Yuezhao Li

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Summary

I am a PhD candidate in mathematics at Leiden university, supervised by Dr. Bram Mesland. My research focuses on noncommutative geometry and its applications in mathematical physics and index theory.

Education

- *Universiteit Leiden*, October 2021 — September 2025 (expected), Netherlands.
  - PhD candidate in mathematics.
  - Supervisor: Dr. Bram Mesland.
- *Georg-August-Universität Göttingen*, October 2018 — August 2021, Germany.
  - Master in mathematics, with minor in physics.
  - Thesis: Invariants for topological insulators coming from decompositions of coarse spaces.
  - Thesis advisor: Prof. Dr. Ralf Meyer.
- *Peking University*, September 2013 — July 2018, China.
  - Bachelor in physics, with minor in mathematics.

Research interest

- Index theory of spectral truncations via bivariant K-theories.
- Mathematics of topological insulators, via groupoids and coarse geometry.
- Unbounded KK-theory and its applications to index theory.

Research output

Research articles

1. Yuezhao Li and Bram Mesland. "Index pairings of spectral truncations: the odd case" (2025). In preparation.
2. Yuezhao Li. "Robustness of topological phases on aperiodic lattices" (2025). In preparation.

Theses

1. Yuezhao Li. "Noncommutative geometry of spectral truncations and aperiodic topological insulators" (2025). PhD thesis at Leiden University. In preparation.
2. Yuezhao Li. "Invariants of topological insulators coming from decompositions of coarse spaces" (2021). Master thesis at Georg-August-Universität Göttingen.

Teachings

- *2024 fall*: Functional analysis, teaching assistant.
- *2024 spring*: Operator algebras, teaching assistant.
- *2023 fall*: Functional analysis, teaching assistant.

◇ *2023 spring*: Differentiable manifolds II, teaching assistant.
◇ *2022 fall*: Functional analysis, teaching assistant.
◇ *2022 spring*: Differentiable manifolds II, teaching assistant.
◇ *2021 fall*: Functional analysis, teaching assistant.

Conferences, workshops and seminars

Participation

◇ *April 2025*: Conference "Applications of noncommutative geometry to gauge theories, field theories, and quantum space-time", Marseille, France.
◇ *October 2024*: Workshop "Noncommutativity behind the dunes", Delft, Netherlands.
◇ *August 2024*: Workshop "OdenSeaG 2024", Odense, Denmark.
◇ *May 2024*: Leiden-Birmingham meeting, Leiden, Netherlands. Give a talk "A hitchhiker's guide to topological insulators in noncommutative geometry".
◇ *April 2024*: Conference "Group operator algebras and noncommutative geometry", Marseille, France.
◇ *November 2023*: Leiden-Luxembourg PhD Away Day, Leiden, Netherlands. Give a talk "Noncommutative geometry in index theory and physics".
◇ *October 2023*: Autumn school on large-scale geometry, Göttingen, Germany. Give a lightning talk "Models of aperiodic topological insulators".
◇ *May 2023*: Hausdorff School "Noncommutative Geometry and Operator Algebras" and Workshop "NSeaG 2023", Bonn, Germany. Assist with taking notes for the lectures "Unbounded KK-theory and spectral triples" and "Baum–Connes conjecture".

Organisation

◇ *January 2023*: Co-organiser of conference 5th Conference of Settat on Operator Algebras and Applications, with Francesca Arici, Marcel de Jeu, Rachid El Harti and Dimitris Gerontogiannis.
◇ I am an organiser of several Leiden local NCG seminars.

Research talks

◇ *March 2025*: On robustness of topological phases of matter. Seminar in analysis and applications, TU Delft, Netherlands.
◇ *January 2025*: Understanding strong and weak topological phases. Forschungsseminar Algebra–Geometrie–Topologie, Uni Greifswald, Germany.
◇ *September 2024*: Index theory of spectral truncations and localisation algebras. East China Normal University, China.
◇ *September 2024*: Noncommutative geometry in the integer quantum Hall effect. Sichuan University, China.

Other skills

◇ Languages: English (fluent), Mandarin Chinese (mother tongue), German (basic), Dutch (beginner).
◇ Software programming: Python, C, C++, Bash script.
◇ Numerical computation: Python, SAS.
◇ I am familiar with the Linux system and command-line environments, around which I build my workflow.