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## RESEARCH INTERESTS

- Geometric structures on manifolds, moduli spaces, and group actions preserving geometric structures
- Discrete subgroups of Lie groups
- Non-positive curvature and geometric group theory
- Local and global rigidity of group actions on compact manifolds (e.g. boundaries)

## EMPLOYMENT

**Max Planck Institute for Mathematics in the Sciences**  
Division: Geometry, Groups, and Dynamics (led by Anna Wienhard)

*Postdoctoral Researcher*  
(October 2023- Present)

**Universität Heidelberg**  
Research Station Geometry and Dynamics  
Mentor: Beatrice Pozzetti

*Postdoctoral Researcher*  
(2021- 2023)

## EDUCATION

**University of Michigan**  
Dissertation: Rank one phenomena in convex projective geometry  
Advisor: Ralf Spatzier

*Ph.D. (2016- 2021)*

**Indian Statistical Institute**  
Thesis: Non-commutative Geometry of Baumslag-Solitar group  $BS(1,-1)$

*M. Math (2014-2016)*  
*P.C.Panzer Gold Medal*

**Jadavpur University**  
Mathematics (Honours)

*Bachelor of Science (2011-2014)*  
*University Gold Medal*

## PUBLICATIONS AND PREPRINTS

1. *A flat torus theorem for convex co-compact actions of projective linear groups.* [ArXiv 1907.03277](#)  
Joint with Andrew Zimmer. [Posted on 07.07.2019](#)  
**Journal of the London Mathematical Society** (2021) Vol 3 Issue 2 470-489 (19 pages).
2. *Convex co-compact actions of relatively hyperbolic groups.* [ArXiv 1910.08885](#)  
Joint with Andrew Zimmer. [Posted on 20.10.2019](#)  
**Geometry & Topology** 27 (2023) 417-511 (95 pages).
3. *Rank-one Hilbert geometries.* [ArXiv 1912.13013](#)  
Second revision submitted, under consideration at **Geometry & Topology** (34 pages). [Posted on 30.12.2019](#)
4. *Convex co-compact representations of 3-manifold groups.* [ArXiv 2009.05191](#)  
Joint with Andrew Zimmer. [Posted on 11.09.2020](#)  
Second revision submitted, under consideration at **Journal of Topology** (40 pages).

5. *Convex co-compact groups with one dimensional boundary faces.*  
 Joint with Andrew Zimmer. ArXiv 2104.05056  
Posted on 11.04.2021  
 First revision submitted, under consideration at **Groups, Geometry, and Dynamics** (24 pages).
6. *The structure of relatively hyperbolic groups in convex real projective geometry.*  
 Joint with Andrew Zimmer. ArXiv 2203.16596  
Posted on 30.03.2022  
 Submitted (31 pages).
7. *Boundary actions of lattices and  $C^0$  local semi-rigidity.*  
 Joint with Chris Connell, Thang Nguyen, and Ralf Spatzier. ArXiv 2303.00543  
Posted on 01.03.2023  
 Submitted (61 pages).

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#### OTHER WRITINGS

*Preliminaries on dynamics on geometrically finite hyperbolic manifolds.*

**Oberwolfach Report** No. 50/2021, pages 2732-2734.

Arbeitsgemeinschaft (Thin groups and Super-approximation), October 2021.

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#### PROJECTS IN PREPARATION

1. *Morse boundaries in convex projective geometry.*  
 Joint with Theodore Weisman.
2. *Relatively Anosov representations, Geometric Finiteness, and Convex Projective Structures.*  
 Joint with Feng Zhu.

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#### TALKS

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##### MINI-COURSES

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| Mini-course (3-part, 4.5 hours) at the conference <i>Groups and Rigidity Around Zimmer Program</i> ( <a href="#">GRAZP Conference</a> ), Ventotene, titled “ <b>Actions of lattices on boundaries</b> ” | Sept. 2023 |
| Lecture series (3-part, 3 hours) titled “ <b>Convex Projective Structures</b> ”, Indian Statistical Institute - Kolkata, India  | Dec. 2022  |

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##### CONFERENCES

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| Arbeitsgemeinschaft: Thin Groups and Super-strong Approximation, Oberwolfach                 | Oct. 2021 |
| Nearly Carbon Neutral Geometric Topology Conference ( <a href="#">NCNGT</a> ) (virtual talk) | June 2020 |

