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The key science goal of the KMTNet Supernova Program (KSP) is to detect and study the early explosions of supernovae using one fifth of the KMTNet time. The *BVI*-band observations of the nearby target fields mostly closer than 30 Mpc distance and the follow-up spectroscopy provide valuable information on the early phase of the supernovae. These data can also be used for the studies of optical transients such as novae, dwarf novae, variable stars, and active galactic nuclei. Stacked images of several hundred images obtained from the time domain observations can be used for the search of low surface brightness galaxies reaching 28 mag arcsec^{-2}. Results and status of the KSP including ≳20 infant supernovae and ≳100 faint dwarf galaxies will be presented in this talk.

[구 KMT-04] Thirty-Minute ToO (TMT) with KMTNet

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Current large observational projects perform both static and dynamic sky surveys. The Thirty-Minute Target of Opportunity (TMT) is the project focusing on the dynamic sky survey using Korea Microlensing Telescope Network (KMTNet) that is the best observing system to investigate the dynamic sky. TMT aims to perform and experiment on following components : 1) to select transient or variable sources having hour to day scale cadences for future science cases, 2) to optimize the observation strategy for these objects, 3) to provide automated photometric pipelines for the time series data, and 4) to test the data release environment for all astronomers. In the near future, it is expected that a huge number of events will be alerted through large area surveys such as LSST. Therefore, the TMT project will provide opportunities to prepare the future large survey era as well as to understand the nature of interesting astronomical events.

[구 KMT-05] Properties of High-Redshift Dust-Obscured Galaxies Revealed in the ADF-S

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The ADF-S (AKARI Deep Field – South) toward South Ecliptic Pole is one of the deep survey fields designed for the study of Extragalactic Background Light (EBL). The deep extragalactic survey was initiated by AKARI far-infrared deep observations. Other space missions (e.g., Euclid, NISS, SPHEREx) will perform the deep observations in the ADF-S. Based upon the recent optical survey with KMTNet, we can identify the optical counterparts for dusty star-forming galaxies such as ULIRG, DOG, SMG. Among them, the Dust-Obscured Galaxies (hereafter DOGs with f(24um)/f(R) > 1,000) in the heavily obscured system are expected to play an important role in the formation of most massive galaxies. We have newly discovered ~100 DOGs in ~12 sq. deg. of the ADF-S from our optical survey with KMTNet. We also confirmed that some of DOGs host the most luminous AGN for their black hole masses through the near-infrared spectroscopic follow-ups. Here, we report the properties of high-z hyperluminous DOGs in the ADF-S.

[구 KMT-06] Searching for Electromagnetic Counterpart of Gravitational Wave Source with KMTNet

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After first identification of electromagnetic counterpart of gravitational wave source (GW170817), era of multi-messenger astronomy has begun. For specifying coordinate, magnitude, and host galaxy information, optical follow-up observation of GW source becomes important. With following engineering run and O3 run of LIGO and VIRGO starting in March 2019, we present searching strategy for optical counterpart of GW source using KMTNet. 24 hours monitoring system and large field of view (4 square-degree) of KMTNet are advantage to discover a transient like GW event. By performing tiling observation of high