

CONTACT

INFORMATION

Associate Professor of Physics
 Physics Program Director
 Schmid College of Science and Technology
 Institute for Quantum Studies
 Chapman University
 Orange, CA 92866-0429

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Web: <http://www.justindressel.com>
Citizenship: USA
Date of Birth: 1983/03/06

RESEARCH
INTERESTS

Quantum foundations: generalized measurements, contextuality, algebraic methods
Quantum information: quantum control, quantum filtering, quantum computing
Quantum and classical field theory: relativistic fields, gauge-theory gravitation
Mathematical physics: Clifford algebras, von-Neumann algebras, geometric calculus
Computer science: functional programming, Bayesian networks, machine learning

EDUCATION

Ph.D. in Quantum Physics, May 2013
 • **University of Rochester**, Rochester, New York USA
 • Adviser: Associate Professor Andrew N. Jordan
 • Thesis: *Indirect Observable Measurement: an Algebraic Approach*

M.A. in Physics, September 2009
 • **University of Rochester**, Rochester, New York USA
 • Adviser: Associate Professor Andrew N. Jordan

B.S. in Physics, May 2005
B.S. in Mathematics, May 2005
 • **New Mexico Institute of Mining and Technology**, Socorro, New Mexico USA
 • *Summa cum Laude*, With Highest Honors in Physics and Mathematics
 • Physics Adviser: Associate Professor Kenneth Eack
 • Mathematics Adviser: Professor Ivan Avramidi

ACADEMIC

APPOINTMENTS

Associate Professor of Physics August 2019 to current
 Faculty of Math and Physics
 Institute for Quantum Studies
Chapman University

Contract Researcher June to July 2018
 Theoretical Quantum Physics Laboratory (CPR),
RIKEN, Wakoshi, Saitama, Japan

Assistant Professor of Physics August 2015 to July 2019
 Faculty of Math, Physics, and Computation
 Institute for Quantum Studies
Chapman University

Contract Researcher

July to August 2016

Interdisciplinary Condensed Matter Physics Team (iTHES),
RIKEN, Wakoshi, Saitama, Japan

Postdoctoral Scholar

September 2013 to August 2015

Quantum Computing and Measurement Physics (QCAMP) Group
 Department of Electrical and Computer Engineering
University of California, Riverside

- Supervisor: Professor Alexander N. Korotkov
- Focus: Quantum measurement with superconducting qubits and circuit-QED, designing robust experimental tests of quantum information protocols

Visiting Researcher

June to August 2013, February 2014, January 2018

Quantum Condensed Matter Research Group (QCMRG)
 Center for Emergent Matter Science (CEMS),
RIKEN, Wakoshi, Saitama, Japan

RESEARCH
EXPERIENCE

- Since 2009, I have published 45 journal papers, including 1 paper in *Nature* (as a cover-feature), 1 paper in *Reviews of Modern Physics*, 2 papers in *npj Quantum Information*, 10 papers in *Physical Review Letters*, 1 paper in *Physical Review Research*, and 1 paper in *Physics Reports*. 3 of these papers published in Physical Review journals were selected as “Editors’ Suggestions.” These papers currently have over 2192 citations (with 380 citations in 2019 alone), including one paper with 457 accumulated citations, yielding an h-index of 23 and i10-index of 34.

My research has spanned a variety of topics, including:

- Foundational theory for the generalized quantum measurements of observables
- Foundational theory that unifies quantum states and quantum observables into conditional parts of the same operational quantum instruments
- Foundational theory for the quantum weak value, and enhancements of weak value methods for sensitive parameter estimation
- Experimental tests of the quantum-to-classical transition using sequential measurements in both entangled optical systems and superconducting qubit systems
- Classical-field and Clifford-algebraic treatments of the the separation of the total angular momentum of light into separately measurable spin and orbital parts
- Practical studies of ancilla quantum bit and microwave resonator methods for implementing generalized measurements in modern quantum computing implementations, with special focus on superconducting systems
- Practical studies of continuous quantum measurements of superconducting transmon qubits for information processing tasks and quantum error correction.
- Practical studies of measuring out-of-time-ordered correlators with sequential measurements
- Acoustic spin and dual-symmetric field theory formulations

FUNDING
EXPERIENCE

- Awarded: NSF-BSF Grant Proposal No. 1915015 (August 2019).
 NSF-BSF: Efficiently Modeling Continuous Quantum Measurements of High-Dimensional Multi-Qubit Systems.
 J. Dressel (CU), L. Vaidman (Tel Aviv U).
 Grant Award No. 1915015.
 \$107,000/yr for 3 years, September 2019 - August 2022.
- Awarded: ARO-LPS Grant Proposal No. W911NF-18-1-0178 (July 2018).
 Implementation of novel benchmarking and error management protocols in planar transmon processors.
 I. Siddiqi (UCB), A.N. Korotkov (UCR), A.N. Jordan (UR), J. Dressel (CU), J.

