Kashyap Rajeevsarathy

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Date of Birth: August 30, 1982.

Department of Mathematics
IISER Bhopal, Bhopal By-pass Road
Bhauri, Bhopal 462066
Madhya Pradesh, India

Education

2005 - 11 Ph.D. Mathematics, University of Oklahoma, USA

2003 - 05 M.S. Mathematics, Indian Institute of Technology Madras, Chennai, India

2000 - 03 B.Sc. Mathematics, Ramakrishna Mission Vivekananda College, Chennai, India

Academic positions

Since 2018 Associate Professor, IISER Bhopal

2011 - 18 Assistant Professor, IISER Bhopal

Administrative positions

Current

Since 2023 Chairperson, Standing Committee for Vetting and Opening of the Tenders, IISER Bhopal

Since 2022 Dean, Alumni and International Relations, IISER Bhopal.

Past

2020 - 22 Head, Department of Mathematics, IISER Bhopal.

2020 - 21 Head, Institute Career Development and Placement Cell (ICDPC), IISER Bhopal.

2014 - 19 Chairperson, Commercial Establishments Committee, IISER Bhopal.

2015 - 16 Convener, Department Undergraduate Committee, IISER Bhopal.

2012 - 16 Dean In-Charge, Student Affairs, IISER Bhopal.

Research interests

Primary: Low-dimensional Topology (specifically, Mapping Class Groups)

Secondary: Algebraic Graph Theory

Research papers

Published or accepted

1. Periodic Surface Homeomorphisms and Contact Structures (with D. Kulkarni and K. Saha), *Journal of the Korean Mathematical Society*, *DOI*: 10.4134/JKMS.j220244, 2023.

2. General primitivity in the mapping class group (with P. Kapari), *Journal of Topology and Analysis*, *DOI:* 0.1142/S1793525323500541, 2023.

3. Factoring periodic maps into Dehn twists (with N. K. Dhanwani and A. Nair), *Journal of Pure and Applied Algebra*, 227(1): 107159, 2023.

4. Geometric realizations of cyclic actions on surfaces - II (with A. Bhattacharya and S. Parsad), *Geometriae Dedicata*, 216(6): 67-94, 2022.

5. Split metacyclic actions on surfaces (with N. Dhanwani and A. Sanghi), *New York Journal of Mathematics*, 28: 617-649, 2022.

6. Liftable mapping classes of regular cyclic covers (with N. Agarwal, S. Dey and N. K. Dhanwani), *Houston Journal of Mathematics*, 47(1): 223-243, 2021.
7. Commuting conjugates of finite-order mapping classes (with N. K. Dhanwani), *Geometriae Dedicata*, 209:69-93, 2020.
8. Spectral properties of the Cayley graphs of split metacyclic groups (with S. Sarkar, S. Lakshmivarahan, and P. K. Aurora), *Journal of the Ramanujan mathematical society*, 35(2):159-175, 2020.
9. Bound on the diameter of metacyclic groups (with S. Sarkar), *Journal of algebra and its applications*, 19(11): 2050219, 2019.
10. The geometric realizations of cyclic actions on surfaces (with S. Parsad, and B. Sanki), *Journal of Topology and Analysis*, 11(4): 929-964, 2019.
11. Roots of Dehn twists about multicurves (with P. Vaidyanathan), *Glasgow Mathematical Journal*, 60(3): 555-583, 2018.
12. Fractional powers of Dehn twists about nonseparating curves, *Glasgow Mathematical Journal*, 56(1): 197-210, 2013.
13. Roots of Dehn twists about separating curves, *Journal of the Australian Mathematical Society*, 95(2): 266-288, 2013.
14. Roots of Dehn twists (with D. McCullough), *Geometriae Dedicata*, 151: 397-409, 2010.

