로필에 따른 이용률 분석이 가능하다. 이에 따른 주요 분석 중 하나인 올해 전체 번역 이용 건수는 한 해 각 기관의 평균 방문자수 대비 87% 성과 목표에 해당되는 약 38만 건에 근접할 것으로 예측된다. 이 자동 번역기는 원문 해독 시간을 단축시키는 효과와 함께 미번역 천문 고문헌의 활용성을 높여 다양한 연구에 기여할 것이다.

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※ 이 연구는 과기정통부가 주무부처이며, 한국정보화진흥원이 전문기관인 "2019년도 ICT기반 공공서비스 촉진사업"중 "클라우드 기반 고문헌 자동번역 확산 서비스 구축 - (부제) 한국천문연구원 천문 분야 고문헌 특화 자동화번역모델 개발"사업에서 수행되었음을 밝힙니다.

[포 HA-02] Analysis of the *Sohyeon-Donggungilgi* Records of Solar Halo Observations

Jaeyeon Hyun[1,2], Byeong-Hee Mihn[1,2], Ki-Won Lee[3], Sang Hyuk Kim[2], Uhn Mee Bahk[2,4]
[1]*Korea University of Science and Technology*
[2]*Korea Astronomy and Space Science Institute*
[3]*Daegu Catholic University*
[4]*Chungbuk National University*

The Donggungilgi (東宮日記) is the daily records of the Siganwon (侍講院), which was a royal office in the Joseon dynasty that took charge of the education for the crown prince who dwelled in the Donggung (East Palace). This literature contains records of meteorological and astronomical observations as well as educational matters. The Sohyeon-Donggungilgi (昭顯東宮日記) includes records from 1625 to 1645, when Prince Sohyeon, the first son of King Injo (仁祖), was the crown prince. We investigate the records of solar halo observations in the Sohyeon-Donggungilgi. For consistency, we restrict our investigation to the period before the second Manchu invasion of Korea (i.e., 1625 to 1635). We extract 2,684 records and classify them into ten events according to the terms in their descriptions. The largest and smallest number of observation records are for the Hun (暈) and Geuk (戟) events (1,794 and 7 records, respectively). To verify what each event represents in modern atmospheric terms, we refer to historical documents of the Seoungwanji (書雲觀志, Treaties on the Bureau of Astronomy) and Cheonmundaeseong (天文大成, Great Achievements in Astronomy). We also calculate the solar altitude based on the observation hour and compare the descriptions to compute simulations provided by Arbeitskreis Meteore e.V.. We find that the descriptions of the Hun, Junghun (重暈), Yi (珥), and Baekhonggwanil (白虹貫日) events indicate a 22° halo, 22° and 46° halos, a parhelion, and a parhelic circle, respectively, Alternatively, we estimate that the Gwan (冠), Dae (戴), Bae (背), Li (履), and Gyohun (交暈) events describe arcs tangent to a 22° or 46° halo such as a upper or lower tangent arc, a circumzenithal arc, or a parry arc. We suggest that further studies are required for the Geuk event because the descriptions of this event differ from both documents referred to this study. In the sense that the number of observation records of the Geuk event is the smallest, however, this event may describe a rare phenomenon. We believe that this work will contribute to the study of historical records of solar or lunar halos.

성간물질/별생성/우리은하

[포 IM-01] Optical spectroscopy of LMC SNRs to reveal the origin of [P II] knots

Rommy L. S. E. Aliste C.[1], Bon-Chul Koo[1], Ji Yeon Seok[2], Yong-Hyun Lee[3]
[1]*Seoul National University*
[2]*Korea Astronomy and Space Science Institute*
[3]*Samsung SDS*

Observational studies of supernova (SN) feedback are limited. In our galaxy, most supernova remnants (SNRs) are located in the Galactic plane, so there is contamination from foreground/background sources. SNRs located in other galaxies are too far, so we cannot study them in detail. The Large Magellanic Cloud (LMC) is a unique place to study the SN feedback due to their proximity, which makes possible to study the structure of individual SNRs in some detail together with their environment.

Recently, we carried out a systematic study of 13 LMC SNRs using [P II] (1.189 μm) and [Fe II] (1.257 μm) narrowband imaging with SIRIUS/IRSF, four SNRs (SN 1987A, N158A, N157B and N206), show [P II]/[Fe II] ratio much higher than the cosmic abundance. While the high ratio of SN 1987A could be due to enhanced abundance in SN ejecta, we do not have a clear explanation for the other cases.

We investigate the [P II] knots found in SNRs N206, N157B and N158A, using optical spectra obtained last November with GMOS-S mounted on Gemini-South telescope. We detected several emission lines (e.g., H I, [O I], He I, [O III], [N II] and [S II]) that are present in all three SNRs, among other lines that are only found in some of them (e.g., [Ne III], [Fe III] and [Fe II]). Various line ratios are measured from the three SNRs, which indicate that the ratios of N157B tend to differ from those of other two SNRs.

