

Abstracts of Presentations

Days 1. July 22nd (Mon), 2019: 10:00 – 15:00

Title : 40m TNRT and RANGD project

Speaker : Dr. Phrudth Jaroenjittichai (NARIT)

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Under construction, the 40m Thai National Radio telescope (TNRT) provides great opportunities in science and technology to Thailand. Tremendous progress has been achieved through close collaborations with the very welcoming radio astronomy community. The modest 40m size and the extensive 0.3-115 GHz frequency capability will not only allow science focus on variable sources but also great contributions to VLBI community. During RANGD phase I (2017-2021), TNRT will be equipped with L-band (1.0-1.8 GHz) and K-band (18-26 GHz) receivers and a versatile Universal Software Backend. A C-band and other receivers have been planned. The commissioning stage is expected in mid 2020. In addition, a 13m Geodetic VLBI antenna is also being developed and will be co-located with TNRT.

Title : Collaboration with East Asian VLBI network and future

Speaker : Prof. Hideyuki Kobayashi (NAOJ)

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East Asian VLBI network, EAVN, has started the open use observation since last year, which is third international VLBI network following European VLBI network, EVN, and Very Long Baseline Array, VLBA. EAVN is organized as a collaboration of Japanese VERA and JVN, Korean KVN, and Chinese CVN. It has better sensitivity at 22 GHz and higher frequency with phase referencing functions. As an extension of EAVN, TNRT is very important because it is most southern station. And it is very important to combine EAVN and LBA, which is the Australian VLBI network. I will introduce EAVN activities and possible combination with TNRT. And I will show the recent discussion about Global Array, which will include all VLBI station in the world.

Title : Pulsar Science with TNRT

Speaker : Dr. Phrudth Jaroenjittichai (NARIT)

Discovered over 50 years ago, pulsars are known to exhibit several fascinating properties and yet to be fully understood. Time domain astronomy has been defined as a subject dealing with variable and transient sources, where the on-source time--rather than sensitivity--plays a major role. Young pulsars, e.g. Crab and Vela, are known to be more active and their characteristics evolve more rapidly. A number of normal pulsars also show various profile phenomena, e.g. drifting subpulse, nulling, mode-switching, profile evolution and intermittent, which may or may not evolved with time. So far, very limited number of bright pulsars can be afforded for intensive monitoring. The 40m TNRT and its state-of-the-art receiver systems will be a perfect instrument for this un-explored pulsar parameter space. It will be able to probe the pulsar's time-domain phenomena of $\sim 1,400$ and ~ 900 at 5 and 1 day cadences, respectively. Similarly, considering time-domain events, online blind search can be effortlessly implemented. Conventional topics, such as pulsar timing and specific study groups and interstellar medium, are also included.

Title : Coherent Radio Transients: FRB and MRO

Speaker : Dr. Takuya Akahori (NAOJ)

Fast radio burst (FRB) is a new radio transient of millisecond duration. The origin of FRB is not known at all, although it is likely extragalactic because the dispersion measure is much larger than the Milky Way value. The fact that some sources repeat to emit FRBs motivate us to consider a neutron star origin. Indeed, some similarities to magnetar radio outburst (MRO) has been reported. One repeating FRB indicates the extremely-large rotation measure, suggesting that its environment is similar to the Galactic center. In this talk, I will introduce some results of recent FRB observations and summarize what these observations tell us about. I will also introduce MRO and report our recent observations using Japanese radio telescopes (single dish and VLBI). Based on the progresses, I will discuss possible use cases of TNRT-40m for the studies of FRB and MRO.

Title : Niches in Galaxy Evolution for the TNRO

Speaker : Dr. Wiphu Rujopakarn (Chulalongkorn Univ./NARIT)

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What is the use case that maximizes the impact of a 40-m single-dish on galaxy evolution studies? This talk is aimed to stimulate the conversation on identifying scientific niches in galaxy evolution that the TNRO, in combination with NARIT's current and future optical facilities around the globe, could aim to explore in the upcoming decade.

Title : Expanding AGN studies with EAVN and TNRT

Speaker : Dr. Kazuhiro Hada (NAOJ)

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I will overview recent studies of active galactic nuclei (AGN) and associated high-energy phenomena (eg, relativistic jets) addressed by the East Asian VLBI Network. I will also discuss how TNRT can play a role in studying these phenomena.

Days 2. July 23rd (Tue), 2019: 10:00 – 16:00

Title : Research for Flux Variability with 40m TNRT

Speaker : Dr. Koichiro Sugiyama (NAOJ/NARIT)

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We have formulated science cases potentially achievable with 40m TNRT, and here I would like to share a research of the evolution of high-mass protostars via observing flux variability of OH, CH₃OH, and H₂O masers, as one of the cases. Especially, this research focuses on a study of characteristic flux variability: periodic and accretion bursting. These variability enables us to indirectly reach close to the stellar surface and its physics. This science case is achievable as a single-dish mode with receivers in L-, C-, and K-bands, and thus will be suitable to be initiated from the beginning of the commissioning phase at TNRT.

Title : Spectral line surveys and polarization studies using 40m TNRT

Speaker : Dr. Kitiyanee Asanok (NARIT)

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The possible projects for spectral line observations using 40m TNRT are reported and summarised. Those mainly focus on OH, H₂O and SiO masers toward the SFRs and evolved stars in the Northern and Southern hemispheres. Unbiased target sources will be selected from many big survey projects and uncovered areas. In addition, the polarisation studies are also discussed in this talk.

Title : Unbiased Ammonia Survey of Galactic Plane with TNRT

Speaker : Dr. Ram Kesh Yadav (NARIT)

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Ammonia is one of best tracers of high density interstellar gas which is associated with early stage of star forming sites. An unbiased Ammonia survey of the northern galactic plane is proposed using 40m Thai National Radio Telescope (TNRT). In this talk, I will discuss the possible science cases achivable with TNRT.

Title : Spectral line observations with TNRT

Speaker : Dr. Tomoya Hirota (NAOJ)

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I will discuss possible science cases for spectral line observations with the TNRT 40 m telescope. For the VLBI observations with EAVN including TNRT, I will propose maser mapping and monitoring of star-forming regions as a future plan of KaVA/EAVN large program. In addition, I will review single-dish observations of star-forming region such as large scale survey of molecular clouds and unbiased spectral line survey toward star-forming regions.

Title : Magnetic chemically peculiar stars in radio waves

Speaker : Dr. Eugene Semenko (NARIT)

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