Emerson (UW).
 Grant Award No. W911NF-17-S-0008.
 Subcontract from UCB: \$130,000/yr for 4 years, July 2018 - July 2022.
 • Awarded: ARO-LPS Grant Proposal No. 67533-PH-QC (August 2015).
 Continuous Quantum State Tracking and Error Correction (CQSTEC).
 I. Siddiqi (UCB), A.N. Korotkov (UCR), A.N. Jordan (UR), J. Dressel (CU).
 Grant Award No. W911NF-15-1-0496.
 Subcontract from UCB: \$100,000/yr for 4 years, August 2015 - August 2019.

TEACHING
 EXPERIENCE

Chapman University, Orange, California USA

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|--|-------------|
| Associate Professor | Fall 2020 |
| <ul style="list-style-type: none"> • PHYS 220/MATH 220: Scientific Computing I | Summer 2020 |
| <ul style="list-style-type: none"> • Summer Undergraduate Research Fellowship (SURF):
Mentor for Trevor Kling | Spring 2020 |
| <ul style="list-style-type: none"> • PHYS 101: General Physics I | Fall 2019 |
| <ul style="list-style-type: none"> • PHYS 220/MATH 220: Scientific Computing I • PHYS 340: Quantum Information Science | Summer 2019 |
| Assistant Professor | Summer 2019 |
| <ul style="list-style-type: none"> • Summer Undergraduate Research Fellowship (SURF):
Mentor for Daniel Briseno | Spring 2019 |
| <ul style="list-style-type: none"> • PHYS 101: General Physics I | Fall 2018 |
| <ul style="list-style-type: none"> • PHYS 220/MATH 220/CPSC 220: Scientific Computing I | Spring 2018 |
| <ul style="list-style-type: none"> • PHYS 101: General Physics I • PHYS 220/MATH 220/CPSC 220: Scientific Computing I (Independent Study) | Fall 2017 |
| <ul style="list-style-type: none"> • PHYS 220/MATH 220/CPSC220: Scientific Computing I • CS 510: Computing for Scientists • PHYS 320: Mechanics I (Independent Study) | Summer 2017 |
| <ul style="list-style-type: none"> • Summer Undergraduate Research Fellowship (SURF):
Mentor for Aaron Grisez | Spring 2017 |
| <ul style="list-style-type: none"> • PHYS 101: General Physics I • PHYS 340: Quantum Information Science • PHYS 422: Electricity and Magnetism II (Independent Study) | Fall 2016 |
| <ul style="list-style-type: none"> • PHYS 220: Scientific Computation I • CS 510: Computing for Scientists | Spring 2016 |

- PHYS 227: Foundations of Scientific Computing
- PHYS 321: Mechanics II

Fall 2015

- PHYS 107: General Physics for the Life Sciences I
- PHYS 451: Quantum Mechanics (Independent Study)
- CS 510: Computing for Scientists

University of Rochester, Rochester, New York USA

Instructor

Summer 2009

- PHY 114: General Physics II

Tutor for David T. Kearns Center

January 2010 to May 2012

- PHY 113: General Physics I. (Spring 2010)
- PHY 121: Mechanics. (Spring 2012, Fall 2011, Spring 2011)
- PHY 122: Electricity and Magnetism. (Fall 2011, Spring 2011)

Teaching Assistant

September 2007 to August 2009

- Workshop Facilitator for PHY 143: Honors Waves and Modern Physics (Spring 2008)
- Workshop Facilitator for PHY 113: General Physics I (Fall 2007)

SERVICE

Chapman University Appointments

- *Computational and Data Science Graduate Program Steering Committee* (Fall 2018 – Present)
- *Physics Program Director* (June 2018 – Present)
- *Math, Physics, and Computation (MPC) Seminar* (Fall 2016 – Spring 2018)
- *CPSC Search Committee Member* (Fall 2017)

Conference Organizer

- *American Physical Society (APS) March Meeting 2018* (March 2018).
Session Committee for the Division of Quantum Information (DQI).
Co-organizer of Focus and Invited Sessions for Quantum Foundations.
Los Angeles Convention Center, Los Angeles CA, March 2018.
- *7th International Conference on Quantum Walks* (March 2018).
Chapman representative and host.
Organizer: Y. Shikano (Keio U).
Conference: March 3-4.
Chapman University, Orange CA, March 2018.
- *30th Anniversary of the AAV Weak Value* (March 2018).
Co-organizers: J. Tollaksen (CU), M. Leifer (CU), J. Dressel (CU).
Conference: March 1-2.
Chapman University, Orange CA, March 2018.
- *American Physical Society (APS) March Meeting 2017* (March 2017).
Focus Session: *Continuous Quantum Measurements and Quantum Foundations*.
Co-organizer: J. Dressel (CU), K. Murch (WU).
New Orleans Convention Center, New Orleans LA, March 2017.
- *Concepts and Paradoxes in a Quantum Universe* (June 2016).
Co-organizers: Y. Aharonov (CU), L. Hardy (PI), J. Dressel (CU), J. Tollaksen (CU), M. Leifer (CU).
Workshop: June 1-19, Conference: June 20-24.
Perimeter Institute for Theoretical Physics, Waterloo, Ontario, Canada, June 2016.