We will use the abundances of He and N (from the detection of [N II] and He I emission lines), together with velocity measurements to tell

whether the origin of the [P II] knots are SN ejecta or CSM/ISM. For this purpose we have built a family of radiative shock with self-consistent pre-ionization using MAPPINGS 5.1.18, with shock velocities in the range of 100 to 475 km/s. We will compare the observed and modeled line fluxes for different depletion factors.

[포 IM-02] Modeling Grain Rotational Disruption by Radiative Torques and Extinction of Active Galactic Nuclei

Nguyen Chau Giang[1,2] and Thiem Hoang[1,2]
[1]Korea Astronomy and Space Science Institute, Daejeon 34055, Repulic of Korea
[2]Korea University of Science and Technology, Daejeon 34113, Repulic of Korea

Extinction curves observed toward individual Active Galactic Nuclei (AGN) usually show a steep rise toward Far-Ultraviolet (FUV) wavelengths and can be described by the Small Magellanic Cloud (SMC)-like dust model. This feature suggests the dominance of small dust grains of size a < 0.1 μm in the local environment of AGN, but the origin of such small grains is unclear. In this paper, we aim to explain this observed feature by applying the RAdiative Torque Disruption (RATD) to model the extinction of AGN radiation from FUV to Mid-Infrared (MIR) wavelengths. We find that in the intense radiation field of AGN, large composite grains of size a > 0.1 μm are significantly disrupted to smaller sizes by RATD up to dRATD > 100 pc in the polar direction and dRATD ~ 10 pc in the torus region.

Consequently, optical-MIR extinction decreases, whereas FUV-near-Ultraviolet extinction increases, producing a steep far-UV rise extinction curve. The resulting total-to selective visual extinction ratio thus significantly drops to RV < 3.1 with decreasing distances to AGN center due to the enhancement of small grains. The dependence of RV with the efficiency of RATD will help us to study the dust properties in the AGN environment via photometric observations. In addition, we suggest that the combination of the strength between RATD and other dust destruction mechanisms that are responsible for destroying very small grains of a <0.05 μm is the key for explaining the dichotomy observed "SMC" and "gray" extinction curve toward many AGN.

[포 IM-03] Catalog of the Paα-emitting Sources observed in the Carina Region

Il-Joong Kim, Jeonghyun Pyo, Woong-Seob Jeong
Korea Astronomy and Space Science Institute

We list up the Paα-emitting sources observed in the Carina Region (l = 276°-296°) using the MIRIS Paα Galactic Plane Survey data. A total of 201 sources are cataloged. Out of them, 118 sources are coincident with those in the WISE H II region catalog. 52 H II region candidates are newly confirmed as definite H II regions by detecting the Paα recombination lines. For the remaining 83 sources, we search the corresponding objects in the SIMBAD database. 26 point-like sources are associated with planetary nebulae or emission-line stars (such as Wolf-Rayet and Blue supergiant stars). Also, we carry out aperture photometry to measure Paα fluxes for the sources that show circular features without overlapping with other bright sources. For the whole Galactic Plane, the complete Paα-emitting source catalog is in progress.

[포 IM-04] Tracing history of the episodic accretion process in protostars

Jaeyeong Kim[1], Jeong-Eun Lee[2], Chul-Hwan Kim[2], Tien-Hao Hsieh[3], Yao-Lun Yang[4], Nadia Murillo[5], Yuri Aikawa[6] and Woong-Seob Jeong[1]
[1]Korea Astronomy and Space Sicence Institute, Daejeon, Korea, [2]Kyung Hee University School of Space Research, Yongin, Korea, [3]Max-Planck-Institute for extraterrestrial Physics, Garching, Germany, [4]The University of Virginia, Department of Astronomy, Charlottesville, US, [5]RIKEN Wako Institute, Saitama, Japan, [6]University of Tokyo, Institute of Astronomy, Tokyo, Japan

Low-mass stars form by the gravitational collapse of dense molecular cores. Observations and theories of low-mass protostars both suggest that accretion bursts happen in timescales of ~100 years with high accretion rates, so called episodic accretion. One mechanism that triggers accretion bursts is infalling fragments from the outer disk. Such fragmentation happens when the disk is massive enough, preferentially activated during the embedded phase of star formation (Class 0 and I). Most observations and models focus on the gas structure of the protostars undergoing episodic accretion. However, the dust and ice composition are poorly understood, but crucial to the chemical evolution through thermal and energetic processing via accretion burst. During the burst phase, the surrounding material is heated up, and the chemical compositions of gas and ice in the disk and envelope are altered by sublimation of icy molecules from grain surfaces. Such alterations leave imprints in the ice composition even when the temperature returns to the pre-burst level. Thus, chemical compositions of gas and ice retain the history of past bursts. Infrared spectral