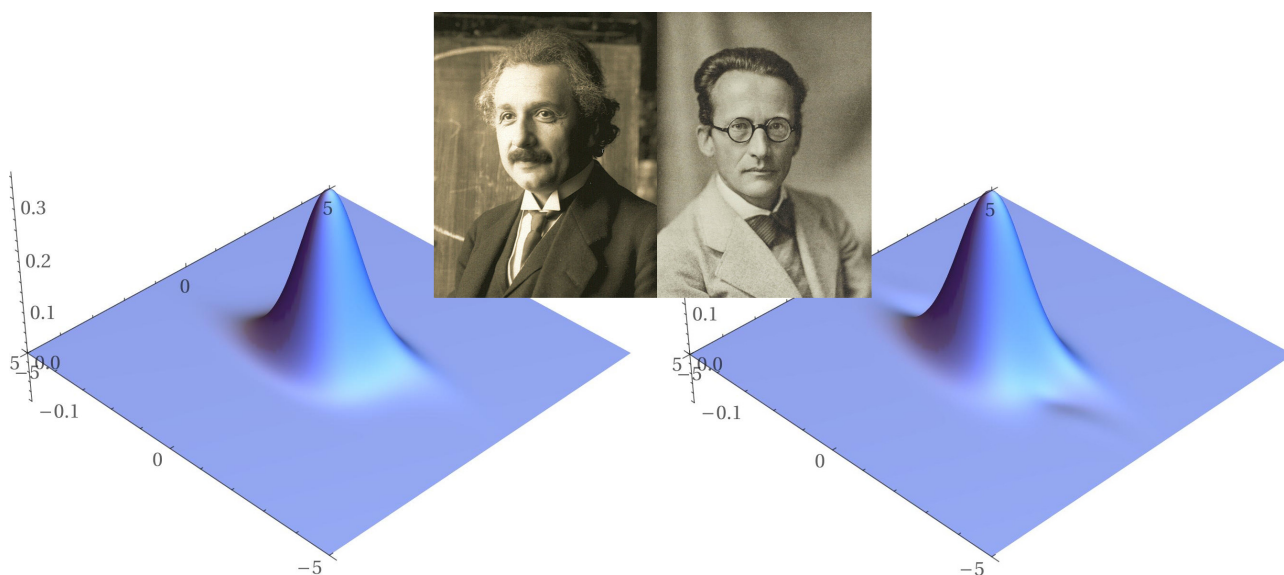




# Towards experimentally probing quantum properties of gravity

**Priv.-Doz. Dr. Matthias Kleinmann**

Universität Siegen



The quantum-mechanical description of gravity is one of the major open problem in theoretical physics. Usually, it is considered as the task of formulating general relativity within the framework of quantum field theory. While such a formulation is essential for a comprehensive theoretical understanding of physics, no foreseeable Earth-bound experiment is likely to strongly confirm a quantized theory of gravity. Recently, however, a new class of quantum-optics inspired table-top experiments has been proposed, suggesting that quantum aspects of gravity eventually can be testable in the near future. In my talk I will discuss what is experimentally known about the “quantumness” of gravity, and how these novel experimental proposal could constrain key aspects of quantum gravity. In particular, I will discuss, whether Newtonian gravity necessarily participates in the Schrödinger equation, and which kind of theory can suggest experiments that could reveal us otherwise.