Arunima Ray

Curriculum vitae

Max-Planck-Institut für Mathematik
Vivatsgasse 7, 53111 Bonn, Germany
http://people.mpim-bonn.mpg.de/aruray/
aruray@mpim-bonn.mpg.de

Research interests

Pure mathematics. Low-dimensional topology: knots and links, 4- and 3-manifolds

Employment

University of Melbourne — Melbourne, Australia

Senior Lecturer (Level C) — Feb 2025 onwards

Max-Planck-Institut für Mathematik — Bonn, Germany

Lise Meitner research group leader
– tenured W2 position — Apr 2023 – Jan 2025
– tenure track W2 position — Aug 2020 – Mar 2023
Research group leader (term-limited W2 position) — Aug 2017 – Jul 2020

Brandeis University — Waltham, USA

Postdoctoral instructor — Jul 2014 – Jun 2017

Visiting positions

Hausdorff Institute for Mathematics — Bonn, Germany

Visitor, Junior Hausdorff Trimester Program (Topology) — Sep – Dec 2016

University of Glasgow — Glasgow, UK

Visiting professor — Apr – Jul 2024

Hausdorff Center for Mathematics — Bonn, Germany

Bonn research fellow — Jul 2025 – Jun 2030

Education

Rice University — Houston, USA

Ph.D. Mathematics — May 2014
Casson towers and filtrations of the smooth knot concordance group
Thesis advisor: Tim D. Cochran

M.A. Mathematics — Dec 2012

State University of New York, College at Geneseo — Geneseo, USA

B.A. Mathematics and Biochemistry, *summa cum laude* — May 2009

Grants & awards

- **Collaborative Research: Conference: Topological and Geometric Structures in Low Dimensions**

  National Science Foundation, 2025-26; awarded 20,000 USD to fund US-based participants in activities related to the thematic program 'Topological and Geometric Structures in Low Dimensions', at Centre de Recherches Mathematiques, Montreal (CRM), with some activities held at Université du Quebec à Montreal (UQAM), joint with John Baldwin, Steve Boyer, Duncan McCoy, Allison N. Miller, Maggie Miller, and Matthew Stover.

- **Lise Meitner Excellence Group**

  Max Planck Society, 2020–25; funding included W2 salary for five years, 50% thereafter (remaining 50% borne by the institute), salary of one scientist (E13-E15), funding for PhD students on funding contract (84,000 EUR per year), as well as 18,000 EUR per year for research related expenses.

- **AIM SQuaRE grant**

  American Institute for Mathematics, 2019–24 (disrupted by Covid-19 pandemic); project titled 'Studying knot concordance via branched covers of S^4', joint with Ryan Blair, Patricia Cahn, Alexandra Kjuchukova, Kent Orr, and Hannah Schwartz.

- **MPG kick-off workshop grant**

  Max Planck Society, September 2023; awarded 14,500 EUR to organise an Indo-German kick-off workshop on low-dimensional topology at the Indian Institute of Science Education and Research in Pune (IISER Pune) and the Tata Institute for Fundamental Research (TIFR) in Mumbai; joint with Stefan Friedl, Radhika Gupta, Tejas Kalelkar, and Mahan Mj.

- **Experiential learning and teaching grant**

  Experiential learning and teaching at Brandeis, Spring 2017; project titled 'An experiential learning approach to MATH 23b', awarded 1,600 USD to support a course assistant in a partially flipped course on mathematical proof-writing.

- **AMS-Simons travel grant**

  American Mathematical Society, Simons Foundation 2015–17; awarded annually to 60 early-career US mathematicians, received 2,000 USD per year for two years to be used for research-related travel.

- **AWM-NSF travel grant**

  Association for Women in Mathematics, National Science Foundation, June 2015; awarded 960 USD for travel to the Princeton low-dimensional topology workshop 2015.

- **Nettie S. Autrey fellowship**

  Rice University Office of Graduate & Postdoctoral Studies, 2013–14; awarded annually to a graduate student in the Schools of Natural Sciences or Engineering, received a stipend of 14,000 USD.

- **Robert Lowry Patten award**

  Rice University Graduate Student Association, 2013; one of four annual awards recognising service towards improving PhD student life and education, received a cash award of 400 USD.

- **President's graduate fellowship**

  Rice University Office of Graduate & Postdoctoral Studies, 2009–10; awarded to ten incoming Ph.D. students across all departments, received a one-year stipend top-up of 5,000 USD.

