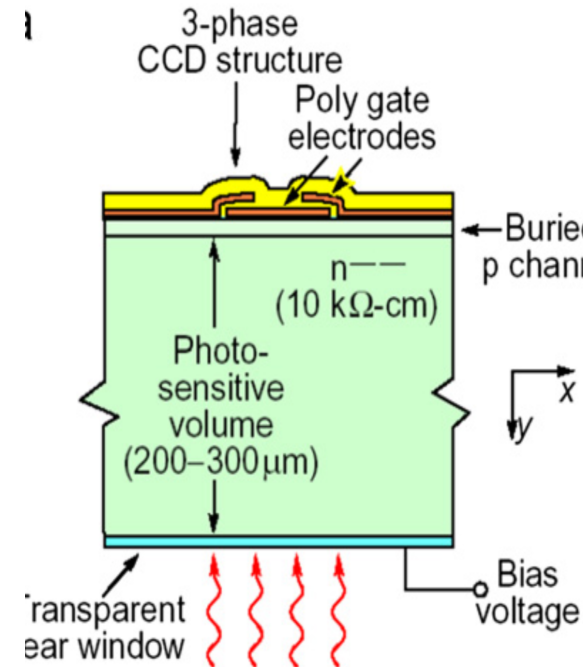
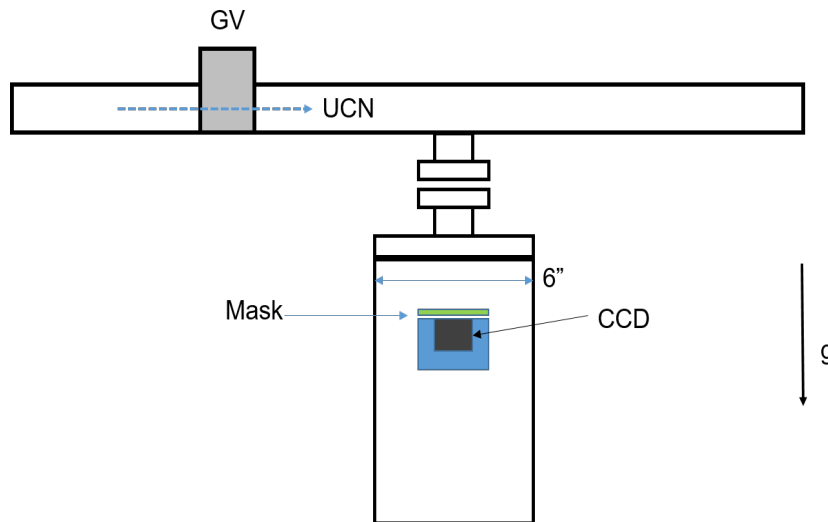
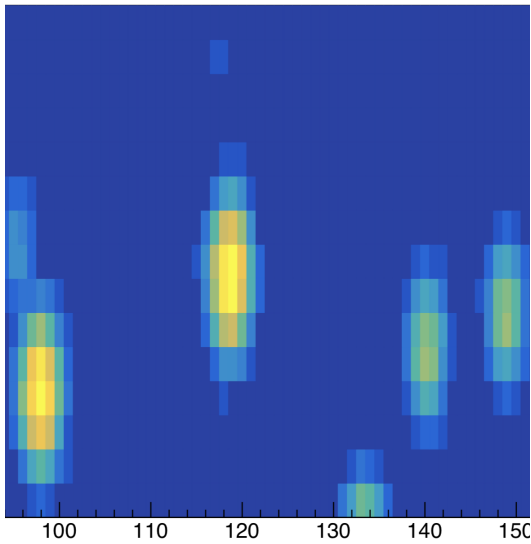


A boron-coated CCD camera for direct detection of Ultracold Neutrons (UCN)

