sake of increased discovery rate, rapid follow-up, timely phase coverage, and efficient data analysis. We will give a brief introduction to test runs conducted at CTIO with the first KMTNet telescope in February and March 2015 and experimental data processing. Preliminary scientific results will also be presented.

[구 KMT-07] Deep Wide-Field Imaging of Nearby Galaxies with KMTNet telescopes

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We will obtain deep wide-field images of the 150-200 nearby bright galaxies in the southern hemisphere, in order to explore the origin of faint extended features in the outer regions of target galaxies. Using KMTNet telescopes, we will take very deep images, spending ~ 4.5 hr for the B and R filters for each object. With this dataset, we will look for diffuse, low-surface brightness structures including outer disks, truncated disks, tidal features/stellar streams, and faint companions.

[구 KMT-08] Test Observations for SULF (Southern ULtra-Faint dwarf galaxies) Survey using KMTNet

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We have proposed a deep observing program to survey more than 3,000 sq. degree of southern sky with the KMTNet telescopes to search for ultra-faint dwarf galaxies. Recently, the test observations for our survey were made in B, V, R, I-band. We will report the performance of the KMTNet camera system and our detailed strategy in both of observations and analysis for the three-year survey.

[구 KMT-09] KMTNet Test Observation of Nearby Southern Galaxy Groups

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We present a test observation result of the KMTNet Intensive Nearby Southern Galaxy group Survey (KINGS). The KINGS is designed to study nearby galaxy groups (NGC 55, NGC 253, NGC 5128, and M83 groups), taking the advantage of the wide field coverage of the KMTNet. The main goal of the KINGS is to produce extensive catalogs of dwarf galaxies, ultra compact dwarfs (UCDs), and intraglobular clusters in the galaxy groups. We will also investigate the spatial distribution of intragroup light in each group. We present a progress report of the project based on the test BVI observations of two galaxy groups. We discuss the result from the test observation and possible improvement for future observations.

특별 세션 — Centennial of the General Relativity

[구 GR-01] General Relativity and Light Bending/Gravitational Lensing (일반상대성이론과 빛의 꺾임/중력렌즈)

Myeong-Gu Park (박명구)
KNU (경북대학교)

Light bending by gravity was the key prediction of general relativity. Solar eclipse expedition of 1919 provided the observational support for the theory of general relativity. Diverse gravitational lensing, i.e., light bending, phenomena have been speculated and predicted by general relativity and ultimately discovered many years later. Gravitationally lensed quasars, luminous arcs, weak lensing, and microlensing have provided invaluable information about the distribution of matter, especially of dark matter, and the cosmology. Gravitational lensing is one of the most spectacular manifestation of general relativity and will remain as an extremely useful astrophysical tools in the future.

[구 GR-02] General Relativity and Modern Cosmology (일반상대성이론과 현대우주론)

Jai-chan Hwang (황재찬)
KNU (경북대학교)

We describe relations between modern cosmology and general relativity in the historical context. We reveal some ironies imbedded in Einstein's final correction of his gravitational field equation in the context of cosmology in 1917 which has apparently opened a new era of modern physical cosmology. The ugly (according to Einstein) correction term was introduced only to build a static cosmology which turns out to be in flat contradiction with observation. Somehow, however, it is the correction term which has saved the modern cosmology from the genuine creativity of nature continuously revealed by astronomical observations. Whether the present precision cosmology is also a correct one is often ignored by the practitioners but still a pressing open question left for future theoretical and observational pursuits.

[구 GR-03] Gravitational-wave detection - for the new age of astronomy
(중력파 검출 - 새로운 천문학의 시대를 위하여)

John J. Oh (오정근)
NIMS (국가수리과학연구소) & KGWG (한국중력파연구협력단)

Gravitational-wave has been predicted by Einstein's general relativity in 1916, but its direct detection has failed to date despite of the persistent efforts in the last fifty years in the ground-based gravitational wave detectors. In the centennial year of the birth of general relativity, 'advanced LIGO', one of the most promising Earth-based gravitational wave detectors, plans to start commissioning for the successful discovery of gravitational waves. In addition, a pathfinder satellite of eLISA project, a space-based GW antenna by European Space Agency (ESA), will be launched in the mid of this year. In this talk, we review the current status of gravitational waves detection experiments and discuss its scientific impacts and the possibility of opening the new age of astronomy.

성간물질 / 우리은하

[구 IM-01] MHD Turbulence in Expanding and Contracting Media

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We investigate the decaying incompressible MHD turbulence by including the effect of the expansion and contraction of background medium. In such an environment, incompressible MHD turbulence has two kinds of time scale. One is the eddy turn-over time (teddy), the other is the expansion/contraction time (texp-cntr). The turbulence is expected to behave differently according to the relationship between the two time scales. For instance, for teddy < texp-cntr, the turbulence would be decay more or less as in a static medium. On the other hand, for teddy > texp-cntr, the effects of expansion and contraction would be dominant. We examine the properties of turbulence in these two regime cases. Based on it, we derive a scaling for the time evolution of flow velocity and magnetic field. (i) In the decay effect dominant case, the velocity and magnetic field scale as $\sqrt{\rho}\,\mathrm{v} \sim \mathrm{a}^{-3}$, $\mathrm{b} \sim \mathrm{a}^{-2.5}$ (expanding media) and $\sqrt{\rho}\,\mathrm{v} \sim \mathrm{a}^{-2}$, $\mathrm{b} \sim \mathrm{a}^{-1.5}$ (contracting media). The total energy and residual spectra follow the $E_k^{\mathrm{T}} \sim k^{-5/3}$, $E_k^{\mathrm{R}} \sim k^{-7/3}$ in the inertial range. (ii) In the expanding and contracting dominant case, the velocity and magnetic field scale as $\sqrt{\rho}\,\mathrm{v} \sim \mathrm{a}^{-2.5}$, $\mathrm{b} \sim \mathrm{a}^{-2}$ (expanding/contracting media). The Kinetic and magnetic energy spectra follow the $E_k^{\mathrm{K}} \sim a^{-5}$, $E_k^{\mathrm{M}} \sim a^{-4}$. We have confirmed that scaling of velocity and magnetic filed is almost the same from the analytic estimates and computational models.

[구 IM-02] Expansion of Dusty H II Regions and Its Impact on Disruption of Molecular Clouds

Jeong-Gyu Kim[1], Woong-Tae Kim[1], Eve Ostriker[2]
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Dynamical expansion of H II regions plays a key role in dispersing surrounding gas and therefore in limiting the efficiency of star formation in molecular clouds. We use analytic methods and numerical simulations to explore expansions of spherical dusty H II regions, taking into account the effects of direct radiation pressure, gas pressure, and total gravity of the gas and stars. Simulations show that the structure of the ionized zone closely follows Draine (2011)'s static equilibrium model in which radiation pressure acting on gas and dust grains balances the gas pressure gradient. Strong radiation pressure