Jeong-Sun Hwang[1], Changbom Park[2]
[1]Department of Physics and Astronomy, Sejong University, [2]School of Physics, Korea Institute for Advanced Study

We use smoothed particle hydrodynamics (SPH) models to study the evolution of galactic spin and the distribution of gas and young stars in the inner region of the galaxies through galaxy encounters. Specifically, we perform numerical simulations of interactions of a late- or an early-type galaxy with either a late- or an early-type galaxy with and without a gas halo at the closest approach distances of 25 and 50 kpc. We find that an early-type galaxy encountering a late-type galaxy have a higher galactic spin and more gas and young stars in the central region of the galaxy after the collision. We are analyzing the role of a gas halo on the changes of galactic spin and central mass distribution during various galaxy-galaxy encounters.

[포GC-19] The impact of ram pressure on the multi-phase ISM probed by the TIGRESS simulation

Woorak Choi[1], Chang-Goo Kim[2], Aeree Chung[1]
[1]Department of Astronomy, Yonsei University, Seoul, South Korea [2]Department of Astrophysical Sciences, Princeton University, Princeton, USA

Galaxies in the cluster environment interact with the intracluster medium (ICM), losing the interstellar medium (ISM) and alternating their evolution. Observational evidences of the extraplanar ISM stripped by the ICM's ram pressure are prevalent in HI imaging studies of cluster galaxies. However, current theoretical understanding of the ram pressure stripping (or ICM-ISM interaction in general) is still limited mainly due to the lack of numerical resolution at ISM scales in large-scale simulations. Especially, self-consistent modeling of the turbulent, multiphase ISM is critical to understand star formation in galaxies interacting with the ICM. To achieve this goal, we utilize the TIGRESS simulation suite, simulating a local patch of galactic disks with high resolution to resolve key physical processes in the ISM, including cooling/heating, self-gravity, MHD, star formation, and supernova feedback. We then expose the ISM disk to ICM flows and investigate the evolution of star formation rate and the properties of the ISM. By exploring ICM parameter space, we discuss an implication of the simple ram pressure stripping condition (so called the Gunn-Gott condition) to the realistic ISM.

우주론 / 암흑물질,암흑에너지

[포GC-20] Testing Gravity with Cosmic Shear Data from the Deep Lens Survey

Cristiano G. Sabiu, Mijin Yoon, M. James Jee
Astronomy Dept, Yonsei University

From the gaussian, near scale-invariant density perturbations observed in the CMB to the late time clustering of galaxies, CDM provides a minimal theoretical explanation for a variety of cosmological data. However accepting this explanation, requires that we include within our cosmic ontology a vacuum energy that is ~122 orders of magnitude lower than QM predictions, or alternatively a new scalar field (dark energy) that has negative pressure.

Alternatively, modifications to Einstein's General Relativity have been proposed as a model for cosmic acceleration. Recently there have been many works attempting to test for modified gravity using the large scale clustering of galaxies, ISW, cluster abundance, RSD, 21cm observations, and weak lensing.

In this work, we compare various modified gravity models using cosmic shear data from the Deep Lens Survey as well as data from CMB, SNe Ia, and BAO. We use the Bayesian Evidence to quantify the comparison robustly, which naturally penalizes complex models with weak data support. In this poster we present our methodology and preliminary constraints on f(R) gravity.

[포GC-21] The Dependence of Type Ia Supernova Luminosities on the Global and Local Properties of Host Galaxies in the YONSEI Supernova Catalog

Young-Lo Kim, Yijung Kang, and Young-Wook Lee
Center for Galaxy Evolution Research & Department of Astronomy, Yonsei University, Seoul 03722, Korea

Trends of Type Ia supernova (SN Ia) luminosities with the properties of host galaxies are important to study the underlying physics for an SN progenitor system and explosion mechanism. In the YONSEI SN catalog, we have a sample of ~600 SN and host data in the wider redshift range, and two independent light-curve models, SALT2 and MLCS2k2. From this catalog, here we present that SNe Ia in low-mass, globally and locally star-forming environments are fainter than those in high-mass, globally and locally passive environments, after light-curve shape and color or extinction corrections. Our results are then compared to previous studies, and show consistent results.

