WWTF Project MA07-037

Correlation in quantum systems

Abstract

Concepts of correlation in quantum systems are very important in several branches of physics. The "correlation energy" is a concept of quantum chemistry responsible for most of the chemical behavior of small molecules. Mysterious phases of condensed matter are attributed to "correlation."
With the advent of ultrafast laser spectroscopy, correlated motion of electrons in atoms has becomes something that can be inferred from experiment. The concept of "entanglement" between disjoint quantum systems is a kind of "correlation" central to quantum information processing. At the center of the project is the quest for a mathematical understanding of "quantum correlation" relevant to the purposes and concepts of modern quantum mechanics. The first stages of this proposal promise immediate benefits for the study ultracold gases of fermions and bosons.

Keywords:
Quantum Physics, Quantum Information, Correlation,Entanglement, Entropy, few electron systems, MCTDHF,ultracold fermions, ultracold bosons

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Further links about the involved persons and regarding the project you can find at
https://archiv.wwtf.at/programmes/mathematics/MA07-037