in view of circumbinary planet, furthermore, we suggest that opposite angular orientation of the planet is relative to the stability of orbits. In here, counter-rotation case is relatively more faster than co-rotation case for being stable. As a result, we find that various initial conditions and thresholds to approach dynamical stability and unstability with unexpectable isolated islands over enormous parameter space. Even, superkeplerian effect of binary is important to habitability of the exoplanet and we can verify that superfaster binary doesn't effect on th planet and increases survivality of planet around the binary.

적외선 영상분광 탐사미션과 활용연구

[구 NS-01] An exosolar planetary system *N*-body simuInfrared Spectro-Photometric Survey in Space: NISS and SPHEREx Missions

Woong-Seob Jeong[1,2], Minjin Kim[1,2], Myungshin Im[3], Jeong-Eun Lee[4], Jeonghyun Pyo[1], Yong-Seon Song[1,2], Sung-Joon Park[1], Bongkon Moon[1], Dae-Hee Lee[1], Won-Kee Park[1], Youngsoo, Jo[1], Duk-Hang Lee[1], Kyeongyeon Ko[1,2], Il-Joong Kim[1], Youngsik Park[1], Yujin Yang[1,2], Jongwan Ko[1], Hyung Mok Lee[3], Hyunjin Shim[5], Goo-Hwan Shin[6], Jangsoo Chae[6], Toshio Matsumoto[1,7], NISS Team[1,2,3,4,5,6] / SPHEREx Korean Consortium[1,2,3,4,5,7,8]
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The NISS (Near-infrared Imaging Spectrometer for Star formation history) onboard NEXTSat-1 have successfully developed by KASI. The capability of both imaging and spectroscopy is a unique function of the NISS. At first, it have realized the low-resolution spectroscopy (R~20) with a wide field of view of 2 x 2 deg. in a wide near-infrared range from 0.95 to 2.5μm. The major scientific mission is to study the cosmic star formation history in local and distant universe. It will also demonstrate the space technologies related to the infrared spectro-photometry in space. Now, the NISS is ready to launch in late 2018. After the launch, the NISS will be operated during 2 years.

As an extension of the NISS, the SPEHREx (Spectro-Photometer for the History of the Universe Epoch of Reionization, and Ices Explorer) is the NASA MIDEX (Medium-class Explorer) mission proposed together with KASI (PI Institute: Caltech). It will perform the first all-sky infrared spectro-photometric survey to probe the origin of our Universe, to explore the origin and evolution of galaxies, and to explore whether planets around other stars could harbor life. Compared to the NISS, the SPHEREx is designed to have much more wide FoV of 3.5 x 11.3 deg. as well as wide spectral range from 0.75 to 5.0μm. After passing the first selection process, the SPHEREx is under the Phase-A study. The final selection will be made in the end of 2018. Here, we report the status of the NISS and SPHEREx missions.

[구 NS-02] Extragalactic Science I

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In this talk, we will review extragalactic science cases with NISS and SPHEREx. With its capability to perform a low resolution spectroscopy over a wide area, NISS and SPHEREx can provide valuable information about the evolution of spectral shapes of galaxies in different environments over cosmic history. This talk will focus on the cases for the studies that are closely related to the galaxy evolution and formation.

[구 NS-03] Extragalactic Science with SPHEREx II

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SPHEREx is a proposed MIDEX mission, planned to conduct spectral imaging survey to cover 0.75-5 um with a spectral resolution of R~40-135. We will briefly overview the uniqueness of SPHEREx data, and how Korean community can take advantage of it. We will present extragalactic science cases that can be addressed with SPHEREx dataset. In particular, SPHEREx survey will uniquely provide the variability information of bright QSOs, both in continuum and fluxes of emission lines, which enables us to investigate the central structures of QSOs through the reverberation mapping method. SPHEREx will also allow us to understand how supermassive black holes and host galaxies

co-evolve, by discovering new high-z QSOs, and investigating star formation properties in nearby QSOs.

