Charge-coupled devices (CCDs) have long been the standard for astronomical image and data capture, often driving state-of-the-art measurements and instruments. However, as observatories and camera electronics alike have evolved and matured, typical CCD noise levels often represent the majority of intrinsic noise, particularly for ultra-faint or ultra-diffuse sources. Skipper CCDs implement an inventive floating readout gate, allowing for multiple non-destructive readouts of each pixel charge. As such, skipper CCDs are capable of obtaining sub-electron noise, enabling individual photon counting. With this project, we will implement a delta-doped, UV enchanced skipper CCD controlled by a Low Threshold Acquisition (LTA) skipper controller developed at Fermilab. We will test for quantum efficiency, as well as sub-electron dark and read noise. Moreover, we will optimize the skipper CCD readout time for a given noise floor and characterize the relation between readout time and noise levels. These sub-electron noise detectors with fast readout times will allow for time sensitive, ultra-diffuse astronomical measurements, including mapping the faint circumgalactic medium (CGM). These extended CGM measurements will help to inform galaxy evolution models, which shape views of cosmology and the formation of the universe.