

The ALMA view of the high redshift relation between Supermassive Black Holes and their Host Galaxies

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I will present the relation between black hole mass and the dynamical mass of massive galaxies at high z ($z \sim 4 - 6$). We have considered a sample of ~ 15 quasars at high redshift for which we have obtained measurements of the host galaxy kinematics from ALMA observations of molecular or atomic transitions. For the first time, we are able to measure galaxy masses dynamically, by modelling the kinematics of galaxy disks, thus avoiding all the problems and biases from photometric measurements of stellar masses. Up to redshift $z \sim 5$, the $M_{\text{BH}}/M_{\text{gal}}$ ratio is consistent with the extrapolation of the relation inferred at $z < 3$. At $z > 5$ we find a steady decrease of the $M_{\text{BH}}/M_{\text{gal}}$ ratio with increasing redshift, possibly witnessing the phase of fast growth of the BHs compared to the host galaxies. I will discuss how these results fit within the coevolution scenario and highlight the constraints that they pose on models of galaxy evolution.

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