[구 NS-04] SPHEREx Galactic Science: Ice Evolution from Molecular Clouds to Protoplanetary Disks

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SPHEREx의 중요 임무 중 하나는 0.75 μm 와 5 μm 사이에서 H_2O, CO, CO_2, XCN, OCS, 그리고 CH_3OH와 같은 얼음 분자의 전천 탐사 스펙트럼을 제공하는 것이다. 이러한 얼음 분자는 성간분자운의 먼지 티끌 표면에서 생성되어 별 탄생의 필연적 산물이며, 행성이 형성되는 원시행성계원반에서 다양한 변화를 겪게 되고, 복잡한 유기분자를 합성하게 된다. 하지만 충분하지 않은 관측 자료로 인해, 얼음 분자의 진화에 대한 이해가 미약한 상태이다. 현재까지는 근적외선에서 충분히 밝은 100 여개의 배경별이나 원시성에 대해서만 얼음 스펙트럼을 관측할 수 있었다. SPHEREx를 이용한 고감도 전천 탐사 미션은 약 20,000 여개의 배경별과 원시성에 대해 얼음 분자 스펙트럼을 제공할 것이다. 이렇게 100 배 이상 늘어난 샘플 스펙트럼 수로 인해, 얼음 분자의 진화에 대해서 통계적으로 의미있는 연구가 가능해 질 것이다. 본 발표에서는 SPHEREx의 Ice Program을 소개하고, 기대되어지는 결과에 대해서 논의하고자 한다.

[구 NS-05] Solar System Sciences with SPHEREx (SPHEREx를 활용한 태양계 연구)

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SPHEREx is expected to provide us with the opportunity of unbiased sampling of small Solar System objects along with near-infrared (0.75–5.0 μm) spectroscopic ($R \sim 41$) information. The estimated numbers of detections are tens of thousands for asteroids, thousands for Trojans, hundreds for comets, and several for Kuiper Belt Objects, Centaurs and Scattered Disk Objects. Wide spectral range covering many bands from carbon-bearing molecules and ices will enable us to systematically survey the volatile materials throughout the Solar System. SPHEREx will, for the first time, produce the near-infrared spectral map of the zodiacal light to pin-down the relative contributions of various populations of Solar System objects and interstellar dust to the dust grains in the interplanetary space. The study of the zodiacal light is also important to remove the foreground for the EBL (extragalactic background light) study, one of the main topics of the mission.

[구 NS-06] Cosmology using SPHEREx

Yong-Seon Song
KASI

We present the methodology to probe the initial condition of the universe using SPHEREx.

천문기기

[구 AI-01] Development of KAMG engineering model in KPLO mission

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대한민국 달탐사 시험용 궤도선은 2020년 말에 발사를 예정으로 위성개발이 진행되고 있다. KPLO(Korea Pathfinder Lunar Orbiter) 라고 명명된 달 궤도선에는 6개의 탑재체가 있으며, 경희대학교 우주탐사학과에서는 달 주위 공간 및 달 표면의 이상 자기장 영역을 관측하는 탑재체 (KMAG: Kplo MAGnetometer)를 개발하고 있다.

자기장센서는 3축 플럭스게이트 센서를 사용하며 약 0.2nT 이하의 분해능을 가지고 있다. 측정주기는 10Hz이며 총 무게는 3.5kg 이다. 1.2m 길이의 붐(Boom) 구조물 내부에 3개의 자기장 센서들을 설치하였으며 가능한 위성체로부터 거리를 두고 자기장을 측정하는 구조로 구성하였다. 시험모델 개발을 완료하고, 개발된 탑제체의 환경시험결과와 성능시험결과 요구조건에 부합되는 결과를 얻었다. KAMG는 국내최초의 심우주 탐사용 자기장 측정기로서 향 후, 행성 및 소행성 탐사 등에 활용하기 위한 기반기술로 활용할 수 있을 것으로 기대한다.

[구 AI-02] Optical mounting method based on current astronomical space missions (최근 천문우주미션에 기초한 광학계 마운팅 방법)

Bongkon Moon (문봉곤)
Korea Astronomy and Space Science Institute (한국천문연구원)

우주를 관측하기 위한 대부분의 천문학 미션을 위한 인공위성은 광학계를 가지는 망원경 구조물과 관측기기를 포함하고 있다. 망원경 구조물은 작은 렌즈 광학계에서 미터급의 대형 미러 광학계에 이르기까지 다양하며, 관측기기에 포함된 광학계는 그 용도에 따라서 다양한 형태를 보