Kim[1,3], Jeonghyun Pyo[1], Bongkon Moon[1], and Won-Kee Park[1]
[1]Korea Astronomy and Space Science Institute
[2]University of Science and Technology
[3]Seoul National University

According to the Korean government's Long-term Space Development Plan 2040, "Creative space science research" is included in a statement to investigate the origin and evolution of the universe by conducting a series of Korean space telescope missions: launch of space telescopes on a small satellite and an international collaboration explorer by 2020, a mid-size domestic space telescope by 2030, and a large size Korea leading international space telescope by 2040. We studied the feasibility of the future Korean Space Telescope (KST) for a mid-size domestic satellite platform. In order to pursue the uniqueness of the science program, we consider a wide range of observing wavelength (0.2um ~ 2.0um) with a spectral resolution of R~6 in the NUV and optical bands, and R~30 for NIR, utilizing an off-axis TMS(Three Mirror System) optics with a wide field of view (2x4 degrees) which is optimized for ultra-low surface brightness sources. The main science goals of the mission include investigations of the galaxy formation, cosmic web, and the cosmic background radiation in the NUV-NIR regions. In this paper, we present the science cases and several technical challenges to be resolved along with the future milestones for the success of the KST mission.

[구 ST-02] Status Report of the Flight Model of the NISS onboard NEXTSat-1

Woong-Seob Jeong[1,2], Bongkon Moon[1], Sung-Joon Park[1], Dae-Hee Lee[1], Jeonghyun Pyo[1], Won-Kee Park[1], Il-Joong Kim[1], Youngsik Park[1], Duk-Hang Lee[1,2], Kyeongyeon Ko[1,2], Mingyu Kim[1,3], Ukwon Nam[1], Minjin Kim[1,2], Jongwan Ko[1], Myungshin Im[3], Hyung Mok Lee[3], Jeong-Eun Lee[4], Goo-Hwan Shin[5], Jangsoo Chae[5], Toshio Matsumoto[1,6]
[1]Korea Astronomy and Space Science Institute, Korea, [2]University of Science and Technology, [3]Seoul National University, Korea, [4]Kyung Hee University, Korea, [5]Satellite Technology & Research Center, KAIST, Korea, [6]ISAS/JAXA, Japan

The NISS (Near-infrared Imaging Spectrometer for Star formation history) is the near-infrared spectro-photometric instrument optimized to the Next Generation of small satellite series (NEXTSat). To achieve the major scientific objectives for the study of the cosmic star formation in local and distant universe, the spectro-photometric survey covering more than 100 square degree will be performed. The main observational targets will be nearby galaxies, galaxy clusters, star-forming regions and low background regions.

The off-axis optics was developed to cover a wide field of view (2 deg. x 2 deg.) as well as the wide wavelength range from 0.95 to 2.5μm, which were revised based upon the recent test and evaluation of the NISS instrument. The mechanical structure were tested under the launching condition as well as the space environment. The signal processing from infrared sensor and the communication with the satellite were evaluated after the integration into the satellite.

The flight model of the NSS was assembled and integrated into the satellite. To verify operations of the satellite in space, the space environment tests such as the vibration, shock and thermal-vacuum test were performed. The accurate calibration data were obtained in our test facilities. Here, we report the test results of the flight model of the NISS.

[구 ST-03] CubeSat Application for Space Astronomy

Ho Jin, Jongho Seon, Seongwhan lee, Jung-Kyu lee, Hyojeong Lee, Jehyuck Shin
School of Space Research, Kyung Hee University

인공위성을 이용한 우주망원경 및 우주탐사장비는 천문학 및 우주과학 연구에 매우 중요한 관측 장비로서 지상에서 불가능한 다양한 파장대에서 관측을 수행하고 있다. 이러한 우주망원경의 경우 개발기간과 비용 또한 상대적으로 매우 큰 규모를 가지고 있다. 또한 장시간의 관측을 위한 관측위성의 운영 신뢰도 확보와 결과 활용을 위해 많은 연구 인력이 투입되는 거대 연구개발 사업이다.

그러나 최근에는 초소형 인공위성을 이용하여 여러 우주관측 및 실험이 수행되고 있다. 큐브위성으로 명명되어 있는 초소형 인공위성은 크기와 전력의 제한은 있지만 상대적으로 단기간의 개발일정과 저비용으로 전 세계적으로 폭발적인 성장을 하고 있는 관측기술이다. 경희대학교에서는 CINEMA라는 2개의 큐브위성을 개발 운영하였고, SIGMA 라는 큐브위성을 개발하여 발사를 기다리고 있다. 또한 향 후 광학관측을 위한 초소형 인공위성을 기획하고 있다. 국내에서는 천문우주용으로 제작되는 위성이외에도 다양한 기술검증용 위성이 10여기 이상 제작되고 있는 상황이다. 이에 초소형인공위성의 동향과 향 후 천문우주 관측에 활용 할 수 있는 방안에 대하여 논의 하였다.

[구 ST-04] Small scale magNetospheric and Ionospheric Plasma Experiments; SNIPE mission

Junga Hwang, Jaejin Lee, Jongdae Shon, Jaeheung