3:30 pm • Friday May 10, 2013 • 2241 Chamberlin Hall • Coffee at 4:30 pm

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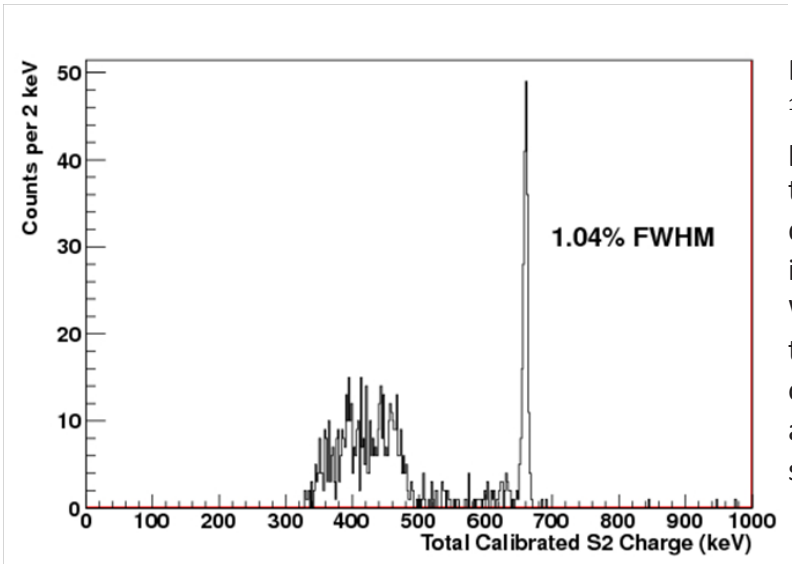
Gas-Filled Detectors
The Darwinian Champions of Particle Physics

Department of Physics Colloquium

WISCONSIN

The first detection of single ionizing events occurred more than 100 years ago when Ernest Rutherford and Hans Geiger succeeded in recording alpha particles from radon decay using a gas-filled detector and an electrometer. Remarkably diverse and useful innovations followed and continue to emerge even today, establishing gas-filled detectors as the exemplary evolutionary survivors in nuclear and particle physics technique. Although this ample record has many interesting chapters, I will focus on my favorite topics within this humble corner of the quest to understand our universe. The evolution of these devices is interesting not only for their substantial contribution to experiment, but also for what was, surprisingly, overlooked as technology evolved.



Energy spectrum measured for ^{137}Cs γ-rays (662 keV) with a high-pressure xenon gas TPC, relevant to the search for neutrino-less double-beta decay in ^{136}Xe and with implications for a direct detection WIMP search. This appears to be the best energy resolution ever obtained in a xenon-based detector and motivates a dual-purpose search.

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