

Lagrange multipliers are used to find the local minima and maxima of a function subject to equality constraints
In statistical mechanics, Lagrange multipliers are used to maximise

$$\frac{N!}{\prod_i N_i!} \prod_i (g_i)^{N_i}$$

subjected to :- $\sum_{i=1}^{\infty} N_i = N$ and $\sum_{i=1}^{\infty} E_i N_i = E$