Consider a simple solid containing N atoms. Let q_i be the (appropriately normalized) amplitude of the ith normal mode, and p_i the momentum conjugate to this coordinate. In this case, we can expand the potential energy of interaction between the atoms to give an expression which is quadratic in the atomic displacements from their equilibrium positions. Now, atoms in solids cannot translate (unlike those in gases), but are free to vibrate about their equilibrium positions. Each atom is specified by three independent position coordinates, and three conjugate momentum coordinates.