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ARNOLD SOMMERFELD  
CENTER FOR THEORETICAL PHYSICS



# Arnold Sommerfeld Lecture Series

Professor Steven Girvin

Yale University, USA

**Condensed Matter Theory Seminar:**

**Circuit QED: Quantum Optics and Quantum Computation with Electrical Circuits**

Recent experimental breakthroughs have led to the construction of artificial superconducting 'atoms': electrical circuit elements whose state variables (voltages and currents) are intrinsically quantum mechanical. When placed inside a high Q resonator, these 'atoms' can strongly interact with single microwave photons. Tests of this new realization of strong-coupling cavity QED are now underway in the lab of Rob Schoelkopf at Yale. In addition to being a new test bed for quantum optics, this architecture has many promising features for quantum computation. We have recently demonstrated high fidelity Deutsch-Josza and Grover search algorithms on a two qubit quantum processor.

Friday, 12<sup>th</sup> June 09, 10:15 h, Room 449, Theresienstr. 37 / IV, LMU