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From NIF to Dark Matter: Extreme Measurements

John A. Oertel
Los Alamos National Laboratory
Los Alamos, NM 87544
Oertel@lanl.gov

One of the major advantages of working at a National Laboratory is the opportunity to contribute to a diverse collection of physics experiments and the unique diagnostic technologies to make the measurements. It seems that the most interesting physics and thus the measurements are in extreme physical environments such as high-energy and flux laser, x-ray, neutron, gamma ray and EMP. In other experiments the challenge is the location of the detector itself. Such is the case with the noble liquid based dark matter detector MiniCLEAN we are constructing that will be located 6800' underground in the active nickel mine at the SNOLab laboratory in Sudbury, Canada. In this talk we will present details on the Gated X-ray Detector (GXD)¹, the Neutron Imaging System (NIS)² presently in place at the National Ignition Facility (NIF) and also the current challenges of fielding a Dark Matter detector underground.³ Finally, we will give a view of the future MARIE facility to be built at LANL and the opportunities for new unique measurements in extreme environments.

1 J. A. Oertel, Rev. Sci. Instrum. 77, 10E308 [2006].

2 M.D Wilke, Rev. Sci. Instrum. 79, 10E529 [2008].

3 K. Rielage, <http://meetings.aps.org/link/BAPS.2010.DNP.FE.1>

4 <http://marie.lanl.gov/>.

Presenter: Mr OERTEL, John Oertel (Los Alamos National Laboratory)