Bastien Lapierre

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Google scholar
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Professional Experience

Since 10/2023	**Postdoctoral Fellow, Princeton University, USA**, with Prof. Shinsei Ryu.
10/2019 – 08/2023	**Research Assistant, University of Zürich, Switzerland**, with Prof. Titus Neupert.

Education

10/2019 – 08/2023	**Ph.D. Physics, University of Zürich, Switzerland**, Thesis title: *Inhomogeneous and Disordered Quantum Systems: From Dynamics to Topology*, Supervisor: Prof. Titus Neupert.
09/2017 – 09/2019	**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.
09/2014 – 06/2017	**B.Sc. Physics, University of Geneva, Switzerland**, *Honors*: Prize for the best B.Sc. in Physics.

Research Publications

Preprints

Lapierre, **B.**, Trifunovic, L., Neupert, T., & Brouwer, P. W. (2024). Topology of ultra-localized insulators and superconductors. arXiv:2407.07957.

Moosavi, P., Oblak, B., **Lapierre**, **B.**, Estienne, B., & Stéphan, J.-M. (2024). Quantum hall edges beyond the plasma analogy. arXiv:2407.19013.

Lapierre, **B.**, Numasawa, T., Neupert, T., & Ryu, S. (2024). Floquet engineered inhomogeneous quantum chaos in critical systems. arXiv:2405.01642.

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

09/2022-02/2023	Teaching assistant for graduate course *General Relativity*, ETH Zürich.
02/2022-06/2022	Teaching assistant for graduate course *Advanced Field Theory*, ETH Zürich.
09/2021-02/2022	Teaching assistant for graduate course *Quantum Field Theory I*, ETH Zürich.
02/2021-06/2021	Teaching assistant for undergraduate course *Proseminar of Theoretical Physics*, University of Zürich.
09/2020-02/2021	Teaching assistant for undergraduate course *Analysis I*, University of Zürich.
02/2020-06/2020	Teaching assistant for undergraduate course *Linear Algebra II*, University of Zürich.

Supervising and mentoring activities

Since 11/2023	Supervision of graduate research project of Zhi-Xing Lin, Princeton University, Project title: *Driven-dissipative dynamics of Tomonaga-Luttinger liquids.*
09/2022-03/2023	Co-supervision of M.Sc. thesis of Valerio Pagni, ETH Zürich, Thesis title: *Heating in a driven disordered gapless field theory.*
10/2021-04/2021	Supervision of B.Sc. thesis of Johannes Christmann, University of Zürich, Thesis title: *Disorder and topology in quantum materials.*
10/2020-03/2021	Supervision of B.Sc. thesis of Fabian Jaeger, University of Zürich, Thesis title: *Floquet dynamics of critical systems in one and higher dimensions.*

Skills

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

Grants and awards

12/2022 Swiss National Science Foundation Postdoc Mobility Fellowship.

Grants and awards (continued)

10/2017 Charles-Eugène Guye Prize, rewards the best B.Sc. degree in physics each year at the University of Geneva.

Conference talks

06/2024 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"* (contributed talk).

03/2024 APS March Meeting 2024, Minneapolis, USA, *"Anisotropic Quantum Hall Droplets"* (contributed talk).

07/2023 Workshop on Mathematical Aspects of Condensed Matter Physics, ETH Zürich, Switzerland, *"Topologically localized phases"* (contributed talk).

06/2022 Workshop on Out-of-equilibrium and collective dynamics of quantum many-body systems, ETH Zürich, Switzerland, *"Marginal quenches and drives in Tomonaga-Luttinger liquids"* (contributed talk).

06/2021 Workshop on Low dimensional quantum many-body systems, Heidelberg, Germany, *"Geometry and black holes in periodically driven critical quantum systems"* (contributed talk).

03/2021 APS March Meeting 2021, online, *"Geometry and black holes in periodically driven critical quantum systems"* (contributed talk).

Invited Talks

08/2024 Group Seminar, Collège de France, France, host: Marco Schiro.

07/2024 Condensed Matter Seminar, LPMMC, Université Grenoble Alpes, France, host: Adolfo Grushin.

06/2024 Group Seminar, European Center for Quantum Sciences, Université de Strasbourg, France, host: Jerome Dubail.

05/2024 Leeds-Loughborough-Nottingham Non-Equilibrium Seminar Series, United Kingdom, host: Jiannis Pachos, Youtube link.

04/2024 Mathematical Physics Seminar, Université de Montreal, Canada, host: William Witczak-Krempa.

02/2024 Theoretical Physics Seminar, Ecole Normale Supérieure de Lyon, France, host: Jean-Marie Stéphan.

11/2023 Quantum Initiative Seminar, Princeton University, USA, host: Shinsei Ryu.

01/2023 Condensed Matter Seminar, Freie Universität Berlin, Germany, host: Piet Brouwer.

10/2021 Speakers' Corner, online, host: Anton Akhmerov, Youtube link.

04/2021 Condensed Matter Seminar, IFW Dresden, Germany, host: Jeroen van den Brink.

10/2019 Condensed Matter Seminar, University of Zürich, Switzerland, host: Titus Neupert.

06/2019 Group Seminar, ETH Zürich, Switzerland, host: Ramasubramanian Chitra.

Scientific outreach

06/2024 Jury at Princeton Research Day 2024: My role was to grade the research projects of undergraduate and graduate students, and give them feedback on their scientific communication skills.

03/2024 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.

11/2022 Outreach talk on the 2022 Physics Nobel prize, as part of the nanoTalks series from Reatch, Zürich, Switzerland.