

Kristan Jensen – Curriculum Vitæ

Department of Physics and Astronomy
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Research Interests

String theory and holography.
Dualities, symmetries, and anomalies in quantum field theory.
Effective field theory and hydrodynamics.
Entanglement in field and string theory.

Professional Experience and Education

07/2023 – Present	University of Victoria. Associate Professor of Physics.
09/2020 – 06/2023	University of Victoria. Assistant Professor of Physics.
01/2016 – 12/2020	San Francisco State University. Assistant Professor of Physics.
09/2013 – 12/2015	C.N. Yang Institute for Theoretical Physics, Stony Brook University. Research Assistant Professor. Supervisor: Christopher Herzog.
09/2010 – 08/2013	University of Victoria. Postdoctoral Fellow. Supervisors: Pavel Kovtun and Adam Ritz.
06/2007 – 08/2010	University of Washington. Graduate Student in Physics. Dissertation: <i>On the Utility of D-Branes</i> . Advisor: Andreas Karch. Ph.D.: 08/2010.

Awards and Funding

2026 – 2031	PI on NSERC Discovery Grant “There and back again: quantum fields and quantum gravity”
2025	<i>Frontiers of Science Award</i> , International Congress of Basic Science.
2024	<i>Faculty of Science Award for Research Excellence</i> , University of Victoria.
2021 – 2026	PI on NSERC Discovery Grant “Quantum gravity and hydrodynamics : a surprising partnership”
2017 – 2020	Co-PI on US Department of Energy Grant “Research in Theoretical High Energy Physics” with Profs. Golterman and Greensite at San Francisco State University.
09/2013 – 12/2015	<i>C.N. Yang Fellowship</i> , C.N. Yang Institute of Theoretical Physics.

Supervised Highly Qualified Personnel

Postdoctoral fellows

Prateksh Dhivakar* (current); 2024-present.
 Eric Mefford* (Lecturer, University of Tampa); 2021-2024.
 Akash Jain* (Postdoc, Oxford University); 2020-2021.

Ph.D. Students

William Harvey (current, University of Victoria); 2023-present.
 Amir Raz* (Postdoctoral Fellow, University of Chicago); 2021-2025.
 Jordan Cotler* (Assistant Professor, Harvard); 2016-2020.

M.S./M.Sc. Advisees

Jeffrey Morais (University of Victoria), 2024-2025.
 Takahiro Uzu (Teacher Training Program, Cambridge University); 2022-2024.
 William Harvey (Ph.D. student, University of Victoria); 2020-2022.
 Alexander Sheynis (Lecturer); 2020-2022.
 Jason Elhaderi (Ph.D. Student; University of Illinois at Urbana-Champaign); 2017-2019.
 Priti Patil (Ph.D. Student; University of California, Davis); 2017-2019.
 Sky Nelson-Isaacs (High School Teacher, El Cerrito); 2016-2017.
 Gaurang Parkar (Ph.D. Student; University of Stavanger); 2016-2017.

B.S. Advisees

Thomas Martin (Current), 2026-2027.
 Matthew Newton (MSc Student, University of Alberta), 2023-2024.
 Jiabao Yang (Ph.D. Student; Cornell University); 2019.

(*Co-advised.)

Publications

Note: Authors are always listed alphabetically on publications in particle physics. It is generally assumed that all authors contributed equally. Papers with an explicit author ordering are indicated in **green**, and I have indicated my single-author papers and papers with only supervised students in **blue**. I have also bolded highly qualified personnel (HQP) authors that I have directly supervised or co-supervised, and italicized HQP authors that I have closely mentored, but am not directly supervising.

