Curriculum Vitae – Guilherme Delfino

Personal Information

Guilherme Delfino
Lafayette, IN 47901
United States
gdelfino@purdue.edu

Education

Present: Purdue University

Ph.D. focused in Condensed Matter Theory. Advisor: Claudio Chamon

2025: Boston Univeristy

M.A. in Physics

Ph.D. in Physics in progress (transferred to Purdue University)

2021: State University of Londrina

M.Sc. in Physics. Thesis advisor: Pedro R. S. Gomes

2019: State University of Londrina

B.Sc. in Physics. Thesis advisor: Mario C. Baldiotti

Publications

Delfino, G., Chamon, C. & You, Y. **Topological order and fractons from gauging exponential symmetries**. Phys. Rev. B (2026) 113, 045130

Delfino, G., Green, D., Vaitiekėnas, S., Marcus, C. M., & Chamon, C. (2024). **Cooper-pair splitters as circuit elements for realizing topological superconductors**. PRX Quantum (2025) 6, 030318

Pace, S. D., Delfino, G., Lam, H. T. & Aksoy, O. M. **Gauging modulated symmetries: Kramers-Wannier dualities and non-invertible reflections**. SciPost Physics (2025), 18(1), 021

Casasola, H., Delfino, G., You, Y., Bienzobaz, P. F. & Gomes, P. R. **Fractal Subsystem Symmetries, Anomalies, Boundaries, and Effective Field Theory**. Phys. Rev. B (2024) 110, 195105

Delfino, G. & You, Y. **Anyon condensation web and multipartite entanglement in 2D modulated gauge theories**. Phys. Rev. B (2024) 109, 205146

Casasola, H., Delfino, G., Gomes, P. R. & Bienzobaz, P. F. **Fractal Subsystem Symmetries, 't Hooft Anomalies, and UV/IR Mixing**. Phys. Rev. B (2023) 109, 075164

Wu, K. H., Khudorozhkov, A., Delfino, G., Green, D., & Chamon, C. **U(1) Symmetry - Enriched Toric Code**. Phys. Rev. B (2023) 108, 115159

Delfino, G., Fontana, W. B., Gomes, P. R., & Chamon, C. **Effective Fractonic Behavior in a Two-dimensional Exactly Solvable Spin Liquid**. SciPost Physics (2023), 14(1), 002

Research Experience

2021 - Present Graduate Research Assistant: Aspects of strongly interacting phases of matter, funded by DOE. Advisor: Claudio Chamon.

2019 - 2021 Graduate Research Assistant: Aspects of quantum field theories and quantum matter, funded by Brazilian agency CNPq. We study effective field theories for fractonic phases of matter and quantum spin liquids. Advisor: Pedro Rogério Sergi Gomes.

2017 - 2018 Undergrad Research Assistant: Hamiltonian approach to black holes' thermodynamics. Advisor: Mario César Baldiotti.

2015 - 2016 Undergrad Research Assitant: Use of experimental nuclear physics techniques, as EDXRF, to study material structure properties. Advisor: Fabio Luiz Melquíades.

2015 - 2016 Undergrad Research Assistant: A study of linear algebra topics focused on understanding isometric immersions and alternative definitions of inner product spaces. Advisor: Bruno Mendonça Rey dos Santos.

Teaching Experience

2024 Fall Teaching Assistant for PY351 Modern Physics at Boston University.

2023 Fall Teaching Assistant for PY408 Intermediate Mechanics at Boston University.

2022 Spring Teaching Assistant for PY212 General Physics II at Boston University.

2021 Fall Teaching Assistant for PY211 General Physics I at Boston University.

Conference Presentations and Talks

Topological Meta-materials from Cooper-pair Splitters. Invited talk at UCSB NSF Quantum Foundry, 2025.

Gauging Modulated Symmetries. Invited talk at Quantum Theory Seminar at Purdue University. West Lafayette, 2025.

Topological Meta-materials from Cooper-pair Splitters. Contributed poster at Program on Anomalies, Topology and Quantum Information in Field Theory and Condensed Matter Physics, ICTP-SAIFR. São Paulo, 2025.

Topological Meta-materials from Cooper-pair Splitters. Contributed talk at the March Meeting 2025. Anaheim, 2025.

Gauging Modulated Symmetries in 1+1D. Invited talk at the Paths to Quantum Field Theory 2024 workshop, University of Sarajevo. Bosnia, 2024.

Gauging Modulated Symmetries in 1+1D. Contributed talk at Summer School - Symmetries and Anomalies: a modern intake, IHES. France, 2024.

Anyon Condensation Web in 2D Modulated Topological Order. Contributed talk at the March Meeting 2024. Minneapolis, 2024.

Aspects of Spatially Modulated Symmetries. Invited talk in the CMT Kids' Seminar Series at Harvard University. Boston, 2024.

Modulated Gauge Theories and Fracton Behavior in 2D. Invited talk in the CMSA Seminar Series at Harvard University. Boston, 2023.

Enriching Topological Order with $U(1)$ Symmetry. Invited talk in the QCOMBINE Seminar Series at Oslo University. Norway, 2023.

Fractonic Behavior in two dimensions. Invited talk in the Quantum Seminar Series at Northeastern University. Boston, 2023.

Effective Fractonic Behavior in a Two-Dimensional Exactly Solvable Spin Liquid. Contributed talk at the March Meeting 2023. Las Vegas, 2023.

A Tutorial on Fractons. Invited talk in the Quantum Seminar Series at Utrecht University. The Netherlands, 2022.

Aspects of Quantum Field Theories in 2+1 Dimensions. Contributed talk at the XX Particles and Fields Jorge André Swieca Summer School. Brazil, 2019.

Hamiltonian Approach to Spherically Symmetrical Black Hole's Thermodynamics. Contributed talk during Physics Week, State University of Londrina. Brazil, 2018.

Awards

2024 - Poster award: Received an Honorable Mention for the poster *"Spatially Modulated Symmetries and Dualities"* at the *Young Researchers School on Topological Aspects of Low-Dimensional Quantum Physics*, Maynooth University, Ireland, 2024.

2023 - Goldhaber Award: For research excellence in the first year of graduate studies at Boston University.

2019 - Merit award: Classified in first place among the Physics undergraduate students at State University of Londrina, with the general accumulated average of 9.32 out of 10.0.