

Salvatore D. Pace

Curriculum Vitae

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Education

Massachusetts Institute of Technology	Cambridge, MA
Ph.D. in Physics	2026 (expected)
Advisor: Xiao-Gang Wen	
University of Cambridge	Cambridge, UK
MPhil in Physics	2021
Thesis: <i>Emergent Axions in $U(1)$ Quantum Spin Liquids</i>	
Advisor: Claudio Castelnovo	
Boston University	Boston, MA
B.A. with honors & M.A. in Physics	2020
Thesis: <i>The Fine Structure Constant in Quantum Spin Ice</i>	
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](#), Minh 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 [<i>slides to appear</i>]	Nov '25
Simons Center for Geometry and Physics [<i>slides to appear</i>]	Oct '25
CU Boulder CTQM Theory Colloquium [<i>slides to appear</i>]	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
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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