Lyα blobs are mysterious, giant (~100 kpc), glowing gas clouds in the distant universe.

They occupy the dark matter halos that will evolve into the richest groups and clusters today. The blob's gas may be the proto-intracluster medium and their embedded galaxies are considered as the progenitors of massive cluster galaxies. Yet we do not know why Lyα blobs glow. There are evidences of kinematic measurements to exclude shocks and winds from AGN or starbursts as a power source, suggesting that photoionizing radiation or scattering of Lyα photons might be responsible. Polarization mapping can discriminate between these photo-ionization and scattering. Previous results of imaging polarimetry for Lyα nebulae are roughly consistent with scattering models. However the polarization morphologies in those of previous results are all different, motivating our polarimetric survey of Lyα nebulae for the statisticallymeaningful sample. As initial results of our survey, we present the total polarization map of the LABd05 which has the spatial offset between the peak of Lyα surface brightness and an obscured AGN. We detect the significant polarization in this target with the radially increasing polarization gradient, suggesting that scattering plays major role within this nebula. The polarization pattern is more aligned with the Lyα peak rather than the AGN (the potential energy source), indicating that the Lyα photons are originated from the region near the peak of Ly α intensity.

[구 GC-15] Impact of Lyman alpha pressure on metal-poor dwarf galaxies

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Understanding the origin of strong galactic outflows and the suppression of star formation in dwarf galaxies is a key problem in galaxy formation. Using a set of radiation-hydrodynamic simulations of an isolated dwarf galaxy, we show that the momentum transferred from resonantly scattered Lyman-alpha(LyA) photons can suppress star formation by a factor of two in metal-poor galaxies by regulating the dynamics of star-forming clouds before the onset of supernova explosions (SNe). This is possible because each LyA photon resonantly scatters and imparts ~10-300 times greater momentum than in the single scattering limit. Consequently, the number of star clusters predicted in the simulations is reduced by a factor of ~5, compared to the model without the early feedback. More importantly, we find that galactic outflows become weaker in the presence of strong LyA radiation feedback, as star formation and associated SNe become less bursty. We also examine a model in which radiation field is arbitrarily enhanced by a factor of up to 10, and reach the same conclusion. The typical mass-loading factors in our metal-poor dwarf system are estimated to be ~5-10 near the mid-plane, while it is reduced to ~1 at larger radii.

[구 GC-16] Polarization as a Probe of Thick Dust Disk in Edge-on Galaxies: Application to NGC 891

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Radiative transfer models were developed to understand the optical polarizations in edge-on galaxies, which are observed to occur even outside the geometrically thin dust disk, with a scale height of ~0.2 kpc. In order to reproduce the vertically extended polarization structure, we find it is essential to include a geometrically thick dust layer in the radiative transfer model, in addition to the commonly-known thin dust layer. The models include polarizations due to both dust scattering and dichroic extinction which is responsible for the observed interstellar polarization in the Milky Way. It is found that the magnetic fields in edge-on galaxies are in general vertical (or poloidal) except the central part, where the magnetic fields are mainly toroidal. We also find that the polarization level is enhanced if the clumpiness of the interstellar medium, and the dichroic extinction by vertical magnetic fields in the outer regions of the dust lane are included in the radiative transfer model. The predicted degree of polarization outside the dust lane was found to be consistent with that (ranging from 1% to 4%) observed in NGC 891.

[구 GC-17] The 105-month Swift-BAT all-sky hard X-ray survey

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We present a new catalog of hard X-ray sources

detected in the first 105 months of observations with the Burst Alert Telescope (BAT) on board the Neil Gehrels Swift observatory. The 105 month Swift-BAT survey is a uniform hard X-ray all-sky survey performed in the 14−195 keV band. The Swift-BAT 105 month catalog provides 1632 (422 new detections) hard X-ray sources in the 14 - 195 keV band above the 4.8 sigma significance level. Adding to the previously known hard X-ray sources, 34% (144/422) of the new detections are identified as Seyfert AGN in nearby galaxies (z < 0.2). The majority of the remaining identified sources are X-ray binaries (7%, 31) and blazars/BL Lac objects (10%, 43). As part of this new edition of the Swift-BAT catalog, we release eight-channel spectra and monthly sampled light curves for each object in the online journal and at the Swift-BAT 105 month Web site.

[구 GC-18] An Interesting Story of Four Gamma-ray Bright AGNs by the iMOGABA

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A Korean VLBI Network key science program, the Interferometric Monitoring of Gamma-ray Bright AGNs (iMOGABA) program continues to reveal the nature of the gamma-ray flares in active galactic nuclei (AGNs). Here in this presentation, we would like to introduce an interesting story about four gamma-ray bright AGNs – BL Lac, 1633+382, 3C 84, and M87 - based on the recent results of the iMGOABA. The results will include a) a sad story of an 'orphan' gamma-ray flare from BL Lac, b) a position offset of 40 pc for a gamma-ray flaring site from the radio regions in 1633+382, c) a position alignment of a gamma-ray flaring site with a central engine region in 3C 84, and d) a flat millimeter spectrum of a core in M87 revealed by the iMOGABA.

[구 GC-19] Ionized gas outflows in z~2 WISE-selected Hot Dust Obscured Galaxies

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The Wide-field Infrared Survey Explorer (WISE) mission has been efficient in selecting Active Galactic Nuclei (AGN) with high luminosities and large obscuration. According to the merger driven AGN powering scenarios, luminous and obscured AGN are in a stage where they go through feeding of gas accretion into the central black hole, and feedback to the host galaxy through outflows. We report the rest-frame UV-optical spectra of 11 Hot Dust Obscured Galaxies (Hot DOGs) at z~2, WISE color-selected to be extremely reddened AGN. A fraction of the targets show blueshifted and broadened [OIII] profiles indicative of ionized gas outflows. We present the occurrence and strength of the outflows, and discuss what impact these AGN activity could give on their hosts.

[박 GC-20] Unveiling Intrinsic Properties of Dusty Red AGNs

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Theoretical simulation studies suggest that dust-obscured AGNs appear for a certain period when merger-driven star-forming galaxies evolve to unobscured type 1 AGNs. The dust-obscured AGNs would have red colors due to the dust extinction in their host galaxies, and they are expected to have higher accretion rates than unobscured type 1 AGNs. Red AGNs are found by selecting type 1 AGNs with very red colors, and they have been suspected as the intermediate-stage, dusty AGNs. However, it is not yet clear if red AGNs really correspond to the dusty AGNs due to a lack of intrinsic properties of red AGNs. For unveiling intrinsic properties of red AGNs, we study the NIR and MIR spectra of unobscured type 1 AGNs and red AGNs. There are three main themes: (i) derivation of NIR and MIR BH mass estimators can be used for red AGN study; (ii) investigation of red AGN selection methods to test its usefulness to identify dusty red AGNs; and (iii) investigation of the accretion rates of red AGNs to see if they have the properties as predicted in the simulation studies.

[구 GC-21] High-z Universe probed via Lensing by QSOs (HULQ): Expected Number of QSOs acting as Gravitational Lenses

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The HULQ project proposes to use gravitational lensing to determine the masses of QSO host galaxies, an otherwise difficult goal. If these host galaxy masses, along with their SMBH masses from single-epoch measurements, are estimated for a substantial number of QSOs at various redshifts, the co-evolution of SMBHs and their host galaxies can be studied for a large portion of the history of the universe. To determine the feasibility of this study, we present how to estimate the number of