UM Physics Department

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Title: From Harmonic Oscillators to Quantum Gravity

Abstract:

Canonical quantization (CQ) has been successful in solving many problems, and is a tool used for nearly all cases. But CQ has not worked well for some problems that have resisted any acceptable solution. Happily, the harmonic oscillator, with $-\infty<p,q<\infty$, is well solved. However, for the half-harmonic oscillator, where $-\infty<p<\infty$, while $0<q<\infty$, CQ fails significantly. Likewise, quantum gravity has failed with CQ as well. A new quantization process called affine quantization (AQ) will be introduced. AQ leads to acceptable solutions for the half-harmonic oscillator and shows considerable success for quantum gravity. This lecture will demonstrate the solution of the half-harmonic oscillator and leads to a meaningful Schrödinger equation for quantum gravity, which is in position to seek appropriate solutions from complex differential equations.