

limited to  $\dot{M} \lesssim 10^{17}$  kg/s  $\approx 0.5 M_{Earth} / \text{yr}$  less than about 20% of the mass of G2. Accordingly, G2 appears to be largely stable against loss of angular momentum and subsequent (partial) accretion at least on time scales  $\lesssim 1$  year. [Park et al. 2015 under review by A&A]

### [☒ GC-07] A Test of Correspondence Model with the HorizonRun 4 Simulation

Jisook Park<sup>1,2</sup>, Juhan Kim<sup>3</sup>, Changbom Park<sup>2</sup>, and Sungsoo S. Kim<sup>1,4</sup>

<sup>1</sup>*School of Space Research, Kyung Hee University*

<sup>2</sup>*School of Physics, Korea Institute for Advanced Study*

<sup>3</sup>*Center for Advanced Computation, Korea Institute for Advanced Study*

<sup>4</sup>*Department of Astronomy and Space Science, Kyung Hee University*

'The one to one correspondence model' defines the relation between a dark matter halo (DM halo) and a galaxy. A basic assumption of this model is that a more massive DM subhalo hosts a brighter galaxy. In a more improved version of the model we may be able to assign a mock galaxy with a morphological type. In this study, we are building a mock galaxy catalog using massive halo merging trees from the Horizon Run 4. We test various merging models to calculate the merging time scale of a subhalo along its merging tree. And we obtain the halo mass functions for major subhalos and satellite subhalos, separately, and compare them with the observed luminosity functions of major galaxies and satellite galaxies from the SDSS group catalog. Furthermore, we are going to make a range of mock galaxy catalogs and investigate their properties, such as spatial distributions, environmental effects, and morphologies.

### [☒ GC-08] Optical 3D Spectroscopic Survey on Gas Outflows in Type 2 AGNs

Hyun-Jin Bae<sup>1</sup>, Jong-Hak Woo<sup>2</sup>, Marios Karouzos<sup>2</sup>, Elena Gallo<sup>3</sup>, Yue Shen<sup>4</sup>, Helene Flohic<sup>5</sup>

<sup>1</sup>*Department of Astronomy, Yonsei University,*

<sup>2</sup>*Department of Physics and Astronomy, Seoul National University,*

<sup>3</sup>*Department of Astronomy, University of Michigan, USA,*

<sup>4</sup>*Carnegie Institution for Science, USA,*

<sup>5</sup>*University of the Pacific, USA*

Strong outflows from active galactic nuclei (AGNs) may play a crucial role in galaxy evolution.

Integral-field spectroscopy (IFS) is the most powerful tool to study the detailed kinematics of AGN outflows. We present the on-going optical 3D spectroscopic survey of ionized gas outflows. Type 2 AGN sample is uniquely selected from SDSS DR7 with a luminosity-limit (i.e.,  $L[\text{O III}] > 10^{41.5}$  erg/s) as well as strong kinematic signatures of ionized gas outflows ( $[\text{O III}]$  velocity shift  $> \sim 200$  km/s or  $[\text{O III}]$  velocity dispersion (FWHM)  $> 1000$  km/s), defining an extremely rare population ( $< \sim 0.5\%$ ). Thus, these AGNs with strong outflow signatures are one of the best suites for investigating AGN feedback. The IFS observations cover several kpc scales for the central region of the host galaxies, providing a detailed information of the kinematics and geometry of the gas outflows. In this contribution, we report the current status of the survey and the preliminary results on gas kinematics of 18 AGNs, based on the Magellan/IMACS-IFU and the VLT/VIMOS data.

### [☒ GC-09] Surface photometry and Structural properties of nearby dwarf galaxies.

Mira Seo, Hong Bae Ann  
*Pusan National University*

We present 2D-photometric decompositions of  $\sim 1,200$  nearby dwarf galaxies. Our representative sample is derived from 'A catalog of Visually classified galaxies in the Local Universe'(Ann, Seo and Ha APJS,,2015) of which galaxy morphological types are determined by visual inspection of color images using the Sloan Digital Sky Survey data release 7. In this catalog, dwarf galaxies were divided into 5 subtypes : dS0, dE, dSph, dEbc, dEblue with distinction of the presence of nucleation in dE, dSph, and dS0. The dSph types are less brighter than other types, and galaxies with nuclei are slightly brighter than those with no nuclei in the same types. Sersic index  $n$  have a range 1~1.5, and  $dE_{\text{un}}$  and  $dSph_{\text{un}}$  galaxies have  $n$  less than 1, and  $dSph_{\text{n}}$  galaxies have largest values. We performed two-dimensional decomposition of galaxies using GALFIT, and analyzed their structural components, and residual features which are seen in the residual image.

