관계 연구들을 소개하고자 한다.

[강 IT-06] 과학은 문화다

이명현
과학책방 갈다 대표

과학이 일반인들과 만나는 방식은 시대정신의 변화와 함께 바뀌어왔다. 과학이 지적 계몽의 도구로 받아들여지던 시대로부터 시작해서 이제는 일반인들의 적극적인 참여가 가치를 발휘하는 '시민의 과학'이 화두가 되기 시작했다. 현재 다양한 형태의 과학문화 활동이 다양한 과학커뮤니케이터들에 의해서 실행되고 있다. 과학문화 활동의 모습을 전체적으로 살펴보고 그 활동의 중심에 있는 다양한 과학커뮤니케이터들의 활약상을 보여주려고 한다. 현재 활동의 진단을 바탕으로 앞으로 과학문화 활동이 나아가야할 지향점에 대해서 논의한다.

[강 IT-07] Sharing the Experience of Mars Desert Research Station

Byung Man Kim, Kyung Soo Moon
Mars Desert Research Station Crew 196(화성탐사연구기지 196기)

미국 유타주 유타사막에 설치된 MDRS(Mars Desert Research Station)는 미국의 비영리기구인 화성학회(The Mars Society)에서 운영하는 화성탐사연구기지다. 화성학회는 1998년 우주비행사, 천문학자, 과학자 4000여 명이 모여 만든 비영리연구단체다. 2001년 미국 유타주에 문을 연 MDRS에서는 토양 미생물 검출실험, 태양에너지 조리실험, 영구동토층 연구, 해빙 연구, 드론 정찰 및 지도 작성 등 인류가 화성에 도착했을 때 실제 수행할 연구들을 진행하고 있다. tVN <갈릴레오 : 깨어난 우주> 촬영 차 MDRS에 머물며 과학실험을 수행한 사례를 공유하고 이를 통해 천문학 및 우주탐사에 대한 대중화 방안에 대해 논의해 보고자 한다.

외부은하 / 은하단

[구 GC-01] Multi-Messenger Observation of Gravitational Wave Source GW170817

Myungshin Im[1], Joonho Kim[1], Changsu Choi[1], Gu Lim1, Chung-Uk Lee[2], Seung-Lee Kim[2], Hyung Mok Lee[2], Yongmin Yoon[1], Seong-Kook Lee[1], Jongwan Ko2, Hyunjin Shim[3], and a larger collaboration
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[2]Korea Astronomy & Space Science Institute
[3]Dept. of Earth Science Education, Kyungpook National University

On August 17th 2017, for the first time in the history, the gravitational wave (GW) detectors recorded signals coming from the merger of two neutron stars. This event was named as GW170817, and more interestingly, gamma-ray emission was detected 2 seconds after the gravitational wave signal, and 11 hours later, telescopes in Chile identified that the GW signal came from the NGC 4993 galaxy at the distance of about 40 Mpc. This is again the first time that electromagnetic (EM) signals are detected for a GW source. The follow-up observations by astronomers all around the world, including our group in Korea, successfully identified the optical emission as the kilonova, the elusive optical/NIR counterpart that has been proposed to originate from a neutron star merger. This whole event started the new era of astronomy, so-called the "multi-messenger astronomy", where the combined information from GW and EM radiation reveals an unprecedented view of the universe. In this talk, I summarize this exciting event, and describe the efforts by Korean astronomers that have led to important discoveries about the kilonova and the host galaxy properties, and finally provide the future prospects.

[구 GC-02] Multi-wavelength Extragalactic Studies in the AKARI Deep Field - South

Woong-Seob Jeong[1,2], Minjin Kim[1,3], Jongwan Ko[1,2], Sung-Joon Park[1], Kyeongyeon Ko[1,2], Youngsoo Jo[1], Min Gyu Lee[4,5], Hyun Jong Seo[1], Taehyun Kim[1], Jeonghyun Pyo[1], Dongseob Lee[3], Il-Joong Kim[1], NISS Team[1,2,3,4,6,7]
[1]Korea Astronomy and Space Science Institute, Korea, [2]University of Science and Technology, Korea, [3]Kyungpook National University, Korea, [4]Seoul National University, Korea, [5]Genesia co., Japan, [6]Kyung Hee University, Korea, [7]ISAS/JAXA, Japan

