2) "Unveiling z>3 heavily obscured AGN missed in X-ray surveys with Spitzer/MIPS: The contribution to the cosmic accretion density at cosmic noon"

by Naoki Matsumoto (Tohoku University)
Time and Date: 10:00-12:00, Nov 25, 2024
Place: Room 721, Science Complex B (H-03) (hybrid)

Registration: "https://us02web.zoom.us/meeting/register/tZUtdO2uqj4oGt1bDMeH-LBCVXYmDX3iozcP"

Supermassive black holes (SMBHs) with masses ranging from several millions to billions times solar mass exist at the centers of almost all massive galaxies in the nearby universe. The large masses of SMBHs in the early universe that are being discovered suggest the need for rapid growth processes like Super-Eddington accretion in the early phase of their growth. The population of active galactic nuclei (AGN) obscured by large amounts of gas and dust in the early universe (i.e., obscured AGN) that is expected to be Super-Eddington phase is said to represent an early violent formation and growth phase of the SMBHs and the host spheroidal components (e.g., Blecha+18), and investigating such population would be a key to understand how SMBHs could gain such a large mass within a limited time scale of the early universe. We performed a MIPS 24um search for z>3 heavily obscured AGN in the XMM-LSS and COSMOS fields, focusing on their strong rest-frame NIR emission originating from AGN hot dust. As a result of the selection, approximately 90% of the selected sources were not detected by the deep X-ray surveys in these fields. SED fitting analysis of all selected candidates revealed that the AGN bolometric luminosities reach $\log(L_{bol})\sim46$–48, indicating that they are heavily obscured and host SMBHs in a vigorous growth phase. The estimated cosmic SMBH growth rate, including heavily obscured AGN, significantly exceeds previous X-ray study estimates. These results emphasize the critical role of obscuration in the early SMBH growth and the importance of this population.

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