

Bastien Lapierre

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🔍 Google scholar

📄 arXiv

Professional Experience

- 2023 – Now ♦ **Postdoctoral Fellow, Princeton University, USA,**
with Prof. Shinsei Ryu
- 2019 – 2023 ♦ **Research Assistant, University of Zürich, Switzerland,**
with Prof. Titus Neupert

Education

- 2019 – 2023 ♦ **Ph.D. Physics, University of Zürich, Switzerland**
Thesis title: *Inhomogeneous and Disordered Quantum Systems: From Dynamics to Topology*
Supervisors: Prof. Titus Neupert and Dr. Luka Trifunovic
- 2017 – 2019 ♦ **M.Sc. Physics, ETH Zürich, Switzerland**
Thesis title: *Heating Dynamics in Floquet Conformal Field Theory*
Supervisor: Prof. Titus Neupert
Honors: Diploma with distinction, 5.91/6.
- 2014 – 2017 ♦ **B.Sc. Physics, University of Geneva, Switzerland**
Honors: Prize for the best B.Sc. in Physics

Research Publications

Preprints

- 1 **Lapierre, B.,** Numasawa, T., Neupert, T., & Ryu, S. (2024). Floquet engineered inhomogeneous quantum chaos in critical systems.

Journal Articles

- 1 Oblak, B., **Lapierre, B.,** Moosavi, P., Stéphan, J.-M., & Estienne, B. (2024). Anisotropic quantum Hall droplets. *Phys. Rev. X*, 14, 011030.
- 2 Datta, S., **Lapierre, B.,** Moosavi, P., & Tiwari, A. (2023). Marginal quenches and drives in Tomonaga-Luttinger liquids. *SciPost Phys.*, 14, 108.
- 3 Mognini, P., **Lapierre, B.,** Chitra, R., & Chen, W. (2023). Probing Chern number by opacity and topological phase transition by a nonlocal Chern marker. *SciPost Phys. Core*, 6, 059.
- 4 **Lapierre, B.,** Neupert, T., & Trifunovic, L. (2022). Topologically localized insulators. *Phys. Rev. Lett.*, 129, 256401.
- 5 Choo, K., **Lapierre, B.,** Kuhlenskamp, C., Tiwari, A., Neupert, T., & Chitra, R. (2022). Thermal and dissipative effects on the heating transition in a driven critical system. *SciPost Physics*, 13(5).
- 6 **Lapierre, B.,** Neupert, T., & Trifunovic, L. (2021). *N*-band Hopf insulator. *Phys. Rev. Research*, 3, 033045.
- 7 **Lapierre, B.,** & Moosavi, P. (2021). Geometric approach to inhomogeneous Floquet systems. *Phys. Rev. B*, 103, 224303.

- 8 **Lapierre, B.**, Choo, K., Tiwari, A., Tauber, C., Neupert, T., & Chitra, R. (2020). Fine structure of heating in a quasiperiodically driven critical quantum system. *Phys. Rev. Research*, 2, 033461.
- 9 **Lapierre, B.**, Choo, K., Tauber, C., Tiwari, A., Neupert, T., & Chitra, R. (2020). Emergent black hole dynamics in critical Floquet systems. *Phys. Rev. Research*, 2, 023085.

Teaching experience

- Fall 2022 ◇ Teaching assistant for graduate course *General Relativity*, ETH Zürich
- Spring 2022 ◇ Teaching assistant for graduate course *Advanced Field Theory*, ETH Zürich
- Fall 2021 ◇ Teaching assistant for graduate course *Quantum Field Theory I*, ETH Zürich
- Spring 2021 ◇ Teaching assistant for undergraduate course *Proseminar of Theoretical Physics*, University of Zürich
- Fall 2020 ◇ Teaching assistant for undergraduate course *Analysis I*, University of Zürich
- Spring 2020 ◇ Teaching assistant for undergraduate course *Linear Algebra II*, University of Zürich

Project supervision

- 2023 ◇ Supervision of graduate research project of ZhiXing Lin, Princeton University
- 2022 ◇ Supervision of M.Sc. thesis of Valerio Pagni, ETH Zürich
- 2021 ◇ Supervision of B.Sc. thesis of Johannes Christmann, University of Zürich
- 2020 ◇ Supervision of B.Sc. thesis of Fabian Jaeger, University of Zürich

Skills

- Languages ◇ French (mother tongue), English (fluent), German (intermediate), Spanish (basic)
- Coding ◇ Python, Qiskit, Mathematica

Awards and Achievements

- 2023 ◇ Swiss National Science Foundation Postdoc Mobility Fellowship
- 2017 ◇ Ch.-E. Guye Prize, rewards the best B.Sc. degree in physics each year at the University of Geneva

Conference talks

- Jun. 2024 ◇ Workshop on Non-equilibrium Many-body Physics Beyond the Floquet Paradigm, Max Planck Institute for the Physics of Complex Systems, Germany, “*Fractal entanglement transitions in a quasiperiodic non-unitary circuit*”
- Mar. 2024 ◇ APS March Meeting 2024, Minneapolis, USA, “*Anisotropic Quantum Hall Droplets*”
- Jul. 2023 ◇ Workshop on Mathematical Aspects of Condensed Matter Physics, ETH Zürich, Switzerland, “*Topologically localized phases*”
- Jun. 2022 ◇ Workshop on Out-of-equilibrium and collective dynamics of quantum many-body systems, ETH Zürich, Switzerland, “*Marginal quenches and drives in Tomonaga-Luttinger liquids*”
- Jun. 2021 ◇ Workshop on Low dimensional quantum many-body systems, Heidelberg, Germany, “*Geometry and black holes in periodically driven critical quantum systems*”

Conference talks (continued)

- Mar. 2021 ♦ APS March Meeting 2021, online, “*Geometry and black holes in periodically driven critical quantum systems*”

Invited Talks & Seminars

- May 2024 ♦ Leeds-Loughborough-Nottingham Non-Equilibrium Seminar series, United Kingdom, “*Floquet engineered inhomogeneous quantum chaos in critical systems*” (Youtube link)
- Apr. 2024 ♦ Université de Montreal, Canada, “*Fractal entanglement transitions in a quasiperiodic non-unitary circuit*”
- Fev. 2024 ♦ Ecole Normale Supérieure de Lyon, France, “*Fractal entanglement transitions in a quasiperiodic non-unitary circuit*”
- Nov. 2023 ♦ Princeton University, USA, “*Topologically localized phases*”.
- Jan. 2023 ♦ Freie Universität Berlin, Germany, “*Topologically localized insulators*”
- Nov. 2021 ♦ Speakers’ Corner, online, “*Topologically localized insulators*” (Youtube link)
- May. 2021 ♦ IFW Dresden, Germany, “*Geometry and black holes in periodically driven critical quantum systems*”
- Oct. 2019 ♦ University of Zürich, Switzerland, “*Heating Dynamics in Critical Floquet Systems*”.
- Jun. 2019 ♦ ETH Zürich, Switzerland, “*Heating dynamics in Floquet conformal field theory*”

Scientific outreach

- Mar. 2024 ♦ Outreach talk at Princeton Postdoctoral Council Seminar Series, “*Emergent Black Hole Dynamics in Quantum Matter*”
Audience: Postdocs from Princeton University across all departments
Awarded best talk of the semester
- Nov. 2022 ♦ Outreach talk on the 2022 Physics Nobel prize, as part of the nanoTalks series from Reatch, Zürich, Switzerland