Past & upcoming research talks

(100+ talks since 2013)

2024

Seminar on non-linear algebra, Max Planck Institute for Mathematics in the Sciences, Leipzig •
Monash University topology seminar • University of Southampton topology seminar • Georgia
topology conference • Focused research group on algebraic methods in 4-manifolds, University of
Glasgow • LiT2: Lost in Topology conference, Centro di Ricerca Matematica Ennio De Giorgi,
Pisa • World Laureate Forum HUB session

2023

MPIM open problems seminar • Max Planck Society partner group meeting • Indian Institute
of Technology, Bombay, mathematics colloquium • Interactions of low-dimensional topology
and quantum field theory, SwissMAP research station • Focused research group on algebraic
methods in 4-manifolds, University of Glasgow • Gauge theory and topology, in celebration
of Peter Kronheimer's 60th birthday, Clay Mathematics Institute • Freie Universität Berlin
research talk • University of Copenhagen algebra/topology seminar

2022

Indian Women in Mathematics, annual conference • Stanford topology seminar • Universität Göttingen mathematics colloquium • Montana State University mathematics seminar •
Columbia geometric topology seminar • Universität Hamburg pure mathematics colloquium •
SUNY Geneseo mathematics colloquium • Princeton topology seminar • Durham topology seminar • New developments in four dimensions, University of Victoria • Universität Regensburg,
SFB lecture • Knot online seminar • Universität Bonn topology seminar • Universität Münster
topology seminar • Berlin mathematical school, MATH+ colloquium • MPIM low-dimensional
topology seminar (2 talks) • Topology in dimension 4.5, Banff International Research Station •
MIT topology seminar • UNC Chapel Hill colloquium

2021

AMS special session on invariants of knots and links, Joint Mathematics Meetings, Washington
DC • MPIM topology seminar • Building bridges seminar • Universität Regensburg low-dimensional geometry and topology seminar • Nearly carbon neutral geometry and topology
conference, plenary talk • Minisymposium on low-dimensional topology, European congress
of mathematics • Hausdorff Center for Mathematics symposium • Special session on recent
advances in low-dimensional topology, AMS southeastern sectional meeting • Paris 6 geometry
and topology seminar

2020

Low-dimensional topology, Clay Mathematics Institute • MPIM topology seminar • CIRGET
geometry and topology seminar • University of Wisconsin-Milwaukee topology seminar • UNC
Chapel Hill AWM lecture series • Tech topology conference

2019

Duke University geometry/topology seminar • Unifying 4-dimensional knot theory, Banff
International Research Station • LMS Durham symposium: pseudoholomorphic curves and
gauge theory in low-dimensional topology • Swissknots 2019 • Conference on knot concordance
and low-dimensional manifolds, Le Croisic, France • Knots and braids in Norway • Indiana

University topology seminar • Rice University topology seminar • Winterbraids IX (contributed talk)

2018
Workshop on twisted and quantum knot invariants, Durham University • Workshop on Topologie, Oberwolfach (contributed talk) • 29. Nordrhein-Westfalen topology meeting, Universität Bonn • MPIM topology seminar

2017
Université de Genève séminaire de topologie et géométrie • Universität Regensburg SFB seminar • Universität Bern mathematics colloquium • Universität Bonn topology seminar • Georgia international topology conference, UGA • Special session on invariants of knots, links and 3-manifolds, AMS spring eastern sectional meeting, Hunter College, City University of New York • Rice University topology seminar • UT Austin topology seminar • Conference on Floer homologies and topology of 4-manifolds, UMass Amherst • Notre Dame topology seminar • CIRGET geometry and topology seminar • Brandeis University topology seminar • UC Riverside special colloquium • Bowdoin College colloquium • AMS special session on topology and manifolds, Joint Mathematics Meetings, Atlanta (contributed talk)

2016
UNC Charlotte special colloquium • Hausdorff Center for Mathematics seminar • Hausdorff Institute for Mathematics knot concordance and 4-manifolds seminar • Topology in dimension 3.5: a conference in memory of Tim Cochran • Indiana University topology seminar • Rice University topology seminar • San Francisco State University special colloquium • University of Virginia geometry seminar • Lafayette College mathematical adventures and diversions • SUNY Geneseo mathematics colloquium • AMS special session on topology and knot theory, Joint Mathematics Meetings, Seattle (contributed talk)

