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The Time Domain Field is one of the future GTO program fields of JWST(JWST/GTO TDS), surveying about 14' diameter field at the North Eliptical Pole(NEP) with NIRCam/NIRISS. As a part of the multi-wavelength study of the field, we have obtained SCUBA-2 850μm mapping which reaches a depth of σ_{rms} = 0.9mJy/beam and detect 93 sources at S/N > 3.5 — which are expected to be highly star-forming (SFR>400M$_{\odot}$/yr) galaxies at $z \gtrsim 1.5$-4 and pinpoint the location at <0."1 accuracy of 68 sub-mm sources by identifying VLA 3GHz radio counterparts. In this talk, we will introduce the SCUBA-2 JWST/GTO TDS project and the newly discovered sub-mm sources in this field.

[구 GC-20] Intensive Monitoring Survey of Nearby Galaxies (IMSNG) : Constraints on the Progenitor System of a Type Ia Supernova SN 2019ein from Its Early Light Curve

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The progenitor of Type Ia supernovae (SNe Ia) is mainly believed to be a carbon/oxygen white dwarf (WD) with non-degenerate (single degenerate) or another WD companion (double degenerate). However, there is little observational evidence of their progenitor system. Recent studies suggest that shock-breakout cooling emission after the explosion can constrain the size of the progenitor system. To do so, we obtained a optical/Near-IR light curve of SN 2019ein, a normal but slightly sub-luminous type Ia supernova, from the very early phase using our high-cadence observation of Intensive Monitoring Survey of Nearby Galaxies (IMSNG). Assuming the expanding fireball model, the simple power-law fitting of the early part of the light curve gives power indices of 1.91 (B) and 2.09 (R) implying radioactive decay of ^{56}Ni is the dominant energy source. By comparison with the expected light curve of the cooling emission, the early observation provides us an upper limit of the companion size of $R_* \leq 1R_{\odot}$. This result suggests that we can exclude a large companion such as red giants, which is consistent with the previous study.

[구 GC-21] Intensive Monitoring Survey of Nearby Galaxies (IMSNG) : On the progenitor system of Type Ia SN 2018kp

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Intensive Monitoring Survey of Nearby Galaxies (IMSNG) has been managed over 6 years. It aimed to constrain the progenitor system and explosion mechanism of SNe by detection of very early signal from shock heated emission. We have conducted monitoring observation of nearby bright galaxies those were carefully selected using global network of 1-m class telescopes. More than 20 SNe have occured in our target fields. As One of result of the survey, we present light curve analysis of type Ia SN 2018kp, which was discovered in NGC 3367.

Based on photometric analysis, we calculated explosion parameters and set constraints of physical conditions of this supernova. We compared the results with theoretical model progenitor systems to find out which scenario is the most fitted to SN 2018kp case. Moreover, we estimate the distance to the galaxy and look into the relation between SNe and galactic physical parameters.

[구 GC-22] Gravitational-wave Electromagnetic Counterpart Korean Observatory (GECKO): Network of Telescopes and Follow-up Observation of GW190425

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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.

We will introduce GW follow-up observation project in Korea for hunting GW EM counterpart rapidly and its strategy for prioritization of GW source host galaxy candidates. 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 a test result for both binary neutron star merger events using previous event and describe observing strategy with our facilities for GW events during the ongoing LIGO/Virgo O3 run. Finally, we report the results of optical/NIR follow-up observation of GW190425, the first neutron

[구 GC-23] Gamma-Ray and Neutrino Emissions from Starburst Galaxies

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Cosmic-ray protons (CRp) are efficiently produced at starburst galaxies (SBGs), where the star formation rate (SFR) rate is high. In this talk, we present estimates of gamma-ray and neutrino emissions from nearby SBGs, M82, NGC253, and Arp220. Inside the starburst nucleus (SBN), CRp are accelerated at supernova remnant (SNR) shocks as well as at stellar wind (SW) termination shocks, and their transport is governed by the advection due to starburst-driven wind and diffusion mediated by turbulence. We here model the momentum distributions of SNR and SW-produced CRp with single or a double power-law forms. We also employ two different diffusion models, where CRp are resonantly scattered off large-scale turbulence in SBN or self-excited waves driven by CR streaming instability. We then calculate gamma-ray/neutrino fluxes. The observed gamma-ray fluxes by Fermi-LAT, Veritas, and H.E.S.S are well reproduced with double power-law distribution for SNR-produced CRp and the CRp diffusion by self-excited turbulence. The estimated neutrino fluxes are <~10-3 of the atmospheric neutrino flux in the energy range of Eneutrino <~100 GeV and <~10-1 of the IceCube point source sensitivity in the energy range of Eneutrino >~60 TeV.

[구 GC-24] Morphology and Dynamical Properties of Ultra-Relativistic Jets

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We study the structures and dynamics of flows generated by ultra-relativistic jets on kpc scales through three-dimensional relativistic hydrodynamics (RHD) simulations. We employ a newly developed RHD code, equipped with the WENO-Z reconstruction, the SSPRK time discretization, and an equation of state that closely approximates the single-component perfect gas in relativistic regime. Exploring a set of models with various parameters, we confirm that the well-known Fanaroff-Riley dichotomy is primarily determined by the jet power, whereas the morphology of simulated jets also depends on the secondary parameters such as the momentum injection rate and the ratio of the jet to background pressure. Utilizing high resolution capabilities of the newly developed code, we examine in detail the dynamical properties of complex flows in different parts of jet-produced structures, and present the statistics of nonlinear dynamics such as shock, shear, and turbulence.

[구 GC-25] On the origin of the thick discs of spiral galaxies from high-resolution cosmological simulations

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Ever since thick disk was proposed to explain the vertical distribution of the Milky Way disk stars, its origin has been a recurrent question. We aim to answer this question by inspecting 19 disk galaxies with stellar mass greater than 10^10 solar mass in recent cosmological high-resolution (>34 pc) zoom-in simulations: Galactica and New Horizon. The thin and thick disks are reproduced by the simulations with scale heights and luminosity ratios that are in reasonable agreement with observations. When we spatially classify the disk stars into thin and thick disks by their heights from the galactic plane, the ``thick'' disk stars are older, less metal-rich, kinematically hotter, and higher in accreted star fraction than the ``thin'' disk counterparts. However, we found that the the thick disk stars were spatially and kinematically