

THE UNIVERSITY OF DENVER

Department of Physics & Astronomy

Presents

Mechanical and Electrical Parametric Processes in Superconducting Circuits

Wednesday, February 22, 2012

4:00 PM

F.W. Olin Hall Room 105

2190 E. Iliff Avenue

Presented by

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National Institute of Standards & Technology (NIST)

Quantum Electronics & Photonics Division

Parametric processes are ubiquitous. At their heart is an interaction that involves a nonlinear relationship between changing quantities. These processes can lead to energy exchange in different forms. One form produces amplification, like the well-known example of a child on a swing who periodically changes her center of gravity causing the resonance frequency of the swing to oscillate, inducing more swing motion. This type of phenomenon can be mechanical (as with a swing) or electrical in nature, lending itself to useful technological applications. Parametric processes are paramount for new emerging quantum information technologies like laser cooled trapped ions, linear quantum optics, or opto-mechanics. Analogous physical systems can be created on a single chip using superconducting circuits. In this talk, I will discuss our experimental efforts to utilize parametric processes to help exchange single energy quanta between chip-based superconducting circuit components, including micro-drum mechanical resonators, superconducting quantum bits, and electromagnetic cavity modes.

HOST: Dr. Barry Zink, (303) 871-3025, Barry.Zink@du.edu

Join us for refreshments & follow-up discussions in Physics Building Room 116, 5:00-6:00 PM