

Curriculum Vitae
ERIC MEFFORD

Local address:

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Research Interests

In my research, I construct new solutions to the Einstein equation in asymptotically locally AdS spacetimes for applications to strongly coupled quantum field theories. I am especially interested in finding ways to study thermal interacting quantum field theories near black holes and wormholes. I also study universal features of holographic CFTs to determine when and if a field theory has a holographic dual.

Education

Ph.D. in Physics (subfield: General Relativity) Title: <i>Thermal Behavior of Holographic CFTs</i> Advisor: Gary Horowitz	June 2018
M.S. in Physics, University of California, Santa Barbara Masters Project: <i>Simple holographic insulator</i> Advisor: Gary Horowitz	June 2015
B.S. in Physics with Distinction, Stanford University University Honors with Distinction Thesis: <i>Cosmic censorship in Kerr-Newman Black Holes</i> , Advisor: Leonard Susskind	June 2012

Publications

- A. Ishibashi, K. Maeda, and E. Mefford, *Violation of the QNEC in a holographic wormhole and IR effects*
 E. Mefford, *State dependence of entanglement entropy near Schwarzschild black holes*, (in preparation)
 E. Mefford, E. Shaghoulian, and M. Shyani, *Sparseness bounds on local operators in holographic CFT_d*,
 JHEP 1807 051 (2018), arXiv: 1711.03122
 A. Ishibashi, K. Maeda, and E. Mefford, *Holographic stress-energy tensor near the Cauchy horizon inside a rotating black hole*, Phys. Rev. D96 no.2, 024005 (2017), arXiv:1703.09743
 Z. Fu, D. Marolf, and E. Mefford, *Time-independent Wormholes*, JHEP 1612 021 (2016),
 arXiv: 1610.08069
 E. Mefford, *Entanglement Entropy in Jammed CFTs*, JHEP 1709 006 (2017), arXiv: 1605.09369
 E. Mefford and G.T. Horowitz, *Simple Holographic Insulator*, Phys. Rev. D90 no.8, 084042 (2014),
 arXiv:1406.4188

Conferences and Summer Schools

2018	UCSB Strings Seminar <i>Talk Title: Boundary wormholes put the heat on null energy conditions</i> So-Cal Strings Graduate Student Conference, UCSB (co-organizer) <i>Talk Title: Holographic QFTs on asymptotically flat wormholes</i> 34 th Annual Pacific Coast Gravity Meeting, CalTech <i>Talk Title: Gravitational Constraints on Operators in Holographic CFT_d</i>
2017	33 rd Annual Pacific Coast Gravity Meeting, UCSB <i>Talk title: Boundary black holes and jammed CFTs</i> So-Cal Strings Graduate Student Conference, UCSD <i>Talk title: Strongly coupled Hawking radiation and holography</i>

- 2016 “New perspectives from strings and higher dimensions” workshop, Benasque, Spain
21st International Conference on General Relativity and Gravitation, Columbia University
Poster title: Entanglement entropy in jammed CFTs
- 2015 Theoretical Advanced Study Institute (TASI), University of Colorado, Boulder
Talk title: The pseudogap phase in holography
- 2014 30th Annual Pacific Coast Gravity Meeting, UCSD
Talk title: Superfluid-Insulator Transition from Holography

Awards and Honors

Academic Senate Doctoral Student Travel Grant (2017)
Herbert P. Broida Fellowship (2012-2013)
Alan and Lauren B. Dachs Endowed Scholarship (2011-2012)
Stanford Fund Scholarship (2010-2011)
2010 Pac-10 All-Academic First Team (Varsity Rowing)
Holliday Scholarship (2008-2010)

Outreach and Physics Extracurricular Activity

Physics Circus (2016-2018)
Interactive physics demonstrations at local elementary schools

Summer Institute for Mathematics and Science (2017-2018)
Through the California NanoScience Institute, mentored and gave a series of lectures to incoming UCSB freshman to encourage research and professional development.

UCSB High Energy Theory Journal Club (2013-2018)
Talks on the Myers Effect, Conformal Bootstrap and 3D Ising Model, RS Braneworlds, Membrane Paradigm, Minimal Models, Weinberg’s soft theorems, 3d Gravity, Quantum teleportation and the information paradox, String theory in two dimensions

UCSB Math Department CFT Seminar (Spring 2017)
String theory as a CFT

Teaching Experience

Head Teaching Assistant: assigned teaching positions, oversaw all teaching assistants, and ran the physics study room (Fall 2013-Winter 2014)

Served as teaching assistant, running discussion sections/labs, writing homework solutions, grading homeworks and exams:

Physics 3 Lab, *Waves, Sound, and Electricity* (Fall 2012, Winter 2013)
Physics 6A, 6B, 6C Lab, *Physics for Life Sciences* (Summer 2013, Winter 2016)
College of Creative Studies (UCSB honor’s college), *Modern Physics, Thermodynamics, Electricity and Magnetism* (Spring 2013, Fall-Spring 2018)
Physics 102: *Linear Algebra* (Fall 2014)
Physics 101: *Complex Analysis* (Winter 2017)
Physics 131: *Undergraduate General Relativity* (Spring 2015)
Physics 231 A,B,C: *Graduate General Relativity* (Winter 2014, Fall 2015-Spring 2016, Spring 2018)
Physics 45 (Stanford): *Thermodynamics for Engineers* (Fall 2011)

Programming Experience

Languages: Mathematica, Python, Java
Numerical methods: Pseudospectral methods, transfinite interpolation, finite differencing