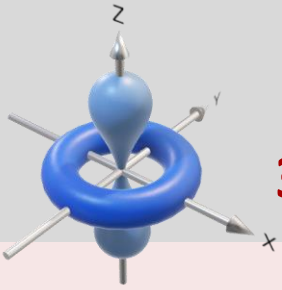
Department of Physics Colloquium

March 30, 2026



3:00 PM

The unity of physics: The beauty and power of spectroscopy

Prof. Paul S. Julienne
Joint Quantum Institute, NIST and the University of Maryland

Abstract: Spectroscopy was a key component in developing the "old" or original quantum physics of the last century, but is also essential for successful implementation of the exotic "new" quantum physics of our current "second quantum revolution." Knowing the spectrum of a complex quantum system is the best way to characterize and control it quantitatively. This talk will look at some basic principles of ultracold atomic and molecular physics, and the importance of good spectroscopy as an underlying, enabling method of building highly quantitative Hamiltonians and predictive models of tunable cold atom scattering and bound states. A comparative examination of the large differences in the characteristics of near-dissociation bound states of the three Li2 isotopologues demonstrate the need for good spectroscopically derived molecular potentials as a basis for comprehensive quantitative understanding of the dynamics of ultracold atomic systems and their various applications in physics and chemistry.

This colloquium will be held in-person, in SERC 116

Host: Marjatta Lyyra and Ergin Ahmed