

## Physics Division Seminar

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# Emerging Scintillators for Fast Neutron Spectroscopy

Host: Filip Kondev

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The scintillator  $\text{Cs}_2\text{LiYCl}_6$  (CLYC) has emerged as a versatile detector for both gammas and neutrons, with excellent pulse shape discrimination. Originally developed as a thermal neutron counter, the discovery of its unexpected and unprecedented ~10% pulse height resolution for fast neutrons in the few MeV range has prompted studies to benchmark its use in low energy nuclear science and applications. The talk will focus on characterization and test experiments with an array of sixteen 1" x 1" and the first 3" x 3"  $^7\text{Li}$ -enriched  $\text{C}^7\text{LYC}$  crystals, optimized for fast neutron spectroscopy. These include elastic and inelastic neutron scattering cross-sections at LANL with a pulsed white neutron source, as well as measurements using mono-energetic neutrons generated at the UMass Lowell Van de Graaff accelerator. Planned and preliminary tests of beta-delayed neutron spectroscopy and fission neutron measurements at NSCL and ANL will be discussed, as well as machine learning techniques for neutron-gamma discrimination with  $\text{C}^7\text{LYC}$ .