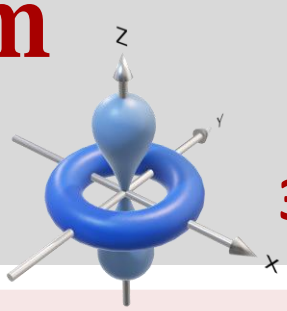
Department of Physics Colloquium

October 31, 2022 **3:00 PM**



The 2022 Nobel Prize in Physics: a Personal Story from a Non-Expert

Prof. Jim Napolitano

Temple University

Quantum mechanics is a tremendously successful framework for building theories of the natural world. Its predictions, however, are based on probabilities, and this led many notable physicists, Albert Einstein among them, to doubt its foundation. A different approach, based on “hidden variables”, was put forth by these physicists, which appeared to give identical predictions to quantum mechanics. Then John Bell showed that you could in fact tell the two approaches apart experimentally, and an experiment was done that agreed with quantum mechanics. The 2022 Nobel Prize in Physics was given to John Clauser for conceiving the experiment, to Alain Aspect for “closing the last loophole”, and Anton Zeilinger for pioneering quantum information science.

Clauser’s experiment was in fact performed by my mentor Stuart Freedman as his PhD thesis. Stuart went on to a uniquely stellar career in atomic, nuclear, and high-energy physics, and was elected to the National Academy in 2001. This colloquium will explain the violation of “Bell’s Inequality” that struck down (local) hidden variable theories and give me a chance to tell you all some stories of the things I learned from Stuart.

This colloquium will be held in-person, at SERC 116 unless announced otherwise.