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##### INVITED SEMINAR TALKS

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| Geometry seminar, Indian Institute of Science (IISc), Bangalore, India             | March 2023 |
| Seminar, Tata Institute of Fundamental Research (TIFR), Bangalore, India           | March 2023 |
| Colloquium, Tata Institute of Fundamental Research (TIFR), Mumbai, India           | March 2023 |
| Seminar, Indian Institute of Technology (IIT) - Mumbai, Mumbai, India              | March 2023 |
| Geometriy seminar, Florida State University  | Nov. 2022  |
| Geometric Analysis seminar, IIT Mumbai, India                                      | Nov. 2022  |
| Ergodic Theory seminar, Institut de Recherche Mathematique de Rennes IRMAR, Rennes | May 2022   |

Colloquium, Indian Statistical Institute Kolkata, India	Dec. 2021
Young Researcher's Meeting of the GDR Platon, CIRM - Marseille	Nov. 2021
Topology and Geometric Group Theory Seminar, Ohio State University	Nov. 2021
Geometry Seminar, University of Virginia	March 2021
Geometry Seminar, Indiana University Bloomington	Dec. 2020
McGill Geometric Group Theory Seminar, McGill University	Nov. 2020
MSRI, Random and Arithmetic Structures in Topology (virtual semester)	Nov. 2020
Topology Seminar, University of Texas, Austin	Nov. 2019
Indian Statistical institute, Kolkata, India	Jan. 2019
Indian Statistical institute, Kolkata, India	July 2017

#### RESEARCH VISITS

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Tata Institute of Fundamental Research (TIFR), Mumbai	March 2023
Institut de Recherche Mathematique de Rennes (IRMAR), Rennes	May 2022
Louisiana State Univeristy	March 2020
University of Texas - Austin	November 2019

#### AWARDS AND ACHIEVEMENTS

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<i>Rackham Predoctoral Fellowship</i> , University of Michigan	2020-2021
<i>Rackham One-Term Dissertation Fellowship</i> , University of Michigan	2020
<i>Mathematics Department Fellowship</i> , University of Michigan	2019
<i>Mathematics Department Fellowship</i> , University of Michigan	2018
<i>Alice Weber Glover in Math Scholarship</i> , University of Michigan	2017
<i>P. C. Panzer Gold Medal</i> , Indian Statistical Institute, India	2017
<i>Kishore Vaigynaik Protsahan Yojana</i> , Govt. of India	2010-2016
<i>Masters' scholarship</i> , National Board of Higher Mathematics, India	2014
<i>University Gold Medal</i> , Jadavpur University, India	2014

#### TEACHING

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At **Universität Heidelberg** and as the **primary instructor**:

<i>Matrix Groups</i> ( <a href="#">Course webpage</a> )	Summer 2023
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At the **University of Michigan** and as the **primary instructor**:

<i>Math 115 Differential Calculus</i>	Fall 2019
<i>Math 115 Differential Calculus</i>	Fall 2018
<i>Math 115 Differential Calculus</i>	Winter 2018
<i>Math 115 Differential Calculus</i>	Fall 2017
<i>Math 115 Differential Calculus</i>	Winter 2017
<i>Math 105 Pre-calculus</i>	Fall 2016

MENTORING

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**Laboratory of Geometry - LoG(M)**, University of Michigan (January-April 2020)Project: *Entropy degeneration of ideal projective pants*

Co-mentored a group of three undergraduate students, alongside two faculty mentors Harrison Bray and Giuseppe Martone. Helped run lectures and discussion sessions. Contributed in the discussion sessions on the computational/ coding component of the project.

OUTREACH

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- **Celebrating the Poincaré Conjecture** (Millenium Prize Problems Mathfest, Heidelberg University, July 2022)  
Event: A set of public events, lectures, and workshops on the Poincareé conjecture aimed at high school students.  
Role: Worked in the team that created the [website](#) (aimed at explaining the Poincare conjecture to the public) and helped with the workshops and organization.
- Public webinar titled **Hyperbolic Geometry and Beyond - An Algebraic and Dynamical Perspective** (Department of Applied Mathematics, Calcutta University, December 2021)  
Event: A webinar for undergraduate students, often from underprivileged backgrounds, with the goal to motivate them for mathematics research.  
Role: Acted as a resource person, gave a talk at the webinar, participated in an interaction session with the students.

SERVICE AND ORGANIZATION

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**Reviewer/Quick Opinions**

Mathematische Zeitschrift, Commentarii Mathematici Helvetici

**Organization (Heidelberg University)**

Differential Geometry seminar (co-organizer)

October 2021 - July 2023

**Organization (University of Michigan)**Learning seminar ( "*Super-rigidity of higher rank lattices*" )

February - June 2020

Learning seminar ( "*Benoist's work on convex divisible sets*" )

February - April 2019

Student Geometry/ Topology seminar (co-organizer)

January 2019 - April 2020

Student Dynamics seminar (co-organizer)

January 2019 - April 2020