density or opening angle and compare with those from previous studies based on other wavelengths (e.g. Infrared or X-ray).

이론/고에너지/고천문학

[박 HA-01] Diffusion of Cosmic Rays in a Multiphase Interstellar Medium Shocked by a Supernova Remnant Blast Wave

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Supernova remnants (SNRs) are one of the most energetic astrophysical events and are thought to be the dominant source of Galactic cosmic rays (CRs). A recent report on observations of gamma rays from the vicinity of SNRs have shown strong evidence that Galactic CR protons are accelerated by the shock waves of the SNRs. The actual gamma-ray emission from pion decay should depend on the diffusion of CRs in the interstellar medium. In order to quantitatively analyze the diffusion of high-energy CRs from acceleration sites, we have performed test particle numerical simulations of CR protons using a three-dimensional magnetohydrodynamics (MHD) simulation of an interstellar medium swept-up by a blast wave. We analyse the CRs diffusion at a length scale of order a few pc, and show the Richtmeyer-Meshkov instability can provide enough turbulence downstream of the shock to make the diffusion coefficient close to the Bohm level for energy larger than 30 TeV for a realistic interstellar medium.

[구 HA-02] Toward the Development of a New MHD Code for Fusion Plasma

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Development of a new code for magnetohydrodynamic (MHD) phenomena in fusion plasma is under progress through a collaboration between plasma physicists, mathematicians, and astrophysicists. The code employs approaches different from those of existing codes. For instance, it is based on a finite difference scheme of high-order and high accuracy, complying conservation laws. The new code will have characteristics distinguished from those of commonly used code such as M3D and NIMROD. Here we will report the progress of the code development.

[구 HA-03] Influence of the Galactic Magnetic Field on the Distribution of Ultra-high-Energy Cosmic Rays

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Recently, the Pierre Auger Observatory (PAO), the largest ground-based project for detecting ultra-high-energy cosmic rays (UHECRs), published their 10-year data. We can access an unprecedented number of UHECR data observed by the project, which give us a possibility to get an accurate statistical test result. In this work, we investigate the influence of the galactic magnetic field (GMF) on the distribution of UHECRs by searching the correlation with the large-scale structure (LSS) of the universe. We simulate the mock UHECR events whose trajectories from the sources would be deflected by the Gaussian smearing angle which reflects the influence by the GMF. By the statistical test, we compare the correlation between the expected/observed distribution of UHECRs and the LSS of the universe in the regions of sky divided by the galactic latitude, varying the smearing angle. Here, we assume the deflections by the GMF are mainly dependent on the galactic latitude. Using the maximum likelihood estimation, we find the best-fit smearing angle in each region. If we get a trend that best-fit smearing angles differ from each region, the influence of GMF may be stronger than that of intergalactic magnetic fields (IGMF) because it is known that the distribution of IGMF follows the LSS of the universe. Also, we can estimate the strength of the GMF using the best-fit parameter by the maximum likelihood.

[구 HA-04] KaVA Q-band Monitoring of Sgr A* in 2013-2014

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We have been monitoring Sgr A*, the radio source at the center of our galaxy, continuously since G2 encounter was predicted. KaVA is a powerful High resolution imaging array at K and Q band, and it has a excellent uv-coverage for Sgr A*. Together with 1-Gbps recording, our observations have provided high-quality images of Sgr A* at Q-band. Our images reveal a scatter-broadened, elliptical Gaussian structure of the source. We found no significant flux or structural variation of Sgr A* in 2013-2014, which is consistent with recent simulations by Kawashima et al. Continuous monitoring in the coming few years would be able to capture the possible flux increase in the source caused by G2, which will lead to better understanding of the accretion process around supermassive black holes.

[구 HA-05] Variation of solar activity and atmospheric change recorded in Korean chronicles during the last millennium

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Korea has a long history in astronomy, which is proved by many observational records written in Korean chronicles. There are 43 sunspot records in Goryeo dynasty (高麗 918-1392) and 13 records in Joseon dynasty (朝鮮 1392-1910). According to analysis of Korean historical records, it is known that sunspot records in Goryeo dynasty show well in match with the well-known solar activity of 11.3 years. It means that Korean historical sunspot records show real solar phenomena. Korean sunspot records also show that solar activity decrease in Joseon dynasty compared with the previous ~500 years. In order to know the change of solar activity in detail, we examine Korean historical atmospheric records which can indicate climate change. We first analyze historical frost records. Korean chronicles have around 600 frost records during the last millennium. We find that the climate change shows sign of cooling down when check the variation of epoch that the first and last frost events in each year are written. This result is well in accord with that of historical sunspot records. Therefore, we claim that solar activity decrease during the last thousand years.

우주망원경

[초 SO-01] WSO-UV progress and SODA project

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The World Space Observatory Ultraviolet (WSO-UV) is the space mission that will grant access to the UV range in the post Hubble epoch.

WSO-UV is equipped with instrumentation for imaging and spectroscopy and it is fully devoted to UV astronomy.

In this talk, we outline the WSO-UV mission model and present the current status of the project.

Also, the NEO observing mission SODA (System of Observation of Day-time Asteroids) is also presented.

[구 SO-02] The Detailed Design of the NISS onboard NEXTSat-1

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The NISS (Near-infrared Imaging Spectrometer for Star formation history) onboard NEXTSat-1 is the near-infrared instrument optimized to the first small satellite of NEXTSat series. The capability of both imaging and low spectral resolution spectroscopy in the near-infrared range is a unique function of the NISS. The major scientific mission is to study the cosmic star formation history in local and distant universe. For those purposes, the main targets are nearby galaxies, galaxy clusters, star-forming regions and low background regions.

The off-axis optical design of the NISS with two linear variable filters is optimized to have a wide field of view (2 deg. x 2 deg.) as well as the wide wavelength range from 0.95 to 3.8μm. The mechanical structure is considered to endure the launching condition as well as the space