## Problems with Bohr's theory

1. Quantum leaping
2. nucleus answer sticks!
3. math only for H (things w/ 1 e⁻)

## What we learned from AE, LdB and WH

wave = particles

... e⁻ = λ

wave equations

can't know where/how moving

stat's + probability

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## Schrodinger's Wave Equation

very simple

psi → wave function

$E\Psi = H\Psi$

Hamiltonian function

math

eqn ... solve ... get ⟹ ? graph

$$E\Psi = -\frac{h^2}{2m}\frac{d^2\Psi}{dx^2}$$

y = mx + b

answer → graph

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## Things to know about standing waves...

Nodes

no measurable value

## Energy v. Wavelength

$E \propto \frac{1}{\lambda}$

only stable .... if

$= \# \cdot \frac{1}{2}\lambda$

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## 4 variables (quantum numbers)

n — NRG level

1, 2, 3 ...

l — orbital type (s, p, d)

↳ # of ∡ nodes

— 0, ... n-1

m — spatial orientation

— $-l$ ... 0 .... $l$

$m_s$ — spin ($\pm \frac{1}{2}$)

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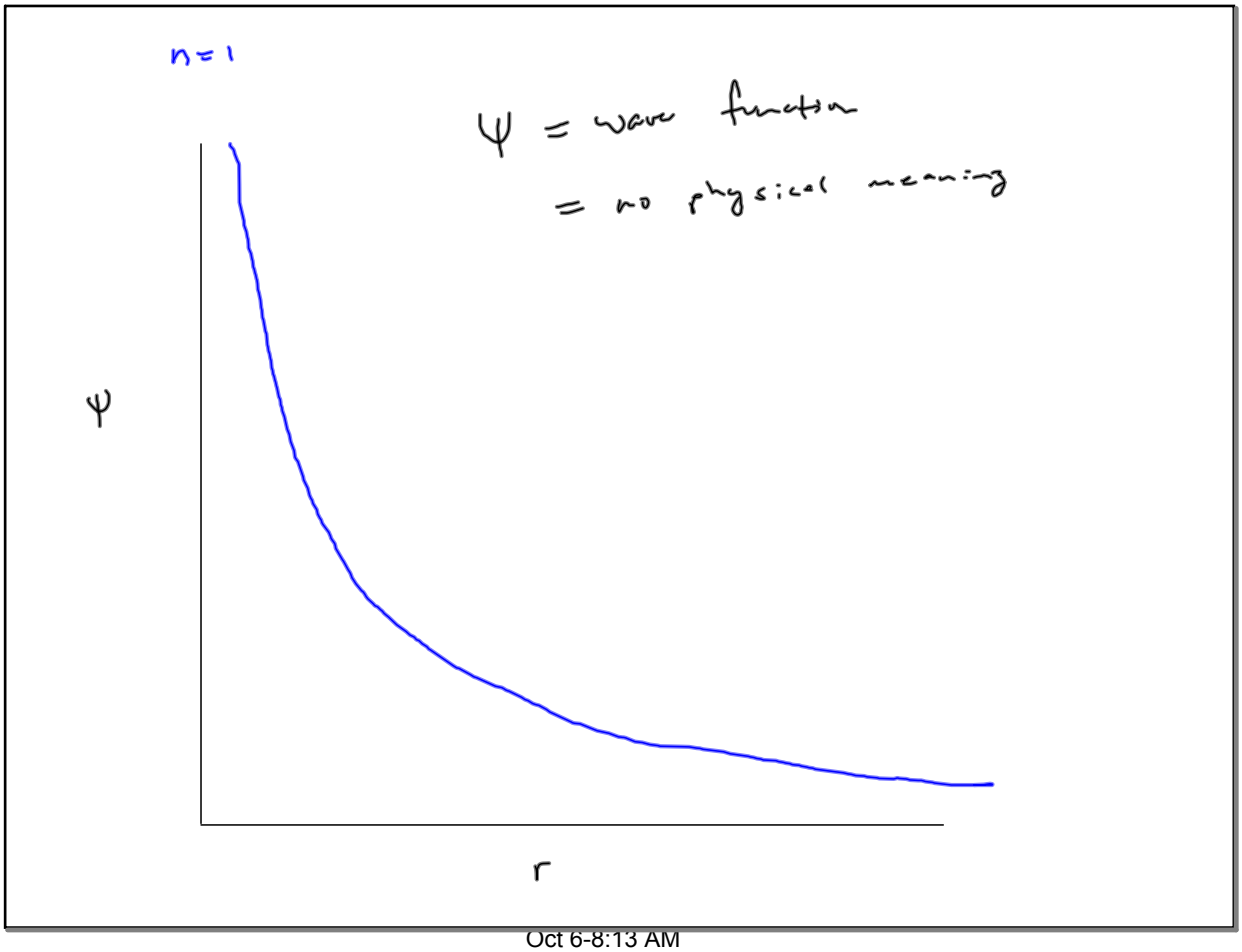