Journal Referee

- *Science*
- *Nature Communications*
- *Nature Physics*
- *Physical Review Letters*
- *Physical Review X*
- *Physical Review A*
- *Physical Review B*
- *Journal of Physics A: Mathematical and Theoretical*
- *Scientific Reports*
- *New Journal of Physics*
- *Foundations of Physics*
- *Quantum Studies: Mathematics and Foundations*
- *Physics Letters A*
- *Optics Letters*
- *Annals of Physics*
- *Atoms*
- *Quantum*
- *IEEE*

Public Outreach

Fall 2017

- STEAM for Teens at Orange Public Library
Quantum Mechanics with your Laser Pointer
Orange Public Library

Fall 2015

- Academic Minute radio program
How quantum physics makes your digital photos grainy
Chapman University

Summer 2010, Summer 2011

- Rochester Scholars summer course for volunteer high school students:
Unexplained Quantum Phenomena Revealed
Guest lecturer, technical assistant for optical demonstrations
University of Rochester

Prospective student recruitment

2019–2020

- Preview Day & Discover Chapman Day
Chapman University

2018–2019

- Preview Day & Discover Chapman Day
Chapman University

- Mentor for Orange High School STEM Scholars

- Local high school demonstrations

2017–2018

- Preview Day & Discover Chapman Day
Chapman University

- Local high school demonstrations

2016–2017

- Preview Day & Discover Chapman Day
Chapman University
Tesla Coil Band Performance
- Tesla Coil Plasma Speaker: Wireless Energy Demo

2015–2016

- Preview Day & Discover Chapman Day
Chapman University

Fall 2008 to Fall 2012

- Graduate student weekend reception and outreach, guest lectures
University of Rochester

Conference photographer

March 2012, June 2013

- Coherence and Quantum Optics (CQO) X
Quantum Information and Measurement (QIM) Conference, 2013
University of Rochester, Rochester, NY (2013)
- Northeast Modern Language Association (NEMLA) Conference, 2012
Rochester Conference Center, Rochester, NY (2012)

PROFESSIONAL EXPERIENCE

National Radio Astronomy Observatory, Socorro, New Mexico USA

Software Engineer

June 2005 to August 2007

Atacama Large Millimeter Array (ALMA) project:

- Integration, Test, and Support (ITS) subsystem: reorganized and maintained the CVS repository for the primary codebase; debugged and integrated software written in C, C++, Java, Python, and Bash by seven different subsystems; technical support for software running at five separate international sites
- Systems architect for large distributed diskless network: helped design, install on site, and maintain a distributed network for managing telescopes; implemented automated (linux) software synchronization in Python and Bash, still in production use in six international locations

SOFTWARE SKILLS **Programming Languages:**

- Fluent: Mathematica, Python, Julia, Haskell, Bash, \LaTeX , C
- Familiar: OCaml, Scheme, Julia, Lisp, Java, Clojure, R, C++, D, Matlab

Version Control:

- Distributed: Git, Mercurial, Darcs
- Centralized: CVS, SVN, RCS

AWARDS AND CERTIFICATES

Chapman University

- Wang-Fradkin Assistant Professorship, 2016–2017

University of Rochester

- David T. Kearns Center, Certificate of Gratitude, 2012
- Agnes M. and George Messersmith Fellowship, 2011–2013
- Certificate in Teaching of College Physics, 2010
- American Association of Physics Teachers (AAPT) Award, 2008
- Department of Education GAANN Fellowship, 2007–2012

National Radio Astronomy Observatory

- Star Award, 2007

New Mexico Institute of Mining and Technology

- Abraham and Esther Brooke Award for Excellence in Physics, 2004

JOURNAL PUBLICATIONS

45. *Footprints of quantum pigeons.*
Reznik, G., Bagchi, S., Dressel, J., and Vaidman, L.
Physical Review Research 2, 023004 (2020) (Editors' Suggestion).

