Old Dominion University
Department of Physics

Colloquium

Tuesday, February 9, 2016

" Five is Different: Symmetry, Solvability and Entanglement in Quantum Few-Body Systems"

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Abstract: In quantum mechanics, one particle systems are “easy” to solve, and two particles are (technically) always solvable. Three and four particles are a lot harder, and five particles…fuhgettaboutit. But why? And why should we care? The second question is straightforward: phenomena in nuclear, atomic, molecular, and solid state systems can often be reduced to the properties of few-body systems. The increasingly precise measurement and control of ultracold atoms in optical traps allows predictions of few-body quantum theory to be tested as never before. Ultracold atoms could be the working material for new quantum technologies that exploit coherence and entanglement to perform efficient information processing. However, answering the first question "why is few body physics so hard" requires looking at how symmetry becomes less and less constraining as the number of particles increases, and finally completely fails (for most systems) at five particles.

Presentation: OCNPS 200 @ 3:00 pm
Refreshments: OCNPS Atrium @ 2:30 pm

All interested persons are cordially invited to attend.