Phys 727 Lecture Notes – List of Symbols (11 apr 2021)

Latin Letters

A ..... observable
B ..... magnetic field
c ..... speed of light, speed of sound
C, C_V, C_p ..... heat capacity
D ..... self-diffusion constant
e ..... base of natural logarithms
e ..... elementary charge
E ..... energy of a system
$\vec{f}$ ..... intensive thermodynamic variables
F ..... Helmholtz free energy
g ..... density of states
g_s ..... number of internal/spin states
G ..... Gibbs free energy
h, $\hbar$ ..... Planck's constant ($\hbar := h/2\pi$)
H ..... enthalpy
H, $\hat{H}$ ..... Hamiltonian, Hamiltonian operator
k, $\mathbf{k}$ or $\vec{k}$ ..... wave number, wave vector
k_{B} ..... Boltzmann's constant
i ..... imaginary unit
i ..... label for a particle in a system
L ..... length
m ..... particle mass
M ..... magnetization
n ..... integer label, number of moles
N ..... total number of particles
N_α ..... occupation number of state α
p, $\mathbf{p}$ or $\vec{p}$ ..... momentum
p ..... pressure
P .... probability function (distribution, density)
q ..... electric charge, configuration variable
Q ..... heat
r, $\mathbf{r}$ or $\vec{r}$ ..... radial distance, position vector
R ..... molar constant
s ..... microstate for physical system
S ..... entropy
T ..... temperature
$\vec{u}_i$ ..... displacement from equilibrium
v, $\mathbf{v}$ ..... speed, velocity
V ..... volume
W ..... work
$\vec{X}$ ..... extensive thermodynamic variables
z ..... fugacity
Z ..... partition function

Greek Letters

α ..... label for single-particle quantum state
β ..... inverse temperature, $1/k_{\mathrm{B}}T$
γ ..... internal part of single-particle state label
δ ..... gas degeneracy parameter
ϵ ..... single-particle energy
η ..... coefficient of viscosity
κ, κ_T, κ_S ..... compressibility
κ ..... coefficient in quadratic Hamiltonian
κ ..... coefficient of thermal conductivity
κ_I ..... effective spring constant for solid lattice
λ ..... wavelength, thermal wavelength
μ ..... chemical potential, magnitude of $\vec{\mu}$
$\vec{\mu}$ ..... magnetic dipole moment
ρ, $\hat{\rho}$ ..... distribution function, density matrix
ρ ..... number density
ϕ ..... element of single-particle state basis
ψ ..... wave function
ω ..... angular frequency
Ω ..... phase space volume, grand potential