

## R01a WISDOM Project – IV Black Hole Mass Measurement Using Molecular Gas Kinematics in NGC 5064

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As a part of the mm-Wave Interferometric Survey of Dark Object Masses (WISDOM) project, we present an estimate of the mass of the supermassive black hole (SMBH) in the nearby quiescent galaxy NGC 5064.  $^{12}\text{CO}(J = 2 - 1)$  emission line was observed by using Atacama Large Millimetre/submillimetre Array (ALMA), to achieve an angular resolution of  $0''.05$ . The data is imaged with a resolution of  $0''.15$  and  $0''.3$  to enhance the signal-to-noise ratio. The observed molecular gas kinematics is analyzed in three dimension to provide a best-fit SMBH mass  $M_{\text{BH}} = 1.61_{-0.64}^{+1.06} \times 10^8 M_{\text{dot}}$ , a  $H$ -band stellar  $M/L = 0.390 \pm 0.005 (M/L_{\odot, H})$ , and other parameters describing the geometry of the molecular gas disc (statistical errors, all at  $3\sigma$  confidence). We confirm the SMBH mass measured is consistent with that estimated from the latest  $M_{\text{BH}} - \sigma$  relation, which correlates SMBH mass and stellar velocity dispersion at the effective radius. Observed evidences show that the molecular gas disc in this spiral galaxy to be thick, contrary to that is assumed in our previous works on early-type galaxies. This work will be submitted to MNRAS within a short amount of time.