properties of the global distribution of the IPD because we can evade the effect of the small scale structures, such as the asteroidal dust bands. The ecliptic poles are frequently visited by the infrared (IR) space telescopes owing to their sun-synchronous orbits or for specific purposes. We collect and analyze the observations toward the ecliptic poles by COBE/DIRBE, AKARI, and MIRIS, covering the wavelengths from about 1 to 25 μm. The observed seasonal variations of the ZL are modeled with a simple IPD cloud model to derive cloud parameters. The parameters are compared with those of the empirical cloud models by Kelsall et al. (1998) and Kondo et al. (2016), and the discrepancies are discussed.

[구 SS-12] A Polarimetric Study of Long-Period Comet C/2013 US10 (Catalina) and Estimation of Its Gas Contamination in Optical and Near-Infrared Wavelengths

Yuna Grace Kwon[1], Masateru Ishiguro[1], Daisuke Kuroda[2], Hidekazu Hanayama[3], Koji S. Kawabata[4], Hiroshi Akitaya[4], Ryosuke Itoh[4], Tatsuya Nakaoka[4]
[1]Department of Physics and Astronomy, Seoul National University, Gwanak, Seoul 08826, Korea; ynkwon@astro.snu.ac.kr, [2]Okayama Astrophysical Observatory, National Astronomical Observatory of Japan, Asakuchi, Okayama 719-0232, Japan, [3]Ishigakijima Astronomical Observatory, National Astronomical Observatory of Japan, Ishigaki, Okinawa 907-0024, Japan, [4]Hiroshima Astrophysical Science Center, Hiroshima University, Kagamiyama 1-3-1, Higashi-Hiroshima 739-8526, Japan

Polarimetric study of light scattering from cometary dust particles can provide us opportunity to decipher their characteristics, such as sizes, structures, compositions of dust grains, etc. Herein, we present the results of our polarimetric study of long-period comet, C/2013 US10 (Catalina), in optical and near-infrared wavelengths which appeared at large phase angle (52.7 degrees) around the mid-December, 2015. We performed polarimetric and spectroscopic observations with HONIR, attached to the 1.5-m telescope at Higashi-Hiroshima Observatory, on UT 2015 December 17−18 and also obtained optical imaging data sets by the Ishigakijima Astronomical Observatory (IAO) and Okayama Astrophysical Observatory (OAO) taken between 2014−2015. By measuring the intensities of gas emission lines with respect to dust continuum and considering transmittance of each filter, we estimated that the percentages of gas contamination are approximately 10 percents in R_C-band and 3 percents in I_C-band. With these results, we derive the degree of linear polarization scattered solely from dust components in the coma. At this presentation, we will compare the phase-angle dependence of the degree of linear polarization with those of previous archive data in a wide coverage of wavelengths from R_C-band to K_S-band. Finally, we are supposed to discuss the spatial variations in polarization within the coma.

[구 SS-13] Dynamical evolution of dust particles: from comets to the inner solar system

Hongu Yang and Masateru Ishiguro
Seoul National University

태양계의 행성간 공간에는 수많은 티끌들이 흩어져 있다. 이들의 존재는 유성, 우주 탐사선의 검출기, 황도광 관측 등으로 확인되고 있으나, 이 티끌들의 수명이 길어야 수백만년에 불과하기에 태양계에는 지속적으로 티끌을 공급하는 기원천체가 있어야 한다. 최근의 광학적 (Yang & Ishiguro, 2015), 역학적 연구는 ~90% 이상의 행성간 티끌들이 혜성에서 방출되었을 것이라 추정하기에 이르렀다. 이러한 상황에서, 본 연구에서는 행성간 티끌구름의 구체적 양상을 설명하려는 목적으로 혜성에서 방출된 티끌들이 태양계에서 겪게 되는 역학 진화를 수치 계산을 통하여 추적하였다.

우리는 다양한 혜성 궤도 분포를 골고루 대표할 수 있도록 실제 혜성 중에서 대표 혜성들을 선정하고, 관측에 기반한 티끌 방출 모형을 이용하여 다양한 크기의 가상적 티끌을 이들 혜성에서 방출시켰다. 태양의 복사에 의한 끌림힘, 8개의 행성에 의한 중력 섭동을 고려하며 이 티끌들의 궤도 진화가 추적되었다. 티끌들의 최종 종착지가 살펴졌고, 정상 상태를 가정하고 행성간 티끌구름을 구성하여 실제 관측되는 티끌구름과 비교하였다.

이번 발표에서는 혜성에 의한 티끌공급량과 내행성계의 티끌 유출입량, 내행성계 티끌구름의 크기도수분포, 티끌구름의 궤도 요소 분포, 황도광의 밝기 분포 등이 수치 계산 결과와 비교되어 설명될 것이다.

