

Rydberg atom properties and interactions with atoms, molecules, and fields

The basic properties of one electron Rydberg atoms are reviewed, with attention to the origin of the scaling laws of Rydberg atom properties. Many, but not all, are due to the large orbital radius of the Rydberg atom and the $1/2n^2$ binding energy. The effects of the finite sized core in any atom other than hydrogen will be discussed. It is the strong interaction of the Rydberg atoms with other atoms, molecules and fields which makes them so interesting. The interactions with atoms and molecules are discussed by means of examples, with a focus on short range interactions (Long range dipole-dipole interactions are postponed to the second day.). The interactions with electric fields, from static fields to visible radiation, is discussed. A focus is pulsed field ionization, a widely used technique for the selective detection of Rydberg atoms.