



Zachary Kenneth Fisher

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CURRENT POSITION

Perimeter Institute for Theoretical Physics
Postdoctoral Researcher

Waterloo, ON, Canada
September 2017 –

It from Qubit Fellow, Simons Collaboration on Quantum Fields, Gravity and Information.

EDUCATION

University of California, Berkeley

August 2012 – May 2017

Ph.D. in Physics awarded May 2017. Thesis title: “Entropy Bounds and Entanglement.”

M.A. awarded May 2014. GPA: 3.97/4.0

Massachusetts Institute of Technology

September 2008 – June 2012

S.B. Physics. Thesis title: “Shuttling of ions for characterization of a microfabricated ion trap.”

GPA: 5.0/5.0

PRIOR EMPLOYMENT

University of California, Berkeley

Berkeley, CA

Junior Researcher

June 2017 – August 2017

University of California, Berkeley

Berkeley, CA

Graduate Student Instructor

Aug. 2012 – June 2014, Aug. 2015 – June 2016, Jan. – June 2017

University of California, Berkeley

Berkeley, CA

Graduate Student Researcher

June 2014 – December 2015, June – December 2016

Research Laboratory of Electronics at MIT

Cambridge, MA

Research Assistant

June 2011 – December 2011

Lawrence Berkeley National Laboratory

Berkeley, CA

Summer Research Assistant

June – August 2009, July – August 2010

PUBLICATIONS

- H. Z. Chen, **Z. Fisher**, J. Hernandez, R. C. Myers and S. M. Ruan. [hep-th/1911.03402](#)
“Information Flow in Black Hole Evaporation.”
To appear.
- **Z. Fisher** and C. Mogni. [hep-th/1706.08257](#)
“A Semiclassical, Entropic Proof of a Weak Gravity Conjecture.”
To appear.
- R. Bousso, **Z. Fisher**, J. Koeller, S. Leichenauer, and A. Wall. [hep-th/1509.02542](#)
“Proof of the Quantum Null Energy Condition.”
Phys. Rev. D 93, no. 2, 024017 (2016).
- R. Bousso, **Z. Fisher**, S. Leichenauer, and A. Wall. [hep-th/1506.02669](#)
“Quantum focussing conjecture.”
Phys. Rev. D 93, no. 6, 064044 (2016).

- R. Bousso, H. Casini, **Z. Fisher** and J. Maldacena. [hep-th/1406.4545](#)
“Entropy on a null surface for interacting quantum field theories and the Bousso bound.”
Phys. Rev. D 91, no. 8, 084030 (2015).
- R. Bousso, H. Casini, **Z. Fisher** and J. Maldacena. [hep-th/1404.5635](#)
“Proof of a Quantum Bousso Bound.”
Phys. Rev. D 90, no. 4, 044002 (2014).
- C. Sun, **Z. Fisher**, C. Pappas, and D. Robin.
“Pulsed Multipole Injection for ALS Upgrade.”
Proceedings of IPAC’10, Kyoto, Japan (2010).

TALKS AND POSTERS

(★ denotes invited talk.)

- ★ “Energy Positivity from Holographic Volume Susceptibility.” *June 18, 2019*
It from Qubit Workshop. Yukawa Institute for Theoretical Physics. Oral Presentation.
- ★ “The view from $10,000 \ell_{\text{AdS}}$.” *March 27, 2019*
Perimeter Institute of Theoretical Physics. Group Meeting.
- “Entropy, energy positivity and causality.” *September 28, 2018*
Perimeter Institute of Theoretical Physics. Group Meeting.
- “Weak gravity conjecture and black hole thermodynamics.” *December 15, 2017*
Perimeter Institute of Theoretical Physics. String Seminar.
- “Weak gravity conjecture and black hole thermodynamics.” *December 5, 2017*
It from Qubit Annual Meeting. Simons Foundation, New York, NY. Poster.
- ★ “Weak gravity conjecture and black hole thermodynamics.” *October 18, 2017*
Massachusetts Institute of Technology, Department of Physics. Seminar.
- ★ “Weak gravity conjecture and black hole thermodynamics.” *September 15, 2017*
Princeton Institute for Theoretical Physics. String Seminar.
- ★ “Quantum focussing conjecture and the quantum null energy condition.” *June 14, 2017*
Aspen Center for Physics.
- “Quantum focussing and the quantum null energy condition.” *September 10, 2016*
Berkeley Center for Theoretical Physics, Tahoe Theorist Retreat.
- “An entropic focussing conjecture.” *September 11, 2015*
Berkeley Center for Theoretical Physics, Tahoe Theorist Retreat.
- ★ “Progress towards a quantum focussing theorem.” *April 1, 2015*
Berkeley Center for Theoretical Physics, String Seminar.
- ★ “Entropy on null surfaces and the covariant bound.” *September 23, 2014*
Berkeley Center for Theoretical Physics, String Seminar.
- “Electron field noise sensing with a scanning ion.” *February 27, 2012*
American Physical Society March Meeting. Session B1: Atom Interferometry and New Techniques with Ultracold Atoms