44. *Acoustic field theory: scalar, vector, spinor representations and the emergence of acoustic spin.*
Burns, L., Bliokh, K.Y., Nori, F., and Dressel, J.
New Journal of Physics **22**, 053050 (2020).
43. *Optimizing measurement strengths for qubit quasiprobabilities behind out-of-time-ordered correlators.*
Mohseninia, R., González Alonso, J. R., and Dressel, J.
Physical Review A **100**, 062336 (2019) (Editors' Suggestion).
42. *Benchmarks of Nonclassicality for Qubit Arrays.*
Waegell, M., and Dressel, J.
npj Quantum Information **5**, 66 (2019).
41. *Out-of-time-ordered-correlator quasiprobabilities robustly witness scrambling.*
González Alonso, J. R., Yunger Halpern, N., and Dressel, J.
Physical Review Letters **122**, 040404 (2019).
40. *Strengthening weak measurements of qubit out-of-time-ordered correlators.*
Dressel, J., González Alonso, J. R., Waegell, M. and Yunger Halpern, N.
Physical Review A **98**, 0120132 (2018).
39. *Weak values from strong interactions in neutron interferometry.*
Denkmayr, T., Dressel, J., Geppert-Kleinrath, H., Hasegawa, Y., and Sponar, S.
Physica B: Condensed Matter **04**, 014 (2018).
38. *The quasiprobability behind the out-of-time-ordered correlator.*
Halpern, N.Y., Swingle, B., and Dressel, J.
Physical Review A **97**, 042105 (2018).
37. *Incoherent qubit control using the quantum Zeno effect.*
Hacohen-Gourgy, S., Martin, L., García-Pintos, L.P., Dressel, J., and Siddiqi, I.
Physical Review Letters **120**, 020505 (2018).
36. *Past observable dynamics of a continuously monitored quantum bit.*
García-Pintos, L.P., Dressel, J.
Physical Review A **96**, 062110 (2017) (Editor's Suggestion).
35. *Arrow of Time for Continuous Quantum Measurements.*
Dressel, J., Chantasri, A., Jordan, A.N., and Korotkov, A.N.
Physical Review Letters **119**, 220507 (2017).
34. *Confined Contextuality in Neutron Interferometry: Observing the Quantum Pi-geonhole Effect.*
Waegell, M., Denkmayr, T., Geppert, H., Ebner, D., Jenke, T., Hasegawa, Y., Sponar, S., Dressel, J., and Tollaksen, J.
Physical Review A **96**, 052131 (2017).
33. *Janus sequences of quantum measurements and the arrow of time .*
Jordan, A.N., Chantasri, A., Murch, K., Dressel, J., and Korotkov, A.N.
AIP Conference Proceedings **1841**, 020003 (2017).
32. *Linear feedback stabilization of a dispersively monitored qubit.*
Patti, T.L., Chantasri, A., García-Pintos, L.P., Jordan, A.N., and Dressel, J.
Physical Review A **96**, 022311 (2017).
31. *Rapid Estimation of drifting parameters in continuously measured quantum systems.*
Cortez, L., Chantasri, A., García-Pintos, L.P., Dressel, J., and Jordan, A.N.
Physical Review A **95**, 012314 (2017).

30. *Experimental demonstration of direct path state characterization by strongly measuring weak values in a matter-wave interferometer.*
Denkmayr, T., Geppert, H., Lemmel, H., Waegell, M., Dressel, J., Hasegawa, Y. and Sponar, S.
Physical Review Letters **118**, 010402 (2017).
29. *Probing quantumness with joint continuous measurements of non-commuting qubit observables.*
García-Pintos, L.P., and Dressel, J.
Physical Review A **94**, 062119 (2016).
28. *Measuring a transmon qubit in circuit QED: dressed squeezed states.*
Khezri, M., Dressel, J., and Korotkov, A.N.
Physical Review A **94**, 012347 (2016).
27. *Preserving entanglement during weak measurement demonstrated with a violation of the Bell-Leggett-Garg inequality.*
White, T.C., Mutus, J.Y., Dressel, J., Kelly, J., Barends, R., Jeffrey, E., Sank, D., Megrant, A., Campbell, B., Chen, Y., Chen, Z., Chiaro, B., Dunsworth, A., Hoi, I.-C., Neill, C., O'Malley, P.J.J., Roushan, P., Vainsencher, A., Wenner, J., Korotkov, A.N., and Martinis, J.M.
Nature Partner Journals: Quantum Information **2**, 15022 (2016).
26. *Qubit measurement error from coupling with a detuned neighbor in circuit QED.*
Khezri, M., Dressel, J., and Korotkov, A.N.
Physical Review A **92**, 052306 (2015).
25. *Spacetime algebra as a powerful tool for electromagnetism.*
Dressel, J., Bliokh, K.Y., and Nori, F.
Physics Reports **589**, 1–71 (2015).
24. *Power-Recycled Weak-Value-Based Metrology.*
Lyons, K., Dressel, J., Jordan, A.N., Howell, J.C., and Kwiat, P.G.
Physical Review Letters **114**, 170801 (2015).
23. *Weak Values as Interference Phenomena.*
Dressel, J.
Physical Review A **91**, 032116 (2015).
22. *Violating the Modified Helstrom Bound with Nonprojective Measurements.*
Dressel, J., Brun, T.A., and Korotkov, A.N.
Physical Review A **91**, 040301(R) (2015).
21. *Heisenberg scaling with weak measurement: A quantum state discrimination point of view.*
Jordan, A.N., Tollaksen, J., Troupe, J.E., Dressel, J., and Aharonov, Y.
Quantum Studies: Mathematics and Foundations **2**, 5–15 (2015).
20. *Conservation of the spin and orbital angular momenta in electromagnetism.*
Bliokh, K.Y., Dressel, J., and Nori, F.
New Journal of Physics **16**, 093037 (2014).
19. *Implementing generalized measurements with superconducting qubits.*
Dressel, J., Brun, T.A., and Korotkov, A.N.
Physical Review A **90**, 032302 (2014).
18. *Mapping the optimal route between two quantum states.*
Weber, S.J., Chantasri, A., Dressel, J., Jordan, A.N., Murch, K.W., and Siddiqi, I.
Nature **511**, 570–573 (2014).

