

Salvatore D. Pace

Curriculum Vitae

Website: salpace.github.io

Email: sdpace4@gmail.com

Phone: (716) 949-9262

Education

Massachusetts Institute of Technology 2021 - Present

- Ph.D. in Physics
- Advisor: [Xiao-Gang Wen](#)

University of Cambridge 2020 - 2021

- MPhil in Physics
- Advisor: [Claudio Castelnovo](#)
- Thesis: *Emergent Axions in $U(1)$ Quantum Spin Liquids*

Boston University 2016 - 2020

- B.A. *with honors* & M.A. in Physics
- Advisor: [Christopher Laumann](#)
- Thesis: *The Fine Structure Constant in Quantum Spin Ice*

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]**

Research Presentations

Oral Presentations

- Oxford String Theory Seminar (invited)
November '25 *slides to appear*
- CU Boulder CTQM Theory Colloquium (invited)
September '25 *slides to appear*
- OIST TSVP Symposium: Aspects of Generalized Symmetries (invited)
June '25 [\[slides\]](#)
- OIST Generalized Symmetries in Quantum Matter Thematic Program (invited)
June '25 [\[pre-talk notes\]](#) [\[main talk slides\]](#)
- Caltech CMT Seminar
May '25 [\[slides\]](#)
- Georgia Tech CMT Seminar (invited)
May '25 [\[slides\]](#)
- KITP Generalized Symmetries in Quantum Field Theory Program (invited)
April '25 [\[slides\]](#) [\[recording\]](#)
- UCSD CMT Seminar
February '25 [\[slides\]](#)

- UCLA CMT Seminar (invited)
February '25 [\[pre-talk notes\]](#) [\[main talk slides\]](#)
- The Symmetry Seminar (invited)
February '25 [\[slides\]](#) [\[recording\]](#)
- Effective Field Theory Beyond Ordinary Symmetries, IBS PCS (invited)
November '24 [\[slides\]](#) [\[recording\]](#)
- Perimeter Institute Seminar (invited)
November '24 [\[slides\]](#) [\[recording\]](#)
- Ohio State University Quantum Symmetries Seminar (invited)
October '24 [\[slides\]](#)
- Harvard CMT Kids Seminar (invited)
October '24 [\[slides\]](#)
- SCGP Workshop on Applications of Generalized Symmetries and Topological Defects to Quantum Matter (invited)
September '24 [\[slides\]](#) [\[recording\]](#)
- Paths to Quantum Field Theory 2024
July '24 [\[slides\]](#)
- IHES Summer School – Symmetries and Anomalies: a Modern Take, Seminar
July '24 [\[slides\]](#)
- Boston University CMT Seminar, (invited)
May '24 [\[notes\]](#)
- American Physical Society March Meeting
March '24 [\[slides\]](#)
- The Symmetry Seminar (invited)
September '23 [\[slides\]](#) [\[recording\]](#)
- American Physical Society March Meeting
March '23 [\[slides\]](#)
- Caltech CMT Seminar
February '23 [\[slides\]](#)
- Boston University CMT Seminar (invited)
June '22 [\[slides\]](#)
- American Physical Society March Meeting
March '21 [\[slides\]](#)
- Highly Frustrated Magnetism Conference (wHFM21),
January '21 [\[slides\]](#)
- MPIPES Condensed matter seminar, (invited)
November '20 [\[slides\]](#)
- American Physical Society March Meeting,
March '20 [\[slides\]](#)
- Greater Boston Area Stat. Mech. Meeting, *Brandeis University*
October '19 [\[slides\]](#)
- American Physical Society March Meeting,
March '19 [\[slides\]](#)
- Boston University Dynamical Systems Seminar Series, (invited)
November '18 [\[slides\]](#)

- Greater Boston Undergraduate Physics Conference, *MIT*
November '18 [\[slides\]](#)

Poster Presentations

- UQM Winter 2025 meeting,
January '25 [\[poster\]](#)
- Symmetries 2024,
August '24 [\[poster\]](#)
- Prospects in Theoretical Physics 2024,
July '24 [\[poster\]](#)
- UQM Winter 2024 meeting,
January '24 [\[poster\]](#)
- Princeton Summer School on Condensed Matter Physics,
July '23 [\[poster\]](#)
- 22nd annual Undergraduate Research Symposium, *Boston University*
October '19 [\[poster\]](#)
- Greater Boston Undergraduate Physics Conference, *MIT*
November '18 [\[poster\]](#)
- 21st annual Undergraduate Research Symposium, *Boston University*
October '18 [\[poster\]](#)

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