

## Matthew E. Ware

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CURRENT EMPLOYMENT	<b>Raytheon BBN Technologies</b> , Cambridge, Massachusetts USA Experimental Physicist, Quantum Information Processing Group	<b>Jan 2015 - Present</b>
ACADEMIC PREPARATION	<b>Syracuse University</b> , Syracuse, New York USA Ph.D., Physics	<b>May 2015</b>
	<b>Syracuse University</b> , Syracuse, New York USA M.S., Physics	<b>May 2011</b>
	<b>University of Alabama</b> , Tuscaloosa, Alabama USA B.S., Physics and Applied Mathematics, Summa Cum Laude	<b>May 2009</b>
HONORS AND AWARDS	University Fellow, Syracuse University	<b>2009 - 2011</b>
	Phi Beta Kappa, University of Alabama	<b>2009</b>
ACADEMIC EXPERIENCE	<b>Syracuse University</b> , Syracuse, New York USA <i>Graduate Student</i> Ph.D. research on superconducting qubits for quantum information processing	<b>July 2009 - December 2014</b>
	<b>University of Alabama</b> , Tuscaloosa, Alabama USA <i>Undergraduate Research</i> Thin film deposition for giant magnetoresistance research in the groups of Patrick LeClair and Gary Mankey	<b>Fall 2008 - May 2009</b>
	<b>Ludwig-Maximilians-Universität</b> , Munich, Germany <i>DAAD R.I.S.E Intern</i> Lab/Research experience fabricating and measuring pentacene thin film transistors in the group of Bert Nickle	<b>May - August 2007</b>
PUBLICATIONS	L. C. G. Govia, Guilhem Ribeill, Diego Ristè, Matthew Ware and Hari Krovi. “Bootstrapping quantum process tomography via a perturbative ansatz.” <i>Nature Commun.</i> 11, 1084 (2020).  Matthew Ware, Blake R. Johnson, Jay M. Gambetta, Thomas A. Ohki, Jerry M. Chow, and B. L. T. Plourde. “Cross-resonance interactions between superconducting qubits with variable detuning.” <i>arXiv:1905.11480</i> , May 2019.  Matthew Ware, Guilhem Ribeill, Diego Ristè, Colm A. Ryan, Blake Johnson and Marcus P. da Silva. “Experimental Pauli-frame randomization on a superconducting qubit.” <i>arXiv:1803.01818</i> , Mar 2018.  P. Bhupathi, Peter Groszkowski, M. P. DeFeo, Matthew Ware, Frank K. Wilhelm, and B. L. T. Plourde. “Transient Dynamics of a Superconducting Nonlinear Oscillator.” <i>Phys. Rev. Applied</i> , 5:024002, Feb 2016.  Daniela F. Bogorin, D. T. McClure, Matthew Ware, and B. L. T. Plourde. “Copper waveguide cavities with reduced surface loss for coupling to superconducting qubits.” <i>IEEE Transactions on</i>	

*Applied Superconductivity*, 24(4), 1700207, June 2014.

A. D. Córcoles, Jay M. Gambetta, Jerry M. Chow, John A. Smolin, Matthew Ware, Joel Strand, B. L. T. Plourde, and M. Steffen. “Process verification of two-qubit quantum gates by randomized benchmarking.” *Phys. Rev. A*, 87:030301, Mar 2013.

J. D. Strand, Matthew Ware, Félix Beaudoin, T. A. Ohki, B. R. Johnson, Alexandre Blais, and B. L. T. Plourde. “First-order sideband transitions with flux-driven asymmetric transmon qubits.” *Phys. Rev. B*, 87:220505, Jun 2013.

CONFERENCE  
TALKS/POSTERS

*APS March meeting talk* **March 2019**  
Matthew Ware, Guilhem Ribeill, Diego Ristè, Luke Govia, Hari Krovi  
“Bootstrapping quantum process tomography via a perturbative ansatz”

*APS March meeting talk* **March 2018**  
Matthew Ware, Guilhem Ribeill, Marcus P. da Silva  
“Detecting measurement correlations with graphical models”

*APS March meeting talk* **March 2017**  
Matthew Ware, Guilhem Ribeill, Diego Ristè, Colm A. Ryan, Blake Johnson,  
Marcus P. da Silva “Experimental Pauli-frame randomization on a  
superconducting qubit”

*APS March meeting talk* **March 2016**  
Matthew Ware, Kin Chung Fong, Colm A. Ryan, Brian Hassik, Thomas Ohki,  
Marcus P. da Silva “Crosstalk characterization in superconducting qubits  
by eigenvalue estimation: Experiment”

*Poster session* **March 2014**  
Matthew Ware, Blake Johnson, Jay M. Gambetta, Colm Ryan, Thomas Ohki,  
Jerry Chow, B. L. T. Plourde. Aspen Center for Physics winter conference “  
Advances in quantum algorithms and computation”. “Cross-resonance interactions  
between superconducting qubits with variable detuning”

*APS March meeting talk* **March 2014**  
Matthew Ware, Blake Johnson, Jay M. Gambetta, Colm Ryan, Thomas Ohki,  
Jerry Chow, B. L. T. Plourde. “Cross-resonance interactions between  
superconducting qubits with variable detuning”

*Student conference talk* **June 2012**  
9th Canadian Student Conference on Quantum Information, and the 2nd AQUA  
Student Congress on Quantum Information, Institute for Quantum Computing,  
University of Waterloo, Ontario Canada. “Material and geometric effects in  
3D transmon qubits”

*APS March meeting talk* **March 2012**  
Matthew Ware, M.P. Defeo, J.D. Strand, B. Xiao, B.L.T. Plourde,  
Stefano Poletto, Chad Rigetti. “Material and geometric effects in  
3D transmon qubits”

PROFESSIONAL  
EXPERIENCE

*Assessing Performance of Quantum Computers (APQC)* **Sept 2019**  
Estes Park Colorado

*Principal Investigator of the QuVDe collaboration*  
LPS/ARO funded quantum verification and validation program

**March 2017-Present**

*Advances in quantum algorithms and computation*  
Aspen Center for Physics, Aspen Colorado

**March 2014**

*12th Canadian summer school on quantum information*  
Institute for Quantum Computing, University of Waterloo, Ontario Canada

**June 2012**

TECHNICAL  
SKILLS

**Fabrication experience:** 5+ years of user experience at Cornell Universities Nanoscale Science and Technology Facility (CNF) including electron-beam lithography, photolithography, wet/dry etching, thin film deposition, Josephson junction processing, imaging/metrology, device design and layout

**Simulation/Design:** HFSS, Sonnet, Cadence

**Code:** C/C++,MATLAB,Python

**Security Clearance:** Top Secret

**Measurement:** 10+ years of low temperature (< 30mK) microwave measurement

PHD ADVISOR

Prof. Britton L. T. Plourde, Syracuse University