

Fiona Torzewska

Curriculum Vitae

School of Mathematics
University of Leeds
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Education

- 2013–2017 **MPhys (Hons), Theoretical Physics, First Class**
University of Leeds, UK
- 2017–2021 **PhD, Mathematics, Viva Dec 2021, 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

Employment History

- 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

Awards

- 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*
Funding for PhD.
- 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

- 2022 **Topological quantum field theories and homotopy cobordisms**, [arXiv:2208.14504](#) (submitted to Applied Catagorical Structures)
- 2021 **Motion groupoids and mapping class groupoids**, *With: P.P.Martin and J.F.Martins*, [arXiv:2103.10377](#) (submitted to Communications in Mathematical Physics)
- 2020 **Non-ergodicity through quantum feedback**, *With: L.A.Clark, B.Maybee, A.Beige*, [EPL 130, 54002](#), (Undergraduate summer placement)

Works in progress

Motion groupoids and monoidal structures, *With: P.P.Martin*

From resistance distances to the Potts model, *With: T.Deguchi*

Generalising tensor equivalences coming from Landau-Ginzburg/conformal field theory correspondence, *With: A.Camacho and J.Plavnik*

Collaboration as part of Women in Mathematical Physics program

Talks

Motion groupoids and mapping class groupoids

August 2022: 60th ARTIN Meeting

November 2021: Cardiff University Geometry, algebra, physics and topology seminar

November 2021: Indiana University Quantum 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)

Topological quantum field theories for cospan cobordisms

November 2019: Glasgow geometry and topology seminar

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

(Flash Talk) TQFTs associated to finite groups: A topological quantum field theory for the category surface tangles

April 2019: New Connections and Directions in Representation Theory and Related Topics

May 2019: Knots and Braids in Norway

A finite total homotopy topological quantum field theory

March 2019: Geometry and Topology GATEWAY seminar, *University of Warwick*

Using model categories to construct topological quantum field theories

March 2019: Low dimensional topology seminar, *RIMS, Kyoto*

Conferences

- 2022 **Quantum Topology and Geometry**, *Institut Henri Poincaré*, 13th-17th June
Bicategories, Categorification and Quantum Theory, *University of Leeds*, 11th-15th July
60th ARTIN Meeting, *University of Nottingham*, 25th-26th August, (Invited talk)
- 2020 **Connections for Women: Quantum Symmetries**, *MSRI*, 23rd-24th January, (Poster and flash talk)
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*, 20th-25th September
- 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
- 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

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*;

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