Systems with just **two outcomes**, like heads/tails or spin up/spin down – Let *p* be the probability of one observation giving the occurrence H and  that of it not occurring. Now repeat the experiment several times and assume these are **independent events**. The probability that H occurs in N trials is given by the binomial distribution.

 

Note: 

For , .

Probability of *n* event out of *N* attempts with *p* small. Then and  This leads to the Poisson Distribution, 

Three coins are flipped – There are possible microstates: HHH, HHT, HTH, HTT, THH, THT, TTH, TTT. What is the probability that we get two heads when tossing three fair coins? 

For Einstein Solids, this count is different. Here there are E things (quanta of energy) to be attached to N objects. This gives .