서 개최되었다. 과학업무 의제의 경우, 5개 의제에 대한 공동제안서가 작성되었으며, 그 결과는 다음과 같다.

1) 7145-7250 MHz 대역의 지구탐사위성(지구대우주)업무의 1순위 분배 지지, 2) 9,200~9,300MHz 및 9,900~10,400MHz대역의 지구탐사위성업무의 신규 SAR용 1순위 분배 지지, 3) 우주선 근거리통신용 410-420MHz 대역 관련 거리제한 규정 삭제 지지, 4) 윤초 삭제 지지, 5) 나노 위성 및 피코 위성의 규정개정 연구를 위한 차기 WRC회의 의제 수행 지지를 들 수 있다.

따라서 본 발표에서는 7월에 개최된 APG-15 5차회의의 주요 결과를 소개하고, WRC-15회의에 대비하여 국내 전파전문업무 보호를 위한 주요 이슈에 대해 소개를 하고자 한다.

[포 AT-02] A diagram of the new TRAO observation system

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Taeduk Radio Astronomy Observatory (TRAO) is about to jump with new system - 16 beams array receiver with low noise temperature, new observation system on VxWorks OS, and FX spectrometer for 32 input signals. We serve a quite obvious diagram to understand new TRAO observation system. This diagram will be quick guide for manager and observer.

[포 AT-03] Electronics Design of the NISS onboard NEXTSat-1

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NISS is a unique spaceborne imaging spectrometer (R = 20) onboard the Korea's next micro-satellite NEXTSat-1 to investigate the star formation history of Universe in near infrared wavelength region (0.9 - 3.8 um), with a customized HIRG IR sensor(Jeong 2014). In this paper, we will introduce the compact electronics system (Fig. 1) as well as the novel readout method to reduce the 1/f noise for NISS.

[포 AT-04] CAGMon: Correlation-based Glitch Monitor for Gravitational Wave Detection

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We study the possibility of new approach for identifying instrumental noise artifacts and sources of gravitational wave (GW) data such as LIGO and CLIO using various correlation analyses. To improve the quality of data for the GW signal search, the instrumental noises should be reduced in an appropriate way. Furthermore, it is important to understand the correlation between auxiliary channels of the GW detector. In this study, we investigate the possible way of identifying glitch triggers by generating time-frequency-correlation (TFC) maps between the related channels and compare the result to the current conventional schemes.

[포 AT-05] Event Trigger Generator for Gravitational-Wave Data based on Hilbert-Huang Transform

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The Hilbert-Huang Transform (HHT) is composed of the Empirical Mode Decomposition (EMD) and the Hilbert Spectral Analysis (HSA). The EMD decomposes any time series data into a small number of components called the Intrinsic Mode Functions (IMFs), compared to the Discrete Fourier Transform which decomposes a data into a large number of harmonic functions. Each IMF has varying amplitude and frequency with respect to time, which can be obtained by HSA. The time resolution of the modes in HHT is the same as that of the given time series, while in the Wavelet Transform, Constant Q Transform and Short-Time Fourier Transform, there is a tradeoff