17. *Entanglement-assisted weak value amplification.*
Pang, S., Dressel, J., and Brun, T.A.
Physical Review Letters **113**, 030401 (2014).
16. *Colloquium: Understanding Quantum Weak Values: Basics and Applications.*
Dressel, J., Malik, M., Miatto, F.M., Jordan, A.N., and Boyd, R.W.
Reviews of Modern Physics **86**, 307 (2014).
15. *Avoiding Loopholes with Hybrid Bell-Leggett-Garg Inequalities.*
Dressel, J., and Korotkov, A.N.
Physical Review A **89**, 012125 (2014).
14. *Classical Field Approach to Quantum Weak Measurements.*
Dressel, J., Bliokh, K.Y., and Nori, F.
Physical Review Letters **112**, 110407 (2014).
13. *Certainty in Heisenberg's uncertainty principle: Revisiting definitions for estimation errors and disturbance.*
Dressel, J., and Nori, F.
Physical Review A **89**, 022106 (2014).
12. *Action principle for continuous quantum measurement.*
Chantrasi, A., Dressel, J., and Jordan, A.N.
Physical Review A **88**, 042110 (2013).
11. *Strengthening weak value amplification with recycled photons.*
Dressel, J., Lyons, K., Graham, T.M., Kwiat, P.G., and Jordan, A.N.
Physical Review A **88**, 023821 (2013).
10. *Quantum instruments as a foundation for both states and observables.*
Dressel, J., and Jordan, A.N.
Physical Review A **88**, 022107 (2013).
9. *Corrigendum: Sufficient conditions for uniqueness of the weak value.*
Dressel, J., and Jordan, A.N.
Journal of Physics A: Mathematical and Theoretical **46**, 029501 (2012).
8. *Weak Values are Universal in Von Neumann Measurements.*
Dressel, J., and Jordan, A.N.
Physical Review Letters **109**, 230402 (2012).
7. *Contextual-value approach to the generalized measurement of observables.*
Dressel, J., and Jordan, A.N.
Physical Review A **85**, 022123 (2012).
6. *Measuring which-path information with coupled electronic Mach-Zehnder interferometers.*
Dressel, J., Choi, Y., and Jordan, A.N.
Physical Review B **85**, 045320 (2012).
5. *Significance of the imaginary part of the weak value.*
Dressel, J., and Jordan, A.N.
Physical Review A **85**, 012107 (2012).
4. *Sufficient conditions for uniqueness of the weak value.*
Dressel, J., and Jordan, A.N.
Journal of Physics A: Mathematical and Theoretical **45**, 015304 (2012).

3. *Experimental Violation of Two-Party Leggett-Garg Inequalities with Semi-weak Measurements.*
Dressel, J., Broadbent, C.J., Howell, J.C., and Jordan, A.N.
Physical Review Letters **106**, 040402 (2011).
2. *Contextual Values of Observables in Quantum Measurements.*
Dressel, J., Agarwal, S., and Jordan, A.N.
Physical Review Letters **104**, 240401 (2010).
1. *Gravitational Redshift and Deflection of Slow Light.*
Dressel, J., Howell, J.C., Rajeev, S., and Jordan, A.N.
Physical Review A **79**, 013834 (2009).

JOURNAL
SUBMISSIONS

2. *Comment: Failed attempt to escape from the quantum pigeon conundrum.*
Aharonov, Y., Bagchi, S., Dressel, J., Reznik, G., Ridley, M., and Vaidman, L.
1. *Always-On Quantum Error Tracking with Continuous Parity Measurements.*
Mohseninia, R., Yang, J., Siddiqi, I., Jordan, A.N., and Dressel, J.
arXiv:1907.08882

PAPERS IN
PREPARATION

3. *Minimal state estimation with denoising autoencoders.*
Mohseninia, R., Barzili, S. L., and Dressel, J.
2. *Delayed choice Lorentz rotations of a quantum bit.*
Dressel, J., and Nori, F.
1. *How zero light intensity can exert a nonzero force on a charged particle.*
Aharonov, Y., Dressel, J., and Tollaksen, J.

