

Dennis McNabb

Lawrence Livermore National Laboratory

Abstract:

LLNL is an applied science laboratory that innovates technology to enable new ideas and concepts for government agencies responsible for nuclear security, counter-terrorism, national defense, energy, and environment. The Nuclear and High Energy Physics Section of LLNL provides and advances nuclear physics, particle physics and accelerator technology capabilities in support of these programs and other national priorities in science and technology. I will give an overview of our research in nuclear theory, nuclear data, low-energy experiments, and heavy-ion collisions and give examples of how we use our unique knowledge and skills in these areas in support of applications. In addition, I will give an overview of LLNL's newest scientific and programmatic resource, the National Ignition Facility. High Energy Density Physics facilities offer the intriguing possibility of studying the effect that hot plasma environments and high-brightness neutron sources have on nuclear reactions, possibly in a regime where there is interplay between nuclear and atomic interactions. To motivate these possibilities, some of the outstanding issues in thermonuclear reactions and neutron-induced reactions on unstable or excited nuclei will be reviewed and our initial experiments and plans for solving and addressing these issues will be presented.