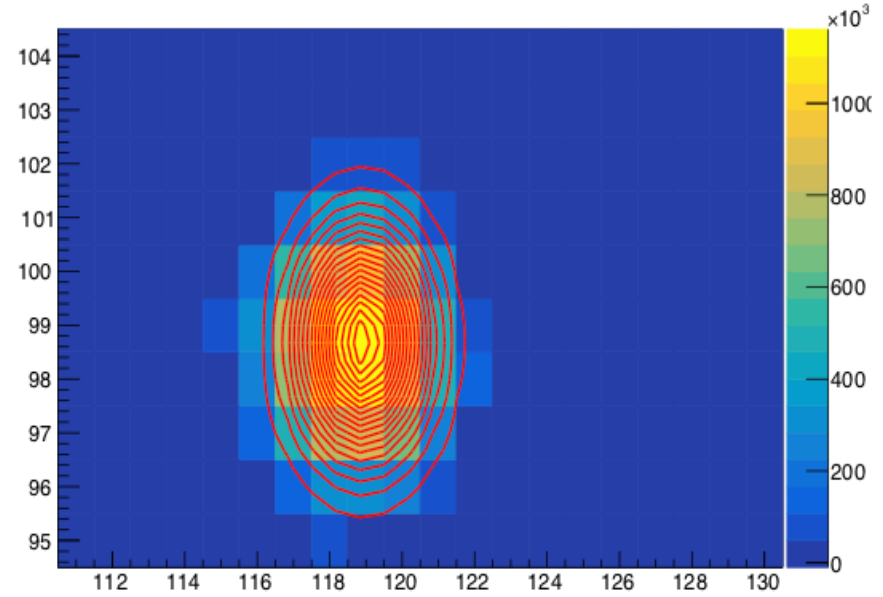
- **Abstract:** A new boron-coated CCD camera is described for direct detection of ultracold neutrons (UCN) through the capture reactions $^{10}\text{B}(n,\alpha\gamma)^7\text{Li}$ (6%) and $^{10}\text{B}(n,\alpha^1\gamma)^7\text{Li}$ (94%).
- The combination of micrometer scale spatial resolution, few electrons ionization thresholds and large area paves the way to new research avenues including quantum physics of UCN.



