neutrinos in ten seconds from a supernova explosion in our Galaxy. The pointing accuracy will be better than 1 degree and be able to guide early optical telescope observations. The expected rate of supernova explosion in our galaxy is once per every 30 years in the most optimistic case or once per every 100 years in the worst case. If it is indeed observed, it will be a historical chance to study the supernova explosion mechanism in great details. In this talk, various astronomy potentials will be discussed if the Korean neutrino observatory is built.

[구 NK-03] Supernova Rates of the Milky Way and the Local Group

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A major goal of the proposed Korean Neutrino Detector and Telescope is to detect neutrino burst from core-collapse supernova (SN) explosions in the Milky Way, which will provide an unprecedented opportunity to look into the core of an exploding massive star. Detection with high statistics would give important information for the explosion physics. It can also detect neutrino signals from SN events in the Local Group and trigger alert of the event for the astronomical community. In this talk, I will review the SN rates of the Milky Way and the Local Group, and will discuss the implications for the proposed neutrino telescope.

[구 NK-04] Supernovae Follow-up Observations and the Korean Neutrino Telescope

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Massive stars ($\geq$8 $M_{\odot}$) are believed to experience core-collapse and finish their lives as supernova (SN) explosions. Astronomers operating the current SN survey facilities try to catch the first moments of SN explosions. Since neutrinos are emitted first from the SNe before the electromagnetic lights, any neutrino detections from more than two sites within around 10 seconds could be useful alert for early follow-up observations, especially for optical SN follow-up telescopes. In this talk, I will brief the current SN follow-up observation projects, what they want to find out and contribute to SN sciences. Focus will be on the early detection and early sciences on SNe, which is what the Korean Neutrino Telescope can contribute most importantly.

고에너지 천체물리학

[구 HA-01] Ultra-high-energy cosmic rays and filaments of galaxies in the northern sky

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The Telescope Array (TA) experiment reported the arrival direction distribution of ultra-high-energy cosmic rays (UHECRs) with energies above 5.7×10^{19} eV in the northern sky. A clustering of TA events, the so-called hotspot, was found; however, its nature has not yet been understood. To understand the origin of the TA hotspot, we examine the sky distributions of the TA UHECR arrival direction and filamentary structures of galaxies in the local universe. By statistical tests for anisotropy, we find a close correlation of the TA events with the filaments of galaxies connected to the Virgo cluster. We discuss our finding and its implications.

[구 HA-02] Shock Acceleration Model for Giant Radio Relics

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Although most of observed properties of giant radio relics detected in the outskirts of galaxy clusters could be explained by relativistic electrons accelerated at merger-driven shocks, a few significant puzzles remain. In some relics the shock Mach number inferred from X-ray observations is smaller than that estimated from radio spectral index. Such a discrepancy could be understood, if either the shock Mach number is