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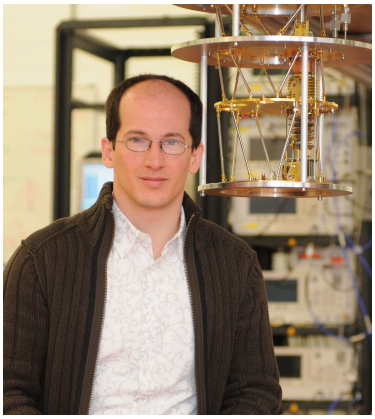
Einladung
zum
Physikalischen Kolloquium

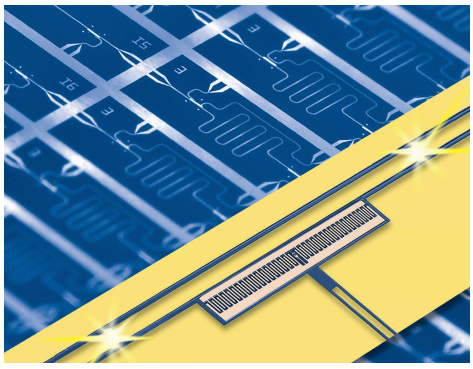
Montag, 14.02.2011,
16.15 Uhr im H2 (025)



Prof. Dr. Andreas Wallraff
Laboratorium für Festkörperphysik, ETH Zürich

Quantum Optics with Superconducting Circuits: Controlling Photons, Qubits and their Interactions

Using modern micro and nano-fabrication techniques combined with superconducting materials we realize quantum electronic circuits. We create, store, and manipulate individual microwave photons on a chip. The strong interaction of photons with superconducting quantum two-level systems allows us to probe fundamental quantum effects of light and also to develop components for applications in quantum information technology. In particular, I will discuss experiments in which we demonstrate first and second-order correlation function measurements of a microwave frequency single photon source. The source is integrated on the same chip with a 50/50 beam splitter. In the absence of efficient single photon counters at microwave frequencies, linear amplifiers and quadrature amplitude detectors are used for correlation measurements [1]. Our data clearly displays single photon coherence in first-order and photon antibunching in second-order correlation function measurements of the propagating fields [2].



[1] M. P. da Silva, D. Bozyigit, A. Wallraff, and A. Blais, Phys. Rev. A 82, 043804 (2010)

[2] D. Bozyigit, C. Lang, L. Steffen, J. M. Fink, C. Eichler, M. Baur, R. Bianchetti, P. J. Leek, S. Filipp, M. P. da Silva, A. Blais, and A. Wallraff, Nat. Phys. 7, 154 (2011)

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