AGN-Starburst Connection

Jong-Hak Woo (SNU)

Collaborators:
Masa Immanishi (NAOJ), Ji Hoon Kim, Hyunjoo Goh (SNU),
Tommaso Treu, Vardha Bennert (UCSB),
Matt Malkan (UCLA), Sarah Gallagher, Draco Szathmary
(Univ. of Western Ontario)
$M_{BH}$ – sigma relation of AGN and non-AGN galaxies

Black hole mass and galaxy properties have correlations, indicating co-evolution of black holes and galaxies

How are SFR and accretion rate connected?

- BH growth and galaxy growth are co-eval?

UIRGS (starburst galaxies) sample
- difficult to measure BH accretion rate
  (e.g. Imanishi et al. 2007)

AGN sample
- difficult to measure SFR
  (cannot use Halpha or UV continuum)
- PAH lines and OII line
BH accretion – starburst connection?

Star formation rate and BH accretion rate correlated?

Flattened at high luminosity? (Maiolino et al. 2007)

Netzer et al. 2007
The AGN-starburst Connection of Seyfert Galaxies at z~0.4

Sample selection
- redshift windows: z=0.36±0.01
- samples: 24 objects with multi-wavelength data,
  5 additional objects without X-ray and IR

AKARI Observations
- 20 objects: 4 pointings
- 6 objects: 1-3 pointings

Parallel Observations
- Chandra X-ray; Spitzer IRAC & MIPS; HST ACS; KECK spectra
HST ACS images of AGN sample

Treu et al. 2007
Examples of SEDs

Szathmary et al. 2010 to be submitted
Examples of optical spectra

Keck LRIS
(blue & red)

SDSS (black)

McGill et al. 2008
Examples of AKARI spectra

Preliminary

4 pointings combined, 3 pixel smoothing to account for oversampling
We measure bolometric luminosity of AGNs at z~0.4, using multi-wavelength data from X-ray to MIR.

We will measure 3.3 micron PAH luminosity or upper limits and investigate the correlation between SFR and BH accretion rate.

We will also use [OII] line luminosity to compare with PAH line luminosity.

We will study in detail AGN and host galaxy fraction in MIR and dust characteristics, using PAH and [OII] line strength.