1019-35-101 **Zhonghai Ding***, Department of Mathematical Sciences, University of Nevada, Las Vegas, NV 89154-4020. *Some three-body problems in atomic and molecular quantum mechanics.*

In this talk, we discuss some three-body problems (He and He like atoms) in atomic and molecular quantum mechanics, which are described by the Schrodinger-Born-Oppenheimer model. We present: (1) some basic analytical properties of the SBO model; (2) the D-scaling analysis of the three-body problems; (3) some mathematical analysis of the Bohr energy function. Numerical computation of the stable and unstable excited states will be discussed also. The numerical algorithms proposed are based on the ideas of the steepest descent method and the numerical mountain pass method. (Received August 08, 2006)