

## CAVITY QED WITH ELECTRONS ON HELIUM

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Electrons nearing the surface of liquid helium, can become weakly bound to the interface, floating several nanometers above the surface. Levitating essentially in vacuum, electrons on helium have the highest known electron mobility and extremely long predicted spin coherence. Further, it has recently become experimentally possible to manipulate thousands of floating electrons in parallel using CCD's much like those used in digital cameras. Yet thus far the coherence of individual electrons has eluded measurement. I will present a new cavity quantum electrodynamics inspired technique for both detecting the quantum state of the electron's spin and motion as well performing gates between electrons. Finally, I will describe present preliminary results on electron trapping and detection.