

PHYSICS 210A : STATISTICAL PHYSICS
HW ASSIGNMENT #5

- (1) For a noninteracting quantum system with single particle density of states $g(\varepsilon) = A \varepsilon^r$ (with $\varepsilon \geq 0$), find the first three virial coefficients for bosons and for fermions.
- (2) How would you formulate the Lindemann melting criterion for Einstein phonons?
- (3) Derive the analogue of Stefan's Law for a two-dimensional blackbody. What happens if the photon dispersion is replaced by $\varepsilon(\mathbf{k}) = C|\mathbf{k}|^\alpha$?