SKILLS

Scripting languages

Python (including NumPy, SciPy, Tensorflow/Keras, PyTorch), Mathematica, MATLAB/Octave, JavaScript, PHP

Programming languages

C, C++, Objective-C

Other languages

HTML, CSS, SQL

AWARDS

- It from Qubit Postdoctoral Fellowship 2017
 - Editors' Suggestion ("Proof of a quantum Bousso bound"), Physical Review D 2014
 - Outstanding Graduate Student Instructor, UC Berkeley 2014
 - Sigma Pi Sigma 2012
 - Phi Beta Kappa 2012
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PROFESSIONAL ACTIVITIES

Peer Review

- Journal of High Energy Physics 2017 – 2019
- Annalen der Physik 2018

Organizational

- Group meeting organizer: Quantum Fields and Strings, Perimeter Institute Fall 2018 –
- Founder: Holography Round Table, Perimeter Institute Fall 2018 – Fall 2019

Mentorship

- Júlia Alsina Orsol, Perimeter Scholars International Spring 2018
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TEACHING ASSISTANTSHIPS

Physics 137B Spring 2017, Spring 2014
Quantum Mechanics II

Physics H7B Spring 2016, Fall 2015, Fall 2013
Physics for Scientists and Engineers with Honors II

Letters & Sciences 125 Spring 2016
Big Ideas: Time

Physics 7B Fall 2013, Spring 2013
Physics for Scientists and Engineers II

Physics 7A Fall 2012
Physics for Scientists and Engineers I

CONFERENCES AND WORKSHOPS ATTENDED

Workshop on Qubits and Spacetime It from Qubit Workshop. Institute for Advanced Studies, Princeton, NJ.	<i>December 2019</i>
Quantum Information and String Theory 2019 It from Qubit School/Workshop. Yukawa Institute of Theoretical Physics, Kyoto, Japan.	<i>June 2019</i>
Theoretical Physics for Machine Learning Aspen Center for Theoretical Physics, Aspen, CO.	<i>January 2019</i>
Qubits on the Horizon It from Qubit/Scanning New Horizons. Oranjestad, Aruba.	<i>January 2019</i>
Quantum Information and Quantum Gravity IV Galileo Galilei Institute for Theoretical Physics, Arcetri, Florence, Italy.	<i>June 2018</i>
Quantum Information and Black Holes Institute for Advanced Studies, Princeton, NJ.	<i>December 2017</i>
20 Years Later: The Many Faces of AdS/CFT Princeton Center for Theoretical Physics, Princeton, NJ.	<i>November 2017</i>
Quantum Information and Quantum Gravity III University of British Columbia, Vancouver, BC.	<i>August 2017</i>
Information in Quantum Field Theory Aspen Center for Theoretical Physics, Aspen, CO.	<i>June 2017</i>
Simons Collaboration on Quantum Fields, Gravity and Information It from Qubit. Perimeter Institute, Waterloo, ON.	<i>July 2016</i>
Theoretical Advanced Study Institute in Particle Theory New Frontiers in Fields and Strings. University of Colorado, Boulder, CO.	<i>June 2015</i>
Simons Summer Workshop The Early Universe, Black Holes and Strings. Simons Center for Geometry and Physics, Stony Brook, NY.	<i>July 2014</i>
American Physical Society March Meeting Session B1: Atom Interferometry and New Techniques with Ultracold Atoms. Boston, MA.	<i>February - March 2012</i>
United States Particle Accelerator School Fundamentals of Charged Particle Optics. University of California, Santa Cruz, CA.	<i>January 2008</i>