### [☒ GC-10] The narrow emission-line properties of radio-loud AGNs in the SDSS archive

Donghoon Son and Jong-Hak Woo  
*Astronomy Program, Department of Physics and*

*Astronomy, Seoul National University*

We investigate the narrow emission-line ratios of 64 radio-loud ( $\log L_{1.4\text{GHz}} > 40$ ) AGNs available in the SDSS archive, in order to examine whether there is a systematic difference in the accretion disk condition of radio-loud AGNs compared to radio-quiet AGNs and compact young radio-loud AGNs. The fluxes of narrow-emission lines, [O II], [Ne III], [O III], [O I], [Ar III], are measured for diagnostics. Based on the [O I]/[O III] and [Ar III]/[O III] ratios with photoionization models, we constrain the states of the accretion disk. We will present the results of the emission-line diagnostics.

**[ㄹ GC-11] X-ray AGNs in Abell 133**

Jaejin Shin<sup>1</sup>, Jong-Hak Woo<sup>1</sup>, Elena Gallo<sup>2</sup>, Richard M. Plotkin<sup>2</sup>, John S. Mulchaey<sup>3</sup>

<sup>1</sup>*Seoul National University, Seoul, Republic of Korea*

<sup>2</sup>*University of Michigan, MI, United States*

<sup>3</sup>*Carnegie Observatories, Pasadena, CA, United States*

Environments (field, galaxy groups, and galaxy clusters) can affect galaxy evolution due to galaxy interaction which is controlled by different galaxy number densities and velocity dispersions. Since the galaxy interaction or merger triggers both star formation and AGN, AGN fraction can be used to understand the effect of environment. We detected X-ray AGN fraction in a nearby galaxy cluster, Abell 133, using Chandra X-ray image and optical spectra. We found ~600 X-ray point sources in the field of Abell 133 using the 2.8 Msec exposure Chandra images. We determined 3 cluster members based on the redshifts derived from optical spectra obtained from Magellan IMACS observation. The AGN fraction in Abell 133 is similar to that of other environments, i.e., COSMOS and CDFS. We will discuss the results by comparing Abell 133 with other environments.

**[ㄹ GC-12] Extremely Red Objects in Subaru GTO2deg<sup>2</sup> Field**

Jihey Shin<sup>1,2</sup> and Hyunjin Shim<sup>3</sup>

<sup>1</sup>*Department of Astronomy and Atmospheric Sciences, Kyungpook National University*

<sup>2</sup>*Research and Training Team for Future Creative Astrophysicists and Cosmologists (BK21 Plus Program)*

<sup>3</sup>*Department of Earth Science Education, Kyungpook National University*

Extremely Red Objects (EROs) are characterized by their red optical-infrared colors (e.g.,  $R-K_s > 5.0$ ), which would be caused by either dusty star formation or old stellar population at moderate to high redshifts. We combine deep optical (Subaru R) and near-infrared (CFHT Ks) observations obtained as part of the Subaru GTO2deg<sup>2</sup> survey to select EROs over this field and to explore their properties. We present number densities of EROs as a function of magnitudes. We are planning to quantify the environments for EROs and to see if EROs reside in overdense regions.

**[ㄹ GC-13] Identification of MgII Absorbers in the Quasar Lines of Sight**

Hyunjin Shim

*Department of Earth Science Education, Kyungpook National University*

Large area infrared surveys are often accompanied with follow-up optical spectroscopic surveys that has a significant legacy value even for other areas of research. Using these spectral database, we have performed a search for MgII absorption lines in the optical spectrum of background quasar. Over the ~4deg<sup>2</sup> of AKARI North Ecliptic Pole survey field and Spitzer First Look Survey field, 18 and 16 MgII absorber systems are identified respectively. The redshift range for the background quasars was  $1.0 < z_{\text{qso}} < 3.4$ , while the redshift range for the absorber was  $0.6 < z_{\text{abs}} < 1.6$ . Galaxies responsible for MgII absorptions are identified in the deep optical images (CFHT r-band), yet the identification still remains ambiguous for 60% of the systems due to the limited image depth and the source crowdedness. The impact parameter ranges 20–60kpc, and the rest-frame equivalent width of MgII absorption ranges 0.7–4 Å. The most critical part in the identification of MgII absorber galaxies is the existence of deep optical images in addition to the high S/N quasar spectrum with  $R > 3000$ .

**[ㄹ GC-14] East Asia VLBI Network: Current Observation Status and Future Prospects**

Kiyooki Wajima<sup>1</sup>, Duk-Gyoo Roh<sup>1</sup>, Se-Jin Oh<sup>1</sup>, Taehyun Jung<sup>1</sup>, Yoshiaki Hagiwara<sup>2</sup>, Hideyuki Kobayashi<sup>2</sup>, Kenta Fujisawa<sup>3</sup>, Tao An<sup>4</sup>, Wu Jiang<sup>4</sup>, Bo Xia<sup>4</sup>, Noriyuki Kawaguchi<sup>4</sup>, Willem A. Baan<sup>4</sup>, Ming Zhang<sup>5</sup>, Longfei Hao<sup>6</sup>, Min Wang<sup>6</sup>

<sup>1</sup>*Korea Astronomy and Space Science Institute,*

<sup>2</sup>*National Astronomical Observatory of Japan,*

<sup>3</sup>*Yamaguchi University,*