CONFERENCE
PRESENTATIONS

59. *Contextuality in non-interacting measurement.*
American Physical Society (APS): March Meeting 2020.
Denver Convention Center, Denver CO, March 2020.
(canceled due to COVID-19: moved online)
58. *High-fidelity quantum state estimation via autoencoder tomography.*
American Physical Society (APS): March Meeting 2020.
Denver Convention Center, Denver CO, March 2020.
(canceled due to COVID-19: moved online)
57. *Spin Angular Momentum in Acoustic Field Theory.*
American Physical Society (APS): March Meeting 2020.
Denver Convention Center, Denver CO, March 2020.
(canceled due to COVID-19: moved online)
56. *Measuring qubit quasiprobability distributions behind out-of-time-ordered correlators.*
American Physical Society (APS): March Meeting 2019.
Boston Convention Center, Boston MA, March 2019.
55. *Continuous parity measurement and error correction.*
American Physical Society (APS): March Meeting 2019.
Boston Convention Center, Boston MA, March 2019.

54. *Out-of-time-ordered-correlator quasiprobabilities for the quantum kicked top.*
American Physical Society (APS): March Meeting 2019.
Boston Convention Center, Boston MA, March 2019.
53. *Minimal quantum state representations from denoising autoencoders.*
American Physical Society (APS): March Meeting 2019.
Boston Convention Center, Boston MA, March 2019.
52. *Tracking non-Markovian quantum dynamics of a superconducting qubit with a recurrent neural network filter.*
American Physical Society (APS): March Meeting 2019.
Boston Convention Center, Boston MA, March 2019.
51. *Strengthening weak measurements for qubit multitime correlators.*
PIMan 2019 Workshop
Chapman University, Orange CA, March 2019.
50. *Strengthening weak measurements for qubit tomography and multitime correlators.*
Invited Talk: CEMS, RIKEN 2019.
CEMS, RIKEN, Wako-shi, Saitama, Japan, January 2019.
49. *Watching Superconducting Qubits with Microwaves.*
Invited Talk: Keio University.
Keio University, Japan, July 2018.
48. *Strengthening weak measurements for qubit tomography and multitime correlators.*
Invited Talk: Chapman University Math, Physics, and Computation (MPC) Seminar.
Chapman University, Orange CA, October 2018.
47. *Quantum Computing: State of Play.*
Invited Talk: Orange County Association of Computing Machinery (ACM) Chapter.
Knobbe Martin's Irvine Office, Irvine CA, May 2018.
46. *Watching Superconducting Qubits with Microwaves.*
Invited Talk: International Conference on Quantum Communication, Measurement and Computing (QCMC) 2018.
Louisiana State University, Baton Rouge LA, March 2018.
45. *Quantization from Clifford Algebra.*
American Physical Society (APS): March Meeting 2018.
Los Angeles Convention Center, Los Angeles CA, March 2018.
44. *Tracking calibration drifts in a continuous quantum measurement.*
American Physical Society (APS): March Meeting 2018.
Los Angeles Convention Center, Los Angeles CA, March 2018.
43. *Weak Values in the Wild.*
Invited Talk: 30th Anniversary of the Weak Value.
Chapman University, Orange CA, March 2018.
42. *Continuous Measurements of Superconducting Qubits: Many-Worlds to Master Equations.*
Invited Talk: International Conference on Quantum Foundations (ICQF) 2017.
National Institute of Technology, Patna, Bihar, India, December 2017.

41. *Watching a Quantum System: How to Continuously Measure a Superconducting Qubit.*
Invited Talk: Chapman University Math, Physics, and Computation (MPC) Seminar.
Chapman University, Orange CA, September 2017.
40. *Watching a Quantum System: How to Continuously Measure a Superconducting Qubit.*
Invited Talk: USC Physics and Astronomy Colloquium.
USC, Los Angeles CA, September 2017.
39. *Continuous measurement of transmon qubits: state-dragging and stabilization using the quantum Zeno effect.*
Invited Talk: USC Electrical Engineering Quantum Group.
USC, Los Angeles CA, June 2017.
38. *What does a continuously monitored qubit readout really show?.*
American Physical Society (APS): March Meeting 2017.
New Orleans Center, New Orleans LA, March 2017.
37. *State dragging using the quantum Zeno effect.*
American Physical Society (APS): March Meeting 2017.
New Orleans Center, New Orleans LA, March 2017.
36. *Probing quantumness with joint continuous measurements of non-commuting qubit observables.*
American Physical Society (APS): March Meeting 2017.
New Orleans Center, New Orleans LA, March 2017.
35. *Linear feedback stabilization of a continuously monitored qubit.*
American Physical Society (APS): March Meeting 2017.
New Orleans Center, New Orleans LA, March 2017.
34. *Arrow of time for repeated and continuous quantum measurement.*
American Physical Society (APS): March Meeting 2017.
New Orleans Center, New Orleans LA, March 2017.
33. *Weak and continuous measurements with superconducting qubits.*
Invited Talk: CEMS, RIKEN 2016.
CEMS, RIKEN, Wako-shi, Saitama, Japan, July 2016.
32. *Experimental violation of a Bell-Leggett-Garg inequality using weak measurements.*
Invited Talk: CEMS, RIKEN 2016.
CEMS, RIKEN, Wako-shi, Saitama, Japan, July 2016.
31. *Weak and continuous measurements with superconducting qubits.*
Concepts and Paradoxes in a Quantum Universe, Conference.
Perimeter Institute of Theoretical Physics, Waterloo, Ontario, Canada, June 2016.
30. *Delayed Choice Lorentz Rotations.*
Concepts and Paradoxes in a Quantum Universe, Workshop.
Perimeter Institute of Theoretical Physics, Waterloo, Ontario, Canada, June 2016.
29. *Continuous Transmon Measurements: Filtering and Parameter Determination.*
Army Research Office (ARO) On-site Grant Review Meeting.
University of California, Berkeley, Berkeley CA, May 2016.

