

Department of Physics & Astronomy

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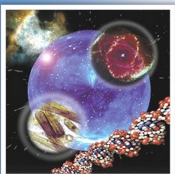
Friday, April 26, 2013

3:00 p.m. - 4:00 p.m.

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Recent Progress Treating Noise in Quantum Devices

Since the mid-1990's, the view that quantum mechanics is useful for creating practical devices has supplanted the view that it is a strange theory necessary for describing nature. It has been shown that quantum states could provide secure communication channels, could be used in new types of games, and for quantum computing. Several quantum computing algorithms provide a speedup over their classical counterparts. These include, but are not limited to, searching an unsorted database, factoring large integers, and simulating quantum systems. To take advantage of quantum mechanics to build quantum devices, the noise in the quantum systems must be overcome. In this talk, I will give a brief description of how we describe noisy quantum evolution and how we might treat the noise present in quantum information processing devices. This includes several methods which use both hardware and software. I will then describe a project to determine and, where possible, reduce, the resources necessary to implement various quantum algorithms by improving error prevention techniques.



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