

Abstract Submitted
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Gas and Stellar kinematics of late type spiral NGC 2976 JAMES GALLAGHER, JASON PINKNEY, Ohio Northern University — We present imaging and spectroscopy from ground and space-based observations of NGC 2976. This Sc galaxy has a small bulge and close proximity (only 3.6 Mpc) making it ideal for our search for small nuclear black holes (BH). Pre-existing information do not show it to have an AGN: *ROSAT* X-ray data do not show a nuclear point source, and it emits no radio jets. We confirm that N2976 has an HII type nuclear spectrum, consistent with intense star formation. *Keck* spectra reveal a stellar velocity dispersion of only $\sigma = 18 - 20 \text{ km s}^{-1}$. The gas velocity dispersion is also about 20 km s^{-1} . *HST* imaging reveals an unusual nuclear double peak whose dominance flips going from the medium band (F547M) image to the narrow band ($\text{H}\alpha$) image. The emission line spectra do not show a regular rotation curve, despite an almost disk-like appearance of the extended $\text{H}\alpha$ emission. The $M_{BH} - \sigma$ relation predicts a BH mass of only $5 \times 10^4 M_{\odot}$. The virial theorem applied to the central gas blob gives a considerably larger upper limit ($\sim 10^6 M_{\odot}$). This appears to be another “nucleus in formation”, and may not have a supermassive BH at all, like M33.

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