2015
Brandeis University IGERT seminar • Session on low-dimensional topology and geometric group theory, 2015 CMS winter meeting, Montreal • Special session on geometric perspectives on knot theory, AMS central sectional meeting, Loyola University • Moab topology conference • AWM research symposium (poster presentation) • Brandeis University everytopic seminar

2014
Syracuse University topology seminar • Wesleyan University topology seminar • Special session on knot concordance and 4-manifolds, AMS central sectional meeting, University of Wisconsin-Eau Claire • Boston College topology seminar • Workshop on topology and invariants of smooth 4-manifolds, Simons Center for Geometry and Physics • University of Wisconsin-Eau Claire STEM colloquium • AMS special session on knots and their invariants, Joint Mathematics Meetings, Baltimore (contributed talk)

2013
Special session on geometric aspects of 3-manifold invariants, AMS central sectional meeting, Washington University at St. Louis • Special session on geometric topology in low dimensions, AMS central sectional meeting, Washington University at St. Louis • Rice University topology seminar (2 talks) • Lehigh University geometry and topology conference • SUNY Geneseo mathematics colloquium

Teaching & mentorship

Postdocs mentored (MPIM)

- JungHwan Park   Jul 2017 – Jun 2018
- Paolo Aceto   Sep 2017 – Aug 2018
- Filip Misev   Mar 2018 – Feb 2020
- Sümeyra Sakallı   Sep 2018 – Aug 2020
- Alexandra Kjuchukova   Oct 2018 – Aug 2020
- Alberto Cavallo   Nov 2018 – Aug 2020
- Wenzhao Chen   Sep 2019 – Aug 2021
- Anthony Conway   Sep 2019 – Dec 2020
- Marco Marengon   Sep 2020 – Aug 2021
- Biji Wong   Sep 2020 – Jan 2022
- Tom Hockenhull   Sep 2020 – Aug 2022
- Patrick Orson   Sep 2021 – Aug 2022
- Abhishek Mallick   Sep 2021 – Aug 2022
- Katherine Raoux   Jul 2021 – Jun 2022
- Isaac Sundberg   Aug 2022 – Jul 2024
- Sarah Blackwell   Sep 2022 – Aug 2023
- Stavroula Makri   Oct 2022 – Nov 2022
- Roberto Ladu   Dec 2022 – Aug 2024
- Hongyi Zhou   Sep 2023 – Aug 2024
- Paula Truöl   Oct 2023 – Sep 2025
- Laura Wakelin   Oct 2023 – Sep 2024
- Daniel Hartman   Aug 2024 – Jul 2026
- Daniel Galvin   Sep 2024 – Aug 2025

Students (MPIM/Universität Bonn)

- Ph.D. thesis:

  - Benjamin Matthias Ruppik, Knotted surfaces, Casson-Whitney   2018-22
    unknotting and deep slice disks (joint with Peter Teichner)
  - Hyeonhee Jin (joint with Peter Teichner)   2021 – present

- Ph.D. thesis committee member:

  - Tynan Kelly (Brandeis), Twisted linking numbers and Casson-Gordon   2015
    invariants
  - Katherine Raoux (Brandeis), Tau-invariants for knots in rational homology   2016
    spheres
  - Jason Joseph (UGA), Applications of Alexander ideals to knotted surfaces   2020
    in 4-space
  - Oliver Singh (Durham), Pseudo-isotopies and embedded surfaces in   2022
    4-manifolds

- Ph.D. student mentor:
  The Bonn International Graduate School in mathematics requires each Ph.D. student to have a
  mentor. The mentor is a trusted professor who checks on the progress of the mentee at least once

a year, and is the point of contact for any issues the mentee does not wish to discuss with their supervisor.