1. *Superfluid memory effect*,
K. Jensen, A. Perez, and S. Prohazka,
arXiv:2608.31172 (submitted to Physical Review Letters).
2. *Inner products and closed universes*,
J. Cotler and K. Jensen,
arXiv:2608.26253 (submitted to Journal of High Energy Physics).
3. *Carrollian holographic duals are non-local*,
J. Cotler, **P. Dhivakar**, and K. Jensen,
Phys.Rev.Lett. **137** (2026), 091601, arXiv:2512.05072.
4. *Developments in JT gravity*,
K. Jensen,
Frontiers of Science Award Summary, Proceedings of the International Congress of Basic Science
July 2025.
5. *Norm of the no-boundary state*,
J. Cotler and K. Jensen,
JHEP **03** (2026), 180, arXiv:2506.20547.
6. *Comparing top-down and bottom-up holographic defects and boundaries*,
W. Harvey, K. Jensen, and **T. Uzu**,
JHEP **08** (2025), 167, arXiv:2504.13244.
7. *A finite Carrollian critical point*,
J. Cotler, **P. Dhivakar**, and K. Jensen,
JHEP **08** (2025), 172, arXiv:2504.12289.
8. *Holographic observers and time-band algebras*,
K. Jensen, S. Raju, and A. Speranza,
JHEP **06** (2025), 242, arXiv:2412.21185.
9. *The Fractional Hall hierarchy from duality*,
K. Jensen and **A. Raz**,
arXiv:2412.17761 (submitted to SciPost).
10. *Soft gravitons in three dimensions*,
J. Cotler, K. Jensen, S. Prohazka, M. Riegler, and J. Salzer,
JHEP **07** (2025), 002, arXiv:2411.13633.
11. *Quantizing Carrollian field theories*,
J. Cotler, K. Jensen, S. Prohazka, **A. Raz**, M. Riegler, and J. Salzer,
JHEP **10** (2024), 049, arXiv:2407.11971.
12. *Dipole superfluid hydrodynamics II*,
A. Jain, K. Jensen, R. Liu, and **E. Mefford**,
JHEP **07** (2024), 197, arXiv:2401.16385.
13. *Non-perturbative de Sitter Jackiw-Teitelboim gravity*,
J. Cotler and K. Jensen,
JHEP **12** (2024), 016, arXiv:2401.01925.

14. *Smeared end-of-the-world branes*,
W. Harvey, K. Jensen, and **T. Uzu**,
Phys.Rev.D. **111** (2025), 066017, arXiv:2311.13643
15. *Fractional Hall physics from large N interacting fermions*,
K. Jensen and **A. Raz**,
Phys.Rev.Lett. **135** (2025), 071601, arXiv:2311.10108.
16. *Generalized entropy for general subregions in quantum gravity*,
K. Jensen, J. Sorce, and A. Speranza,
JHEP **12** (2023), 020, arXiv:2306.01837.
17. *Dipole superfluid hydrodynamics*,
A. Jain, K. Jensen, R. Liu, and **E. Mefford**,
JHEP **09** (2023), 184, arXiv:2304.09852.
18. *Eternal traversable wormholes in three dimensions*,
W. Harvey and K. Jensen,
JHEP **10** (2023), 178, arXiv:2302.14049.
19. *Isometric evolution in de Sitter quantum gravity*,
J. Cotler and K. Jensen,
Phys.Rev.Lett. **131** (2023), 211601, arXiv:2302.06603.
20. *A precision test of averaging in AdS/CFT*,
J. Cotler and K. Jensen,
JHEP **11** (2022), 070, arXiv:2205.12698.
21. *Large N fractons*,
K. Jensen and **A. Raz**,
Phys.Rev.Lett. **132** (2024), 071603, arXiv:2205.01132.
22. *Fractons in curved space*,
A. Jain and K. Jensen,
SciPost.Phys **12** (2021), 142, arXiv:2111.03973.
23. *Wormholes and black hole microstates in AdS/CFT*,
J. Cotler and K. Jensen,
JHEP **09** (2021), 001, arXiv:2104.00601.
24. *Gravitational Constrained Instantons*,
J. Cotler and K. Jensen,
Phys.Rev.D. **104**, 081501 (2021), arXiv:2010.02241.
(Highlighted by PRD as an Editor's Suggestion.)
25. *AdS₃ wormholes from a modular bootstrap*,
J. Cotler and K. Jensen,
JHEP **11** (2020), 058, arXiv:2007.15263.
26. *AdS₃ gravity and random CFT*,
J. Cotler and K. Jensen,
JHEP **04** (2021), 033, arXiv:2006.08648.
27. *Emergent unitarity in de Sitter from matrix integrals*,
J. Cotler and K. Jensen,
JHEP **12** (2021), 089, arXiv:1911.12358.
28. *Chern-Simons dualities with multiple flavors at large N* ,
K. Jensen and **P. Patil**,
JHEP **12** (2019), 043, arXiv:1910.07484.

