Phys 301 Lecture 25
The Schrödinger Equation!

"THE" Schrödinger Equation?

$$\frac{d^2\psi(x)}{dx^2} = -\frac{2m}{\hbar^2}[E - U(x)]\psi(x)$$

Second derivative of ψ with respect to position.

m = mass of particle.
That's an *h*-bar squared in the denominator!

Total mechanical energy of the particle (constant)

Potential energy of the environment (the particle-environment system), as a function of position.

The ψ we know and love, as a function of position.

1925
(de Broglie: 1924)

A Clarification

- That is the time-*IN*dependent Schrödinger Equation.
- Work with the Time-Dependent Schrödinger Equation, and practice with solving differential equations.
- Handout A

Potential Functions

- Practice with $U(x)$ using classical examples, before we apply this to quantum mechanics.
- For conservative forces:

$$\Delta U(x) = -\int_{x_1}^{x_2} F_x^{cons}(x)\,dx \qquad F_x^{cons}(x) = -\frac{dU(x)}{dx}$$

- Start Handout B