Macro variables: T, Le, V  The mical potential  (alternatively, may choose z = e  fugacity  of (T, p, V) = \( \frac{Z}{Z} \) \( \Q_N(T, V) = \( \frac{Z}{N^2} \) \( \frac{Z}{N} \) \( \Q_N(T, V) \)  • Ensemble average:  (f) = \( \frac{Z}{N^2} \) \( \Q_N(T, V) \)  • Connection between grand canonical ensemble and thermo dynamics:  P V = & T log &  pressure	· Grand canonical en	semble: system in contact , heat and particle reso
(alternatively, may choose 2 = e  figurity  Frank partition function Q:  G(T, n, V) = \( \frac{\pi}{N} \)	Macrovaniables:	Τ, μ, ν
Frank partition function &:  Q(T, y, V) = \( \frac{2}{N} \) \( \Q_N(T, V) = \( \frac{2}{N} \) \( \Q_N(T, V) \)  Ensemble average:  \( \frac{1}{N} = \frac{2}{N} \) \( \Q_N(T, V) \)  \( \frac{1}{N} = \frac{2}{N} \) \( \Q_N(T, V) \)  Connection between grand canonical ensemble and thermody namics:  \( \frac{1}{N} = \frac{1}{N} \)  \( \frac{1}{N} = \frac{1}{N} \)  \( \frac{1}{N} = \frac{1}{N} \)  \( \frac{1}{N} = 1		
· Frank partition function Φ:  G(T, μ, V) = Σ  N=0 2 Q <sub>N</sub> (T, V) = E  N=0 E  Semble average:  (f) = Σ  N=0 f 2 Q <sub>N</sub> (T, V)  (onnection between grand canonical ensemble and thermody namics:  P V = & T log Q		
Of $(T_1, \mu_1, V) = \sum_{N=0}^{\infty} \frac{2}{2} R_N (T_1, V) = \sum_{N=0}^{\infty} \frac{2}{2} R_N (T_1, V)$ • Ensemble average:  (f) = $\sum_{N=0}^{\infty} \frac{1}{2} R_N (T_1, V)$ • Connection between grand canonical ensemble and thermodynamics:  P $V = k T \log Q$		
Ensemble average:  (f) = \( \frac{1}{N-5} \) \( \frac{1}{2} \) \( Q_N(\tau_1 \) \)  (connection between grand canonical ensemble and thermodynamics:  \[ P V = k \) \( \text{log.} \) \( \text{Q} \)		
· Connection between grand canonical ensemble and thermodynamics:  PV = & T log &	· Ensemble average	
thermodynamics:  PV = kT log Q	( ) = No.5	$\frac{2}{2} Q_{N}(T_{i}V)$
PV = kT log Q	· Connection between	grand canonical ensemble and
pressure	thermo dy namics	PV=&Tlog Q
		pressure