



PROBING THE INVISIBLE: WEIGHING SUPERMASSIVE BLACK HOLES

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Supermassive black holes are now known to lurk at the centres of most galaxies, and are believed to play a key role in their evolution. Here, I will present key results from the mm-Wave Interferometric Survey of Dark Object Masses (WISDOM), a high resolution survey of molecular gas in galaxy nuclei. First, I will show that CO can be used to easily and accurately measure the masses of the supermassive black holes lurking at galaxy centres. Second, I will discuss substantial ongoing efforts to do exactly that, and present many spectacular new measurements, the latest of which rival the best black hole measurements to date. Third, I will compare molecular gas and megamaser measurements, discuss black hole scaling relations, and introduce the newly-discovered "mm fundamental plane of black hole accretion", that is surprisingly tight and holds for a wide variety of active galactic nuclei and stellar-mass black holes. This work opens the way to literally hundreds of measurements across the Hubble sequence (in both active and non-active galaxies) with a unique method, and thus promises to revolutionise our understanding of the co-evolution of galaxies and black holes.

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