

Lecture notes

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Thermodynamic limit

$$N \rightarrow \infty \wedge \frac{V}{N} = \text{constant} \wedge \frac{U}{N} = \text{constant}$$

Ergodic system

$$\text{Time average } \overline{N_1} = \lim_{\tau \rightarrow \infty} \frac{1}{\tau} \int_0^\tau N_1(t) dt$$

$$\text{Ensemble average } \langle N_1 \rangle = \sum_{N_1=0}^N N_1 P(N_1)$$

$$\text{Ergodic theorem: } \langle N_1 \rangle = \overline{N_1}$$

'For ergodic systems, the time average and the ensemble average are equal.'