The ADF-S (AKARI Deep Field - South) toward South Ecliptic Pole is one of the deep survey fields designed for the study of Cosmic Infrared Background (CIB). Owing to the easy accessibility with space missions and its low background brightness, the deep extragalactic survey was initiated by AKARI deep far-infrared observations and it will be performed by other future missions (e.g., Euclid, NISS, SPHEREx). The recent optical survey with KMTNet enabled us to identify the optical counterparts for dusty star-forming galaxies such as ULIRG, DOG, SMG. In addition, the NISS will perform the valuable spectro-photometric survey in the ADF-S. Those multi-wavelength data

sets helps to trace the major galaxy population contributing to the CIB. Here, we introduce the extragalactic survey with the NISS and report the current status of the multi-wavelength extragalactic studies in the ADF-S.

[구 GC-03] A New Extensive Census of Warped Disk Galaxies in Nearby Universe

Galaxy Woong-bae Zee (지웅배), Suk-Jin Yoon (윤석진)
Department of Astronomy and Center for Galaxy Evolution Research, Yonsei University (연세대학교 천문우주학과 & 은하진화연구센터)

The galactic warp is almost ubiquitous among disk galaxies and suspected to be an imprint of recent interactions with other galaxies. The detailed evolutionary course, however, is still uncertain due to the lack of observational evidence. To address this issue, we construct a new extensive catalog of 412 conspicuously warped disks at z = 0.01 ~ 0.05, based on SDSS DR7. We classify the warp morphology through a visual inspection from the Zooniverse Project and our new automated scheme for the warp measurement. We find an interesting color difference between S- and U-shaped warps. The U-type warp galaxies exhibits considerable color offset towards blue compared to both the S-type warps and the control sample of un-warped galaxies. The effect is even more pronounced for galaxies (a) with the greater warp amplitude and (b) with lower luminosity. This is the first piece of observational evidence that the S- and U-shaped warps are on different evolutionary phases in terms of not only dynamics but stellar populations as well. We discuss the implications in the context of the warp evolution theory.

[구 GC-04] Towards the Understanding of the Growth and Evolution of Supermassive Black Holes at Galaxy Centers

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As computational resolution of modern cosmological simulations reach ever so close to resolve individual star-forming clumps in a galaxy, a need for "resolution-appropriate" physics for a galaxy-scale simulation has never been greater. To this end, we introduce a self-consistent numerical framework that includes explicit treatments of feedback from star-forming molecular clouds and massive black holes. We perform a state-of-the-art cosmological simulation of a quasar-host galaxy at z~7.5, and demonstrate that previously undiscussed types of interplay between galactic components may hold important clues about the growth and impact of quasar-host galaxies.

[구 GC-05] Horizon-AGN virtual observatory: SED-fitting performance and forecasts for future imaging surveys

Clotilde Laigle[1], I. Davidzon[2], O. Ilbert[3], J. Devriendt[1], D. Kashino[4], P. Capak[2], S. Arnouts[3], S. De la Torre[3], Y. Dubois[5], G. Gozaliasl[6], D. Leborgne[5], H. J. McCracken[5], C. Pichon[5]
[1]University of Oxford, [2]California Institute of Technology, [3]LAM Universite d'Aix-Marseille & CNRS, [4]ETH Zurich, [5]Institut d'Astrophysique de Paris, [6]University of Turku Vaisalantie

We use the synthetic light-cone from the cosmological hydrodynamical simulation Horizon-AGN to produce a mock photometric galaxy catalogue on the redshift range 0<z<4 using the 30 COSMOS, LSST, DES and Euclid filter passbands. The virtual photometry consistently includes complex star formation histories and metallicities, dust, IGM attenuation on each sightline and realistic flux errors. These latter are calibrated to mimic COSMOS2015, a LSST-like and an Euclid-like surveys. Redshifts and physical properties are then computed through SED-fitting with the same configuration as those routinely used for observed datasets, and compared with the properties directly extracted from the simulation. From this comparison we quantify uncertainties and systematics related to the depth of the survey, the choice of photometric filters and simple assumptions at the SED-fitting stage on star-formation histories, metallicity enrichment and dust attenuation. Using a dust-free virtual photometry, the specific role of dust in driving part of the systematics is isolated. The impact of IMF, stellar evolution prescriptions, and flux errors is discussed. The expected performance of future imaging surveys at completion are also investigated.

[구 GC-06] The BAT AGN Spectroscopic Survey: concept, status, and future perspectives

Kyuseok Oh[1,2], Yoshihiro Ueda[1], Michael Koss[3],