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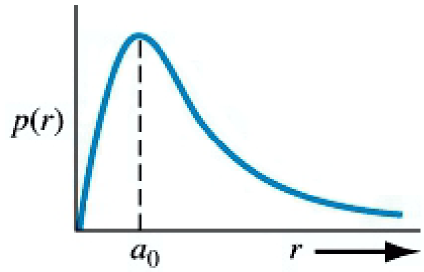

Figure 3.1 | (a) Probability density function of an isolated hydrogen atom.

- Remember that the Bohr radius $a_0 = 0.529$ Å.
- Next look at what happens when two hydrogen atoms (and their electrons) are put with in ~8 Å of one another.

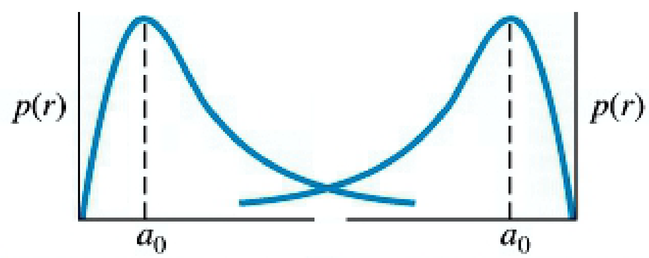

Figure 3.1 | (b) Overlapping probability density functions of two adjacent hydrogen atoms.

- Per Pauli exclusion principle, both electrons can not have the same quantum state ⇒ the E_1 energy state splits into two (very close) discrete energy states.

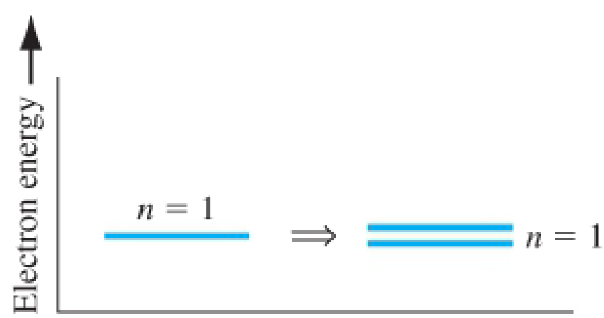

Figure 3.1 | (c) The splitting of the $n = 1$ state.