

# Chirantan Mukherjee

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CONTACT INFORMATION	Department of Mathematics University of Western Ontario 1151 Richmond Street, Middlesex College London, ON, Canada, N6A 5B7	mukherjeechirantan.github.io/ cmukher@uwo.ca
RESEARCH INTERESTS	Algebraic topology, homotopy theory, and category theory- especially higher category theory	
EDUCATION	<b>University of Western Ontario</b> Ph.D. in Mathematics, Sep. 2022–Anticipated Aug. 2026 <ul style="list-style-type: none"><li>• Advisor: Dan Christensen</li></ul> <b>University of Trento</b> M.Sc. in Mathematics, Sep. 2019–Mar. 2022 <ul style="list-style-type: none"><li>• Dissertation Topic: Complete Segal Spaces as a model of Higher Categories</li><li>• Advisor: Nima Rasekh</li></ul> Erasmus+ Study in University of Warsaw	
	<b>Institute of Mathematics and Applications</b> B.Sc. in Mathematics and Computing, Aug. 2015–Apr. 2018 <ul style="list-style-type: none"><li>• Dissertation Topic: Set Theory and Foundation of Mathematics</li><li>• Advisor: Shashi Mohan Srivastava</li></ul>	
PUBLICATIONS	Preprint Mar. 2022	C. Mukherjee. <i>Twisted Arrow Construction for Segal Spaces</i> . arXiv preprint, 2022. arXiv:2203.01788.
RESEARCH EXPERIENCE	2021–Present	École Polytechnique Fédérale de Lausanne <ul style="list-style-type: none"><li>• Provide a comprehensive characterisation of the Kan model structure on simplicial sets by reviewing categorical homotopy theory and the theory of model categories. Examine simplicial spaces, especially complete Segal spaces, as a model of <math>(\infty, 1)</math>–categories</li><li>• Generalizing the twisted arrow construction to complete Segal spaces</li><li>• Proving the projection map <math>Tw(W) \rightarrow W^{op} \times W</math> is a left fibration of complete Segal spaces</li></ul>
	2017–2018	Indian Statistical Institute <ul style="list-style-type: none"><li>• Investigate how Cantor’s solution of a unique representation of a function by trigonometric series led to the discovery of ordinal numbers and the general notion of topology</li><li>• Examine how Cantor developed the notion of transfinite numbers by taking indefinite derivatives of a set</li><li>• Understanding Gödel’s and Cohen’s proof of the (generalized) continuum hypothesis, as well as its relationship to the ZFC axioms</li></ul>
GRANTS AND AWARDS	2021–2022 2020–2021	Thesis Research Abroad, University of Trento. €2,700 Erasmus+ Grant, Italian Erasmus+ Agency. €6,207

RESEARCH SCHOOLS AND INTERNSHIPS ATTENDED	2022	Higher Category Lecture, Australian National University Instructors: Yuki Maehara
	2021	Masterclass on Topological Field Theories and Factorization Homology, University of Copenhagen. €336.07+ €469.69 Instructors: Adrien Brochier; Quantum character varieties and TFTs, and Claudia Scheimbauer; Dualizability, higher categories and TFTs
	2021	EPFL Topology Seminar Spring 2021, EPFL Seminar on algebraic topology and category theory
	2021	Intensive Research Programme: Higher Homotopical Structures, Centre de Recerca Matemàtica (CRM) Development of higher-categorical tools for theory and computations in algebraic K-theory and related theories
	2020	Scuola Matematica Interuniversitaria ( <i>Interuniversity Mathematical Summer School</i> ), University of Perugia Instructors: Barbara Nelli; Differential geometry, and Frédéricch Robert; Functional Analysis
	2017	Summer Research Programme, The Institute of Mathematical Sciences. ₹11,000 Advisor: Pralay Chatterjee
	2017	Project on basic set topology, Indian Statistical Institute, Kolkata Advisor: Goutam Mukherjee
TALKS AND PRESENTATIONS	Mar. 2021	<i>The Conf<sub>2</sub> space of rational homology of <math>S^3</math> and propagators</i> University of Warsaw
	Jan. 2021	<i>Differentiable manifolds and forms, de Rham cohomology</i> University of Warsaw
	Dec. 2020	<i>Products and cochains of equivariant cohomology theories</i> University of Warsaw
	Nov. 2020	<i>Polish spaces</i> University of Warsaw
TEACHING EXPERIENCE	Jun. 2017	Regional Mathematical Olympiad Training Camp Train junior mathematical olympiad 2016 awardees for mathematical olympiad
	Jun. 2017	Training Camp for Pathani Samanta Mathematics Scholarship Nurturing of talents in mathematics from rural India
	May 2016	Training Camp for Pathani Samanta Mathematics Scholarship Nurturing of talents in mathematics from rural India
	2015–2018	Sunday Morning Problem Solving Classes Interactive classes for school children, with emphasis on children from vernacular schools
TECHNICAL SKILLS	Languages:	C/C++, Java
	Softwares:	L <sup>A</sup> T <sub>E</sub> X, Mathematica, Octave
RELEVANT SKILLS	Languages:	English (Fluent), Bengali (Native), Hindi (Native)
	Extra:	Poet (Published a book of poems), Swimmer and Life Guard
REFERENCES	<b>Dr. Nima Rasekh</b> Institute of Mathematics École Polytechnique Fédérale de Lausanne	+41-21693-0386 nima.rasekh@epfl.ch
	<b>Prof. Edoardo Ballico</b> Department of Mathematics University of Trento	+39-0461-281646 edoardo.ballico@unitn.it