[포GC-22] Big Data Astronomy : Let's "PySpark" the Universe (빅데이터 천문학 : PySpark를 이용한 천문자료 분석)

Sungryong Hong
Korea Institute for Advanced Study

The modern large-scale surveys and state-of-the-art cosmological simulations produce various kinds of big data composed of millions and billions of galaxies.

Inevitably, we need to adopt modern Big Data platforms to properly handle such large-scale data sets.

In my talk, I will briefly introduce the de facto standard of modern Big Data platform, Apache Spark, and present some examples to demonstrate how Apache Spark can be utilized for solving data-driven astronomical problems.

항성/항성계/외계행성

[포SA-01] High Resolution Spectroscopic Monitoring of Symbiotic Stars AG Draconis and UV Aurigae

Soo Hyun Kim[1], Tae Seog Yoon[1], Hyung-il Oh[1]
[1]*Kyungpook National University*

보현산 천문대 1.8m 망원경과 고분산 에셀 분광기 BOES(BOao Echelle Spectrograph)를 이용한 공생별 AG Draconis와 UV Aurigae의 분광학적 특성을 파악한다. 중성수소 Balmer 선과 주요 원소에 의한 방출선들의 특징과 변화를 살펴보며, 두 별의 활동성 및 등급에 따른 Balmer 선의 변화 양상에 대해 알아보고자 한다.

[포SA-02] A comparison study between the AESOPUS Low Temperature Opacity and that of Ferguson, on Standard Stellar Models and Isochrones

Yong -Cheol Kim[1] and Minje Beom[2]
[1]*Astronomy Department, Yonsei University, Korea*
[2]*Astronomy Department, NMSU, USA*

A comparison study between two low temperature opacity tables has been conducted. The opacity is the one of the major input physics in stellar model construction. Opacity is generally provided in a tabular form and as a function of 3 parameters, ie, density, temperature and chemical composition. Among available opacity tables, it has been common practice to utilize OPAL opacity table (Iglesias & Rogers, 1996) augmented with Ferguson opacity table (Ferguson et al. 2005) for the low temperature domain. For low temperature domain, another table, AESOPUS (Marigo & Aringer, 2009), has been announced in 2007. Reportedly, this opacity covers even lower temperature region, and is compatible with that of Ferguson in the overlapping temperature domain. To test the compatibility, stellar models and isochrones for various ranges in mass, metallicity and chemical composition, have been constructed. It is confirmed that there is no significant difference in the stellar models and isochrones constructed with the two different low temperature opacities. Therefore, in the construction of stellar models and isochrones, Ferguson low temperature opacity can be replaced with the AESOPUS opacity. The wider range in the temperature and chemical mixtures, and the easier accessibility make AESOPUS favorable in practical purpose.

[포SA-03] Stellar Wind Accretion and Raman O VI Spectroscopy of the Symbiotic Star AG Draconis

Young-Min Lee[1], Hee-Won Lee[1], Ho-Gyu Lee[2], Rodolfo Angeloni[3]
[1]*Sejong University,* [2]*KASI,* [3]*Universidad de La Serena*

High resolution spectroscopy of the yellow symbiotic star AG Draconis is performed with the Canada-France-Hawaii Telescope to analyse the line profiles of Raman scattered O VI broad emission features at 6825 Å and 7082 Å with a view to investigating the wind accretion process from the mass losing giant to the white dwarf.

These two spectral features are formed through inelastic scattering of O VIλλ1032 and 1038 with atomic hydrogen.

We find that these features exhibit double-component profiles with red parts stronger than blue ones with the velocity separation of ~ 60 km s−1 in the O VI velocity space.

Monte Carlo simulations for O VI line radiative transfer are performed by assuming that the O VI emission region constitutes a part of the accretion flow around the white dwarf and that Raman O VI features are formed in the neutral part of the slow stellar wind from the giant companion.

The overall Raman O VI profiles are reasonably fit with an azimuthally asymmetric accretion flow and the mass loss rate ~ 4 × 10^{−7} M_sun yr^{−