



## Ioan Pop

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### **Towards quantum simulations with superconducting circuits**

In the first part of my talk, I will present an experiment where we demonstrate immunity to superconducting quasiparticle dissipation in a Josephson junction. At the foundation of this protection rests a prediction by Brian Josephson from fifty years ago: the particle-hole interference of superconducting quasiparticles when tunneling across a Josephson junction [1]. The junction under study is the central element of a fluxonium artificial atom, which we place in an extremely low loss environment and measure using radio-frequency dispersive techniques [2,3]. In the second part of the talk, using similar circuits, I will briefly present a proposal to hard-wire a superconducting quantum simulator.

[1] B. D. Josephson, Physics Letters 1, 251 (1962) ; [2] I. M. Pop et al., Nature 508 (2014) ; [3] U. Vool et al., PRL 113 (2014);

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