구 두 발 표 초 록

초 청 강 연

[초 IT-01] Hearts of Darkness: Rethinking the Role of Supermassive Black Holes in Galaxy Evolution

Ann Zabludoff
Steward Observatory, University of Arizona

While astronomers are working hard to detect the earliest galaxies and to follow their evolution to redshift z~0, they remain baffled by the present-day dichotomy between disky, star forming (aka late-type) galaxies and quiescent, spheroidal (aka early-type) galaxies. The key is to find galaxies in transition from one class to the other, whose spectra indicate intense recent star formation that has now ended. We have identified thousands of such "post-starburst galaxies" and discovered that they are often the products of late-type galaxy-galaxy mergers. Their current kinematics, stellar populations, and morphologies are consistent with late- to early-type galaxy evolution. I will discuss recent work that suggests new connections between this violent history and the central supermassive black hole. In particular, the molecular gas reservoir of a

post-starburst galaxy declines rapidly after the starburst ends and in a manner consistent with feedback from an active nucleus. Furthermore, a star is ~300x more likely to be tidally disrupted by the nucleus of a post-starburst galaxy than in other galaxies. Like the well-known black hole-bulge mass correlation, these surprising links between the properties of a galaxy on kpc scales and its supermassive black hole on pc scales require explanation.

외부은하 / 은하단

[구 GC-01] The progenitor star of Type Ic SN 2017ein from IMSNG survey

Changsu Choi[1,2], Myungshin Im[1,2], Sung-Chul Yoon[2] and IMSNG team
[1]*Center for the Exploration of the Origin of the Universe, Department of Physics and Astronomy, Seoul National University, Gwanak-gu, Seoul 151-742, Korea*
[2]*Astronomy Program, Department of Physics and Astronomy, Seoul National University, Gwanak-gu, Seoul 151-742, Korea*

The progenitor star properties of supernovae (SNe) are not fully understood though a large number of SNe have been discovered so far. One of the promising ways to understand the properties of progenitor stars is to study SN early light curve where the shock heated emission after explosion is imprinted in. We have performed Intensive Monitoring Survey of Nearby Galaxies (IMSNG) using a global network of telescopes with the aim to snatch the very early moments of SNe explosion. As one of the fruits of our project, we present the result on the type Ic SN, SN 2017ein which was discovered at 2017 May 25 in NGC 3938. We will present the physical properties of the type Ic SN progenitor star that are obtained from the analysis of early epoch data.

[구 GC-02] Distances of Type II-P Supernovae SN 2014cx and SN 2017eaw

Sophia Kim[1], Myungshin Im[1], ChangsuChoi[1] and IMSNG Team[1]
[1]*Center for the Exploration of the Origin of the Universe (CEOU), Astronomy Program, Dept. of Physics & Astronomy, Seoul National University., Korea.*

Supernovae (SNe) are well known as good cosmological distance probes owing to their brightness. Specifically, type Ia SNe contribute greatly to our understanding of acceleration of cosmic expansion. However, type IIP supernovae are the most common type of SNe and have been found out to a large redshift, so the application of these SNe as distance indicators is promising.

IMSNG is a project for monitoring nearby galaxies (<50Mpc) to catch early light curves of transients and get inspections of their progenitors. The daily monitoring observation allows us to construct a dense light curve of SNe, too.

In this talk, we present the light curves of two SNe IIP, SN 2014cx (NGC337) and SN 2017eaw (NGC6946), using our IMSNG data. A newly developed technique, the Photometric Color Method (PCM), employs only photometric data to estimate distances for SNe IIP. We present the distances to our targets measured through PCM and compare this to that of obtained via other methods.

[구 GC-03] A Search for Low Surface Brightness Dwarf Satellite Galaxies in Low Density Environments Using IMSNG

Gu Lim[1], Myungshin Im[1], Jisu Kim[2], and Changsu Choi[1], IMSNG team
[1]Center of the Exploration of the Origin of the Universe, Astronomy Program, Department of Physics & Astronomy, Seoul National University
[2]School of Space Research and Institute of Natural Sciences, Kyung Hee University

Searching for low surface brightness (LSB) dwarf galaxies in low density environments (isolated and group) can help us resolve the discrepancy between observation and theory known as the 'missing satellite' problem. They are also important to study the evolution of low mass galaxies in these environments. Although the number of dwarfs in such environments is rapidly increasing in many recent studies, it is still not easy to characterize their general properties. Motivated by this, we present preliminary results of our search for LSB dwarf galaxies around 60 nearby galaxies (D<50Mpc) using deep optical images. Imaging data from Maidanak Astronomical Observatory (MAO) in Uzbekistan as a part of Intensive Monitoring Survey of Nearby Galaxies (IMSNG; Im in prep.) and other archival data are used to find previously unknown LSB dwarf galaxies. Extended LSB sources (central surface brightness μ_0 > 23 mag/arcsec^2) are first selected in the μ_0 - magnitude plane (Rines & Geller 2008). The dwarf galaxy candidates are chosen by visual inspection. We discuss whether these candidates are actual satellite galaxies, by measuring the projected number densities in group environments and in the field. Also, their structural and photometric properties are compared with those of previously discovered dwarf galaxies in the literature.

[구 GC-04] Luminosity Distribution of Dwarf Elliptical-like Galaxies

Mira Seo, Hong Bae Ann
Pusan National University

We present the structural parameters of ~ 910 dwarf elliptical-like galaxies in the local universe ($z \lesssim 0.01$) derived from the r−band images of the Sloan Digital SKy Survey (SDSS). We examine the dependence of structural parameters on the morphological types (dS0, dE, dEbc, dSph, and dEblue) and the environment. There is not much difference in the structural parameters among the five subtypes but the mean surface brightness within the effective radius (<μe>) of dSph galaxies is clearly different from that of other subtypes. The frequency of disk features such as spiral arm, bar, lens, and rings strongly depends on the morphology of dwarf elliptical-like galaxies with no disk features in dSph galaxies. The absence of disk features and the low surface brightness of dSph galaxies are thought to be closely related to their low mass which leads to different evolution from other subtypes of dwarf elliptical-like galaxies. Density Environments Using IMSNG

[구 GC-05] WITNESSING DISSOLUTION OF A STAR CLUSTER IN THE SEXTANS DWARF GALAXY

Hak-Sub Kim[1], Sang-Il Han[1], Seok-Joo Joo[1], Suk-Jin Yoon[2]
[1]Korea Astronomy and Space Sience Institute,
[2]Department of Astronomy & Center for Galaxy Evolution Research

We report a possible discovery of a relic of a dissolved star cluster in the Sextans dwarf spheroidal galaxy. Using the hk index (≡ (Ca-b)-(b-y)) as a photometric metallicity indicator, we have successfully discriminated the metal-poor and metal-rich stars in the galaxy and found an unexpected number density peak of metal-poor stars near the galaxy center. The analysis of color-magnitude diagrams reveals that they appear to be originated from an old, metal-poor globular cluster which might be slightly farther than the bulk of field stars in the galaxy. This supports the presence of the star cluster remnants in the galaxy which have been suggested by previous studies. If confirmed, dissolution of a star cluster provides a piece of evidence of a cored dark-matter halo profile for the Sextans dwarf galaxy.

[구 GC-06] Spectral Analysis of the Seyfert Galaxy NGC 4051 and Mrk 79

So-Yeong Park[1], Siek Hyung[1] and Donghoon Son[2]
[1]Chungbuk National University, [2]Astronomy program, Department of Physics and Astronomy, Seoul National University

We study the kinematical properties of the Seyfert galaxy, NGC 4051 and Mrk 79. The data