Preprints

1. Alternating and symmetric actions on surfaces (with R. Dey), *arXiv:*2310.06550 [math.GT], 2023.
2. Generating the liftable mapping class groups of cyclic covers of spheres (with P. Kapari), *arXiv*:2308.12071 [math.GT], 2023.
3. Infinite metacyclic subgroups of the mapping class group (with P. Kapari and A. Sanghi), *arXiv*:2207.13910 [math.GT], 2022.
4. Metacyclic actions on surfaces (with A. Sanghi), *arXiv*:2201.09602 [math.GT], 2022.
5. Generating the liftable mapping class groups of regular cyclic covers (with S. Dey, N. Dhanwani, and H. Patil), *arXiv*:2111.01626 [math.GT], 2021.
6. Estimating the Cheeger constant using machine learning (with A. Jain and S. Pal), *arXiv:*2005.05812 [math.CO], 2020.

Research Projects

Ongoing

2023 - 26 Liftable mapping class groups (SERB-MATRICS as PI for Rs.6,00,000)

Completed

2018 - 21 *Pseudo-periodic mapping classes and contact structures* (SERB-EMR as PI for Rs.23,59,350)

Geometric realizations of finite groups of mapping classes of surfaces (SERB-EMR as Co-PI for Rs.23,04,598)

2012 -17 Fractional powers of Dehn twists (SERB Ramanujan Fellowship as PI for Rs.73,00,000)

Awards and recognitions

2022 - 23 Distinguished teacher award (at IISER Bhopal)

2011 - 16 Ramanujan National Fellowship (SERB, India)

2011 - 12 John C. Brixley Graduate Scholarship (at OU)

2009 - 10 Corinne Price Scholarship (at OU)

2008 - 09 Andree Memorial Scholarship (at OU)

Students

PhD students

Current

Since 2022	Rohan Suresh Mahure (PMRF, Co-supervised))
Since 2021	Satyajit Maity (Co-supervised)
Since 2020	Pankaj Kapari (PMRF)
Since 2019	Rajesh Dey

Graduated

2020 - 22	Apeksha Sanghi
2017 - 20	Neeraj Kumar Dhanwani

Masters' students

2022 - 23	Prakruti Kalsaria (SVNIT Surat)
2019 - 21	Shashank Pathak

Undergraduate students

Current

2023 - 24	Faisal Farooq Chachi

Graduated

2022 - 23	Saumya Jain
	Aniket Hinge
2021 - 22	Prutha Bhide
	Hricha Acharya
2020 - 21	Harsh Patil
	Srabana Biswas
	Gokul H
2019 - 20	Vishal Gupta
2018 - 19	Vidit Das
	Deepak Kumar
	Mayank Jain
2017 - 18	Ajay Kumar Nair
	Sreekanth D
2016 - 17	Ashwin Koodathil
2012 - 13	Abhay Chandel

Postdoctoral fellows

Current

Since 2023	Ravi Tomar (IISER Mohali)

Past

2022 - 23	Suman Paul (IIT Kanpur)
2021 - 22	Neha Nanda (IISER Mohali)
2020 - 21	Apratim Chakraborty (Stony Brook, USA)
2019 - 21	Kuldeep Saha (CMI, Channai)
2018 - 19	Soumya Dey (IISER Mohali)
2016 - 17	Bidyut Sanki (IISc Bangalore)
2015 - 17	Shiv Parsad Bansal (IISER Mohali)

Teaching

At IISER Bhopal

2023 - 24	Group Theory
2022 - 23	Topology II
	Introduction to groups and symmetry
2021 - 22	Real Analysis II
	Topology II
2020 - 21	Topology I
	Elementary number theory
2019 - 20	Numerical analysis
2018 - 19	Differential geometry of curves and surfaces
	Introduction to groups and symmetry
2017 - 18	Programming and data structures
	Introduction to hyperbolic geometry
2016 - 17	Metric spaces and topology
	Group Theory
2015 - 16	Topology II
	Topology I
2014 - 15	Programming and data structures
	Multivariable calculus and differential equations
2013 - 14	Topology I
	Real analysis
2012 - 13	Linear algebra
	Introduction to algebraic topology
2011 - 12	Linear algebra
	Elementary number theory
	Calculus of one variable

