

# Shen-Ning Tung

# Curriculum Vitae

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National Tsing Hua University  
Department of Mathematics  
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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 Ramdurai

## 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 Ramdurai  
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

- 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

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

Aug 2024	University of British Columbia, Canada	Host: Sujatha Ramdurai
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

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  
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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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