29. *Scrambling in nearly thermalized states at large central charge*,
K. Jensen,
[arXiv:1906.05852](#).
30. *Low-dimensional de Sitter quantum gravity*,
J. Cotler, K. Jensen, and A. Maloney,
JHEP **6** (2020), 048, [arXiv:1905.03780](#).
31. *From the Weyl Anomaly To Entropy for Two-Dimensional Boundaries and Defects*,
K. Jensen, A. O'Bannon, B. Robinson, and R. Rodgers,
Phys.Rev.Lett. **122**, 241602 (2019), [arXiv:1812.08745](#).
32. *A theory of reparameterizations for AdS_3 gravity*,
J. Cotler and K. Jensen,
JHEP **2** (2019), 079, [arXiv:1808.03263](#).
33. *A panoply of Schwinger-Keldysh transport*,
K. Jensen, R. Marjeh, N. Pinzani-Fokeeva, and A. Yarom,
SciPost.Phys **5** (2018) 053, [arXiv:1804.04654](#).
34. *An entropy current in superspace*,
K. Jensen, R. Marjeh, N. Pinzani-Fokeeva, and A. Yarom,
JHEP **1** (2019), 061, [arXiv:1803.07070](#).
35. *A master bosonization duality*,
K. Jensen,
JHEP **1** (2018) 031, [arXiv:1712.04933](#).
36. *Locality and anomalies in warped conformal field theory*,
K. Jensen,
JHEP **12** (2017) 111, [arXiv:1710.11626](#).
37. *'t Hooft anomalies and boundaries*,
K. Jensen, E. Shaverin, and A. Yarom,
JHEP **1** (2018) 085, [arXiv:1710.07299](#).
38. *Embedding three-dimensional bosonization dualities into string theory*,
K. Jensen and A. Karch,
JHEP **12** (2017) 031, [arXiv:1709.07872](#).
39. *Displacement Operators and Constraints on Boundary Central Charges*,
C. Herzog, K. W. Huang, and K. Jensen,
Phys.Rev.Lett. **120**, 021601 (2018), [arXiv:1709.07431](#).
40. *Bosonizing three-dimensional quiver gauge theories*,
K. Jensen and A. Karch,
JHEP **11** (2017) 018, [arXiv:1709.01083](#).
41. *Dissipative hydrodynamics in superspace*,
K. Jensen, N. Pinzani-Fokeeva, and A. Yarom,
JHEP **09** (2018) 127, [arXiv:1701.07436](#).
42. *Thermoelectric transport in disordered metals without quasiparticles: the Sachdev-Ye-Kitaev models and holography*,
R. Davison, W. Fu, A. Georges, Y. Gu, K. Jensen, and S. Sachdev,
Phys.Rev.B. **95**, 155131 (2017), [arXiv:1612.00849](#).
(Highlighted by PRB as an Editor's Suggestion.)
43. *Chaos in AdS_2 holography*,
K. Jensen,
Phys.Rev.Lett. **117**, 111601 (2016), [arXiv:1605.06098](#).
(Highlighted by PRL as an Editor's Suggestion.)

