

$$\mathcal{Z} = \frac{V^N}{N!h^{3N}} \prod_{i=1}^N \int \mathrm{d}^3\boldsymbol{r_i} \, \mathrm{d}^3\boldsymbol{p_i} \, e^{-\beta H(\boldsymbol{p_1},\dots,\boldsymbol{p_N},\boldsymbol{r_1},\dots,\boldsymbol{r_N})}$$