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Ionized hydrogen survey for supermassive black hole detection SAMUEL MONTGOMERY, DAVID WESTPFAHL, New Mexico Tech, DANIEL KLINGLESMITH III, Magdalena Ridge Observatory — Central regions of several nearby spiral galaxies are completely void of atomic hydrogen. Using a telescope at the Etscorn Observatory fitted with a charge coupled device (CCD) with several different filters, direct observations of spiral galaxies have been made. The detection of ionized hydrogen is expected to take the place of the absent atomic hydrogen. Ionized hydrogen is observed as the recombination of protons with freed electrons in an ionized soup of hydrogen atoms. This recombining of particles triggers the emission of a specific wavelength photon in a process known as $H\alpha$ emission. The galaxies M81 and NGC2903 show the presence of ionized hydrogen, glowing strongly in the images produced using an H α filter. Ionized hydrogen resides in galactic environments with energy sources high enough to strip electrons from their host protons. The primary ionization energy source being the supermassive black holes located at the centers of M81 and NGC2903. When matter forms an accretion disk around a supermassive black hole it forms a quasar. Quasars emit a powerful amount of electromagnetic radiation, which is hypothesized as the source for the energy needed to ionize the surrounding atomic hydrogen. Data will be collected from several more spiral galaxies.

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