

# EXAMPLES OF PDE'S

Laplace's equation

$$\nabla^2 \phi = \frac{\partial^2 \phi}{\partial x^2} + \frac{\partial^2 \phi}{\partial y^2} + \frac{\partial^2 \phi}{\partial z^2} = 0$$

↑ electrostatic potential

The wave equation

$$\nabla^2 \phi = \frac{1}{c^2} \frac{\partial^2 \phi}{\partial t^2}$$

↑ speed  $c$

The Schrödinger equation

$$-\frac{\hbar^2}{2m} \nabla^2 \psi + V \psi = i\hbar \frac{\partial \psi}{\partial t}$$

↑ quantum wave function  
(probability amplitude)

↑ potential energy

The heat-flow equation

$$\nabla^2 \phi = \frac{1}{D} \frac{\partial \phi}{\partial t}$$

↑ temperature inside body