

Shen-Ning Tung

Curriculum Vitae

National Tsing Hua University
Department of Mathematics
Room 515, General Building III
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<https://sntung41406.github.io/>

Research Interests

Mathematical Finance, Optimization and Control, Decentralized Finance, Automatic Market Makers
Number Theory, Galois Representations, Automorphic Forms, p -adic Local Langlands

Employment

- 2022 - present **Assistant Professor**, Department of Mathematics, National Tsing Hua University
2019 - 2022 **Postdoctoral Fellow**, Department of Mathematics, University of British Columbia
Advisor: Rachel Ollivier and Sujatha Ramdorai

Education

- 2015 - 2019 **Ph.D. in Mathematics**, Universität Duisburg-Essen
Advisor: Vytautas Paškūnas
Dissertation: On the automorphy of 2-dimensional potentially semi-stable deformation rings of $G_{\mathbb{Q}_p}$
2016 - 2015 **M.Sc. in Mathematics**, University of British Columbia
Advisor: Sujatha Ramdorai
Thesis: Fontaine rings and p -adic L -functions
2008 - 2012 **B.S. in Mathematics**, National Taiwan University

Grants and Funding

- 2022 - 2025 **NSTC Research Fellowship**, NTD2,116,000
Patching and the completed homology of locally symmetric space

Publications

- (Joint with Wei-Ru Chen and A. Christian Silva) Stylized facts in Web3
Frontiers of Mathematical Finance, 2024, 3(4): 572-609.
- (Joint with Joseph Najnudel, Kazutoshi Yamazaki and Ju-Yi Yen) An arbitrage-driven price dynamics of Automated Market Makers in the presence of fees
Frontiers of Mathematical Finance, 2024, 3(4): 560-571.
- (Joint with Vytautas Paškūnas) Finiteness properties of the category of mod p representations of $\mathrm{GL}_2(\mathbb{Q}_p)$
Forum of Mathematics, Sigma, 9. (2021)
- On the modularity of 2-adic potentially semi-stable deformation rings
Math. Z. 298, 107-159 (2021).
- On the automorphy of 2-dimensional potentially semi-stable deformation rings of $G_{\mathbb{Q}_p}$
Algebra & Number Theory, 15 (2021), No. 9, 2173–2194.

Preprints

- A mathematical framework for modelling CLMM dynamics in continuous time
arXiv:2412.18580 (Joint with Tai-Ho Wang)

2. Growth rate of liquidity provider's wealth in G3Ms
arXiv:2403.18177 (Joint with Cheuk Yin Lee and Tai-Ho Wang)

Teaching

- National Tsing Hua University (2022 - present):
 - Math597 Mathematical Foundations of Data Science, Winter 2024
 - Math571 Financial Mathematics II, Spring 2024
 - Math570 Financial Mathematics I, Winter 2023
 - Math104 Calculus II, Spring 2023
 - Math103 Calculus I, Winter 2022
- University of British Columbia (2019 - 2022):
 - Math317 Vector Calculus, University of British Columbia, Spring 2022
 - Math220 Mathematical Proof, Winter 2021 & Winter 2020
 - Math253 Multivariable Calculus, Summer 2020
 - Math105 Integral Calculus with Applications to Commerce and Social Sciences, Spring 2020
 - Math104 Differential Calculus with Applications to Commerce and Social Sciences, Winter 2019

Service

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| 2024 | Mentor, Undergraduate Summer Research Program, National Center for Theoretical Sciences |
| 2023 - 2025 | Course committee member, Department of Mathematics, National Tsing Hua University |
| 2023 - 2024 | Organizer, Colloquium, Department of Mathematics, National Tsing Hua University |
| 2023 - 2024 | Mentor, Undergraduate Research Program, National Center for Theoretical Sciences |
| 2022 | Organizing committee member, Annual Meeting, Taiwanese Mathematical Society |

Graduate Students Supervised

2022 - 2024 Wei-Ru Chen (co-supervised with Yuki Chino)

Research Visits

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|---------------------|------------------------------------------|------------------------|
| Feb 2025 - Apr 2025 | University of Calgary, Canada | Host: Jinniao Qiu |
| Aug 2024 | University of British Columbia, Canada | Host: Sujatha Ramdorai |
| Dec 2020 - Feb 2021 | Academia Sinica, Taiwan | Host: Ming-Lun Hsieh |
| May 2020 - Jun 2020 | Academia Sinica, Taiwan | Host: Ming-Lun Hsieh |
| Jul 2019 | Academia Sinica, Taiwan | Host: Ming-Lun Hsieh |
| Jul 2019 | Morningside Center of Mathematics, China | Host: Yongquan Hu |
| May 2018 | University of Cambridge, UK | Host: Jack Thorne |

Invited Talks

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| 2055 | Mar | Mathematics Colloquium, National Sun Yat-sen University |
| | Feb | Mathematical Finance Seminar, University of Calgary |
| 2024 | May | TWSIAM Annual Meeting, National Chung Hsing University |
| 2020 | Feb | Number theory seminar, University of Toronto |
| 2019 | Jul | Number theory seminar, Academia Sinica |
| | Jul | Number theory seminar, Morningside Center of Mathematics |
| 2018 | Jul | Number theory seminar, University of Bonn |
| | May | Number theory seminar, University of Cambridge |
| | Mar | Number theory seminar, University of British Columbia |

References

Prof. Tai-Ho Wang
Department of Mathematics
Baruch College, The City University of New York
tai-ho.wang@baruch.cuny.edu, +1 (646) 312-4130

Prof. Ju-Yi Yen (concerning teaching)
Department of Mathematical Sciences
University of Cincinnati
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Prof. Shuenn-Jyi Sheu
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National Chengchi University
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