[구 GC-28] Beyond halo mass: the role of vorticity-rich filaments in quenching galaxy mass assembly

Hyunmi Song[1] (송현미), Clotilde Laigle[2], Ho Seong Hwang[3] (황호성), Julien Devriendt[4], Yohan Dubois[2], Katarina Kraljic[5], Christophe Pichon[2,6], Adrianne Slyz[4], Rory Smith[3]
[1]Yonsei University (연세대학교),
[2]Institut d'Astrophysique de Paris,
[3]Korea Astronomy and Space Science Institute (한국천문연구원),
[4]University of Oxford,
[5]University of Edinburgh,
[6]Korea Institute for Advanced Study (고등과학원)

We examine how the mass assembly of central galaxies depends on their location in the cosmic web. The HORIZON-AGN simulation is analysed at z ~2 using the DISPERSE code to extract multi-scale cosmic filaments. We find that the dependency of galaxy properties on large-scale environment is mostly inherited from the (large-scale) environmental dependency of their host halo mass. When adopting a residual analysis that removes the host halo mass effect, we detect a direct and non-negligible influence of cosmic filaments. Proximity to filaments enhances the build-up of stellar mass, a result in agreement with previous studies. However, our multi-scale analysis also reveals that, at the edge of filaments, star formation is suppressed. In addition, we find clues for compaction of the stellar distribution at close proximity to filaments. We suggest that gas transfer from the outside to the inside of the haloes (where galaxies reside) becomes less efficient closer to filaments, due to high angular momentum supply at the vorticity-rich edge of filaments. This quenching mechanism may partly explain the larger fraction of passive galaxies in filaments, as inferred from observations at lower redshifts.

천문우주관측기술

[구 AT-01] Status Report on All-sky Infrared Spectro-Photomeric Survey Mission, SPHEREx

Woong-Seob Jeong[1,2], Yujin Yang[1,2], Sung-Joon Park[1], Jeonghyun Pyo[1], Youngsoo Jo[1], Il-Joong Kim[1], Seungcheol Bang[1], SPHEREx Korean Consorthium[1,2,3,4,5,6]
[1]Korea Astronomy and Space Science Institute, Korea, [2]University of Science and Technology, Korea, [3]Kyungpook National University, Korea, [4]Kyung Hee University, Korea, [5]Seoul National University, Korea, [6]Korea Institute for Advanced Study, Korea

Based upon the previous heritage in the complete development of the infrared imaging spectrometer, NISS (Near-infrared Imaging Spectrometer for Star formation history) onboard NEXTSat-1, we are participating in the NASA MIDEX mission (PI Institute: Caltech), the all-sky infrared spectro-photometric surveyor SPHEREx (Spectro-Photometer for the History of the Universe, Epoch of Reionization, and Ices Explorer). The SPHEREx will provide us the first all-sky infrared spectro-photometric data set 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.

After the SPEHREx have passed the PDR (Preliminary Design Review) on this September, the fabrication of flight hardware will be started soon. As an international partner, KASI takes part in the hardware development, the operation and the science for the SPHEREx. Here, we report the status of the SPHEREx project and the progress in the Korean participation.

[구 AT-02] Gamma-Ray Burst Observation by SNIPE mission

Jae-Jin Lee[1], Hong Joo Kim[2], Uk-Won Nam[1], Won-Kee Park[1], Jongdae Shon[1], Soon-Wook Kim[1], Jeong-Sook Kim[1], Yong-Woo Kang[1], Z. Lucas Uhm[1], Sinchul Kang[2], Sang Hyeok Im[2], Sunghwan Kim[3]
[1]Korea Astronomy and Space Science Institute,
[2]Kyungpook National University,
[3]Cheongju University

For the space weather research, KASI (Korea Astronomy and Space Science Institute) is developing the SNIPE (Small-scale magNetospheric and Ionospheric Plasma Experiment) mission, which consists of four 6U CubeSats of ~10 kg. Besides of space weather research, the SNIPE mission has another astrophysical objective, detecting Gamma-Ray Bursts(GRB). By cross-correlating the light curves of the detected GRBs, the fleet shall be able to determine the time difference of the arriving signal between the satellites and thus determine the position of bright short bursts with an accuracy ~100′. To demonstrate the technology of the GRB observation, CSI gamma-ray detectors combined with GPS and IRIDIUM communication modules are placed on each SNIPE CubeSat. The time of each spacecraft is synchronized and when the GRB is detected, the light curve will be transferred to the