

## Research Interests

- Primary Differential and low-dimensional topology, in particular Heegaard Floer homology, Knot Theory  
Secondary Combinatorics, in particular Graph Theory

## Education

- 2023-present **DPhil in Mathematics**, University of Oxford, UK, supervised by Prof. András Juhász  
2017-2023 **BSc in Electrical Engineering and Mathematics**, Sharif University of Technology, Iran  
G.P.A. 18.62/20  
2013-2017 **Mathematics and Physics diploma**, Allameh Helli High School, Iran  
G.P.A. 20/20

## Publications

- 2023 **8. Negative definite spin filling and branched double covers**  
22 pages, arXiv:2308.08022 [↗](#) - To appear in Algebraic and Geometric Topology [↗](#)  
2023 **7. Lower bounds for the chromatic number of certain Kneser-type hypergraphs**, with A. Jafari  
European Journal of Combinatorics, Volume 110, 103664 [↗](#)  
2021 **6. On some topological and combinatorial lower bounds on the chromatic number of Kneser type hypergraphs**, with A. Jafari  
Journal of Combinatorial Theory, Series B, Volume 146, 372-381 [↗](#)

## Preprints

- 2025 **5. Twisting, Stabilization and Bordered Floer homology**  
112 pages, arXiv:2507.15144 [↗](#)  
2025 **4. Chainmail links, Dehn surgery number and  $10/8$**   
13 pages, arXiv:2505.19884 [↗](#)  
2024 **3. On Fox's trapezoidal conjecture**, with A. Juhász and T. Kálmán  
64 pages, arXiv:2406.08662 [↗](#) - submitted  
2023 **2. Twisting and stabilization in knot Floer homology**  
19 pages, arXiv:2312.01501 [↗](#)  
2021 **1. Manyfans**, with A. Jafari and A. Rastegar  
Undergraduate Differential Topology essay, Available on ResearchGate [↗](#)

## Awards and Honours

- 2023 **Clarendon Scholarship**, University of Oxford  
2021 **3rd Rank**, Iranian University Students Scientific Olympiad in Mathematics

- 2019 **Academic Achievement Award**, Sharif University of Technology
- 2017 **288th Rank (among 148,000 students)**, Iranian University Entrance Exam (Konkour)
- 2016 **Silver medal**, Iranian National Mathematics Olympiad

## Invited Talks

- Apr 2025 **UK TILDE**, Newcastle University  
Title: Negative definite spin filling and branched double covers - slides [↗](#)
- Mar 2025 **London Low-Dimensional Topology Seminar**, King's College London  
Title: Twisting, stabilisation and knot Floer homology
- Feb 2025 **Oberseminar Topologie**, Ruhr-University Bochum  
Title: Twisting, stabilisation and knot Floer homology
- Nov 2024 **Junior Topology and Group Theory Seminar**, University of Oxford  
Title: Floer Homology and Square Peg Problem
- Oct 2023 **Junior Topology and Group Theory Seminar**, University of Oxford  
Title: Alternating knots and branched double covers
- May 2020 **Sharif Mathematics Seminar**, Sharif University of Technology  
Title: Graphs, Polytopes and Duality - slides [↗](#)
- Aug 2019 **IST Poster session**, IST Austria  
Title: Topological Methods in Distributed Computation - original poster [↗](#) - a more detailed poster [↗](#)

## Conference and Workshop Attendance

- Jul 2025 **Categorification in Low Dimensional Topology**, 21-26 July, Ruhr-University Bochum
- May 2025 **Matemale Spring School on Khovanov homology and exotic phenomena**, 19-23 May
- Aug 2024 **What's your trick? A Non-Traditional Conference in Low-Dimensional Topology**, 4-9 August  
online (streamed from Banff International Research Station)
- Sep 2023 **Swiss Knots**, 6-8 September, University of Regensburg
- Jul 2023 **Gauge Theory and Topology: in Celebration of Peter Kronheimer's 60th Birthday**, 24-28 July,  
University of Oxford
- Jun 2023 **Matemale Summer School on Seiberg-Witten theory**, 19-23 June

## Research Visits

- Feb 2025 **Ruhr-University Bochum**, 20-21 February, invited by Prof. Claudius Zibrowius
- Summer 2019 **IST Austria**, Internship supervised by Prof. Uli Wagner  
Applications of Algebraic Topology to problems in computer science such as Distributed Computing and Promise Constraint Satisfaction

## Teaching

- 2023-present **Mathematical Institute, University of Oxford:**  
**Low-dimensional Topology and Knot Theory**, 4th year course, 5-10 students  
**Tutor** : Hilary term 2025, Trinity term 2023 (Consultation sessions)  
**TA** : Hilary term 2024, Hilary term 2023

**Topology and Groups**, 2nd year course, 10-15 students

**Tutor** : Michaelmas term 2024

**TA** : Michaelmas term 2023

Dec 2024 **Keble College, University of Oxford:**

**Undergraduate Admission Interviews**, Interviewer

2021-2022 **Sharif University of Technology:**

Spring 2022 **Algebraic Topology**, Graduate course, 37 students

**Marker**, Lecturer: Prof. Siavash Shahshahani

Spring 2021 **Algebra I**, 2nd year course, 54 students

**Tutor**, Lecturer: Prof. Amir Jafari

## Organizational Activity and Services

2018-2021 **Iran National Mathematics Olympiad Committee**

Member of problem selection committees for the 3rd and 4th stage exams.

2018-2021 **Alborz High School**, Mathematics Olympiad program

Combinatorics tutor for the 11th graders

Aug 2021 **Maryam Mirzakhani foundation**, Summer School for 9th grade students

TA for Geometry of Surfaces course, Lecturer: Tina Torkaman

Aug 2020 **Institute for Research in Fundamental Sciences**, Mathematics Summer School [!\[\]\(84f47badaad7772cd95667a7c387a639\_img.jpg\)](#)

TA for Topological Graph theory course, Lecturer: Prof. Amir Jafari

## Languages

**Persian** Native speaker

**English** Advanced

**Arabic** Basic