[구 SS-14] Measuring Homopause Temperatures of Jupiter, Saturn, and Titan via Three-micron Emission Spectra of CH_4

Sang-Joon Kim
School of Space Research, Kyung Hee University, Korea

Current high-resolution IR spectroscopy at ground-based observatories made it possible to observe 3-μm CH_4 emission lines from the atmospheres of Jupiter, Saturn, and Titan through narrow atmospheric windows avoiding the

counterparts of telluric CH_4 absorptions if proper Doppler shifts betwen Earth and these planetary objects are provided. We are also expecting low-resolution (R~300) infrared spectra of Jupiter from the upcoming observations by JUNO's infrared 2-5 μm spectrograph during the encounter with Jupiter approximately starting from July 4, 2016. Although the spectral resolution is not enough to resolve the 3-μm P, Q, R branch lines of CH4, the gross envelopes of the P, Q, R branches should yield information on rotational temperatures. The rotational temperatures are useful because theycan be regarded as local temperatures, as discussed by Kim et al. (2014). Since the 3-μm CH_4 emission is mostly formed at micro-bar pressure levels, the derived rotational temperatures represent the local temperatures near the hompause of Jupiter. We discuss possible sciences from the derived homopause temperatures in the auroral and non-auroral regions of Jupiter.

[구 SS-16] An interpretation of potential catastrophic collision at P/2010 A2

Yoonyoung Kim[1], Masateru Ishiguro[1], Tatsuhiro Michikami[2], Akiko M. Nakamura[3]
[1]Seoul National University, [2]Kinki University, [3]Kobe University

Solar System has evolved with numerous collisions among asteroids. Ancient catastrophic collisions of large parent bodies led the formation of asteroid families and relevant dustband structures up to the present day, and it would be interesting to address a question – "what happens if an asteroid collides with another asteroid?" Recent discoveries of "active asteroids" in the main-belt have attracted interest for their potential to witness a catastrophic collision in the current Solar System. So far, however, there is no direct evidence for catastrophic collision on active asteroids while several objects have been confirmed for other mechanisms (e.g., 596 Scheila for impact cratering, P/2013 R3 and P/2013 P5 for rotational breakup). The most potential candidate for catastrophic collision could be a sub-km active asteroid P/2010 A2, which is still controversial on its driving mechanism, but if confirmed, would have made P/2010 A2 the unique example of catastrophic collision on the current main asteroid belt. In this presentation, we revisit all of archival data of P/2010 A2 in a combination with our own observation using Subaru/Suprime-Cam on 2011 June, where we have a great benefit of a large orbital coverage. We found a grain size dependence of dust ejection velocity from P/2010 A2 (a power-law size distribution with an index of k~ -1/10), which is favorable to a catastrophic disruption scenario in agreement with laboratory impact experiments. At this conference, we plan to provide our understanding of the morphology of P/2010 A2 through a perspective of catastrophic collision.

성간물질

[구 IM-01] MIRIS Paschen-α Galactic Plane Survey: Comparison with the H II region catalog in Cepheus region

Il-Joong Kim[1], Jeonghyun Pyo[1], Woong-Seob Jeong[1], Won-Kee Park[1], Min Gyu Kim[1,2], Dukhang Lee[1], Bongkon Moon[1], Sung-Joon Park[1], Youngsik Park[1], Dae-Hee Lee[1], Wonyong Han[1]
[1]Korea Astronomy and Space Science Institute
[2]Seoul National University

MIRIS Paschen-α (Paα) Galactic Plane Survey (MIPAPS) presents the first whole Galactic plane (with the width of $-3^\circ < b < +3^\circ$) map for the Paα emission line. Many of Paα features were detected more brightly than the previous observed Hα features, and they coincide well with dense cloud regions. This means that newly detected Paα blobs can indicate massive star forming regions (H II regions) screened by foreground clouds around Galactic plane. Anderson et al. (2014) presented the most complete Galactic H II region catalog based on WISE 12 and 22 um data. Of the cataloged sources, only ~20% have measured radio recombination line (RRL) or Hα emission, and the rest are still candidate H II regions. At first, we compare the MIPAPS results with Anderson's H II region catalog for the Cepheus region (Galactic longitude from $+96^\circ$ to 116°). From this, we will investigate how much MIPAPS can supplement the catalog, and show MIPAPS scientific potential. After that, we plan to extend this work to the whole plane, and finally catalog MIRIS Paα blob sources for the whole Galactic plane.

[구 IM-02] A comparison study of approximate and Monte Carlo radiative transfer methods for late type galaxy models

Dukhang Lee[1,2], Maarten Baes[3], Kwang-il Seon[1,2]
[1]Korea Astronomy and Space Science Institute (KASI), Republic of Korea,