Contribution ID: **45** Type: **Oral (onsite)**

# Tip of the iceberg: overmassive black holes at 4<z<7 found by JWST are not inconsistent with the local MBH-M* relation

*Thursday 21 November 2024 11:00 (20 minutes)*

JWST is revealing a remarkable new population of high-redshift (z>4), low-luminosity Active Galactic Nuclei (AGNs) in deep surveys and detecting the host galaxy's stellar light in the most luminous and massive quasars at z~6 for the first time. Recent findings claim that SMBHs in these systems are significantly more massive than predicted by the local MBH-M*relation and that this is not due to sample selection effects. Through detailed statistical modeling, we demonstrate that the coupled effects of selection biases (i.e., finite detection limit and requirements for detecting broad lines) and measurement uncertainties can largely explain the reported offset and flattening in the observed mass relation towards the upper envelope of the local relation. We further investigate the possible evolution of the MBH-M* relation at z>4. The bias-corrected intrinsic MBH-M* relation in the low-mass regime suggests a large population of low-mass BHs (MBH<10^5), possibly originating from lighter seeds, may remain undetected or unidentified. These results underscore the importance of forward modeling observational biases to understand BH seeding and SMBH-galaxy coevolution mechanisms in the early universe, even with the deepest JWST surveys.

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