Kürşat Sözer

CONTACT INFORMATION	Department of Mathematics and Statistics Email:sozerk@mcmaster.ca McMaster University Office: HH 303A Hamilton, Ontario Canada L8S 4E8
RESEARCH INTEREST	Quantum invariants of low-dimensional manifolds, topological field theories, homotopy field theories, cobordism hypothesis, homotopy self-equivalences of higher-dimensional manifolds, Hopf algebras, fusion and modular categories, and crossed modules

EDUCATION

Indiana University Bloomington

> Ph.D. in Mathematics, August 2014 – May 2020
> Advisor: Vladimir Turaev

Middle East Technical University (Ankara)

> B.S. in Mathematics, September 2009 – June 2014
>
> - Magna cum laude
>
> Minor in Physics, January 2010 – June 2014

EMPLOYMENT

McMaster University, Postdoctoral Fellow	Sep 2022 -
École Polytechnique Fédérale de Lausanne, OCHoTop post-doc	2021 - 2022
Université de Lille, OCHoTop post-doc	2020 - 2021

PAPERS AND PREPRINTS

▶ *The space of homotopy self-equivalences of a manifold: Homotopy groups* (with I. Hambleton and R. Sroka), in preparation.

▶ *Crossed extensions of graded fusion categories* (with A. Virelizier), in preparation.

▶ *3-dimensional cohomological HQFTs and twisted Yetter invariant* (with A. Virelizier), in preparation.

▶ *Remarks on 2-dimensional extended HQFTs*, in preparation.

▶ *3d-TQFTs and 3-manifold invariants* (with A. Virelizier), to appear in Encyclopedia of Mathematical Physics 2nd Edition, PDF File (11 pages).

▶ *Hopf crossed module (co)algebras* (with A. Virelizier), submitted, arXiv:2305.15485 (31 pages).

▶ *Monoidal categories graded by crossed modules and 3-dimensional HQFTs* (with A. Virelizier), Advances in Mathematics, 428 (2023) 109155 (94 pages).

▶ *Two-dimensional extended homotopy field theories*, Algebraic & Geometric Topology, 23:9 (2023) 3909–3996. PDF File (88 pages).

SEMINAR TALKS: RESEARCH

Ohio State University Quantum Symmetry Seminar	Apr 13, 2023
McMaster University Topology Seminar	Sep 15,2022
OCHoTop Online Seminar	Feb 19, 2021
UCGEN Online Seminar	Jan 20, 2021
EPFL Topology Seminar	Nov 3, 2020
University of Southern California Geometry, Topology, and Categorification Seminar	Feb 3, 2020
University of Lille Topology Seminar	Jan 30, 2019
Michigan State University Topology Seminar	Oct 1, 2018
Indiana University Bloomington Topology Seminar	May 25, 2018

Conference (Meetings) Talks	Quantum Symmetries at the CRM (Contributed talk)	Oct 12, 2022
	Quantum Topology and Geometry conf. in honor of V. Turaev	June 17, 2022
	QuaSy-Con at Univ. of Illinois Urbana-Champaign (Contrib. talk)	Nov 9, 2019
	AMS Sectional Meeting at Binghamton University (Contrib. talk)	Oct 12, 2019
	Young Topologist Meeting at EPFL (Contributed talk)	July 23, 2019
	GSTGC at Univ. of Illinois Urbana-Champaign (Contrib. talk)	Mar 31, 2019
	Aspects of Higher Repres. Theory at Brussels (Contrib. talk)	Jan 22, 2019
	Higher Str. in Holomorphic and Topological Field Theory at IHES (Contrib. talk)	Jan 16, 2019
Teaching	At McMaster University	
	MATH-3T03 Inquiry in Topology (Lecturing)	Fall 2023
	MATH-2ZZ3 Engineering Mathematics 4 (Lecturing)	Winter 2023
	MATH-3T03 Inquiry in Topology (Lecturing)	Fall 2022
	At EPFL	
	MATH-110(a) Advanced Linear Algebra I (Assisting)	Fall 2021
	Participated in Teaching Toolkits for Exercises 1-2 seminars	Sept 2021
	Presented Polya's problem-solving method to assistants	Sept 2021
	At Indiana University Bloomington	
	M435-Introduction to Differential Geometry (Grading)	Spring 2020
	M303-Linear algebra and M311-Calculus 3 help sessions (Assisting)	Spring 2020
	M27-Precalculus with Trigonometry (Lecturing)	Fall 2019
	M25-Precalculus (Lecturing)	Spring 2016
	M311-Calculus 3 (Recitation)	Fall 2016
	T336-Topics in Euclidean Geometry (Grading)	Fall 2016
	M521-Topology (Grading)	Fall 2016
	M311-Calculus 3 (Recitation)	Fall 2015
	M321-Intuitive Topology (Grading)	Fall 2015
	T336-Topics in Euclidean Geometry (Grading)	Fall 2015
	M413-Introduction to Analysis (Grading)	Fall 2014
Mentoring	Directed Reading Program in Türkiye for undergraduates in and around Türkiye on Hausdorff Topological Spaces	Summer 2023
	Mentoring Donghan Wang for his master's thesis at EPFL	Spring 2022
	Directed Reading Program for undergraduates at IU Bloomington on Knots and 3-manifolds	Spring 2019
	Directed Reading Program for undergraduates at IU Bloomington on Differential Forms and de Rham Cohomology	Spring 2017
Organization	Geometry and Topology seminar at McMaster University	Fall 2023
	Reading Seminar at McMaster on Cobordism Thy (with R. Sroka)	Winter 2023
	Local seminar at EPFL among the topology group	Spring 2022
	Graduate Student Topology and Geometry Conference 2020 at IU Bloomington (Leading co-organizer); postponed due to COVID-19	April 2020
	IU Grad. Student Knot Theory and TQFT Seminar (Co-organizer)	Spring 2017
	Grad. Student Topology-Geometry Confer. at IU (Co-organizer)	2016

HONOURS AND AWARDS	Outstanding Thesis Award (one of the three awardees)	2020
	AMS Graduate Student Travel Award	2019
	Hazel King Thompson Summer Reading Fellowship	2017, 2019
	Indiana University Graduate Fellowship	2015
	Fulbright Fellowship Awardee	2013
	Middle East Technical University High Honor List	2010-2014

GRADUATE COURSEWORK

- ❑ Complex Variables 1-2
- ❑ Metric Geometry
- ❑ Commutative Algebra
- ❑ Algebraic Topology 1-2
- ❑ Lie Algebras & Lie Groups 1-2
- ❑ Geometric Topology 1-2
- ❑ Homotopy Type Theory
- ❑ Group Representations
- ❑ Quantum Topology
- ❑ Etale Cohomology
- ❑ Reidemeister Torsion

- ❑ Theory of Gravitation
- ❑ Symplectic Geometry and 4-manifolds
- ❑ Rational Billiards and Teichmüller Dynamics (nonregistered)
- ❑ Surface homeomorphisms; topology, geometry, analysis (nonregistered)
- ❑ Calculus of Functors (nonregistered)
- ❑ Representation varieties of 2- and 3-manifold groups (nonregistered)
- ❑ Derived categories (nonregistered)

LANGUAGES   Turkish (Native), English (Fluent), French (Intermediate)

CITIZENSHIP   Turkey