Bastien Lapierre

blapierre@princeton.edu
0000-0002-1017-6507
Google scholar
arXiv

Professional Experience

2023 – Now ◇ **Postdoctoral Research 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. Molignini, 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.**, Kuhlenkamp, 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)

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

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, Internationales Wissenschaftsforum 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

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"*

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

Nov. 2022 ◇ Outreach talk on the 2022 Physics Nobel prize, as part of the nanoTalks series from Reatch, Zürich, Switzerland