

Fiona Torzewska

Curriculum Vitae

School of Mathematics, University of Bristol
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Employment History

- 2023-2026 **Research Fellow**, *University of Bristol*, October 2023 - September 2026
- 2023 **Visiting researcher**, *University of Vienna*, Funded by LMS Cecil King Travel Scholarship, July 2023 - September 2023
- 2023 **Junior Research Fellow**, *Erwin Schrödinger Institute, Vienna*, April 2023 - July 2023
- 2022-2023 **Senior Research Associate**, *University of East Anglia*, EPSRC funded project: 2-representation theory and categorification, PI: Dr Vanessa Miemietz, Dec 2022 - Mar 2023
- 2021-2022 **EPSRC Research Associate**, *University of Leeds*, Dec 2021 - Dec 2022
- 2019-2019 **JSPS Summer Program Fellow**, *Deguchi Lab, Ochanomizu University, Tokyo*, 10th June-21st August
- 2017-2021 **Teaching Assistant**, *University of Leeds*
- 2016 **Summer Research Placement: Adiabatic computation in abelian quantum doubles**, Supervisor: Professor Jiannis Pachos, School of Physics and Astronomy, University of Leeds, 13th June-5th August
- 2015 **Summer Research Placement: Hidden quantum markov models**, Supervisor: Dr Almut Beige, School of Physics and Astronomy, University of Leeds, 15th June-7th August

Education

- 2017-2022 **PhD, Mathematics, Jan 2022**, *Embedded cobordisms, motion groupoids and topological quantum field theory*, School of Mathematics, University of Leeds, UK
Supervisors: Professor Paul Martin and Dr João Faria Martins
Examiners: Professor Tara Brendle and Dr Andrew Brooke-Taylor
- 2013-2017 **MPhys (Hons), Theoretical Physics, First Class**, University of Leeds, UK

Awards

- 2023 **Cecil King Travel Scholarship**, Funding body: *London Mathematical Society*
Junior Research Fellowship, Funding body: *Erwin Schrödinger Institute, Vienna*
Project: From motion groupoids to defect TQFT.
- 2019 **JSPS Summer Program Fellowship**, Funding body: *JSPS*
Project: From resistance distances to the Potts model.
- 2017 **Leeds Doctoral Scholarship**, Funding body: *University of Leeds*
- 2016 **School of Mathematics Excellence Scholarship**, Funding body: *University of Leeds*
- 2015 **Undergraduate Research and Leadership Scholarship**, Funding body: *University of Leeds*, Value: £6,000
Funding for summer research placements and outreach activities, and some leadership training.

Publications and preprints

- 2023 **Classification of charge-conserving loop braid representations**, *With: P.P.Martin, E. Rowell*, [arXiv:2301.13831](#)
- 2023 **Motion groupoids and mapping class groupoids**, *With: P.P.Martin and J.F.Martins*, *Communications in Mathematical Physics*, 402, pgs.1621–1705
- 2022 **Topological quantum field theories and homotopy cobordisms**, [arXiv:2208.14504](#)
- 2021 **Embedded cobordisms, motion groupoids and topological quantum field theories**, *PhD Thesis*
- 2020 **Non-ergodicity through quantum feedback**, *With: L.A.Clark, B.Maybee, A.Beige*, *EPL* 130, 54002, (Undergraduate summer placement)

Talks

Classification of charge-conserving loop braid representations

February 2023: [UEA Pure Maths Seminar](#)

February 2023: [Applications of Hecke algebras: Representations, Integrability and Physics](#)

November 2023: [Bristol Algebra Seminar](#)

Topological quantum field theories and homotopy cobordisms

November 2019: [Glasgow geometry and topology seminar](#)

November 2019: [Leicester postgraduate conference in category theory and its applications](#) (25 min version)

September 2022: [28th YAMCATS Meeting](#)

November 2022: [Lisbon TQFT club seminar](#)

June 2023: [Masaryk University Algebra Seminar](#)

