Guilhem Ribeill

Quantum & Unconventional Compute Technologist

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Profile

Quantum technology leader with ten years of industry experience spanning superconducting devices, quantum control, and emerging computing architectures. Sets research strategy, leads multidisciplinary programs, and translates technical concepts into funded development efforts and commercial hardware. Combines hands-on quantum engineering with business leadership and experience in reservoir and neuromorphic computing. Active Secret Clearance.

Professional Experience

2016–present **RTX BBN Technologies**, *Cambridge, MA*

Senior Scientist, 2024–present
Scientist II, 2018–2024 **Scientist I**, 2016–2018

Strategy — Served as Quantum Computing Line of Business Lead in the Quantum and Photonic Computing group, setting technical direction and developing a portfolio of internally and externally funded research. Translate emerging technical opportunities and sponsor priorities into proposals and development plans.

Product — Led development of a commercially available superconducting parametric amplifier from concept and design through commercialization. Worked across technical and business functions to transition the technology from laboratory research to a commercial offering.

Quantum control — Developed quantum-control hardware and hardware/software architectures, including FPGA/RFSoC-based sequencing, waveform generation, readout, and synchronization. Connected experimental requirements with control-system design and software interfaces.

Program leadership — Served as Principal Investigator on government-funded quantum information programs, ranging from exploratory studies to multiyear, multi-institution efforts. Developed proposals from concept to award and lead multidisciplinary teams in executing technical plans.

Machine learning — Co-developed the channel-equalization application and circuit ansatz for quantum reservoir computing on temporal data, published in Nature Communications (2024). Co-authored research on sampling-noise limits in physical machine learning (Physical Review X, 2023); Secured funding for two multi-year programs studying quantum reservoir computing

Technical — Led superconducting-device fabrication and process development, including fabrication-tool maintenance. Developed processes contributing to a tenfold improvement in qubit coherence times. Direct experience in cryogenic microwave measurement, device and system characterization, and quantum experiments.

Technical & Leadership Expertise

Leadership	Technology strategy; R&D portfolio development; proposal and business development; multidisciplinary program leadership; research commercialization; technical presentations.
Quantum systems	Superconducting qubits; quantum control and readout; cryogenic microwave systems; device characterization; FPGA-based experiment control; hardware/software co-design.
Computing	Quantum machine learning; reservoir and neuromorphic computing; physical dynamical systems; quantum-control architectures.
Programming	Python, Julia, MATLAB, C, Bluespec SystemVerilog, LaTeX; working familiarity with C++ and VHDL.
Engineering	RF/microwave design, cryogenic measurement, and superconducting-device nanofabrication. Tools: Ansys HFSS, Sonnet EM, Keysight ADS, Synopsys EDA.

Education

2009–2016 **Ph.D., Physics**, *University of Wisconsin–Madison*, Madison, WI
Thesis: *Qubit Readout with the Josephson Photomultiplier*

2005–2009 **B.S., Physics; B.A., Chemistry**, *North Carolina State University*, Raleigh, NC
Summa cum laude

Selected Publications

2024 F. Hu, S. A. Khan, N. T. Bronn, G. Angelatos, G. E. Rowlands, **G. J. Ribeill**, and H. E. Türeci. "Overcoming the coherence time barrier in quantum machine learning on temporal data." *Nature Communications* **15**, 7491.

2023 F. Hu, G. Angelatos, S. A. Khan, M. Vives, E. Türeci, L. Bello, G. E. Rowlands, **G. J. Ribeill**, and H. E. Türeci. "Tackling Sampling Noise in Physical Systems for Machine Learning Applications: Fundamental Limits and Eigentasks." *Physical Review X* **13**, 041020.

2020 W. D. Kalfus, D. F. Lee, **G. J. Ribeill**, S. D. Fallek, A. Wagner, B. Donovan, D. Ristè, and T. A. Ohki. "High-Fidelity Control of Superconducting Qubits Using Direct Microwave Synthesis in Higher Nyquist Zones." *IEEE Transactions on Quantum Engineering* **1**, 6002612.

Selected Granted Patents

2026 **US 12,555,011**: Superconducting reservoir computer with Josephson transmission lines. Co-inventor; granted February 17, 2026.

2025 **US 12,353,845**: Duffing oscillator reservoir computer. Co-inventor; granted July 8, 2025.

2025 **US 12,193,338**: Reservoir computer with a series array of Josephson junctions. Co-inventor; granted January 7, 2025.

Languages

English and French (fluent).