- – Simona Veselá   2022 – present
- – Lory Aintablian   2023 – present
- – Matthias Storzer   2024-25

- Visiting Ph.D. student:

  - – Oğuz Şavk (Bogazici University)   Jan – Jun 2022

- Masters thesis:

  - – Didac Violan Aris, The proper h-cobordism theorem and the   2018-19
    4-dimensional Poincaré conjecture
  - – Constanze Schwarz, Donaldson's theorem as a sliceness obstruction   2020-21
  - – Isacco Nonino, Smooth structures on non-compact 4-manifolds   2021-22
  - – Fadi Mezher, Kreck's modified surgery and applications to the   2021-22
    classification of manifolds
  - – Yikai Teng, Knot traces   2022-23
  - – Raphael Floris, A Whitney embedding theorem for topological manifolds 2022-23
  - – Agata Sienicka, The four-dimensional lightbulb theorem   2022-23
  - – Cara Hobohm, (Strongly) quasipositive knots and links   2023-24
  - – Magdalina von Wunsch-Rolshoven   2024-25

- Masters thesis, second evaluator:

  - – Mihail Arabadji, Indeterminacy of triple linking numbers   2019-20
  - – Freya Bretz, Surface graphs, surface bundles and spin structures   2020
  - – Maximilian Hans, A lightbulb theorem for multi-disks   2024

- Visiting masters student:

  - – Maya Kayalli (Université de Bourgogne)   Jul 2023

- Bachelors thesis:

  - – Miriam Ruß, Milnor's invariants of links   2018
  - – Ekin Ergen, Fundamentals of 3-manifold topology   2019
  - – Magdalina von Wunsch-Rolshoven, 3-manifolds as branched covers   2020
  - – Arne Beines, The bridge number of knots   2020
  - – Felix Bertram, Generalised Whitehead manifolds   2020
  - – Frieda Kern, Universal branching links   2021
  - – Yves Etienne Jäckle, The trace embedding lemma   2021
  - – Line Uhe, The algebraic knot concordance group   2022
  - – Maximilian Hans, Integer homology spheres   2022

- Bachelors thesis, second evaluator:

  - – Florian Tecklenburg, Euler number of a map   2020
  - – Pauline Kranenburg, Wirtinger-Präsentierung für Knotengruppen   2022

Lecture courses & student seminars

- Calculus II, Rice University   Summer 2011, Fall 2011
- Introduction to algebra, Part II, Brandeis University   Spring 2015
  (honours course)
- Applied linear algebra, Brandeis University   Spring 2015
- Topology I, Brandeis University   Fall 2015, Fall 2014
  (first-year Ph.D. course)
- Introduction to topology, Brandeis University   Fall 2015
  (honours course)
- Introduction to proofs, Brandeis University   Spring 2017, Spring 2016
  (writing-intensive course)
- Topology II, Brandeis University   Spring 2017
  (first-year Ph.D. course)
- Topology of 4-manifolds, MPIM/Universität Bonn   Winter 2018/19
  (masters-level course, co-taught with Peter Teichner)
- Topological manifolds, MPIM/Universität Bonn   Winter 2020/21
  (masters-level course, co-taught with Mark Powell)
  offered online, 30+ regular viewers worldwide
- Topological manifolds II, MPIM/Universität Bonn   Summer 2021
  (masters-level student seminar, co-taught with Mark Powell)
- Einführung in die Geometrie und Topologie, Universität Bonn   Summer 2021
  (bachelors-level course in German, co-taught with Daniel Kasprowski)
- Slice knots & knot concordance, MPIM/Universität Bonn   Summer 2023
  (masters-level course, co-taught with Isaac Sundberg)
  hybrid course, held in person in Bonn and streamed through Zoom

Minicourses

- Young topologists' meeting, 3 lectures, Universität Münster   Aug 2024
- Surfaces in 4-manifolds, 3 lectures, Institut Fourier summer school   Jun 2024
- Direct and indirect constructions of locally flat surfaces in 4-manifolds   May 2024
  4 lectures, Georgia topology summer school, University of Georgia
- Classifying 2-, 3-, and 4-dimensional spaces, 3 lectures,   Oct 2023
  Saha institute for nuclear physics
- Topological 4-manifolds, 4 lectures, IISER Pune   Sep 2023
- The double suspension theorem, 3 lectures, IMPRS minicourse   Jan 2022
  MPIM/Universität Bonn
- Slice knots and knot concordance, 3 lectures, Winterbraids XI, Dijon   Dec 2021
- Topological 4-manifolds: the disc embedding theorem and beyond,   Jul 2021
  5 lectures, Tech topology summer school (online)
- Exotic $\mathbb{R}^4$s, 2 lectures, IMPRS minicourse, MPIM/Universität Bonn   Jan 2018
- Sequences and series, 10 lectures, Rice emerging scholars program   Jul 2012

