

**Evgeny Mozgunov**

**The title of my talk is: "Adiabatic theorem for unbounded Hamiltonians, with applications to superconducting circuits"**

**The abstract is:**

We present a new form of an adiabatic theorem, that allows one to rigorously bound the adiabatic timescale for a variety of systems. Our bound is geared towards the qubit approximation of superconducting circuits, and presents a sufficient condition to stay within  $2n$ -dimensional qubit subspace. The novelty of this adiabatic theorem is that it does not contain  $2n$  as a factor, and it allows to obtain an expression for an adiabatic timescale independent of the cutoff of the infinite dimensional Hilbert space of the circuit Hamiltonian. We also provide an explicit expression for the effective qubit Hamiltonian that best approximates the dynamics induced by slowly changing circuit control parameters."