Subhadip CHOWDHURY

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PERSONAL INFORMATION

Date of Birth	27 May, 1992
Citizenship	India

RESEARCH INTERESTS

Low dimensional dynamics and topology, specifically nonabelian group actions on the circle. Application of algebraic topology to formal language theory. Related topics in geometry and geometric group theory.

EDUCATION

2012–Present **Ph.D. in Mathematics**
The University of Chicago, USA
- Advisor - Danny CALEGARI
- Expected - June 2018

2014 **M.S. in Mathematics**
The University of Chicago, USA
- Topic Proposal - Stable Commutator Length and Quasimorphisms

2009–2012 **Bachelor of Mathematics**
Indian Statistical Institute, Bangalore Centre, India
- First Division with Distinction

PUBLICATIONS AND PREPRINTS

- **Ziggurat fringes are self-similar.** *Ergodic Theory and Dynamical Systems*, doi:10.1017/etds.2015.75.

  In this paper, we give explicit formulae for fringe lengths of the Calegari-Walker Ziggurats – i.e. graphs of extremal rotation numbers associated to positive words in free groups. These formulae reveal (partial) integral projective self-similarity in ziggurat fringes, which are low-dimensional projections of characteristic polyhedra on the bounded cohomology of free groups. This explains phenomena observed experimentally by Gordenko and Calegari-Walker.

- **A Topological proof that O_2 is 2-MCFL.** arxiv.org/abs/1710.04597

  In this paper, we give a new proof of Salvati's theorem that the group language O_2 is 2 multiple context free using homology theory. Unlike Salvati's proof, our arguments do not use any idea specific to two-dimensions. This raises the possibility that the argument might generalize to O_n.

Teaching Experience

2014-2018 **Instructor of Record**, *University of Chicago College*

- Mathematical Methods for Social Sciences, Math 195 (Fall 2017), __, Math 195 (Winter 2018)
- Linear Algebra, Math 196 (Summer 2017)
- Calculus II, Math 152 (Fall 2016), __ III, Math 153 (Winter 2017)
- Calculus II, Math 152 (Fall 2015), __ III, Math 153 (Winter 2016), Elementary Functions and Calculus III, Math 133 (Spring 2016)
- Calculus I, Math 151 (Fall 2014), __ II, Math 152 (Winter 2015), __ III, Math 153 (Spring 2015)

2013-2014 **College Fellow**, *University of Chicago*

- Teaching Assistant for Honors Calculus I-III, Math 161-163 taught by Eugenia Cheng

2014,2016 **Mentor for Research Experience for Undergraduates**, *University of Chicago*

Advised expository and research papers written by undergraduate students

- *Scissors congruence*, *Rationality of zeta functions over finite fields*, *Canonical energy and black hole stability* (Summer 2016); *An introduction to knot theory and the knot group*, *The Jordan-Chevalley decomposition* (Summer 2014).

2014–2016 **Directed Reading Program Mentor**, *University of Chicago*

Met weekly with undergraduate students to guide mathematics reading projects

- *Topology* with Dan Su (Winter 2016), *The dynamics of Circle Homeomorphisms* with Wenyu Chen (Fall 2015), *Discrete Group actions on Topological Spaces* with Weston Ungemach (Spring 2014).

2013-2017 **Grader for First year graduate courses**, *University of Chicago*

- Riemannian Geometry taught by André Neves (Spring 2017)
- Differential Topology taught by Danny Calegari (Winter 2016)
- Differential Geometry taught by Sidney Webster (Winter 2015)
- Algebraic Topology taught by Danny Calegari (Fall 2013)

2010–2011 **Instructor in Regional Mathematical Olympiad and National Mathematical Olympiad Training Camp**

in Kolkata, West Bengal and Bangalore, Karnataka, India

Other Service

2015-2018 Led a team of graduate students to place incoming Freshmen students via the *University of Chicago College Calculus Accreditation Exam* under supervision of Jitka Stehnova and John Boller

Duties included -

- Creating a MCQ question bank (2018)
- Grading subjective answers
- Designing sorting criteria and algorithm
- Processing large data sets using Excel and Python

2015 **Judge, QED Young Math Symposium**, *Math Circles of Chicago*

- Chicagos only youth math symposium

2014–Present Webmaster and active member of the UChicago chapter of *Association for Women in Mathematics*

2014–Present	Member of the American Mathematical Society

Invited Talks

April 2018	*American Mathematical Society Spring Southeastern Sectional Meeting*, Vanderbilt University, Nashville, TN, USA
January 2018	*Joint Mathematical Meetings - AMS Special Session on Dynamical Systems: Smooth, Symbolic, and Measurable*, San Diego, California, USA
September 2017	*American Mathematical Society Fall Eastern Sectional Meeting*, SUNY, Buffalo, USA
December 2016	*Canadian Mathematical Society Winter Meeting*, ON, Canada

Awards and Scholarships

2012–2013	**McCormick Fellowship**, University of Chicago Awarded by the Admissions Committee to a small number of highly rated applicants to the Ph.D. program of the Department of Mathematics, for an amount of $9000 over two years.
2012	**S.H. Aravind Gold Medal**, Indian Statistical Institute Awarded for outstanding performance in B. Math, to the student with highest CGPA in the program.
2011	**Summer Reaserch Fellowship**, Indian Academy of Science
2009	**Bronze medal, 50th International Mathematical Olympiad**, Germany
2009	**National Board of Higher Mathematics scholarship**, Department of Atomic Energy, Government of India
2008	**Kishore Vaigyanik Protsahan Yojana fellowship**, Department of Science and Technology, Government of India
2007	**National Talent Search Examination scholarship**, National Council of Education Research and Training, India

Skills and Languages

Technical	C, Python, Haskell, Mathematica, Octave, PHP, HTML, CSS, LaTeX, MS Office
Language	English, Bengali, and Hindi - fully proficient in speaking, reading, and writing