포 스 터 발 표 초 록

교육홍보

[포 AE-01] Activity Report of Young Astronomers Meeting in 2016-17 Season

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지난 2016년 4월, 젊은 천문학자 모임 (Young Astronomers Meeting, YAM) 정기총회에서 2016-17년도 임원진으로 회장 이주원 (경희대학교), 부회장 김진협 (연세대학교), 총무 최두현 (세종대학교) 을 선출하였다. 임원진은 서울대학교 김윤영, 세종대학교 장석준, 연세대학교 백준현, 경북대학교 신지혜를 학교별 운영위원으로 임명하였다. 현 임원진은 YAM 창단 초기에 발간되었다 중단되었던 소식지 <하늘 사랑>의 재창간을 임기 목표로 하고, 2016년 가을에 재창간호 (통권 5호), 2017년 봄에 6호를 발간하였다. 임원진은 <하늘 사랑>을 통해 회원들 간의 교류를 증진하고 회원들의 다양한 의견을 수렴하고자 하였다. 이와 더불어 홈페이지를 통한 입회 시스템을 도입하였고, 흩어져있던 과거 자료들을 회원들로부터 제보 받아 통합하는 작업을 마쳤으며 EAMA10에 참여하여 YAM의 활동과 역할에 대해 발표하였다. 이번 포스터에서는 2016-17년도 동안의 활동 내용을 보고하고 이후의 계획에 대해 논의하려고 한다.

[포 AE-02] The Role of Planetariums in Astronomy Education(천문학 교육에서 천체투영관의 역할)

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올해는 1967년 광화문 우체국에 설치된 천체투영관을 시작으로 국내에 천체투영관이 도입된 지 50주년이 되는 해이다. 지방자치제의 시행과 더불어 디지털 투영기가 보급되면서 국내 천문시설은 급격히 증가하게 되었고, 현재 국내에는 약 80곳의 천체투영관이 있으며 연간 약 250만 명이 방문하는 인기 있는 천문시설 중 하나로 자리 잡게 되었다. 하지만 현재의 천체투영관은 영상물 상영 위주의 운영이 주를 이루고 있고 교육 시설로의 활용은 부족한 편이다. 반면 해외에서는 1960년대부터 학교와 지역사회에서 천체투영관을 활용한 교육이 활발하게 이루어지고 있다. 또한 천체투영관의 교육적 효과에 대한 연구도 지속적으로 이루어지고 있으며 천문학적 개념 형성에 긍정적인 효과가 있는 것으로 나타나고 있다. 따라서 본 발표에서는 해외에서 이루어지고 있는 천체투영관을 활용한 다양한 방식의 연구방법과 사례를 살펴보고 현재 국립대구과학관에서 개발하여 운영 중인 프로그램과 활용방법에 대해 소개하고자 한다.

외부은하/우주론

[포 GC-01] On the origin of the Oosterhoff-intermediate characteristics of RR Lyrae stars in dwarf galaxies

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In our recent investigation of the Oosterhoff dichotomy among globular clusters (GCs), we have shown that the RR Lyrae variables in the Oosterhoff groups I, II, and III are produced mostly by first, second, and third generation stars (G1, G2, and G3), respectively. Unlike GCs, RR Lyrae stars in the Local Group dwarf galaxies show Oosterhoff-intermediate characteristics. The origin of this, however, is yet to be understood. In this poster, we will present our progress in understanding the origin of this phenomenon.

[포 GC-02] Cosmic mass accretion history of satellites around a dwarf galaxy

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We aim to trace cosmic mass accretion history of satellites around a dwarf galaxy in Lambda-CDM cosmology frame. Each satellite has a unique mass accretion history due to different environment, potential depth, and different merging events. We perform three different zoom simulations whose

target galaxy has a mass of ~10^{10} Msun, using ~17 million particles covering a cubic box of 1 $(Mpc/h)^3$. Here, individual particle masses for dark matter (DM) and gas are M_{DM} = 4.1×10^3 Msun and Mgas = 7.9×10^2 Msun, respectively, and thus each satellite can be resolved with more than several hundreds of particles.

[포 GC-03] On the origin of Na-O anticorrelation in globular clusters

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In order to investigate the origin of multiple stellar populations in the halo and bulge of the Milky Way, we have constructed chemical evolution models for the low-mass proto-Galactic subsystems such as globular clusters (GCs). Unlike previous studies, we assume that supernova blast waves undergo blowout without expelling the pre-enriched gas, while relatively slow winds of massive stars, together with the winds and ejecta from low and intermediate mass asymptotic giant branch stars, are all locally retained in these less massive systems. We first applied these models to investigate the origin of super-helium-rich red clump stars in the metal-rich bulge as recently suggested by Lee et al. (2015). We find that chemical enrichments by the winds of massive stars can naturally reproduce the required helium enhancement (dY/dZ = 6) for the second generation stars. Disruption of these “building blocks” in a hierarchical merging paradigm would have provided helium enhanced stars to the bulge field. Interestingly, we also find that the observed Na-O anticorrelation in metal-poor GCs can be reproduced, when multiple episodes of starbursts are allowed to continue in these subsystems. Specific star formation history with decreasing time intervals between the stellar generations, however, is required to obtain this result, as would be expected from the orbital evolution of these subsystems in a proto-Galaxy. The “mass budget problem” is also much alleviated by our models without ad-hoc assumptions on star formation efficiency and initial mass function.

[포 GC-04] Chemical Properties of Star-Forming Dwarf Galaxies in Different Environments

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Star forming dwarf galaxies in various environments are attractive objects for investigating the environmental effects on chemical evolution of dwarf galaxies. Using SDSS DR7 spectroscopic data and GALEX ultraviolet (UV) imaging data, we study the chemical properties of star forming dwarf galaxies in various environments of the Virgo cluster, Ursa Major group, and field. We derived gas-phase abundance, galaxy mass, and UV specific star formation rate (sSFR) of subsample, early-type (ETD) and late-type star forming dwarf (LTD) galaxies, which are divided by visually classified galaxy morphology. We found no O/H enhancement of LTDs in cluster and group environments compared to the field, implying no environmental dependence of the mass-metallicity relation for LTDs. LTDs in the Virgo cluster and Ursa Major group have similar sSFR at a given galaxy mass, but they exhibit systematically lower sSFR than those in isolated field environment. We suggest that LTDs in the Virgo cluster are an infalling population that was recently accreted from the outside of the cluster. We found that ETDs in the Virgo cluster and Ursa Major group exhibit enhanced O/H compared to those in the field. However, no distinct difference of N/O of galaxies between different environments. The chemically evolved ETDs in the Virgo cluster and Ursa Major group also show similar mass-sSFR relation, but systematically lower sSFR at a fixed galaxy mass compared to the field counterparts. We suggest that ETDs in the Virgo cluster and Ursa Major group have evolved under the similar local environments. We also discuss the evolutionary path of ETDs and LTDs with respect to the environmental effects of ram pressure stripping and galaxy interaction/merging.

[포 GC-05] Chemically young AGNs at high redshift

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Metallicity is one of the most important properties in understanding galaxy evolution. However, measuring metallicity is limited to low redshift (z<3.5) due to the faintness of the metallicity indicators in normal galaxies. For high redshift universe, active galactic nuclei (AGN) can be used to constrain the host galaxy metallicity.