Reading courses (Brandeis University)

- Abstract algebra, Doreen Reuchsel   Spring 2015
  (post-baccalaureate student)

- Mathematical biology, Gabriel Pimentel   Summer 2015
  (undergraduate student, Brazil scientific mobility program)
- 4-manifolds, Anthony Villafranca, McKee Krumpak, Langte Ma   Spring 2016
  (masters/Ph.D. students)

Outreach

- **Gender equality officer**, MPIM, November 2020 – November 2024; elected position with four-year term; responsibilities include supporting hiring procedures, organising events and disseminating information to guests and employees, collaborating with management in the development and implementation of the institute's gender equality plan, and providing counselling in cases of sexualised harassment and discrimination
- **Event organisation:**
  - Graduate Research Opportunities for Women (GROW@Bonn), a conference for undergraduate women in mathematics, Universität Bonn/MPIM, March 2022, March 2023, April 2024
    (joint variously with Pieter Belmans, Yajnaseni Dutta, Ben Heuer, Regula Krapf, Dominique Mattei, Emanuel Reinecke, and Laura Wakelin)
  - Lunch meetup of female, non-binary and otherwise gender-diverse Ph.D. students, postdocs and faculty in mathematics in Bonn, December 2022, monthly meetups starting March 2023
    (joint variously with Magdalena Balcerak Jackson, Ana Caraiani, Jessica Fintzen, and Andrea Kohlhuber)
  - Teatime with women in mathematics, event for Ph.D. students and postdocs, Universität Bonn/MPIM, June 2021
    (joint with Clelia Albrecht, Anna Kraut, and Saeda Marello)
  - Virtual screening, *Picture a scientist*, MPIM, March 2021
    (joint with Rachael Boyd)

- **Talks:**
  - *Imposterism*, Ally day, Universität Bonn, November 2022
    (talk for bachelors and masters mathematics students)
  - *Einführung in die Knotentheorie*, Schüler*innenwoche, Universität Bonn, August 2022
    (2 lectures in German to high school students)
  - *Welche Form hat unser Universum?*, Bonner Mathenacht, November 2021
    (online public lecture in German for a general audience)
  - *Knoten in der Mathematik*, Bonner Matheclub, June 2021
    (online lecture in German for middle school and high school students)

- **Moderation:**
  - Discussion on *Journeys of Women in Mathematics*, Young number theorists in Bonn, conference at MPIM, September 2023
  - Discussion on *Picture a scientist*, Community-building in the Langlands program (CLAP), conference at Universität Bonn, August 2022
  - Discussion on *Picture a scientist*, Universität Bonn, May 2021

- **Panel discussions:**

  - Panelist, Erasure of femininity in mathematics, Teatime with women in mathematics, Universität Bonn, January 2024
  - Moderator, Applying to masters and Ph.D. programs, GROW@Bonn conference for undergraduate women, MPIM/Universität Bonn, March 2022, March 2023
  - Panelist, Increasing diversity in STEM and ways in which high school and middle school girls can make contributions, Sonia Kovalevsky day, University of Wisconsin-Eau Claire, March 2014
  - Panelist, Women in grad school, Women's resource center, Rice University, November 2012
  - Panelist, I know what you should do next summer, Nebraska conference for undergraduate women in mathematics, February 2009

- Invited guest, Ally day, Teatime for people in mathematics, Universität Bonn, November 2021
- Invited guest, Upstream lunch break, Universität Heidelberg, February 2021, February 2022
- Invited guest, Teatime for women in mathematics, Universität Bonn, January 2021
- Judge, AWM essay contest: biographies of contemporary women in mathematics, 2016, 2017, 2018, 2020, 2021, 2022, 2023.
- Participant, Communicating mathematics workshop, hybrid event at Cornell University, August 2022
- Participant, Train the trainer workshop, Universität Heidelberg, March 2022

