Ultracold atomic physics, the study of matter at temperatures near absolute zero, has allowed scientists to observe macroscopic quantum phenomena, such as superfluidity, superconductivity, and Bose-Einstein condensation. Ultracold physics continues to be at the forefront of new technologies such as atomic clocks and quantum computers. Over the past decade there has been growing interest in studying simultaneously trapped and cooled atomic ions, molecular ions, and neutral atoms. These hybrid ion-neutral traps [pioneered at the University of Connecticut (UCONN)] have been used to study cold and ultracold ion-neutral elastic and charge-exchange collisions. The study of ion-neutral collision dynamics within the ultracold regime is of interest to such fields as precision spectroscopy, astrophysics, and quantum information. This talk will focus on the physics behind the hybrid trap apparatus, as well as highlight some of the most interesting results from experiments performed at University of California-Los Angeles, Massachusetts Institute of Technology, University of Cambridge, and UCONN.

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(refreshments will be offered at 2:45 pm)