28. *Sagnac Sensing Weak Value Amplification: Technical feasibility analysis.*
DRS Technical Review Meeting.
Teleconference with slides, April 2016.
27. *How zero-intensity light can exert a non-zero force on a charged particle.*
American Physical Society (APS): March Meeting 2016.
Baltimore Convention Center, Baltimore MD, March 2016.
26. *Experimental violation of a Bell-Leggett-Garg inequality using weak measurements.*
Invited Talk: Math, Physics, and Computation (MPC) Seminar.
Chapman University, Orange, CA, December 2015.
25. *Experimental violation of a Bell-Leggett-Garg inequality using weak measurements.*
Invited Talk: International Conference on Quantum Foundations (ICQF) 2015.
National Institute of Technology, Patna, Bihar, India, December 2015.
24. *Entanglement-assisted weak measurement.*
American Physical Society (APS): March Meeting 2015.
San Antonio Convention Center, San Antonio TX, March 2015.
23. *Entanglement-assisted weak measurement.*
American Physical Society (APS): March Meeting 2015.
San Antonio Convention Center, San Antonio TX, March 2015.
22. *Violating the Modified Helstrom Bound with Nonprojective Measurements.*
American Physical Society (APS): March Meeting 2015.
San Antonio Convention Center, San Antonio TX, March 2015.
21. *Experimental violation of a Bell-Leggett-Garg inequality using weak measurements, Part II: The Violation.*
American Physical Society (APS): March Meeting 2015.
San Antonio Convention Center, San Antonio TX, March 2015.
20. *Experimental violation of a Bell-Leggett-Garg inequality using weak measurements, Part I: Avoiding loopholes.*
American Physical Society (APS): March Meeting 2015.
San Antonio Convention Center, San Antonio TX, March 2015.
19. *Mapping the Optimal Route Between Two Quantum States.*
Riverside Postdoctoral Association, Inaugural Symposium 2014.
University of California, Riverside, Riverside CA, September 2014.
18. *Violating the modified Helstrom bound.*
Workshop Talk: UCSB Meeting 2014.
University of California: Santa Barbara, Santa Barbara CA, September 2014.
17. *Implementing generalized measurements.*
Workshop Talk: UCSB Meeting 2014.
University of California: Santa Barbara, Santa Barbara CA, September 2014.
16. *Optimal routes through quantum phase space.*
Workshop Talk: UCSB Meeting 2014.
University of California: Santa Barbara, Santa Barbara CA, September 2014.
15. *Avoiding Loopholes with Hybrid Bell-Leggett-Garg Inequalities.*
American Physical Society (APS): March Meeting 2014.
Denver Convention Center, Denver CO, March 2014.

14. *Enhancing Weak Value Amplification.*
Invited Talk: UCB 2014.
University of California, Berkeley CA, January 2014.
13. *An Action Principle for Continuous Quantum Measurements.*
Invited Talk: USC 2013.
University of Southern California, Los Angeles CA, November 2013.
12. *Weak Measurements, Weak Values, and Bell-Leggett-Garg Inequalities.*
Workshop Talk: UCSB Meeting 2013.
University of California: Santa Barbara, Santa Barbara CA, September 2013.
11. *Weakly Measuring Observables with Generalized Eigenvalues.*
Invited Talk: CEMS, RIKEN 2013.
CEMS, RIKEN, Wako-shi, Saitama Japan, July 2013.
10. *Weak Values are Universal in von Neumann Measurements.*
American Physical Society (APS): March Meeting 2013.
Baltimore Convention Center, Baltimore MD, March 2013.
9. *Grounding generalized measurements in the laboratory.*
Optical Society of America (OSA): Frontiers in Optics (FiO) 2012.
Rochester Convention Center, Rochester NY, October 2012.
8. *Weak values need not be weak.*
Cross Borders Workshop (XBW) XIV.
McGill University, Montreal Quebec, Canada, June 2012.
7. *Contextual Values: Going beyond the eigenvalues of an observable.*
Cross Borders Workshop (XBW) XIII.
University of Rochester, Rochester NY, June 2011.
6. *Experimental Violation of Two-Party Leggett-Garg Inequalities with Semi-weak Measurements.*
American Physical Society (APS): March Meeting 2011.
Dallas Convention Center, Dallas TX, March 2011.
5. *Quantum measurement with Mach-Zehnder Interferometers.*
American Physical Society (APS): March Meeting 2011.
Dallas Convention Center, Dallas TX, March 2011.
4. *Quantum Strangeness: or, How I learned to stop worrying and love Weak Values.*
University of Rochester Prospective Physics Weekend.
University of Rochester, Rochester NY, February 2011.
3. *Experimental Violation of Two-Party Leggett-Garg Inequalities with Semi-weak Measurements.*
Optical Society of America (OSA): Frontiers in Optics (FiO) 2010.
Rochester Convention Center, Rochester NY, October 2010.
2. *Weak Value Inequalities as a Test of Hidden Variable Theories.*
Symposium on Quantum Control and Quantum Entanglement.
University of Rochester, Rochester NY, October 2009.
1. *Gravitational Redshift and Deflection of Slow Light.*
American Physical Society (APS): March Meeting 2009.
Pittsburgh Convention Center, Pittsburgh PA, March 2009.