Service

- **Semester, conference, and special session organisation:**

  - MFO workshop: Low-dimensional topology, 2026
    (joint with Marc Lackenby, Jessica Purcell, and Saul Schleimer)
  - Centre de recherches mathematique (CRM) thematic program: Topological and Geometric Structures in Low Dimensions, July – September 2025
    (joint with John Baldwin, Steven Boyer, Duncan McCoy, Lisa Piccirillo, and Alan Reid)
  - Conference on topological manifolds, CRM thematic program, Université de Montréal, July 2025
    (joint with Duncan McCoy and Patrick Orson)
  - Special session: Early Career Showcase in Low-Dimensional Topology, Joint meeting of the NZMS, AustMS, and AMS, University of Auckland, December 2024
    (joint with David Auckly, Shelly Harvey, and Josh Howie)
  - Indo-German kick-off workshop on low-dimensional topology, IISER Pune, September 2023
    (joint with Stefan Friedl, Radhika Gupta, Tejas Kalelkar, and Mahan Mj)
  - MFO workshop: Morphisms in low dimensions, January 2023
    (joint with Andrew Lobb and Maggie Miller)
  - MATRIX-MFO tandem workshop: Invariants and structures in low-dimensional topology, September 2021
    (joint with Stefan Friedl, Jessica Purcell, and Stephan Tillmann)

– AMS special session on women in topology, Joint mathematics meetings, January 2017, January 2019, January 2020
(joint with Jocelyn Bell, Rochy Flint, Rosemary Guzman, Eleanor Ollhoff, and Candice Price)
– Workshop on 4-manifolds, MPIM, September 2019
(joint with Dave Gay, Jeffrey Meier, and Peter Teichner)
– Workshop on four-manifolds: confluence of high and low dimensions, Fields institute, July 2019
(joint with Ian Hambleton, Alexander Kupers, and Mark Powell)
– Workshop on smooth concordance classes of topologically slice knots, American institute for mathematics, June 2019
(joint with Shelly Harvey and JungHwan Park)
– Special session on 3- and 4-manifolds, AWM research symposium, Rice University, April 2019
(joint with Allison N. Miller)
– Conference on 4-manifolds and knot concordance, MPIM, October 2016
(joint with Christopher W. Davis, Peter Feller, Min Hoon Kim, Jeffrey Meier, Allison N. Miller, Mark Powell, and Peter Teichner)

- **Seminar organisation:**

  – Low-dimensional topology seminar, MPIM, June 2020 – present
  (joint at various times with Sarah Blackwell, Daniel Galvin, Daniel Hartman, Roberto Ladu, Isaac Sundberg, Peter Teichner, Paula Truöl, Laura Wakelin, and Hugo Zhou)
  – Topology seminar, MPIM, August 2017 – present
  (joint at various times with Grigori Avramidi, Tobias Barthel, Nate Bottman, Dave Gay, Viktoriya Ozornova, and Peter Teichner)
  – EveryTopic seminar, Brandeis University, Spring 2017, 2015–16
  (joint with McKee Krumpak, Konstantin Matveev, and Carl Wang Erickson)
  – Spectral sequences seminar, Brandeis University, Fall 2014
  – Heegaard-Floer "computationar", Rice University, Spring 2014
  – 4-manifolds seminar, Rice University, Spring 2014
  – Characteristic classes seminar, Rice University, Summer 2012
  – Knot invariants seminar, Rice University, Summer 2011

- **Local committees:**

  – DEI working group for early career researchers, Universität Bonn, January 2023 – present
  – BIGS selection committee, Universität Bonn, December 2022 – present; advise on selection of new Ph.D. students in the BIGS program
  – IMPRS selection committee, MPIM, December 2020 – present; advise on selection of new Ph.D. students in the IMPRS program
  – MPRGL selection committee, MPIM, Fall 2019, Fall 2020; advise on selection of new Max Planck research group leaders at the MPIM
  – Outreach coordinator selection committee, MPIM, 2023-4
  – Scientific committee, MPIM, August 2017 – present; advise on selection of new guests at MPIM
  – Planning committee (graduate student representative), Center for Teaching Excellence, Rice University, 2013-14

- – Graduate Student Association, mathematics department representative, Rice University, 2009-13
  - – Graduate centennial committee, co-ordinator, Graduate Student Association, Rice University, Fall 2012; planning and implementation of events for graduate students at Rice's centennial celebration
  - – University council, graduate student representative, Rice University, 2010-12; advisory body for the university president
  - – Graduate orientation committee, Graduate Student Association, Rice University, 2011

