

# Yi-Ting Tu (涂懿庭)

Email: yttu@umd.edu Website: ricktu288.github.io Pronouns: he/him

## EDUCATION

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**University of Maryland, College Park, MD, USA**

Aug. 2021 – Present

*Ph.D. student in Physics*

**National Tsing Hua University, Hsinchu, Taiwan**

Sep. 2015 – Jun. 2020

*Bachelor of Science*

- Double Major: Physics and Mathematics
- Graduated with Honor in Physics
- GPA: 4.2/4.3
- Ranking: 1/58

## RESEARCH EXPERIENCE

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**Condensed Matter Theory Center**

Apr. 2022 – Present

University of Maryland, College Park, MD, USA

**Condensed Matter Theory Group**

Jul. 2020 – Aug. 2021

National Tsing Hua University, Hsinchu, Taiwan

- Developing a generalized version of the gauging procedure, using it to construct non-Abelian fractons, and exploring their algebraic properties.
- Generalizing 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**

Feb. 2018 – Jun. 2020

National Tsing Hua University, Hsinchu, Taiwan

- Using the mathematical language of symplectic geometry to reformulate the positive partial transpose criterion in phase space.

## AWARDS & SCHOLARSHIPS

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Academic Achievement Award, seven semesters (top 5% in class)

2016 – 2019

2019 NTHU College of Science Elite Student Award

Spring 2019

- Awarded for showing high motivation and exceptional academic performance

Undergraduate Research Scholarship, Ministry of Science and Technology, Taiwan

Fall 2018

The Zhu Shun Yi He Qin Scholarship

Spring 2018

- NT\$100,000 awarded to top one junior student in College of Science, NTHU for outstanding performance in research and coursework

## SCIENTIFIC ACTIVITIES

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| [1] | APS March Meeting, online<br>“Non-Abelian fracton order from gauging a mixture of subsystem and global symmetries”<br>(Oral)   | Mar. 2022 |
| [2] | The NCTS international summer school and workshop on emergent quantum many-body phenomena, online<br>“Non-Abelian fracton order from gauging a mixture of subsystem and global symmetries”<br>(Oral) | Jul. 2021 |
| [3] | APS March Meeting, online<br>“Gauge Theories and Stabilizer Codes: From Abelian to non-Abelian models” (Oral)  | Mar. 2021 |
| [4] | Young Researchers Forum on Quantum Information Science, Taiwan<br>“Positive Partial Transpose Criterion in Symplectic geometry” (Oral)   | Aug. 2019 |
| [5] | Annual Meeting of the Physical Society, Taiwan<br>“Positive Partial Transpose Criterion in Symplectic geometry” (Oral)   | Jan. 2019 |
| [6] | Asian Quantum Information Science Conference, Japan<br>“Positive Partial Transpose Criterion in Symplectic geometry” (Poster)  | Sep. 2018 |

## PUBLICATIONS & PREPRINTS

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| [1] | Yi-Ting Tu, Yu-Chin Tzeng, and Po-Yao Chang, “Rényi entropies and negative central charges in non-Hermitian quantum systems,” SciPost Phys. <b>12</b> , 194 (2022).              |
| [2] | Yi-Ting Tu, Iksu Jang, Po-Yao Chang, and Yu-Chin Tzeng, “General properties of fidelity in non-Hermitian quantum systems with PT symmetry,” (2022), arXiv:2203.01834 [quant-ph]. |
| [3] | Yi-Ting Tu and Po-Yao Chang, “Non-Abelian fracton order from gauging a mixture of subsystem and global symmetries,” Phys. Rev. Research <b>3</b> , 043084 (2021).                |

## TEACHING EXPERIENCE

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### Teaching Assistant of Graduate Course in

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

### Teaching Assistant of Undergraduate Course in

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|--|-----------------------|
| • 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

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- Mathematica (Advanced)
- L<sup>A</sup>T<sub>E</sub>X (Advanced)
- C (Intermediate)
- Python (Intermediate)
- MATLAB (Basic)