

Name: Dr. Nicholas T. Bronn

Affiliation: IBM Quantum

Bio:

After earning his Ph.D. in experimental Condensed Matter Physics from the University of Illinois, supported in part by a National Science Foundation Graduate Research Fellowship, Nick joined IBM Quantum as a post-doctoral researcher in 2013. Continuing as a Research Staff Member since 2015, he has been responsible for developing and integrating quantum hardware and deploying quantum systems over the cloud, and now leads digital content creation for advanced Qiskit users, enablement of advanced IBM Quantum capabilities through collaborative research, and supports the education of the quantum community at large.

Talk Title: "Outlook for Quantum Computing with Superconducting Qubits and their Supporting Architecture"

Talk Abstract:

Quantum computers promise to solve certain problems that are intractable on any current or future classical computer. Recently, small-scale noisy quantum computing prototypes have been constructed, with those consisting of superconducting qubits a currently popular modality. In this talk, I'll give an overview of the physics of superconducting qubits, including the role of materials in their fabrication and effects on decoherence, followed by IBM's hardware and software roadmaps for scaling these processors and their applications. A major effort of this scaling involves supporting architecture such as cryogenic microwave components for filtering/routing/amplifying signals and quantum interconnects for sharing quantum information across chips/QPUs/cryostats. I'll conclude with development thrusts of this auxiliary hardware and outlook for the future of quantum computing.

Talk timing: Featured speaker Dr. Bronn will be presenting a talk to conclude CS MANTECH 2023 on Thursday, May 18 and provide attendees a glimpse into emerging quantum computer analog electronics.