Nuclear Science and Security Consortium

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Webinar

Detection of very low-energy ionizing radiation: from dark matter to neutrinos

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View the live webcast at:

https://bluejeans.com/183762971

Abstract

Numerous observations over a wide range of scales indicate the existence of a component of our universe that is more than five times more massive than normal matter, known as dark matter. I discuss one well motivated dark-matter particle candidate, the WIMP, for which there have been many dedicated efforts to directly detect over a few decades, and LUX, a liquid-xenon experiment that currently holds the worlds-best sensitivity to WIMP particles. One of the challenges in building a detector that is sensitive to WIMPs is achieving sensitivity to very low-energy nuclear recoils. This technical challenge is one common to the search for evidence of coherent neutrino-nucleus interactions. This type of interaction, which is predicted by the Standard Model of particle physics, is expected to be a relatively high-rate phenomenon, yet low energy (compared to more traditional neutrino detection processes). I further discuss ideas in related detector technologies that might be able to bring low-energy sensitivity to unprecedented levels.

About Aaron Manalaysay

Aaron Manalaysay is a postdoctoral fellow at the University of California, Davis, where he works mainly on the LUX and LZ dark matter experiments, in addition to detector R&D. He held a postdoctoral research position at the University of Zurich from 2010 to 2013, after obtaining a M.S. and Ph.D. at the University of Florida, and a B.S. from Case Western Reserve University.