Instituto de Astronomía
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# Seminario de Investigación Extraordinario

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**11:00 hrs, Auditorio IA-Ensenada**

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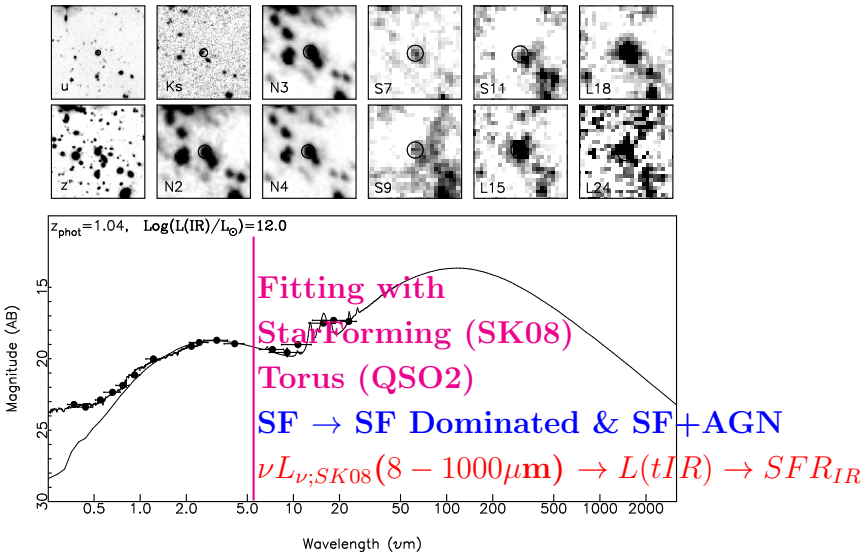
## STAR FORMATION and AGN ACTIVITY in AKARI DETECTED GALAXIES at Z=0.4-2




We studied the star-formation and AGN activity of massive galaxies in the redshift range $z = 0.4-2$, which were detected in a deep survey field using the AKARI InfraRed (IR) astronomical satellite and *Subaru* telescope toward the North Ecliptic Pole (NEP). The AKARI/IRC Mid-InfraRed (MIR) multiband photometry was used to trace the star-forming activities with Polycyclic-Aromatic Hydrocarbon (PAH) emission, which is effective not only to distinguish between star-forming and AGN galaxies, but also to estimate the Star Formation Rate (SFR) with converting its flux to the total emitting IR (TIR) luminosity. In combination with the analysis of the stellar components, we studied the MIR SED features of the star-forming and AGN-harboring galaxies, which we summarized below: 1) The rest-frame 7.7-$\mu$m and 5-$\mu$m luminosities are good tracers of star-forming and AGN activities from their PAH and dusty tori emissions even up to $z \simeq 2$, respectively. 2) For star-forming galaxies without AGN, the SFR shows a correlation that is nearly proportional to the stellar mass of the host galaxies. The specific SFR (sSFR) per unit stellar mass increases with redshift across the whole range of stellar masses, and are nearly constant, or show a weak dependence on stellar mass, 3) The star-forming galaxies detected from the MIR photometry show that calorimetric extinction from TIR and uncorrected UV luminosities tend to be $\sim 2$ magnitudes larger than the classical extinction from optical SED fittings, which may be caused by geometric variations and concentrations of dust in the galaxies, 4) Even for dusty star-forming galaxies with AGN, SFRs can be derived from TIR luminosities with subtraction of the obscured AGN contribution, which indicates that their SFRs were possibly quenched around $z \simeq 0.8$ compared with those without AGN. 5) The AGN activity derived from their rest-frame 5-$\mu$m luminosity suggests that their Super Massive Black Holes (SMBH) could already have grown to $\simeq 3 \times 10^8 M_\odot$ in most massive population with $10^{12} L_\odot$ and $10^{11} M_\odot$ in the MIR selected AGNs at $z > 1.2$, suggesting that the mass relation between SMBHs and their host