mission of NASA. The flight software can process encoding and decoding data, control the subsystems, and provide observation autonomy. We developed a python-based testing framework to improve software reliability. The flight software development is one of the crucial contributions of KASI and an important milestone for the next project which is developing a solar coronagraph to be installed at International Space Station.

[구 NGSC-06] BITSE Ground Software

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We have developed Ground Software (GSW) of BITSE. The ground software includes mission operation software, data visualization software and data processing software. Mission operation software is implemented using COSMOS. COSMOS is a command and control system providing commanding, scripting and data visualization capabilities for embedded systems. Mission operation software send commands to flight software and control coronagraph. It displays every telemetry packets and provides realtime graphing of telemetry data. Data visualization software is used to display and analyze science image data in real time. It is graphical user interface (GUI) and has various functions such as directory listing, image display, and intensity profile. The data visualization software shows also image information which is FITS header, pixel resolution, and histogram. It helps users to confirm alignment and exposure time during the mission. Data processing software creates 4-channel polarization data from raw data.

[구 NGSC-07] BITSE Preliminary Result and Future Plan

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BITSE is a technology demonstration mission to remotely measure the speed, temperature, and density of the solar wind as it forms as close as 3 Rs. BITSE obtained coronal images during its one day flight above more than 99% of the atmosphere, and calibration data are taken in the laboratory as well as during the flight. As the linearly polarized K-corona is much fainter than other bright sources like diffraction, sky, and F-corona, a careful data reduction is required to obtain reliable scientific results. We will report status of the obtained data, the reduction progress, and future plan.

특별세션
Pillars of the Standard Model of Cosmology

[구 PSMC-01] Deviations from power-law primordial spectrum

Jinn-Ouk Gong
Korea Astronomy and Space Science Institute

We discuss theoretical motivations for deviations from standard power-law primordial power spectrum and possible mechanism to provide non-trivial scale dependence for the primordial power spectrum.

[구 PSMC-02] Testing the Curvature of the Universe

Benjamin L'Huillier
Yonsei University

In a homogeneous and isotropic universe, the solution to the Einstein Field equation is the Friedmann-Robertson-Lemaître-Walker metric, which describes an expanding Universe with spatial curvature. The curvature has profound implications, in particular regarding the early universe.

In this talk, I will review the state-of-the-arts constraints on the spatial curvature of the Universe using different cosmological observations. In particular, I will focus on model-independent tests using baryon acoustic oscillations and supernovae.

[구 PSMC-03] Candidates of cold dark matter

Ki-Young Choi
Sungkyunkwan University

The astrophysical and cosmological observations are consistent with the cold dark matter in the standard cosmology. I review the possible candidates of cold dark matter and their production in the early Universe with their possible

detection.

[구 PSMC-04] Forecasting special events driving the assembly of dark halos

Christophe Pichon
Institut d'Astrophysique de Paris

I will compute the rate of merger events in the multi-scale initial conditions to forecast special events driving the anisotropic assembly of dark matter halos and understand their impact on galaxy formation. Beyond halo mergers, I consider all sets of mergers, including wall and lament mergers, as they impact the geometry of galactic infall. Their one- and two-points statistics are computed as a function of cosmic time. I establish the relation between merger rates and connectivity, which is then used to assess the impact the large scale structures on assembly bias. The anisotropy of the cosmic web, as encoded in this theory, is a signi cant ingredient to describe jointly the physics and dynamics of galaxies in their environment, e.g. in the context of intrinsic alignments or morphological diversity.

[구 PSMC-05] Transitional Dark Energy – A solution to the H0 tension

Ryan Keeley
Korea Astronomy Space Science Institute

In this talk, I will explain the implications of a rapid appearance of dark energy between the redshifts (z) of one and two on the expansion rate and growth of perturbations. Using both Gaussian process regression and a parametric model, I show that this is the preferred solution to the current set of low-redshift ($z<3$) distance measurements if $H_0=73~\rm km\,s^{-1}\,Mpc^{-1}$ to within 1\% and the high-redshift expansion history is unchanged from the ΛCDM inference by the Planck satellite. Dark energy was effectively non-existent around $z=2$, but its density is close to the ΛCDM model value today, with an equation of state greater than -1 at $z<0.5$. If sources of clustering other than matter are negligible, we show that this expansion history leads to slower growth of perturbations at $z<1$, compared to ΛCDM, that is measurable by upcoming surveys and can alleviate the σ_8 tension between the Planck CMB temperature and low-redshift probes of the large-scale structure.

[구 PSMC-06] Cosmology with large-area extra-galactic radio surveys from SKA and pathfinders

David Parkinson
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The last two decades have seen an immense growth in our understanding of the physics of the birth and evolution of our Universe. However there are still many unanswered questions, such as: what is the nature of the dark energy, which drives the acceleration of the expansion of the Universe? Is the acceleration driven by a cosmological constant, some dynamical dark energy, or a modification of the gravitational force law on large scales? The next generation of radio observatories will conduct large area radio continuum and HI intensity mapping surveys, and so will make possible new and complimentary tests of these fundamental questions. In this talk I present the design of these next generation of surveys, current forecasts for the effectiveness of these cosmological probes, and results from precursor experiments.

특별세션
소형망원경 네트워크

[구 STN-01] Korean Small Telescope Network (소형망원경 네트워크)

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In this talk, we will give an overview of the small telescope network project in Korea. The small telescope network is a project in planning that would gather 0.4m-1.0m telescopes in Korea together for a common use in research and education, and the project is being led by the Optical/IR Astronomy Division of KAS. Even in the era of giant telescopes, small telescopes are still competitive for various research topics that require rapid response or long-term, steady monitoring. There are quite a few small telescopes in Korea, but the research use of these telescope has been very limited. By organizing these