$$F = -(k_B T) \ln Q_N(T,V)$$

$$\Big\| \quad \Big[Q_1(T,V) \Big]^N$$

$$F = -(k_B T) N \ln \left[Q_1(T,V) \right]$$

$F = F(T,V,N) \rightarrow F = F(T,M,N)$ SISTEMA MAGNÉTICAMENTE

$U = U(S,M,N) \rightarrow U[T] \equiv F = U - TS$

$$F = F(T,H,N)$$

$$U[T,H] \equiv G_{Mag}(T,H,N) = U[T] - H \cdot M$$

"entalpía magnética"

$$\boxed{G_{mag}(T,H,N) = U[T](T,H,N) - H \cdot M(T,H,N)}$$

$U[T] = U[T](T,M,N)$

$\frac{\partial U[T]}{\partial M} = H \Rightarrow H = H(T,M,N) \Rightarrow M = M(T,H,N)$

$\frac{\partial U[T,H]}{\partial H} = -M \quad \Rightarrow \quad \frac{\partial}{\partial H}\left(-N(k_B T) \ln Q_1(T) \right) = -M$

$$M = \frac{\partial}{\partial H}\left(N(k_B T) \ln Q_1(T) \right)$$

$$\boxed{M = N(k_B T) \frac{\partial}{\partial H}\left(\ln Q_1(T) \right)}$$

OZ proiektatu

"KLASIKOKI"

"KUANTIKOKI"