At University of Oklahoma, USA

2010- 11	Calculus IV
	Calculus I
2009-10	Precalculus and Trigonometry
2008-09	Precalculus for Business, Life, and Social Sciences
2006-07	Calculus I (Discussion section)
2005-06	Calculus II (Discussion section)

Talks

Invited talks

Research talks

- Generating the liftable mapping class group of regular cyclic covers (at IITB), Department Seminar, April 6, 2023.
- Generating the liftable mapping class group of regular cyclic covers (at TIFR Mumbai), Random Geometric Seminar, April 3, 2023.
- Infinite metacyclic subgroups of the mapping class group (at IISER Mohali), Department Seminar, December 8, 2022.
- Infinite metacyclic subgroups of the mapping class group, 37^{th} Annual Conference of Ramanujan Mathematical Society (at SSN College of Engineering Chennai), December 6-8, 2022.
- Generating the liftable mapping class group of regular cyclic covers, A Topology Day (at IIT Madras), December 5, 2022.
- Generating the liftable mapping class group of regular cyclic covers, Inter IISER Math Meet (at IISER Kolkata), May 31 - June 2, 2022.
- Liftable mapping classes of regular cyclic covers (at Group Theory Sangam Virtual Seminar), March 16, 2021.
- Liftable mapping classes of regular cyclic covers (at IISER Mohali virtual Geometry-Topology seminar), March 3, 2021.
- Commuting conjugates of finite-order mapping classes, Math Seminar (at CMI), March 20, 2019.
- Introduction to mapping class groups I & II, CMI, March 18-19, 2019.
- The geometric realizations of finite order mapping classes, Inter IISER Math Meet (at IISER Pune), May 11-12, 2017.
- On the symplectic representations of finite order mapping classes, TIMC-AMS international symposium on Teichmuller Theory/Differential geometry (at BHU Varanasi), December 14-17, 2016.
- Primitivity in the mapping class group, 81st Anniversary General Meeting of the Indian National Science Academy (at IISER Bhopal), December 28-31, 2015.
- Primitivity in the mapping class group, Conclave of Ramanujan Fellows (IIT Indore), December 22-23, 2015.
- Multicurves and primitivity in $\mathrm{Mod}(S_g)$, 30^{th} Annual conference of the Ramanujan Mathematical Society, May 15-17, 2015.
- Multicurves and primitivity in $\mathrm{Mod}(S_g)$, Ramanujan Fellowship Review Meeting, IIT Guwahati, April 25, 2015.
- Multicurves and primitivity in $\mathrm{Mod}(S_g)$, International conference on Geometry and Analytical Aspects of Hyperbolic Spaces (at Delhi University, India), December 10-15, 2014.
- Finite groups of Möbius transformations, Winter School in Mathematics (at IISER Bhopal, India), December 8-19, 2014.
- Multicurves and primitivity in $\mathrm{Mod}(S_g)$, Ramanujan Fellowship Review Meeting, Kolkata, India, May 20, 2014.
- Multicurves and primitivity in $\mathrm{Mod}(S_g)$, Math Seminar, IISER Pune, India, April 7, 2014.
- Roots of Dehn twists about multicurves, $79th$ Annual Meeting of the IMS (at RSET Cochin), December 28-31, 2013.

- On the fractional powers of Dehn twists, Mathematics Colloquium, IMSc Chennai, India, January 31, 2013.
- Crash course in hyperbolic geometry, Groups, Geometry and Dynamics (at Almora, UK, India), December 3-4, 2012.
- On the fractional powers of Dehn twists, Math Seminar, IISER Pune, India, November 11, 2012.
- Fractional powers of Dehn twists about nonseparating curves, Geometry Topology Seminar, GATech, Atlanta, USA, May 14, 2012.
- Roots of Dehn twists, Mathematics Seminar, IISc Bangalore, India, December 13, 2011.

