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

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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)

Myungshin Im1, Yonggi Kim2,3, Wonseok Kang4, Chung-Uk Lee5, Heewon Lee6, Hyunjin Shim7, Hyun-Il Sung5, Masateru Ishiguro1, Seung-Lee Kim5, Taewoo Kim4, Min-Su Shin5, Joh-Na Yoon3, Jong Hak Woo1
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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

telescopes together, the small telescope network hopes to bring these telescopes in full operation and offer Korean astronomers competitive observational resources. In this talk, we will outline the project, describe potential resources, and several science cases such as multi-messenger astronomy, supernovae, and AGN. We will also introduce how this project might be run, with the expected operation of the small network starting at 2020.

[구 STN-02] 국내 소형망원경 네트워크 구축을 위한 국내 소형 망원경 현황 조사 및 수요 Study on current potential resources and demand for networking the small telescopes in Korea

Yonggi Kim[1,2], Junhyeok Jeon[1,3], Joh-Na Yoon[2], Jong-Jin Lim[1], Sang Geol Kim[1], Myungshin Im[4]
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본 연구는 소형망원경 네트워크 구축과 활용을 위해 수행한 국내 천문대(천문과학관)에서 운용중인 주 망원경의 현황을 파악하고 망원경보유 기관의 종사자들이 소형망원경네트워크 구축에 대한 관심을 알아보보는 설문조사 및 분석으로 구성되었다. 각 기관이 보유하고 있는 주망원경에 대한 제원, 사용하고 있는 관측기기, 원격관측 가능여부 및 향후 네트워크 참여 의향 여부 및 주망원경을 이용한 교육프로그램 등에 대한 15가지 설문내용을 국내 망원경보유기관에 설문의뢰해서 얻어진 결과들을 발표할 예정이다. 국내 소형망원경들을 공동 활용하여 연구 및 교육활동에 활발하게 사용하는데 기여하기 위한 방안의 일환으로 사용될것으로 판단된다

[구 STN-03] Exoplanet Science Cases with Small Telescope Network

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Based on our experience on exoplanet transit observation, we propose the exoplanet science cases with Small Telescope Network. One is the follow-up observation for validation of exoplanet candidates. TESS(Transiting Exoplanet Survey Satellite) is pouring out exoplanet candidates in bright stars(V<15) on all the sky. Since Small Telescope Network will consist of 0.5-1m telescopes, we will expect to produce promising outcomes from the follow-up observation of bright candidates. Next is the transit time observation. By spectroscopy of space and large telescopes during transit event, it can be possible to find the bio signatures in exoplanet atmosphere. So, in terms of cost, it is critical to determine the exact time of transit event. In addition, detecting the variation of transit time can reveal another exoplanet and exomoon in the system. In order to determine the transit time and its variation, the accumulation of transit event data is more important than the quality of photometric data. We expect that it can be a challenging project of Small Telescope Network.

[구 STN-04] Monitoring Observations of Active White Dwarf Binary Systems

Hee-Won Lee[1], Bo-Eun Choi[1], Myungshin Im[2], Gu Lim[2]
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Binary systems of a white dwarf showing mass transfer activities are classified into cataclysmic variables and symbiotic stars. In the case of cataclysmic variables, the companion is usually a late type main sequence star filling its Roche lobe, where material is transferred through the inner Lagrangian point to form an accretion disk around the white dwarf. The disk becomes unstable and highly viscous when the surface density exceeds the critical density, leading to dwarf nova outbursts. In contrast, symbiotic stars are wide binary systems having a giant as the mass donor. Some fraction of giant stellar wind is accreted to the white dwarf giving rise to various symbiotic activities. In particular, half of symbiotics show Raman O VI at 6830 and 7088, which are important spectroscopic probe of mass transfer process. Monitoring observations using 1 m class telescopes will produce valuable information regarding the mass loss and mass transfer to white dwarf stars, shedding much light on the last stage of stellar evolution of low and intermediate mass stars.

[구 STN-05] Research on Solar System Small Bodies using the Korean Small Telescopes Network

Masateru Ishiguro
Seoul National University

Small bodies in the solar system are pristine leftovers of planetesimals since the formation epoch (~4.6 Gyr ago). After the formation, icy planetesimals have been preserved in the distant cold place beyond 30 au (i.e., Trans-Neptunian region) until recently without any catastrophic processes but have just been injected into inner region (<~5 au from the Sun) to be observed as