44. *University Entanglement and Boundary Geometry in Conformal Field Theory*,
C. P. Herzog, K. W. Huang, and K. Jensen,
JHEP **01** (2016) 162, arXiv:1510.00021.
45. *A Constraint on Boundary and Defect Renormalization Group Flows*,
K. Jensen and A. O'Bannon,
Phys.Rev.Lett. **116**, 091601 (2016), arXiv:1509.02160.
46. *Boundary effective action for quantum Hall states*,
A. Gromov, K. Jensen, and A. G. Abanov,
Phys.Rev.Lett. **116**, 126802 (2016), arXiv:1506.07171.
47. *Anomalies for Galilean fields*,
K. Jensen,
SciPost.Phys **5** (2018) 005, arXiv:1412.7750.
48. *Revisiting non-relativistic limits*,
K. Jensen and A. Karch,
JHEP **04** (2015) 155, arXiv:1412.2738.
49. *Aspects of hot Galilean field theory*,
K. Jensen,
JHEP **04** (2015) 123, arXiv:1411.7024.
50. *On the coupling of Galilean-invariant field theories to curved spacetime*,
K. Jensen,
SciPost.Phys **5** (2018) 011, arXiv:1408.6855.
(Highlighted by SciPost as Select, reserved for the top 10% of articles published therein.)
51. *Wormholes and entanglement in holography*,
K. Jensen and J. Sonner,
Intl.J.Mod.Phys.D (2014), 1442003, arXiv:1405.4872
(Gravity Research Foundation essay – Honorable Mention).
52. *The holographic dual of a Hawking pair has a wormhole*,
K. Jensen, A. Karch, and B. Robinson,
Phys.Rev.D. **90**, 064019 (2014), arXiv:1405.2065.
53. *On Holographic Defect Entropy*,
J. Estes, K. Jensen, A. O'Bannon, E. Tsatis, and T. Wrase,
JHEP **05** (2014), 084, arXiv:1403.6475.
54. *Chern-Simons terms from thermal circles and anomalies*,
K. Jensen, R. Loganayagam, and A. Yarom,
JHEP **05** (2014), 110, arXiv:1311.2935.
55. *Anomaly inflow and thermal equilibrium*,
K. Jensen, R. Loganayagam, and A. Yarom,
JHEP **05** (2014), 134, arXiv:1310.7024.
56. *Holography, Entanglement Entropy, and Conformal Field Theories with Boundaries or Defects*,
K. Jensen and A. O'Bannon,
Phys.Rev.D. **88**, 106006 (2013), arXiv:1309.4523.
57. *Chiral conductivities and effective field theory*,
K. Jensen, P. Kovtun, and A. Ritz,
JHEP **10** (2013), 186, arXiv:1307.323.
58. *The holographic dual of an EPR pair has a wormhole*,
K. Jensen and A. Karch,
Phys.Rev.Lett. **111**, 211602 (2013), arXiv:1307.1132.
(Highlighted at APS Physics, by PRL as an Editor's Suggestion.)

59. *Moduli Spaces of Cold Holographic Matter*,
M. Ammon, K. Jensen, K.-Y. Kim, J. Laia, and A. O'Bannon,
JHEP **11** (2012), 55, arXiv:1208.3197.
60. *Thermodynamics, gravitational anomalies, and cones*,
K. Jensen, R. Loganayagam, and A. Yarom,
JHEP **02** (2013), 88, arXiv:1207.5824.
61. *Triangle Anomalies, Thermodynamics, and Hydrodynamics*,
K. Jensen,
Phys.Rev.D **85**, 125017 (2012), arXiv:1203.3599.
62. *Towards hydrodynamics without an entropy current*,
K. Jensen, M. Kaminski, P. Kovtun, R. Meyer, A. Ritz, and A. Yarom,
Phys.Rev.Lett **109**, 101601 (2012), arXiv:1203.3556.
(Highlighted by PRL as an Editor's Suggestion.)
63. *Parity-Violating Hydrodynamics in 2 + 1 Dimensions*,
K. Jensen, M. Kaminski, P. Kovtun, R. Meyer, A. Ritz, and A. Yarom,
JHEP **5** (2012), 102, arXiv:1112.4498.
64. *Semi-holographic quantum criticality*,
K. Jensen,
Phys.Rev.Lett. **107**, 231601 (2011), arXiv:1108.0421.
65. *Towards a holographic marginal Fermi liquid*,
K. Jensen, S. Kachru, A. Karch, J. Polchinski, and E. Silverstein,
Phys.Rev.D. **84**, 126002 (2011), arXiv:1105.1772.
66. *Chiral anomalies and AdS/CMT in two dimensions*,
K. Jensen,
JHEP **1** (2011), 109, arXiv:1012.4831.
67. *Non-Mean-Field Quantum Critical Points from Holography*,
N. Evans, K. Jensen, and K.-Y. Kim,
Phys.Rev.D **82**, 105012 (2010), arXiv:1008.1889.
68. *A Holographic Fractional Topological Insulator*,
C. Hoyos-Badajoz, K. Jensen, and A. Karch,
Phys.Rev.D **82**, 086001 (2010), arXiv:1007.3253.
69. *More Holographic Berezinskii-Kosterlitz-Thouless Transitions*,
K. Jensen,
Phys.Rev.D. **82**, 046005 (2010), arXiv:1006.3066.
70. *Holographic Berezinskii-Kosterlitz-Thouless Transitions*,
K. Jensen, A. Karch, D. T. Son, and E. Thompson,
Phys.Rev.Lett. **105**, 041601 (2010), arXiv:1002.3159.
(Highlighted at APS Physics.)
71. *A Holographic Quantum Critical Point at Finite Magnetic Field and Finite Density*,
K. Jensen, A. Karch, and E. Thompson,
JHEP **05** (2010), 015, arXiv:1002.2447.
72. *Hadronization at the AdS wall*,
N. Evans, J. French, K. Jensen, and E. Threlfall,
Phys.Rev.D **81**, 066004 (2010), arXiv:0908.0407.
73. *ABJM Mirrors and a Duality of Dualities*,
K. Jensen and A. Karch,
JHEP **09** (2009), 004, arXiv:0906.3013.

