

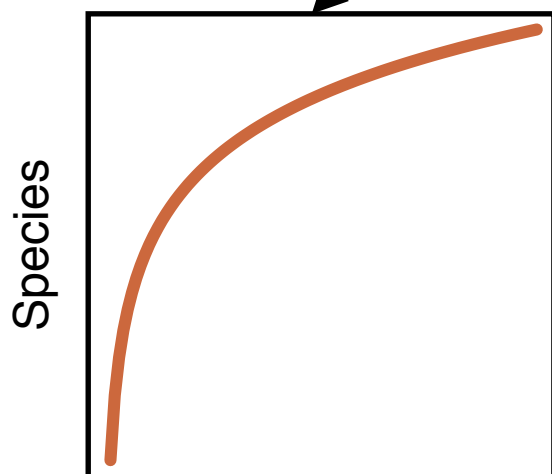
Joint probability of abundance (n)
and metabolic rate (ε)

$$R(n, \varepsilon) = \frac{1}{Z} e^{-\lambda_1 n} e^{-\lambda_2 n \varepsilon}$$

λ_1 and λ_2 are Lagrange multipliers from
constrained entropy maximization

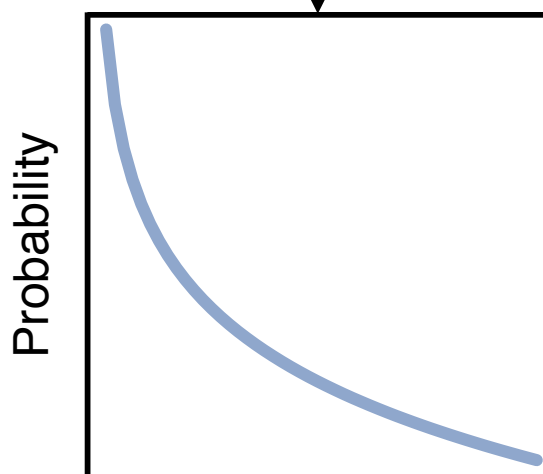
$$S_0 \sum_n \Pi(0|n) \int R(n, \varepsilon) d\varepsilon$$

Π comes from entropy
maximization across space



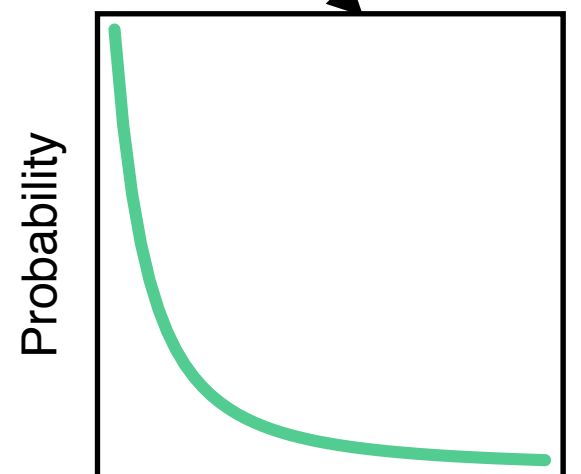
Area

$$\int R(n, \varepsilon) d\varepsilon$$



Abundance

$$\frac{S_0}{N_0} \int n R(n, \varepsilon) dn$$



Metabolic rate