

# 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

- Lapierre, B.**, Numasawa, T., Neupert, T., & Ryu, S. (2024). Floquet engineered inhomogeneous quantum chaos in critical systems.
- Lapierre, B.**, Trifunovic, L., Neupert, T., & Brouwer, P. W. (2024). Topology of ultra-localized insulators and superconductors.

### Journal Articles

- Oblak, B., **Lapierre, B.**, Moosavi, P., Stéphan, J.-M., & Estienne, B. (2024). Anisotropic quantum Hall droplets. *Phys. Rev. X*, 14, 011030.
- Datta, S., **Lapierre, B.**, Moosavi, P., & Tiwari, A. (2023). Marginal quenches and drives in Tomonaga-Luttinger liquids. *SciPost Phys.*, 14, 108.
- 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.
- Lapierre, B.**, Neupert, T., & Trifunovic, L. (2022). Topologically localized insulators. *Phys. Rev. Lett.*, 129, 256401.
- 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).
- Lapierre, B.**, Neupert, T., & Trifunovic, L. (2021). *N*-band Hopf insulator. *Phys. Rev. Research*, 3, 033045.

**Lapierre, B., & Moosavi, P.** (2021). Geometric approach to inhomogeneous Floquet systems. *Phys. Rev. B*, 103, 224303.

**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.

**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

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

## Project supervision

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|------|---|
| 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

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

## Awards and Achievements

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|------|---|
| 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

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|------|---|
| 2024 | Workshop on Non-equilibrium Many-body Physics Beyond the Floquet Paradigm, Max Planck Institute for the Physics of Complex Systems, Germany, " <i>Fractal entanglement transitions in a quasiperiodic non-unitary circuit</i> " |
|      | APS March Meeting 2024, Minneapolis, USA, " <i>Anisotropic Quantum Hall Droplets</i> "  |
| 2023 | Workshop on Mathematical Aspects of Condensed Matter Physics, ETH Zürich, Switzerland, " <i>Topologically localized phases</i> "  |

## Conference talks (continued)

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- 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*”
- 2021 Workshop on Low dimensional quantum many-body systems, Heidelberg, Germany, “*Geometry and black holes in periodically driven critical quantum systems*”
- APS March Meeting 2021, online, “*Geometry and black holes in periodically driven critical quantum systems*”

## Invited Talks & Seminars

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- 2024 LPMMC, Université Grenoble Alpes, France, host: A. Grushin  
European Center for Quantum Sciences, Université de Strasbourg, France, host: J. Dubail  
Leeds-Loughborough-Nottingham Non-Equilibrium Seminar series, United Kingdom, host: J. Pachos, [Youtube link](#)  
Université de Montreal, Canada, host: W. Witczak-Krempa  
Ecole Normale Supérieure de Lyon, France, host: J.M. Stéphan
- 2023 Princeton University, USA, host: S. Ryu  
Freie Universität Berlin, Germany, host: P. Brouwer
- 2021 Speakers’ Corner, online, host: A. Akhmerov, [Youtube link](#)  
IFW Dresden, Germany, host: J. van den Brink
- 2019 University of Zürich, Switzerland, host: T. Neupert  
ETH Zürich, Switzerland, host: R. Chitra

## Scientific outreach

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- 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