15. *A quantum algorithm for verifying first-order logic.*
D. Briseno, J. Dressel, M. Andrew Moshier, O. Wissa
Southwest Quantum Information and Technology (SQuInT) Conference 2020.
Eugene OR, February 2020.
14. *Contextuality from quantum reference frames.*
L. Burns, L. Catani, T. Gonda, T. Galley, J. Dressel
Southwest Quantum Information and Technology (SQuInT) Conference 2020.
Eugene OR, February 2020.
13. *Efficient simulation of non-Markovian qubit trajectories.*
S. Greenfield, S. L. Barzili, J. Dressel
Southwest Quantum Information and Technology (SQuInT) Conference 2020.
Eugene OR, February 2020.
12. *Solving 3-SAT through simulated quantum evolution.*
T. Kling, J. Dressel
Southwest Quantum Information and Technology (SQuInT) Conference 2020.
Eugene OR, February 2020.
11. *High-fidelity quantum state estimation via autoencoder tomography.*
S. L. Barzili, N. Stevenson, B. Mitchell, R. Mohseninia, I. Siddiqi, J. Dressel
Southwest Quantum Information and Technology (SQuInT) Conference 2020.
Eugene OR, February 2020.
10. *Minimal quantum state representations from denoising auto-encoders.*
S. Barzili, R. Mohseninia, J. Dressel
Southwest Quantum Information and Technology (SQuInT) Conference 2019.
Santa Fe NM, February 2019.
9. *Out-of-time-ordered-correlator quasi-probabilities for the quantum kicked top.*
J. R. González Alonso, N. Shammah, S. Ahmed, F. Nori, and J. Dressel
Southwest Quantum Information and Technology (SQuInT) Conference 2019.
Santa Fe NM, February 2019.
8. *A local non-contextual model of non-interacting measurement.*
S. Greenfield, J. Dressel
Southwest Quantum Information and Technology (SQuInT) Conference 2019.
Santa Fe NM, February 2019.
7. *Always-on quantum error tracking with continuous parity measurements.*
R. Mohseninia, J. Yang, A. N. Jordan, A. N. Korotkov, J. Dressel
Southwest Quantum Information and Technology (SQuInT) Conference 2019.
Santa Fe NM, February 2019.
6. *Continuous Quantum Measurement Using Recurrent Neural Networks.*
S. Barzili, J. Dressel,
Office of Undergraduate Research and Creative Activity (OURCA) Research Day
2018.
Chapman University, Orange CA, May 2018.
5. *Resilience of Measurement Protocols for Out-of-Time-Ordered Correlators.*
J. R. González Alonso, J. Dressel
Southwest Quantum Information and Technology (SQuInT) Conference 2018.
Santa Fe NM, February 2018.

4. *Violating the Modified Helstrom Bound with Partial Projections.*
J. Dressel, A. N. Korotkov
Multi-Qubits Coherent Operations (MQCO) IARPA Technical Exchange Meeting
2014.
Baltimore MD, May 2014.
3. *Avoiding Loopholes with Hybrid Bell-Leggett-Garg Inequalities.*
J. Dressel, A. N. Korotkov
Multi-Qubits Coherent Operations (MQCO) IARPA Technical Exchange Meeting
2014.
Hilton San Fransisco Financial District, San Fransisco CA, January 2014.
2. *Weak values need not be weak.*
J. Dressel, A. N. Jordan
Coherence and Quantum Optics (CQO) X /
Quantum Information and Measurement (QIM) 2.
University of Rochester, Rochester NY, June 2013.

Cross Borders Workshop (XBW) XIV.
McGill University, Montreal Quebec, Canada, June 2012.
1. *Gravitational Redshift and Deflection of Slow Light.*
J. Dressel, S. Rajeev, A. N. Jordan
American Physical Society (APS): Symposium, New York State Section.
Laboratory for Laser Energetics, Rochester NY, April 2009.