Jan 21

$dw = \rho(p,q)\,dp\,dq$ Class.

$w_n,\ w(E)$

$\bar{f} = \int dp\,dq\, f(p,q)\,\rho(p,q);\quad \int \rho\, dp\,dq = 1$

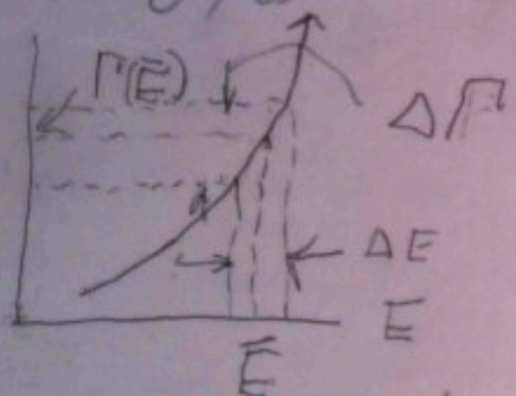
$\bar{f} = \sum_n w_n f_{nn} \qquad w_n = e^{-\alpha - \beta E_n}$ Gibbs

$\sum_n w_n = 1 \longrightarrow \int w(E) \frac{d\Gamma}{dE} dE = 1$

\# quantum state occupied by a system at finite T is enormous

$\Gamma(E)$ \# states with energies less than some chosen energy E $\quad E > E_{ground}$

$\Gamma(E)$



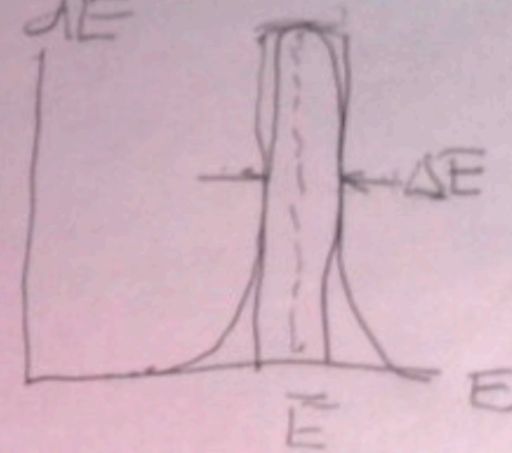
ΔΓ effective \# of quantum states system occupies

Introduce an prob density for E $W(E)$

$\int W(E)\, dE = 1$

$W(E) = \frac{d\Gamma}{dE}\, w(E)$

$W(E)$



$W(\bar{E})\,\Delta E = 1;\ \Delta E \ll \bar{E}$

$w(\bar{E})\,\Delta\Gamma = 1$

$\Delta\Gamma = \Delta(E, \alpha, \beta)$

$\sigma^{(q)} = \ln \Delta\Gamma^{(q)} \qquad \Delta\Gamma = 1,\ T = 0$

as $T \longrightarrow 0$ $\Delta\Gamma$ gets smaller

$\sigma^{(q)} \longrightarrow 0$ as $T = 0$

dimensionless entropy is $\ln \Delta\Gamma$