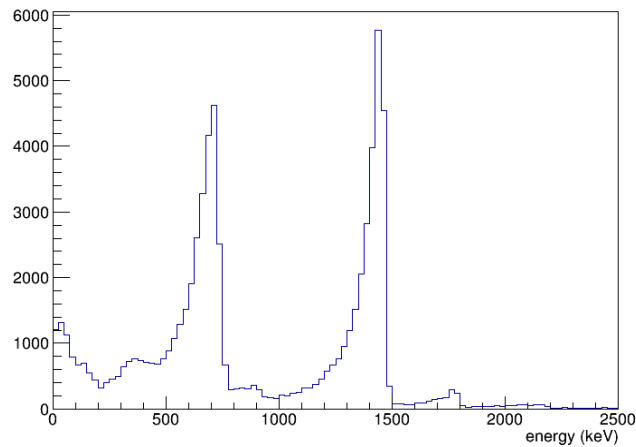
Data is exquisite



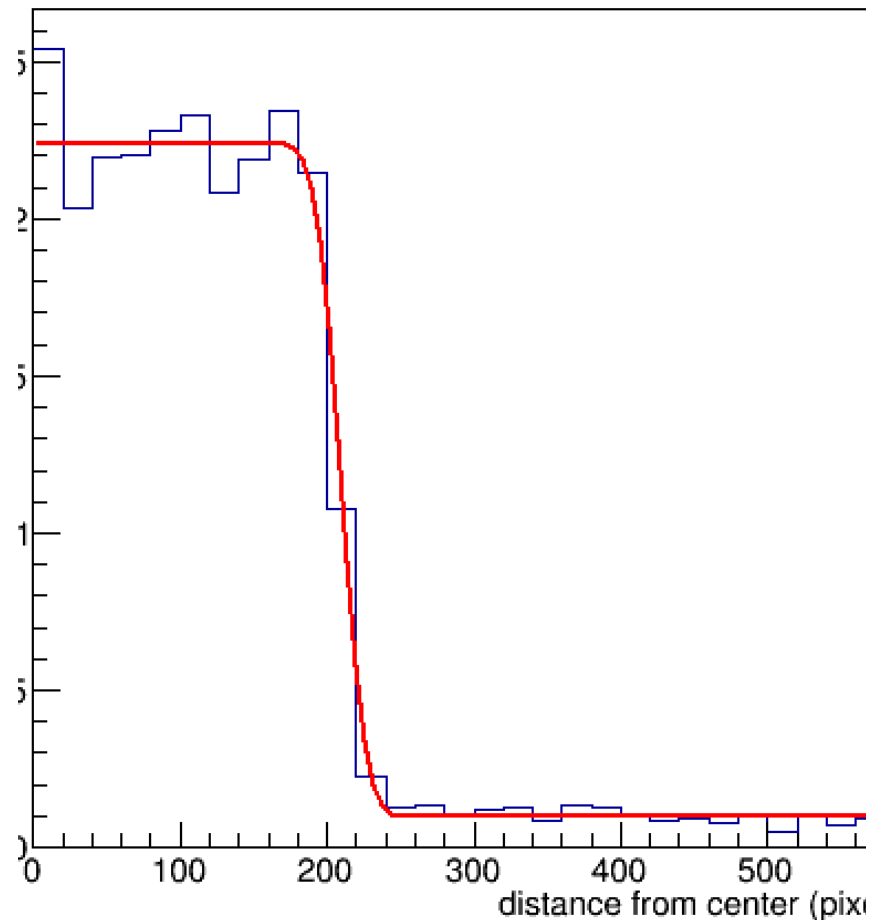
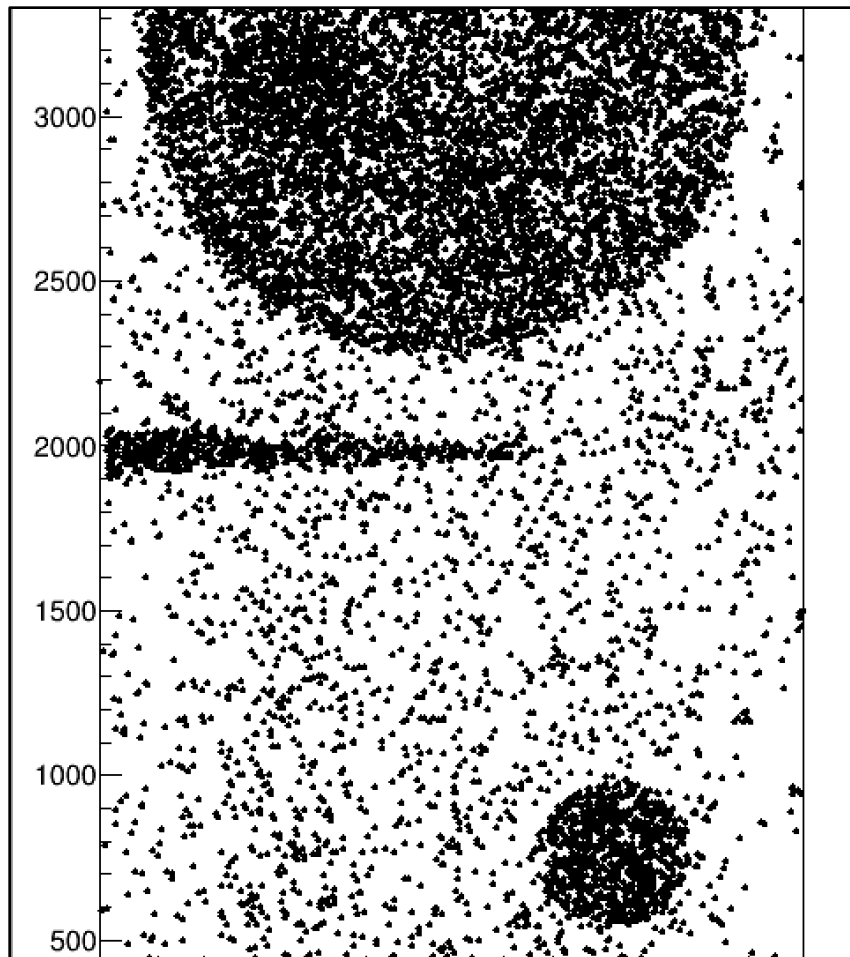
Cosmic rays and Electrons



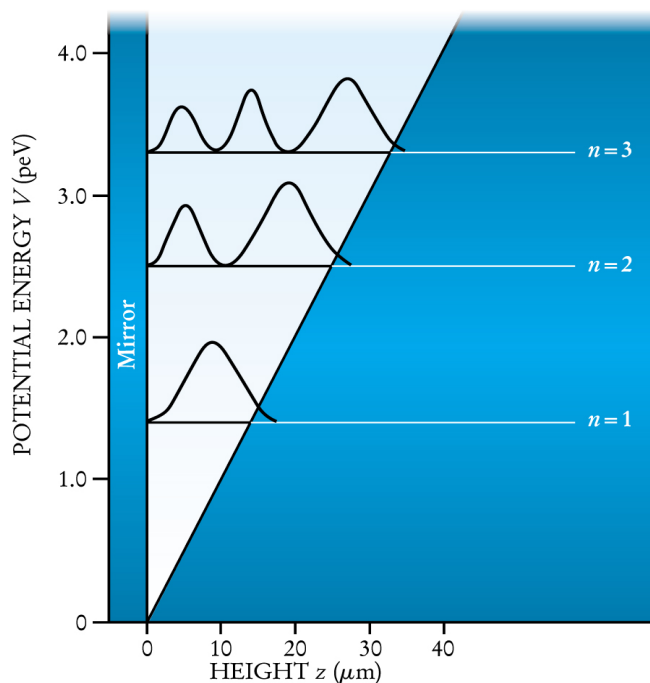
alpha



Positional resolution of better than 60 microns (1000 x improvement)



Future Tests at FNAL, LANL, ILL



- Neutron physics that can be addressed with this type of detector:
 - Mass of neutron – 4 sigma discrepancy
 - Confirmation of quantum nature between particle physics and classical gravity
 - Grazing Incidence Neutron Diffraction
 - Commercial use as directional neutron detector