December 2023: [Abu Dhabi Geometry, Topology and Physics Seminar](#)

Motion groupoids and mapping class groupoids

November 2021: [Cardiff University Geometry, algebra, physics and topology seminar](#)

November 2021: [Indiana University Quantum topology seminar](#)

August 2022: [60th ARTIN Meeting](#)

April 2023: [Higher Structures & Field Theory Seminar](#)

May 2023: [Moduli and Friends Seminar](#)

October 2023: [ICMS Topological Quantum Computation Workshop](#)

December 2023: [Sheffield Topology Seminar](#)

Motion groupoids and mapping class groupoids series

Series of three lectures aimed at PhD students delivered as part of the LMS funded YAMCATS category theory and its applications series, available [here](#). (2020)

Teaching experience

- 2022 **Summer research project supervisor**, *University of Leeds*, With: P.Martin, J.Faria Martins, Project title: Links, Loop Braids and Topological Quantum Computing
- 2017–2021 **Teaching assistant**, *University of Leeds*
- Topology, Marker, *Spring 2021*
 - Introductory Linear Algebra (Joint Honours), Tutorial assistant, *Spring 2019*;
 - Groups and Vector Spaces, Tutorial assistant/Marker, *Autumn 2018, 2019, 2020*;
 - Rings and Polynomials, Marker, *Spring 2018, 2019, 2020*;
 - Special Relativity, Marker, *Autumn 2017*;
 - Sporadic lecture cover, 'Rings and Polynomials' and 'Groups and Symmetry'.

Conferences

- 2024 **Skew Braces, Braids and the Yang-Baxter Equation**, *BIRS*, 5th - 10th May
- 2023 **Applications of Hecke and related algebras: Representations, Integrability and Physics**, *Ecole de Physique des Houches*, 26th Feb - 3rd March, (Talk)
- Higher Structures in Functorial Field Theory**, *University of Regensburg*, 14th - 18th August
- Topological Quantum Computation**, *ICMS, Edinburgh*, 9th - 13th October, (Invited talk)
- 2022 **Quantum Topology and Geometry**, *Institut Henri Poincaré*, 13th-17th June
- Bicategories, Categorification and Quantum Theory**, *University of Leeds*, 11th-15th July
- Higher categories and topological order**, *American Institute of Mathematics, San Jose*, 26th-30th September
- 2020 **Introductory workshop: Quantum Symmetries**, *MSRI*, 27th-31st January
- Winter Braids X**, *Università di Pisa*, 17th-21st February, (Poster and flash talk)
- Women in Mathematical Physics**, *BIRS, Banff*, 21st-22nd September, Online
- 2019 **Winter Braids IX**, *Université de Reims*, 4th-7th March
- New Connections and Directions in Representation Theory and Related Topics**, *University of Leeds*, 15th -17th April
- Knots and Braids in Norway**, *NTNU, Trondheim*, 13th-17th May
- Postgraduate conference in category theory and its applications**, *University of Leicester*, 18th-19th November, (Invited talk)
- 2018 **Quantum Computation and Information Workshop**, *Texas A&M University*, 20th-22nd Sept, (Presented poster)
- 2017 **Higher Structures Lisbon**, *Instituto Superior Técnico, Lisbon*, 24th-27th July

Other professional experience

- 2021-2022 **Seminar organiser: Algebra seminar**, With: S.May (Autumn 2021), E.Faber (2022), School of Mathematics, University of Leeds
- 2019 **Conference organiser: Loops in Leeds: motion groups and related topics**, With: C.Damiani, J.Faria Martins, P.Martin, A.Bullivant, H.Albeladi, School of Mathematics, University of Leeds
- 2018 **Conference organiser: Higher Gauge Theory: Where should we look for higher gauge matter?**, With: J.Faria Martins, P.Martin, School of Mathematics, University of Leeds
- 2018–2019 **Seminar organiser: Pure postgraduate seminar**, With: J. Howe, School of Mathematics, University of Leeds