[구AK-01] Supermassive Black Holes in Quasars: At the Edge of the World

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We present for the first time the rest-frame optical spectra of high redshift QSOs (z > 4.5) taken with the AKARI space telescope. High redshift QSOs hold an important key to the understanding of the growth of supermassive black-holes and their role in the galaxy formation. However, our understanding of high redshift QSOs has been hampered by the lack of rest-frame optical spectra where one can find the popular spectral diagnostics such as Balmer lines. Using the AKARI's unique spectroscopic capability, we have observed QSOs at 4.5 < z < 6.5, revealing for the first time, the opitcal emission lines of QSOs at z > 4.5, and constraining the mass of supermassive blackholes using well-calibrated optical spectral lines (H-alpha). Our study shows that supermassive blackholes with > 10^9 M_sun existed out to z ~ 6, suggesting the formation of massive galaxies started very early in the history of the universe.

This work is based on observations with AKARI, a JAXA project with the participation of ESA.

[구AK-02] AKARI lightens the Universe at 1 < z < 1.5 : 15 um Observation of the Extended Groth Strip

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With the extensive multi-wavelength data including spectroscopic redshifts, the Extended Groth Strip(EGS), a 0.5 square degree region, is one of the primary fields for studying the evolution and the formation of galaxies.

To understand the cosmic star formation history at high redshift, the IR study becomes crucial since the star forming galaxies are more likely to be dust-obscured ones at higher redshifts, as previous Spitzer IRAC/MIPS works have shown. However, a gap between Spitzer 8um and 24um band coverages has stood as a great obstacle in studying IR star-forming galaxies at 1 < z < 1.5. In this view, AKARI L15 band is of great use to study z > ~1 dust obscured star forming galaxies, since the rest frame 8um PAH emission-a widely used indicator of star forming rate- falls into the L15 band. It also provides a powerful means to separate AGN populations which are also very interesting objects to study. Here, we present the preliminary results of AKARI 15um observation of the EGS region, including the multi-band nature of EGS 15um sources and star forming rate of z=1~1.5 galaxies derived from their SEDs.

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