74. *Light quark energy loss in strongly-coupled $\mathcal{N} = 4$ supersymmetric Yang-Mills plasma*, P. M. Chesler, K. Jensen, A. Karch, and L. Yaffe, Phys.Rev.D **79**, 125015 (2009), arXiv:0810.1985.
75. *Jets in strongly-coupled $\mathcal{N} = 4$ super Yang-Mills theory*, P. M. Chesler, K. Jensen, and A. Karch, Phys.Rev.D. **79**, 025021 (2009), arXiv:0804.3110.
76. *Strongly bound mesons at finite temperature and in magnetic fields from AdS/CFT*, K. Jensen, A. Karch, and J. Price, JHEP **04** (2008), 058, arXiv:0801.2401.

Invited Talks

Here I have listed selected high-profile presentations. In addition I have given over 90 invited national and international seminars.

Colloquia

1. “Black holes and wormholes in quantum gravity”, TRIUMF, October 2025.
2. “Black holes and wormholes in quantum gravity”, University of Victoria, September 2024.
3. “Black holes and wormholes in quantum gravity”, University of Colorado Boulder, December 2023.
4. “Some recent developments in non-perturbative quantum gravity”, Yang Institute of Theoretical Physics, Stony Brook University, March 2020.
5. “Some recent developments in non-perturbative quantum gravity”, University of Victoria, March 2020.
6. “Some recent developments in non-perturbative quantum gravity”, Brandeis University, January 2020.
7. “Fluids and black holes”, California State University, East Bay, October 2016.
8. “Monotonicity and entanglement in boundary quantum field theory”, Stanford Institute for Theoretical Physics, September 2015.
9. “Hydrodynamics, strings, and anomalies”, San Fransisco State University, February 2015.
10. “Hydrodynamics, strings, and anomalies”, University of Kentucky, February 2015.
11. “A primer to anomalies and hydrodynamics”, Simons Center for Geometry and Physics, Stony Brook (USA), October 2013.

Public/Outreach Talks

1. “Black holes and wormholes in quantum gravity,” *Lecture for VISII Middle School*, Victoria (Canada), April 2026.
2. “Black holes and wormholes”, *Night with a Prof*, Victoria (Canada), March 2026.
3. “String theory and black holes,” *Cafe Scientifique*, Victoria (Canada), November 2024.

Conferences, Workshops, and Schools

1. “Caveat emptor”, *Carrollian Physics and Geometry*, Solvay Center at ULB (Belgium), June 2026.
2. “Comments on overlaps in semiclassical de Sitter quantum gravity”, *Observers, wormholes and complex saddles in cosmology*, Bernoulli Center at EPFL (Switzerland), May 2026.
3. “Troubles in paradise”, *Simons Collaboration on Celestial Holography Satellite Meeting*, Simons Foundation (USA), April 2026.
4. “Norm of the no-boundary state”, *Workshop on Approaches to Quantum Gravity in de Sitter space*, Abdus Salam International Centre for Theoretical Physics (Italy), October 2025.

