

# Maxwell Relations

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$$\left(\frac{\partial T}{\partial V}\right)_S = - \left(\frac{\partial p}{\partial S}\right)_V$$

Energy,  $E(S, V)$

$$\left(\frac{\partial T}{\partial p}\right)_S = \left(\frac{\partial V}{\partial S}\right)_p$$

Enthalpy,  $H(S, p)$

$$\left(\frac{\partial S}{\partial V}\right)_T = \left(\frac{\partial p}{\partial T}\right)_V$$

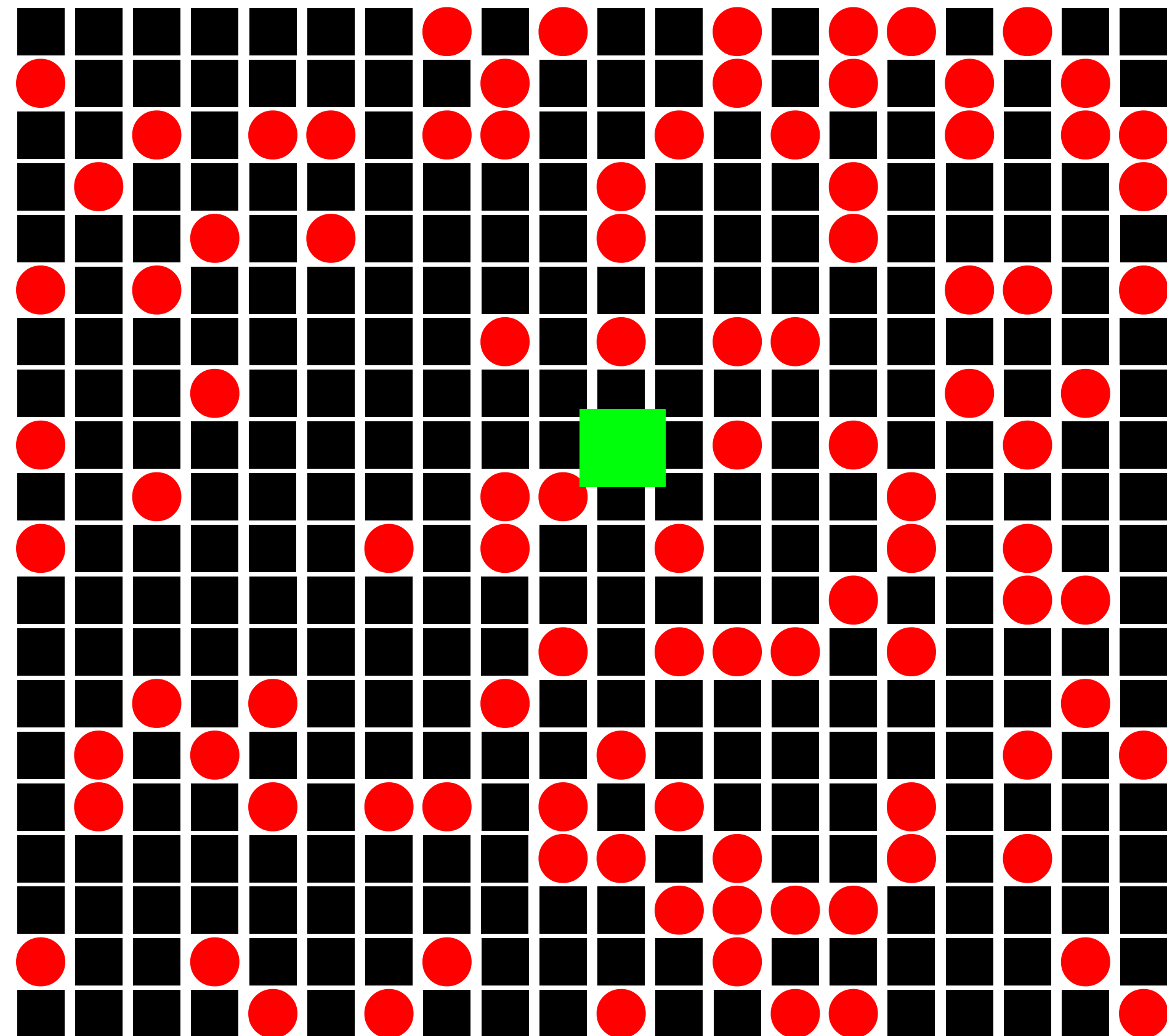
Free Energy,  $F(T, V)$

$$\left(\frac{\partial S}{\partial p}\right)_T = - \left(\frac{\partial V}{\partial T}\right)_p$$

Gibbs Free Energy  $G(T, P)$

# Contribution to Entropy From a Single Site:

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Pick a site: the other sites form the reservoir at temperature  $T$