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Notes on Gravity as a Quantum Theory

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1 Classical Fields

$\phi(\vec{\mathbf{x}}, t)$ gives the value of the classical field at every point in spacetime. The simplest classical field is the *real scalar field*, which is characterized only by real numbers. The Klein-Gordon equation governs a free massive scalar field.

$$\frac{\partial^2 \phi}{\partial t^2} - \sum_{x_j} \frac{\partial^2 \phi}{\partial x_j^2} + m^2 \phi = 0$$