5. “Norm of the no-boundary state”, *Strings in Seoul 2025*, Korea Institute for Advanced Study, Seoul (South Korea), September 2025.
6. “Developments in JT gravity”, *International Congress of Basic Science 2025*, Beijing Institute of Mathematical Sciences and Applications, Beijing (China), July 2025.
7. “Wormholes and random matrix statistics in pure 3d supergravity”, *Black holes and strongly coupled thermal dynamics*, Simons Center for Geometry and Physics (USA), June 2025.
8. “Quantum mechanics of low-dimensional de Sitter gravity”, *Focus Meeting on de Sitter, SYK, and Matrix Models*, IAS Princeton (USA), January 2025.
9. “Non-perturbative de Sitter JT gravity”, *Strings 2025*, Abu Dhabi (UAE), January 2025.
10. “de Sitter quantum gravity from (a continuation of) RMT”, *Quantum chaos and Holography 24*, Würzburg (Germany), May 2024.
11. “Wormholes in AdS_3 ”, *Speakable and Unspeakable in Quantum Gravity*, Institute Pascal, Saclay (France), May 2024.
12. “Fractons and quantum systems with exotic symmetry”, *Carrollian Physics and Holography*, Erwin Schrödinger International Institute for Mathematics and Physics (Austria), April 2024.
13. “More on de Sitter holography”, *Quantum Aspects of Cosmology*, Kavli Institute for Cosmological Physics (USA), March 2024.
14. “Wormholes and random matrix statistics in pure 3d supergravity”, *Random Physics*, Princeton Center for Theoretical Science (USA), March 2024.
15. “Fractional Hall states from large N interacting fermions”, *Workshop on String Theory, Holography and Black Holes*, Abdus Salam International Centre for Theoretical Physics (Italy), October 2023.
16. “Non-perturbative de Sitter JT gravity”, *Gravity from Chaotic Quantum Dynamics*, Oxford University (UK), July 2023.
17. “An invitation to hydrodynamics for systems with exotic spacetime symmetry (with applications to ‘fractons’)”, *The Many Faces of Relativistic Fluid Dynamics*, Kavli Institute for Theoretical Physics (USA), May 2023.
18. “Isometric evolution in de Sitter gravity” *Gravity from algebra: modern field theory methods for holography*, Kavli Institute for Theoretical Physics (USA), January 2023.
19. “Large N fractons”, *Simons Ultra Quantum Matter Collaboration meeting*, UT Austin (USA), August 2022.
20. “Frontiers in hydrodynamics”, panel discussion for *Simons Ultra Quantum Matter Collaboration meeting*, UT Austin (USA), August 2022.
21. “Wormholes in holography”, two 90 minute lectures for *School Reconstructing the Gravitational Hologram with Quantum Information*, Galileo Galilei Institute, Firenze (Italy), June 2022.
22. “Large N fractons”, *Developments in transport for strongly correlated systems*, Ecole Polytechnique (France), June 2022.
23. “Large N fractons”, *Geometrical Aspects of Topological Phases of Matter: Spatial Symmetries, Fractons and Beyond*, Simons Center for Geometry and Physics, Stony Brook (USA), May 2022.
24. “Large N fractons”, *Emergent Hydrodynamics in Condensed Matter and High-energy Physics*, Max Planck Institute for the Physics of Complex Systems, Dresden (Germany), May 2022.
25. “Soft theorems in three dimensions”, *From Coadjoint Orbits to Black Holes*, SWISSMAP Les Diablerets (Switzerland), February 2022.
26. “Wormholes and black hole microstates in AdS/CFT ”, *DPF 2021*, Florida State University, Tallahassee (USA), July 2021.
27. “Wormholes and black hole microstates in AdS/CFT ”, *Strings 2021*, ICTP Sao Paolo (Brazil), June 2021.

