## 2 ebatze-modoa
## Multzo kanonikoan dagoen sistema
***biderkatzaileen metodoa***

$$\ln W = \ln(\mathcal{N}!) - \sum_r \ln(n_r!)$$

$$\ln W = \mathcal{N} \ln \mathcal{N} - \sum_r n_r \ln n_r$$

$$\delta(\ln W) \doteq -\sum_r (\ln n_r + 1)\delta(n_r)$$

$$\sum_r \delta n_r = 0$$

$$\sum_r E_r \delta n_r = 0$$

$$\sum_r \{-(\ln n_r^* + 1) - \alpha - \beta E_r\}\delta n_r = 0$$

$$\ln n_r^* = -(\alpha + 1) - \beta E_r$$

$$n_r^* = C \exp(-\beta E_r) \qquad \frac{n_r^*}{\mathcal{N}} = \frac{\exp(-\beta E_r)}{\sum_r \exp(-\beta E_r)}$$

Multzo MIKROkanonikoan erabili den metodoa:

- Lagrange-ren biderkatzaileak +
- itxidura-baldintza(k) = energiarekin lotuta dagoena!

$$n_r^* = C \exp(-\beta E_r) \qquad \frac{n_r^*}{\mathcal{N}} = \frac{\exp(-\beta E_r)}{\sum_r \exp(-\beta E_r)}$$

$$\frac{\mathcal{E}}{\mathcal{N}} = \frac{\sum_r E_r \exp(-\beta E_r)}{\sum_r \exp(-\beta E_r)} \qquad \rightarrow \qquad \beta$$