

Victor Zhang

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Research interests

Diagrammatic categories and algebras: The Lusztig–Vogan categories, module categories over Soergel bimodules, quantum knot invariants from braided tensor categories.

Representation theory: Representations of (real) Lie groups; Representations of S_n in characteristic p .

PUBLICATIONS AND PREPRINTS

Semisimplifying categorical Heisenberg actions and periodic equivalences 2025
with Chris Hone, Finn Klein, Bregje Pauwels, Alexander Sherman and Oded Yacobi, arXiv:2509.07377 (submitted).

On detection probabilities of link invariants 2025
with Abel Lacabanne, Daniel Tubbenhauer and Pedro Vaz, arXiv:2509.05574 (submitted).

Big data comparison of quantum invariants 2025
with Daniel Tubbenhauer, arXiv:2503.15810 (to appear in J. Exp. Math.).

EDUCATION

University of New South Wales Sydney, Australia
Ph.D. Mathematics Feb. 2024 – Aug. 2027 (ongoing)

- *Supervisors:* Anna Romanov (primary) and Pinhas Grossman (secondary).
- *Topic:* Diagrammatic Lusztig–Vogan Categories.
- First candidature assessment passed.

University of New South Wales Sydney, Australia
B.Sc. (Hons) Advanced Mathematics (First Class Honours)/B.Sc. Computer Science Feb. 2019 – Dec. 2023

- *Supervisors:* Anna Romanov (primary) and Arnaud Brothier (secondary).
- *Thesis Title:* Diagrammatic Categories in Representation Theory.

TEACHING

University of New South Wales Sydney, Australia

- Tutor, *Mathematics 1A, Discrete Mathematics* (2024 – ongoing).
- Drop-in centre tutor, First year mathematics (2023 – ongoing).
- Exam Invigilator, First year mathematics (2024).
- Assessment Marker, First year mathematics (2025 – ongoing).

University of Sydney Sydney, Australia

- Teaching Assistant, *Models of Computation* (2023 S2).

RESEARCH TALKS

A Diagram Calculus for a few Type-A Lusztig–Vogan Categories Dec. 2025
AustMS Conference 2025; La Trobe University.

Data analysis and Quantum knot invariants Sep. 2025
MATRIX-MFO Workshop: Machine Learning and AI for Mathematics; University of Melbourne.

A Diagram Calculus for a few Type-A Lusztig–Vogan Categories Aug. 2025
UNSW Math. Postgrad. Conference; University of New South Wales.

The LV-category (and LV-module) for $SU(n, 1)$, $n \geq 1$ May 2025
Math. Research Group Meeting; University of New South Wales.

Graph colouring, $SO(3)$ webs and the B_1 invariant Mar. 2025
PhD/Masters seminar; University of New South Wales.

The Diagrammatic Lusztig–Vogan category for $SL(2, \mathbb{R})$ Dec. 2024
Australian Mathematical Sciences Students Conference; University of Western Sydney.

The Diagrammatic Lusztig–Vogan category for $SL(2, \mathbb{R})$ Oct. 2024
Math. Research Group Meeting; University of New South Wales.

SEMINAR TALKS

Existence of the Canonical Basis <i>Canonical Basis Learning Seminar; University of Sydney.</i>	Apr. 2026
Incarnations of the Bruhat Order: classical and for the LV-module <i>Math. Research Group Meeting; University of New South Wales.</i>	Jun. 2025
Representations of S_n in characteristic p and the basic representation of $\hat{\mathfrak{sl}}_p$ <i>One Tree Island Workshop in Representation Theory.</i>	Aug. 2024
Real Forms of Lie Groups <i>Math. Research Group Meeting; University of New South Wales.</i>	Apr. 2024
Drawing Monoidal Categories <i>Tensor Categories Learning Seminar; University of Sydney.</i>	Mar. 2024

CONFERENCES

AustMS Meeting 2025 <i>La Trobe University</i>	Dec. 2025
ICERM Workshop in Diagrammatic Categorification <i>Brown University</i>	Oct. 2025
Matrix–MFO Workshop 2025 <i>University of Melbourne</i>	Sep. 2025
UNSW Mathematics Postgraduate Conference <i>University of New South Wales</i>	Aug. 2025
WARTHOG 2025 <i>University of Oregon</i>	Aug. 2025
Representation Theory Down Under <i>University of Sydney</i>	Jun. 2025
Australian Mathematical Sciences Students Conference <i>University of Western Sydney</i>	Dec. 2024
One Tree Island Workshop in Representation Theory <i>One Tree Island, Queensland, Australia</i>	Aug. 2024
UNSW Mathematics Postgraduate Conference <i>University of New South Wales</i>	Aug. 2024
Categorification in Representation Theory <i>University of Sydney</i>	Feb. 2023

SERVICE

Organising: UNSW Research Group Shut-up and Write.

TECHNICAL SKILLS

Computer Algebra Systems: GAP, MAGMA, Maple, Mathematica/Wolframscript, Maxima, SageMath.
General programming: Bash, C, Haskell, Java, Javascript, Python, R, Rust, SQL.