has been formed to outline the framework of the EAO-Subaru partnership, and the working group report has been prepared. In this talk, I will explain the proposed partnership framework in the working group report. Inputs are very welcome from KAS members about the proposed framework.

[구 AT-03] Populations Accessible to Gravitational Wave and Multi-Messenger Astronomy Within 10 Years

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Gravitational-wave (GW) sources for the next decades would be in majority binaries consisting of neutron stars and/or black holes reside in the extragalactic environment. For example, GW170817 was the first extragalactic neutron star - neutron star binary found by GW observations and it was proved the power of multi-messenger astronomy (MMA) including the KMTNet observations. With the ever increased sensitivity, the 3rd observation run (O3) led by the advanced LIGO and advanced Virgo this year aims to search for more 'standard' populations as well as 'exotic' ones expected by stellar evolution. I will present highlights of on-going efforts by researchers in Korea and those in abroad for estimating physical parameters of a source. Mass, spin, distance, and location are prerequisite information to constrain theoretical understanding of the source formation and evolution. Furthermore, these information are to be shared with the international community for follow-up multi-messenger observations. I will present the observational accuracy expected for the future GW observations and discuss their implications. If time allows, I will make a few remarks on prospects of O3 with KAGRA collaborations, which many domestic researchers are closely involved in.

[구 AT-04] Observing strategy for electromagnetic counterpart of gravitational wave source

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Recent observation of the neutron star merger event, GW170817, through both gravitational wave (GW) and electromagnetic wave (EM) observations opened a new way of exploring the universe, namely, multi-messenger astronomy (MMA). One of the keys to the success of MMA is a rapid identification of EM counterpart through optical/NIR observations.

We will present the strategy for prioritization of GW source host galaxy candidates to be observed with narrow-field optical telescopes. Our method relies on recent simulation results regarding plausible properties of GW source host galaxies and the low latency localization map from LIGO/Virgo. We will show the test results for both NS merger and BH merger events using previous events and possible future events and describe observing strategy with our facilities for GW events during the ongoing LIGO/Virgo O3 run.

[구 AT-05] Sirius: The KASI-SNU Optical Intensity Interferometer

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Optical intensity interferometry, developed in the 1950s, is a simple and inexpensive method for achieving angular resolutions on microarcsecond scales. Its low sensitivity has limited intensity interferometric observations to bright stars so far. Substantial improvements are possible by using avalanche photodiodes (APDs) as light detectors. We present here the results of laboratory measurements with a prototype astronomical intensity interferometer using APDs in continuous ("linear") detection mode - arguably, the first of its kind. We used two interferometer configurations, one with zero baseline and one with variable baseline. Using a superluminous diode as light source, we unambiguously detected Hanbury Brown-Twiss photon-photon correlations at very high significance. From measuring the correlation as function of baseline, we measured the angular diameter of the light source, in analogy to the measurement of the angular diameter of a star. Our results demonstrate the possibility to construct large astronomical intensity interferometers that can address a multitude of astrophysical science cases.

[구 AT-06] PSF Deconvolution on the Integral Field Unit Spectroscopy Data

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We present the application of the Point Spread Function (PSF) deconvolution method to the astronomical Integral Field Unit (IFU) Spectroscopy data focus on the restoration of the galaxy kinematics. We apply the Lucy-Richardson deconvolution algorithm to the 2D image at each wavelength slice. We make a set of mock IFU data which resemble the IFU observation to the model galaxies with a diverse combination of surface brightness profile, S/N, line-of-sight geometry and Line-Of-Sight Velocity Distribution (LOSVD). Using the mock IFU data, we demonstrate that the algorithm can effectively recover the stellar kinematics of the galaxy. We also show that lambda_R_e, the proxy of the spin parameter can be correctly measured from the deconvolved IFU data. Implementation of the algorithm to the actual SDSS-IV MaNGA IFU survey data exhibits the noticeable difference on the 2D LOSVD, geometry, lambda_R_e. The algorithm can be applied to any other regular-grid IFS data to extract the PSF-deconvolved spatial information.

특별세션 EHT

[구 EHT-01] Event Horizon Telescope : Earth-sized mm-VLBI array to image supermassive black holes

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Immediate vicinity of a supermassive black hole (SMBH) is an important place to test general relativity in strong gravity regime. Also, this is a place where mass accretion and jet formation actively occurs at the centers of active galaxies. Theoretical studies predict presence of bright ring-like emission encircling an accreting SMBH with a diameter of about 5 Schwarzschild radii, and a flux depression at the center (i.e., BH shadow). Direct imaging of the BH shadow is accordingly of great importance in modern astrophysics. However, the angular sizes of the horizon-scale structures are desperately small (e.g., ~40-50 microarcseconds (uas) diameter for the nearest best candidates). This poses serious challenges to observe them directly.

Event Horizon Telescope (EHT) is a global network of sensitive radio telescopes operating at 230 GHz (1.3 mm), providing ultra-high angular resolution of 20 uas by cutting-edge very long baseline interferometry techniques. With this resolution, EHT aims to directly image the nearest SMBHs; M87 and the galactic center Sgr A* (~40-50 uas diameters). In Spring 2017, the EHT collaboration conducted a global campaign of EHT and multiwavelength observations of M87 and Sgr A*, with addition of the phased ALMA to the 1.3mm VLBI array. In this talk, I review results from past mm-VLBI and EHT observations, provide updates on the results from the 2017 campaign, and future perspectives.

[구 EHT-02] EHT data processing and BH shadow imaging techniques

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Event Horizon Telescope (EHT) aims to resolve the innermost region to the super massive black hole (SMBH) with its extremely high angular resolution (~20-25 uas) and enhanced sensitivity (down to 1-10 mJy) in concert with the Atacama Large Millimeter/submillimeter Array (ALMA) at 1.3 mm wavelength. This has a great importance as the first observational probe of the black hole shadow which has been theoretically predicted as a ring-like emission affected by the general relativistic effect under a strong gravitational field of SMBH.

During the 2017 April 5-11, four nights of EHT observing campaign were carried out towards its primary targets, M87 and SgrA*. To robustly ensure the data processing, independent pipelines for various radio data calibration softwares (e.g., AIPS, HOPS, CASA) have been developed and cross-compared each other. The EHT has also been developing newer interferometric imaging techniques (e.g., eht-imaging-library, SMILI, dynamical imaging), as well as using an established method (CLEAN). With these, the EHT has designed various strategies which will be adopted for convincing imaging results.

In this talk, I review how the robustness of EHT data processing and imaging will be validated so that the results can be ensured against well known uncertainties or biases in the interferometric data calibration and imaging.

[구 EHT-03] Korean activities for mm-VLBI and EHT collaboration

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