Salvatore D. Pace

Curriculum Vitae

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Education

Massachusetts Institute of Technology — Cambridge, MA
- Ph.D. in Physics — 2021 - Present
- Advisor: Xiao-Gang Wen

University of Cambridge — Cambridge, England
- MPhil in Physics — 2020 - 2021
- Thesis: *Emergent Axions in U(1) Quantum Spin Liquids*
- Advisor: Claudio Castelnovo

Boston University — Boston, MA
- B.A. with honors & M.A. in Physics — 2016 - 2020
- Thesis: *The Fine Structure Constant in Quantum Spin Ice*
- Advisor: Christopher Laumann

Selected Awards and Honors

Kavli Institute for Theoretical Physics Graduate Fellowship	2024
National Science Foundation Graduate Research Fellowship	2021-2025
Churchill Scholarship	2020-2021
American Physical Society LeRoy Apker Award Finalist	2020
Learning Assistant of the Year	2019
Goldwater Scholarship	2019

Scientific Papers [Google Scholar]

[17] Salvatore D. Pace, Ömer M. Aksoy, and Ho Tat Lam, *Spacetime symmetry-enriched SymTFT: from LSM anomalies to modulated symmetries and beyond*, arXiv:2507.02036

[16] Salvatore D. Pace, Minho Luke Kim, Arkya Chatterjee, and Shu-Heng Shao, *Parity anomaly from LSM: exact valley symmetries on the lattice*, arXiv:2505.04684

[15] Salvatore D. Pace, Arkya Chatterjee, and Shu-Heng Shao, *Lattice T-duality from non-invertible symmetries in quantum spin chains*, SciPost Phys. **18**, 121 (2025)

[14] Salvatore D. Pace, Ho Tat Lam, and Ömer M. Aksoy, *(SPT-)LSM theorems from projective non-invertible symmetries*, SciPost Phys. **18**, 028 (2025)

[13] Salvatore D. Pace, Guilherme Delfino, Ho Tat Lam, and Ömer M. Aksoy *Gauging modulated symmetries: Kramers-Wannier dualities and non-invertible reflections*, SciPost Phys. **18**, 021 (2025)

[12] Arkya Chatterjee, Salvatore D. Pace, and Shu-Heng Shao, *Quantized axial charge of staggered fermions and the chiral anomaly*, Phys. Rev. Lett. **134**, 021601 (2025)

[11] Salvatore D. Pace, Chenchang Zhu, Agnès Beaudry, and Xiao-Gang Wen *Generalized symmetries in singularity-free nonlinear σ models and their disordered phases*, Phys. Rev. B **110**, 195149 (2024)

[10] Salvatore D. Pace *Emergent generalized symmetries in ordered phases and applications to quantum disordering*, SciPost Phys. **17**, 080 (2024)

[9] Salvatore D. Pace and Yu Leon Liu *Topological aspects of brane fields: Solitons and higher-form symmetries*, SciPost Phys. **16**, 128 (2024)

[8] Salvatore D. Pace and Xiao-Gang Wen, *Exact emergent higher-form symmetries in bosonic lattice models*, Phys. Rev. B **108**, 195147 (2023)

[7] Yun-Tak Oh, Salvatore D. Pace, Jung Hoon Han, Yizhi You, and Hyun-Yong Lee, *Aspects of $\mathbb{Z}_N$ rank-2 gauge theory in $(2+1)$ dimensions: Construction schemes, holonomies, and sublattice one-form symmetries*, Phys. Rev. B **107**, 155151 (2023)

[6] Salvatore D. Pace, Claudio Castelnovo, and Chris R. Laumann, *Dynamical Axions in $U(1)$ Quantum Spin Liquids*, Phys. Rev. Lett. **130**, 076701 (2023)

[5] Salvatore D. Pace and Xiao-Gang Wen, *Emergent higher-symmetry protected topological orders in the confined phase of $U(1)$ gauge theory*, Phys. Rev. B **107**, 075112 (2023)

[4] Salvatore D. Pace and Xiao-Gang Wen, *Position-dependent excitations and UV/IR mixing in the $\mathbb{Z}_N$ rank-2 toric code and its low-energy effective field theory*, Phys. Rev. B **106**, 045145 (2022)

[3] Salvatore D. Pace, Siddhardh C. Morampudi, Roderich Moessner, and Chris R. Laumann, *Emergent Fine Structure Constant of Quantum Spin Ice Is Large*, Phys. Rev. Lett. **127**, 117205 (2021) **[Editors' Suggestion and Featured in Physics]**

[2] Salvatore D. Pace, Kevin A. Reiss, and David K. Campbell, *The β Fermi-Pasta-Ulam-Tsingou Recurrence Problem*, Chaos **29**, 113107 (2019)

[1] Salvatore D. Pace and David K. Campbell, *Behavior and breakdown of higher-order Fermi-Pasta-Ulam-Tsingou recurrences*, Chaos **29**, 023132 (2019) **[Selected as an Editor's Pick]**

Invited Talks

Oxford [*slides to appear*]	Nov '25
Simons Center for Geometry and Physics [*slides to appear*]	Oct '25
CU Boulder CTQM Theory Colloquium [*slides to appear*]	Sept '25
OIST TSVP Symposium: Aspects of Generalized Symmetries [slides]	June '25
OIST Thematic Program: Generalized Symmetries in Quantum Matter [pre-talk notes] [main talk slides]	June '25
Georgia Tech [slides]	May '25
KITP Program: Generalized Symmetries in Quantum Field Theory: High Energy Physics, Condensed Matter, and Quantum Gravity [slides] [recording]	Apr '25
UCLA [pre-talk notes] [main talk slides]	Feb '25
Symmetry Seminar [slides] [recording]	Feb '25
IBS PCS Workshop on Effective Field Theory Beyond Ordinary Symmetries [slides] [recording]	Dec '24
Perimeter Institute for Theoretical Physics [slides] [recording]	Nov '24
Ohio State University [slides]	Oct '24

Harvard [slides] Oct '24

SCGP Workshop on Applications of Generalized Symmetries and Topological Defects to Quantum Matter [slides] [recording] Sept '24

Boston University [notes] May '24

Symmetry Seminar [slides] [recording] Sept '23

Boston University [slides] June '22

Max Planck Institute for the Physics of Complex Systems [slides] Nov '20

Teaching Experience

Schools and workshops

- Invited TA: The Physics and Mathematics of Boundaries, Impurities, and Defects Fall '25
- Invited TA: Atlantic TQFT Spring School 2025 Spring '25

Massachusetts Institute of Technology

- Two-time guest lecturer of 8.513: Modern Quantum Many-Body Physics Fall '23
- Two-time guest lecturer of 8.231: Physics of Solids I Fall '22

Boston University

- Undergraduate Teaching Assistant (Learning Assistant)
  - PY406: Electromagnetic Fields and Waves II Spring '20
  - PY405: Electromagnetic Fields and Waves I Fall '19
  - PY452: Quantum Physics II Fall '19
  - PY451: Quantum Physics I Spring '19
  - PY410: Statistical Physics & Thermodynamics Spring '19
  - PY351: Modern Physics I Fall '18
  - PY313: Waves and Modern Physics Fall '18
- Guest lecturer of PY410: Statistical Physics & Thermodynamics Spring '19

Mentorship and Academic Services

SciPost referee

Physical Review referee

Mentor for Project SHORT 2020 - Present

MIT Physics Graduate Student Council Officer 2021 - 2024

MIT UROP Supervisor 2022 - 2023

Mentor for Boston University's PRISM 2018 - 2020