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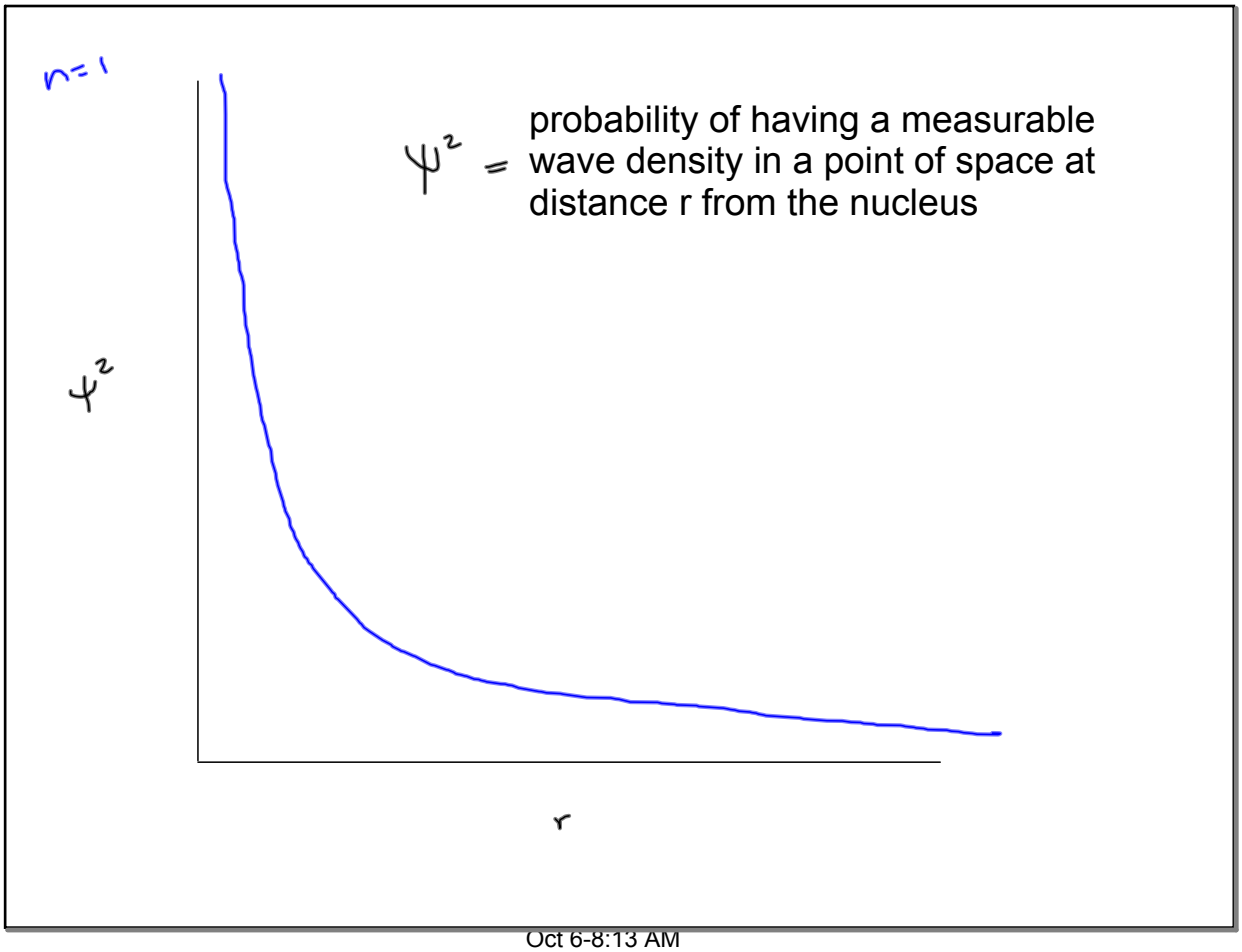