Popular science and outreach talks

- Lectures on topology in the Annual Foundation School (AFS) - I organized by the NCM and TIFR Mumbai (at GITAM University, Bengaluru), December 4-9, 2023.
- The Poincaré Conjecture: A historical and conceptual overview (at Krea University), January 30, 2023.
- The Poincaré Conjecture: A historical and conceptual overview at the Continuum 2021 (at IISER Bhopal), March 13, 2021.
- The Poincaré Conjecture: A historical and conceptual overview at the Director's Colloquium (at IISER Bhopal), April 12, 2019.
- Euler Characteristic: The magic number, Outreach Programme (at IISER Bhopal), May 2015.
- Groups and symmetry, Outreach Programme (at IISER Bhopal), May 2014.
- Euler Characteristic: The magic number, Outreach Programme (at IISER Bhopal), May 2013.

Contributed talks

- Bounds on the degrees of roots of Dehn twists, Contributed Session, AMS Sectional Meeting (at Tampa, Fl), March 10-11, 2012.
- Fractional powers of Dehn twists - Special Session on Geometric Topology, 45^{th} Spring Topology and Dynamics Conference (at Tyler, TX), March 17-19, 2011.
- Fractional powers of Dehn twists - AMS Session on Differential Topology, 2011 Joint Mathematics Meetings (at New Orleans, LA), January 6-9, 2011.
- Roots of Dehn twists about separating curves - Contributed Session, 44^{th} Spring Topology and Dynamics Conference (at Starkville, MS), March 18-20, 2010.

Conferences and workshops

Organized (or Co-organized)

- Annual Meet of Indian Women and Mathematics (IWM), July 13-15, 2023.
- IISER Bhopal Math Symposium 2021, March 25-26, 2021.
- Indian School of Logic and its Applications 2020 - A Virtual School, December 18-23, 2020.
- NCM workshop on "Contact and symplectic geometry", December 1-15, 2018.
- Inter IISER-NISER Mathematics Meet 2018, July 7-8, 2018.
- Workshop on Mathematica 11 (at IISER Bhopal), March 16-17, 2018.
- Indian Women and Mathematics (IWM), Regional Workshop on Research and Opportunities (at IISER Bhopal), October 7-8, 2017.
- Topology and Dynamics Conference (at IISER Bhopal), December 3-5, 2015.

Participated

- Inter IISER Math Meet (at IISER Pune), May 11-12, 2017
- TIMC-AMS international symposium on Teichmuller Theory/Differential geometry (at BHU Varanasi), December 14-17, 2016.
- 81^{st} Anniversary General Meeting of the Indian National Science Academy (at IISER Bhopal), December 28-31, 2015.
- 30^{th} Annual conference of the Ramanujan Mathematical Society (at IISER Mohali), May 15-17, 2015.
- International conference on Geometry and Analytical Aspects of Hyperbolic Spaces (at Delhi University, India), December 10-15, 2014.
- Winter School in Mathematics (at IISER Bhopal, India), December 8-19, 2014.
- $79th$ Annual Meeting of the IMS (at Cochin, Kerala, India), December 28-31, 2013.
- Groups, Geometry and Dynamics (at Almora, UK, India), December 3-16, 2012.
- AMS Sectional Meeting (at Tampa, Fl, USA), March 10-11, 2012.
- 45^{th} Spring Topology and Dynamics Conference (at Tyler, TX, USA), March 17-19, 2011.
- 2011 Joint Mathematics Meetings (at New Orleans, LA, USA), January 6-9, 2011.
- Graduate Topology and Geometry Conference (at Ann Arbor, MI, USA), April 10-11, 2010.
- 44^{th} Spring Topology and Dynamics Conference (at Starkville, MS, USA), March 18-20, 2010.

Professional service

Referee/reviewer for:

- *Geomtetriae Dedicata*
- *Proceedings of the American Mathematical Society*
- *Rocky Mountain Journal of Mathematics*
- *Zentralblatt MATH*

Computer Skills

Programming:	LaTeX, Mathematica, GAP, C, C++, HTML
Operating systems:	Windows, Mac OSX, Linux