

Fall 2019 Colloquium

Department of Physics & Astronomy, TAMU-Commerce

Sep,19 Thursday, 4-5 PM in Science Building 127

(coffee and cookies will be served at 3:50 PM)

Nuclear Physics

Neutron Cross Sections for Applied and Basic Science

Dr. Sally Hicks

University of Dallas



Dr. Sally Hicks earned a BS (1981) degree in Physics and Mathematics at Eastern Kentucky University and MS (1984) and Ph.D. degrees (1987) in Physics at the University of Kentucky. Her Ph.D. research topic was on Neutron Scattering on ^{48}Ca in the Low-Energy Resonance Region. In 1988, Dr. Hicks began her appointment as an assistant professor at the University of Dallas, where she is currently doing research in nuclear physics studying neutron scattering for pure and applied science. She also serves as the Chair of the Texas Section of the American Physical Society. More information about Dr. Hicks and her research can be found at

<https://udallas.edu/constantin/academics/programs/physics/faculty/hicks-sally.php>

Abstract

Neutron elastic and inelastic scattering cross sections, along with γ -ray production rates, are required in many technical fields such as basic nuclear science, experimental design and analysis, medical treatment and dosimetry, the fission and fusion power industries, homeland security, non-proliferation, safeguards, and the interrogation communities. Our collaboration, which includes scientists from the United States Naval Academy, the University of Kentucky, and the University of Dallas, has spent the last several years measuring neutron cross sections that are particularly important for the energy-production community and for our understanding of how neutrons interact with matter. Facilities at the University of Kentucky Accelerator Laboratory (UKAL) give us the opportunity to measure cross sections with well-defined incident neutron energies in the fast part of the spectrum. Our measurements have focused on the measurement of cross sections for ^{23}Na , $^{54,56}\text{Fe}$, ^{12}C , ^7Li and ^{19}F , which are materials for next-generation reactors, containment vessels, energy-calibration standards and global data evaluations. An overview of our experimental program and results from our studies will be presented.