28. “Wormholes, random matrices, and (non-)factorization in $d > 2$ ”, *Island Hopping 2020: from Wormholes to Averages*, CERN, Geneva (Switzerland), November 2020.
29. “Euclidean wormholes in $d > 2$ dimensions and AdS/CFT”, *Autumn Symposium on String Theory*, Korea Institute for Advanced Study, Seoul (South Korea), September 2020.
30. “Some thoughts on bootstrapping de Sitter amplitudes”, *Bootstrap 2020*, Harvard University, Boston (USA), June 2020.
31. “Jackiw-Teitelboim gravity on two-dimensional nearly de Sitter spacetime”, *Non-Perturbative Methods in Quantum Field Theory*, Abdus Salam International Centre for Theoretical Physics, Trieste (Italy), September 2019.
32. Four lectures on Anomalies in Quantum Field Theory; Hydrodynamics; and Low-Dimensional Quantum Gravity, Korea Institute for Advanced Study, August 2019.
33. “Low dimensional de Sitter gravity”, *Advances in Quantum Field Theory*, CERN, Geneva (Switzerland), March 2019.
34. “de Sitter and SYK”, *Chaos, Holography, and Coadjoint Orbits*, Université de Genève, Geneva (Switzerland), February 2019.
35. “Quantum gravity in three dimensions and coadjoint orbits”, *Chaos and Order: from Strongly Correlated Systems to Black Holes*, Kavli Institute for Theoretical Physics, Santa Barbara (USA), November 2018.
36. “A theory of reparameterizations for AdS_3 gravity”, *Southern California Strings Seminar*, University of California, Los Angeles (USA), October 2018.
37. “A theory of reparameterizations for AdS_3 gravity”, *Bounding Transport and Chaos in Condensed Matter and Holography*, NORDITA, Stockholm (Sweden), August 2018.
38. “Chern-Simons dualities, and AdS_2 holography”, Three lectures for *Duality, Disorder and Chaos in Quantum Systems*, University of Cape Town, Cape Town (South Africa), May 2018.
39. “A zoo of bosonization dualities”, *Field Theory Dualities and Strongly Correlated Matter*, Aspen Center for Physics, Aspen (USA), March 2018.
40. “Chaos and symmetry breaking in AdS_2 ”, *Hydrodynamics, ergodicity, entanglement and localization in interacting lattice models and field theories*, Simons Center for Geometry and Physics, Stony Brook (USA), November 2017.
41. “Embedding three-dimensional bosonization dualities into string theory”, *Post-Strings 2017*, Weizmann Institute, Rehovot (Israel), July 2017.
42. “A dual to three-dimensional gravity”, *Simons Symposium on Entanglement 2017*, Schloss Elmau, Krün (Germany), May 2017.
43. “Schwinger-Keldysh effective field theory”, *Applied Newton-Cartan Geometry*, Simons Center for Geometry and Physics, Stony Brook (USA), March 2017.
44. “Chaos and symmetry breaking in low-dimensional AdS spacetimes”, *Bay Area Particle Theory Seminar*, San Francisco State University, San Francisco (USA), March 2017.
45. “Chaos and symmetry breaking in low-dimensional AdS spacetimes”, *QCD in Finite Temperature and Heavy-Ion Collisions*, RIKEN BNL Research Center Workshop, Brookhaven National Laboratory (USA), February 2017.
46. Chalkboard talk, *Chaos, the SYK Model, and AdS_2* , Institute for Advanced Study, Princeton (USA), October 2016.
47. “Chaos and hydrodynamics near AdS_2 ”, *Conformal Field Theory and Renormalization Group Flows in $d > 2$* , Galileo Galilei Institute, Firenze (Italy), June 2016.
48. “Large N limits and chaos in quantum mechanics and AdS_2 ”, *Current Themes in Holography*, Niels Bohr Institute (Denmark), April 2016.

