*Co-Evolution of Central Black Holes and Galaxies*
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# *AKARI* Infrared Views of AGNs

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**Abstract.** The Japanese infrared satellite *AKARI* has unique capabilities for near-infrared spectroscopy and an all-sky survey in the mid- and far-infrared. We present the recent results on active galactic nuclei that use the unique capabilities of *AKARI*.

**Keywords.** galaxies: active, infrared: galaxies, quasars: emission lines

## 1. *AKARI*, the Japanese Infrared Satellite

*AKARI*, the Japanese infrared satellite, launched in 2006 February, has a 70-cm primary mirror cooled with the combination of liquid helium and mechanical coolers. It has unique capabilities for near-infrared spectroscopy in the wavelength range 2 $\mu$m to 5 $\mu$m, and carried out an all-sky survey in the mid- and far-infrared. It has broadband filters comprehensively covering near-, mid-, and far-infrared wavelengths (Murakami *et al.* 2007).

## 2. Near-Infrared Spectroscopy of High-Redshift Quasars

Near-infrared spectroscopy of the high-redshift quasars RX J1759.4+6638 at $z = 4.3$ and APM 08279+5255 at $z = 3.9$ led to detection of the H$\alpha$ emission line at the highest redshift to date (Oyabu *et al.* 2007; Oyabu *et al.* 2009). In addition, for APM 08279+5255, the hydrogen recombination emission lines Pa$\alpha$ and Pa$\beta$ as well as the optically thick blackbody emission which comes from the inner part of dust torus were detected. Neither quasar provided any suggestion of evolution when compared with low-redshift quasars.

## 3. Mid-Infrared Search for Active Galactic Nuclei

Using the point source catalog from the *AKARI* mid-infrared all-sky survey, we are searching for AGNs, not only for normal AGNs but also for dusty AGNs, in the local Universe. Our detection limits in the mid-infrared all-sky survey reach 50 mJy and 120 mJy in 9 $\mu$m and 18 $\mu$m bands, respectively (Ishihara *et al.* 2009). *AKARI* provides remarkable improvement in sensitivity and spatial resolution compared to the previous all-sky survey with IRAS. Red mid-infrared sources away from the Galactic plane are observed using the near-infrared spectroscopy capability that remains since the cyrogenic helium was exhausted. During these follow-up observations, we have started to detect hidden AGNs located in galaxies in which AGN activity was not recognized at other wavelengths (Oyabu *et al.* in preparation).

## References

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