$$\ln\left(\frac{\Omega_2}{\Omega_1}\right) = \ln\Omega_2 - \ln\Omega_1 \quad \begin{cases} N_T \ln(N) >> 1 \\ N \ln(N_T) << 1 \end{cases}$$

$$= \frac{N!}{\left(\left(\frac{N_T}{N}\right)!\right)^N} - \frac{N!}{N_T!}$$

$$= \ln N! - \ln\left(\frac{N_T}{N}!\right)^N - \left[\ln N! - \ln N_T!\right]$$

$$= \ln N! - \ln(N_T!)^N + \ln(N!)^N - \ln N! + \ln N_T!$$

$$= N\ln N - N - N\ln N_T + N\ln N - N\ln N + N + N_T \ln N_T + N_T$$

$$= N\ln N - N\ln N_T + N_T \ln N_T + N_T$$

$$= N \ln \frac{N}{N_T} + N_T \ln N_T + N_T$$

NTO PEQUENO

$$= N_T \ln N_T + N_T$$

$$= e^{N_T \ln N_T} \; e^{N_T}$$

$$= \left(N_T e\right)^{N_T}$$