Yi-Ting Tu (涂懿庭)

Email: yttu@umd.edu Website: yitingtu.com Pronouns: he/him

EDUCATION

University of Maryland, College Park, MD, USA Aug. 2021 – Present

Ph.D. candidate in Physics

- Advisor: Sankar Das Sarma

National Tsing Hua University, Hsinchu, Taiwan Sep. 2015 – Jun. 2020

Bachelor of Science

- Double Major: Physics and Mathematics
- Graduated with Honor in Physics

RESEARCH EXPERIENCE

Condensed Matter Theory Center, University of Maryland Apr. 2022 – Present
Advisor: Sankar Das Sarma

- Numerically calculated the decay rates of a quasiperiodic spin chain coupling to a thermal bath at one end, whose scaling property provides an estimation of the avalanche stability of large quasiperiodic many-body localized systems.
- Calculated the Lorenz ratio of graphene with a bipolar diffusive Boltzmann transport theory with disorders and phonon scattering, which provides an alternative explanation for the sharp finite-temperature peak of the Lorenz ratio observed in an experimental paper.

Condensed Matter Theory Group, National Tsing Hua University Jul. 2020 – Aug. 2021
Advisor: Po-Yao Chang

- Developed a generalized version of the gauging procedure, using it to construct non-Abelian fractons, and exploring their algebraic properties.
- Generalized the entanglement entropy to non-Hermitian quantum systems, such that the scaling properties of conformal field theories are retained at critical points.

Quantum Optics Group, National Tsing Hua University Feb. 2018 – Jun. 2020
Advisor: Ray-Kuang Lee

- Formulated the positive partial transpose criterion in optical phase spaces using symplectic geometry.

AWARDS & SCHOLARSHIPS

Academic Achievement Award, seven semesters (top 5% in class)	2016 – 2019
2019 NTHU College of Science Elite Student Award	Spring 2019
Undergraduate Research Scholarship, Ministry of Science and Technology, Taiwan	Fall 2018
The Zhu Shun Yi He Qin Scholarship	Spring 2018

SCIENTIFIC ACTIVITIES

[1] APS March Meeting, Las Vegas, NV, USA — Mar. 2023
"Avalanche stability transition in interacting quasiperiodic systems" (Oral)

[2] APS March Meeting, online — Mar. 2022
"Non-Abelian fracton order from gauging a mixture of subsystem and global symmetries" (Oral)

[3] The NCTS international summer school and workshop on emergent quantum many-body phenomena, online — Jul. 2021
"Non-Abelian fracton order from gauging a mixture of subsystem and global symmetries" (Oral)

[4] APS March Meeting, online — Mar. 2021
"Gauge Theories and Stabilizer Codes: From Abelian to non-Abelian models" (Oral)

[5] Young Researchers Forum on Quantum Information Science, Hsinchu, Taiwan — Aug. 2019
"Positive Partial Transpose Criterion in Symplectic geometry" (Oral)

[6] Annual Meeting of the Physical Society, Hsinchu, Taiwan — Jan. 2019
"Positive Partial Transpose Criterion in Symplectic geometry" (Oral)

[7] Asian Quantum Information Science Conference, Nagoya, Japan — Sep. 2018
"Positive Partial Transpose Criterion in Symplectic geometry" (Poster)

PUBLICATIONS

[1] Yi-Ting Tu and S. Das Sarma, "Wiedemann-Franz law in graphene," Phys. Rev. B **107**, 085401 (2023).

[2] Yi-Ting Tu, DinhDuy Vu, and S. Das Sarma, "Avalanche stability transition in interacting quasiperiodic systems," Phys. Rev. B **107**, 014203 (2023).

[3] Yi-Ting Tu, Iksu Jang, Po-Yao Chang, and Yu-Chin Tzeng, "General properties of fidelity in non-Hermitian quantum systems with PT symmetry," Quantum **7**, 960 (2023).

[4] Yi-Ting Tu, Yu-Chin Tzeng, and Po-Yao Chang, "Rényi entropies and negative central charges in non-Hermitian quantum systems," SciPost Phys. **12**, 194 (2022).

[5] Yi-Ting Tu and Po-Yao Chang, "Non-Abelian fracton order from gauging a mixture of subsystem and global symmetries," Phys. Rev. Research **3**, 043084 (2021).

TEACHING EXPERIENCE

Teaching Assistant of Graduate Course in

- Condensed Matter Physics(II) — Feb. 2021 – Jun. 2021
- Special Topic: Quantum Information — Sep. 2020 – Jan. 2021

Teaching Assistant of Undergraduate Course in

- Experimental Physics II: Electricity and Magnetism — Aug. 2021 – May 2022
- Linear Algebra (College of EECS) — Sep. 2019 – Jan. 2020
- Quantum Physics — Sep. 2018 – Jun. 2019

PROGRAMMING LANGUAGES & SOFTWARE

- Mathematica (Advanced)
- LaTeX (Advanced)
- C (Intermediate)
- Python (Intermediate)
- MATLAB (Basic)