

Asuka Shiga

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Education

- 2024–present Ph.D. Program in Mathematics, Tohoku University. Advisor: Professor Nobuo Tsuzuki. Expected completion: March 2027.
- 2022–2024 M.Sc. in Mathematics, Tohoku University. Thesis: “Behavior of the Tate–Shafarevich groups of elliptic curves under field extensions.”
- 2018–2022 B.Sc. in Mathematics, Kobe University. Advisor: Professor Kentaro Mitsui.

Publications

Nontrivial torsion in the Tate–Shafarevich group of elliptic curves via visibility and twists. Preprint; arXiv:2602.19861, v2. ([arXiv](#))

Infinitely many pairs of non-isomorphic elliptic curves sharing the same BSD invariants. Revised manuscript under review at *Research in Number Theory*; arXiv:2507.18574, v3. ([arXiv](#))

Asuka Shiga, “Behaviors of the Tate–Shafarevich Group of Elliptic Curves under Quadratic Field Extensions,” *Tokyo Journal of Mathematics* 49 (2026), no. 1, 199–224.

Talks

- Nov. 2026 Invited talk (forthcoming), Arithmetic Geometry in Sendai, Tohoku University: “BSD twins and arithmetic invariants of elliptic curves.”
- Aug. 2026 Accepted poster (forthcoming), Arithmetic Statistics, Paderborn University: “Abundance and rarity of BSD twins of elliptic curves.”
- Mar. 2026 Invited talk, Research on Calabi–Yau Manifolds, Nagoya University: “Infinitely many pairs of non-isomorphic elliptic curves sharing the same BSD invariants and visibility for Tate–Shafarevich groups.”
- Jan. 2026 Invited talk, Number Theory Joint Seminar, Kyoto University: “Infinitely many pairs of non-isomorphic elliptic curves sharing the same BSD invariants and visibility for Tate–Shafarevich groups.”
- Dec. 2025 Invited talk, Mini-workshop on Arithmetic Geometry in Sendai, Tohoku University: “Infinitely many pairs of non-isomorphic elliptic curves sharing the same BSD invariants and the visibility theorem.”
- Sep. 2025 Invited talk, Ishigaki Algebraic Geometry Workshop: “BSD invariants shared by infinitely many pairs of non-isomorphic elliptic curves.”

- Sep. 2025 Contributed talk, Y-RANT: Young Researchers in Number Theory, University of Nottingham: “Infinitely many pairs of non-isomorphic elliptic curves sharing the same BSD invariants.”
- Mar. 2025 Contributed talk, Annual Meeting of the Mathematical Society of Japan, Waseda University: “On the behavior of Tate–Shafarevich groups of elliptic curves under quadratic extensions.”
- Nov. 2024 Invited talk, Tsuda University Number Theory Workshop 2024: “The relation between quadratic extensions and twists for Tate–Shafarevich groups.”

Research Experience

- Aug.–Sep. 2024 Summer Intern, NTT Research Institute for Fundamental Mathematics. Computational research on rational points on curves, Mordell–Weil ranks of elliptic curves without rational torsion, and Tate–Shafarevich groups.

Teaching

- Spring 2024 Teaching Assistant, Introduction to Algebra A, Tohoku University (exercise sessions, grading, and student support).
- Spring 2023 Teaching Assistant, Linear Algebra A, Tohoku University (grading and student support).

Service

- July 2025 Organized and chaired the Tohoku Number Theory Seminar talk by Alexandros Konstantinou, “The order of the Tate–Shafarevich group modulo squares.”

Honors and Awards

- 2024 Kawai Encouragement Award for an outstanding master’s thesis, Department of Mathematics, Tohoku University.

Fellowships and Research Support

- 2024–present JST SPRING / Tohoku University Doctoral Student Support (JPMJSP2114).
- 2024–present Tohoku University Doctoral Student Challenge Research Support.

Languages

Japanese (native); English (research writing, presentations, and mathematical discussion).

Last updated: July 13, 2026