49. “Anomaly matching and locality in warped conformal field theory”, *Gauge/gravity duality and condensed matter physics*, Banff International Research Station (Canada), March 2016.
50. “Fluids and black holes”, Two lectures for school at *Holography near and far from equilibrium*, University of Alabama, Tuscaloosa (USA), October 2015.
51. “Entanglement and monotonicity in boundary quantum field theory”, *AdS/CFT and quantum gravity*, Centre de recherches mathématiques, Montreal (Canada), September 2015.
52. “A new constraint on boundary renormalization group flows”, *Holography and its applications*, Asia Pacific Center for Theoretical Physics, Pohang (Korea), August 2015.
53. “A menagerie of non-relativistic physics”, *Gauge/Gravity Duality 2015*, Galilei Galileo Institute, Firenze (Italy), April 2015.
54. “Galilean-invariant theory in curved spacetime”, *Geometric Aspects of Quantum States in Condensed Matter*, International Institute of Physics – Universidade Federal do Rio Grande do Norte, Natal (Brazil), August 2014.
55. “Deriving anomaly-induced response from thermal equilibrium” (two talks), *Quantum Anomalies and Hydrodynamics*, Simons Center for Geometry and Physics, Stony Brook (USA), March 2014.
56. “The holographic dual of an EPR pair (has a wormhole!),” *Gauge/Gravity Duality 2013*, Max Planck Institute, Munich (Germany), July 2013.
57. “Gravitational anomaly-induced transport in four (and more!) dimensions,” *Relativistic hydrodynamics and the gauge gravity duality*, Technion (Israel), May 2013.
58. “Anomaly inflow and exact results at $T > 0$,” *Holography and Applied String Theory*, Banff International Research Station (Canada), February 2013.
59. “Thermodynamics (and hydrodynamics), reconsidered,” *Applications of Gauge-Gravity Duality*, Technion (Israel), June 2012.
60. “Holographic aspects of finite density systems in $1 + 1d$,” *Strongly Correlated Systems and Gauge/Gravity Duality*, Aspen (USA), February 2011.

Professional Activities

Organizational Service

Schools

Canadian Advanced Theory School (CATS), Ph.D. Summer School rotating between Victoria, UBC, and Perimeter, August 2028 – future, *Forthcoming*.

Long-term programs

Statistics of the gravitational path integral, Aspen Center for Physics (USA), June 2027, *Forthcoming*.

QFT at the Boundary, Mainz Institute for Theoretical Physics, Mainz (Germany), September 2021.

Hydrodynamics, ergodicity, entanglement and localization in interacting lattice models and field theories, Simons Center for Geometry and Physics, Stony Brook (USA), September 2017 - December 2017.

Workshops and conferences

Werner Israel Memorial Symposium, a memorial conference in honor of Werner Israel’s life and scientific contributions, University of Victoria (Canada), May 2023.

Pacific Northwest Particle Theory Seminar, a yearly one-day meeting for particle theorists in the Pacific Northwest, Spring 2022 - Present.

QFT at the Boundary, Mainz Institute for Theoretical Physics, Johannes Gutenberg University (Germany), September 2021.

Boundaries and Defects in Quantum Field Theory, Perimeter Institute for Theoretical Physics, Waterloo (Canada), August 2019.

Progress in quantum collective phenomena - from MBL to black holes, Simons Center for Geometry and Physics, Stony Brook (USA), November 2017.

Bay Area Particle Theory Seminar (BAPTS), a one-day meeting twice a year for particle theorists in the Bay Area, San Francisco State University, San Francisco (USA), Fall 2017 - Fall 2020.

Quantum Anomalies and Hydrodynamics: Applications to Nuclear and Condensed Matter Physics, Simons Center for Geometry and Physics, Stony Brook (USA), February 2014.

Media Coverage

The paper *The holographic dual of an EPR pair has a wormhole* with A. Karch led to articles in

APS Physics – [Entangled through a wormhole](#), November 2013.

Science Magazine – [A Link Between Wormholes and Quantum Entanglement](#), December 2013.

Scientific American – [Physicists Find a Link between Wormholes and Spooky Action at a Distance](#), December 2013.

Huffington Post – [Quantum Entanglement May Link Wormholes In Universe, Physicists Say](#), December 2013.

NBC News – [Spooky physics phenomenon may link universe's wormholes](#), December 2013.

PBS – [Are Wormholes Everywhere?](#), December 2013.

Wired – [Wormholes and Quantum Entanglement May Be Linked](#), December 2013.