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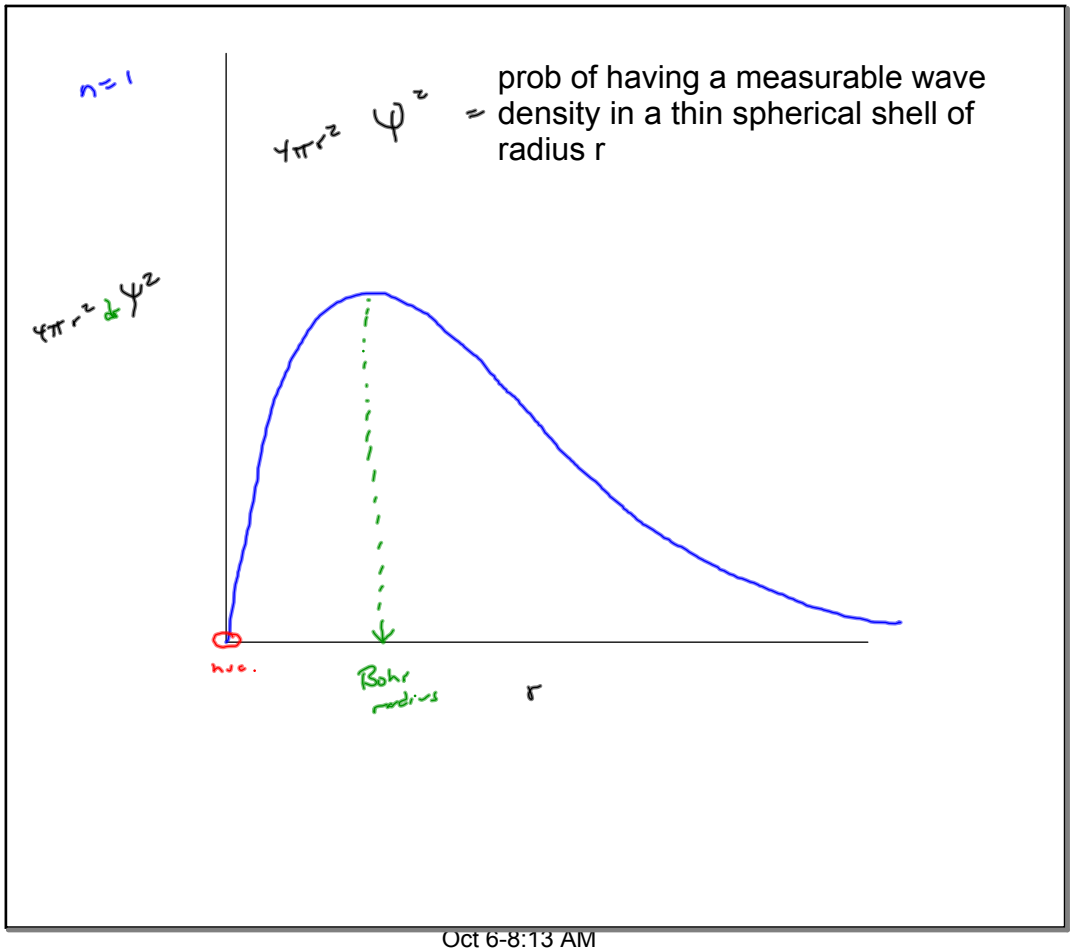
n = 1
$4\pi r^2 \psi^2$ = prob of having a measurable wave density in a thin spherical shell of radius r
$4\pi r^2 d\psi^2$
nuc.
Bohr radius
r

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