

THE ROLE OF RYDBERG STATE IN PRESSURE BROADENING AND  
MOLECULAR PHOTOIONIZATION

Chris Greene

*JILA, University of Colorado, Boulder, CO*

The study of diatomic Rydberg molecules having one electronic ground state atom that is far from a Rydberg atom has led to the prediction of a number of unusual quantum mechanical states. In some of these states, Born-Oppenheimer potential curves are predicted to exist that exhibit numerous oscillations as a function of the internuclear distance,  $R$ . The oscillations are comparable to the de Broglie wavelength of the Rydberg electron when it moves at distances comparable to  $R$ . While such states were predicted years ago, experimental evidence for their existence remains questionable. This talk will discuss our progress towards making concrete predictions of their properties that will hopefully result in experimental tests of their existence and of their main features.