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**Long Range, Cold Cs Rydberg Atom–Rydberg Atom  
Molecules**

Cold Rydberg gases are a promising system for exploring many of the ideas of quantum computation because of the dipole blockade effect. Dipole blockade takes place when the interaction between Rydberg atoms prevents additional Rydberg atom excitation due to the energy shift of the transition out of resonance with an applied laser field. The interaction between Rydberg atoms can also bind the atoms in a unique molecular state analogous to a biexciton or lead to inelastic collisions. In this talk we will describe the Rydberg atom interactions that lead to blockade as well as experiments on molecule formation and collisions.



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