0. What do I "see" if I "look" at a star?
Surface! What is the surface? What you see

1.) Temperature ← Planck spectrum

2.) $E = hf = h\frac{c}{\lambda}$ H H

3.) Strength of a given spectral line

# of atoms in correct state × intrinsic strength

$$\frac{1}{e^{E/kT}} \rightarrow \text{Temperature}$$

$\rightarrow f_{surface} \simeq \sigma T^4$ + Parallax → Size!

Classical: $x(t)$

Q.M.: $\psi(x,t) \in \mathbb{C}$ Wave function (state vector)

$\rightarrow$ Prob $(x \dots x+\Delta x) \simeq |\psi(x,t)|^2 \Delta x$

"Standing" wave functions
Stationary states $|\psi(x,t)|^2$

Hamilton Operator
represents energy

$$H\psi \overset{ex.}{=} -\frac{\hbar^2}{2m}\frac{\partial^2}{\partial x^2}\psi + V(x)\psi$$

kinetic energy; potential energy

stationary states: [eigenfunctions of H]: $H\psi = E\psi$

H: operator; E: constant number

E = [binding] energy