- Referee reports & quick opinions for:
  Inventiones Mathematicae, Duke Mathematical Journal, Journal of Differential Geometry, Geometry & Topology, Journal für die reine und angewandte Mathematik (Crelle's journal), Compositio Mathematica, Advances in Mathematics, Journal of the European Mathematical Society, Memoirs of the European Mathematical Society, Forum of Mathematics: Sigma, Proceedings of the London Mathematical Society Mathematische Annalen, Journal of Topology, Indiana University Mathematics Journal, International Mathematical Research Notices, Algebraic & Geometric Topology, Michigan Mathematical Journal, NYJM Monographs, Mathematical Research Letters, Communications in Analysis and Geometry, Bulletin of the London Mathematical Society, Journal of Knot Theory & its Ramifications, Topology Proceedings, Topology & its Applications.
- Moderator, MPIM preprints, September 2020 – February 2023
- Reviewer, Mathematical reviews, Zentralblatt MATH, 2013-22
- Undergraduate advisor (18 advisees), Brandeis University, 2015-16
- Examining committee for a postdoctoral position, SISSA (Trieste)
- Grant review: NSF ($\times 2$, USA), NSERC (Canada), ERC advanced grant (declined due to conflict of interest).

Miscellaneous

- Languages:

  - – English (near-native/spoken since early childhood)
  - – German (C1 in 2024)
  - – Bengali (native)
  - – Hindi (conversant)

- Citizenship: India

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Arunima Ray

Publication list

Max-Planck-Institut für Mathematik
Vivatsgasse 7, 53111 Bonn, Germany
http://people.mpim-bonn.mpg.de/aruray/
aruray@mpim-bonn.mpg.de

Edited volumes

[1] S. Behrens, B. Kalmár, M. H. Kim, M. Powell, and A. Ray, eds. *The disc embedding theorem*. Oxford University Press, 2021.

Book chapters

[2] S. Behrens, D. Kasprowski, M. Powell, and A. Ray. "Skyscrapers are standard: the details". In: *The disc embedding theorem*. Oxford University Press, 2021.

[3] S. Behrens, M. Powell, and A. Ray. "Context for the disc embedding theorem". In: *The disc embedding theorem*. Oxford University Press, 2021.

[4] M. H. Kim, P. Orson, J. Park, and A. Ray. "Good groups". In: *The disc embedding theorem*. Oxford University Press, 2021.

[5] M. H. Kim, P. Orson, J. Park, and A. Ray. "Open problems". In: *The disc embedding theorem*. Oxford University Press, 2021.

[6] D. McCoy, J. Park, and A. Ray. "Picture camp". In: *The disc embedding theorem*. Oxford University Press, 2021.

[7] J. Meier, P. Orson, and A. Ray. "Shrinking starlike sets". In: *The disc embedding theorem*. Oxford University Press, 2021.

[8] P. Orson, M. Powell, and A. Ray. "Surgery theory and the classification of simply connected 4-manifolds". In: *The disc embedding theorem*. Oxford University Press, 2021.

[9] P. Orson, M. Powell, and A. Ray. "The *s*-cobordism theorem, the sphere embedding theorem, and the Poincaré conjecture". In: *The disc embedding theorem*. Oxford University Press, 2021.

[10] W. Politarczyk, M. Powell, and A. Ray. "From immersed discs to capped gropes". In: *The disc embedding theorem*. Oxford University Press, 2021.

[11] M. Powell and A. Ray. "Basic geometric constructions". In: *The disc embedding theorem*. Oxford University Press, 2021.

[12] M. Powell and A. Ray. "Gropes, towers, and skyscrapers". In: *The disc embedding theorem*. Oxford University Press, 2021.

[13] M. Powell and A. Ray. "Intersection numbers and the statement of the disc embedding theorem". In: *The disc embedding theorem*. Oxford University Press, 2021.

[14] M. Powell and A. Ray. "Key facts about skyscrapers and decomposition space theory". In: *The disc embedding theorem*. Oxford University Press, 2021.

[15] M. Powell and A. Ray. "The development of topological 4-manifold theory". In: *The disc embedding theorem*. Oxford University Press, 2021.

[16] A. Ray. "Outline of the upcoming proof". In: *The disc embedding theorem*. Oxford University Press, 2021.

Published and accepted papers

[17] A. Ray. "Slice knots which bound punctured Klein bottles". In: *Algebr. Geom. Topol.* 13.5 (2013), pp. 2713–2731.

[18] T. D. Cochran, C. W. Davis, and A. Ray. "Injectivity of satellite operators in knot concordance". In: *J. Topol.* 7.4 (2014), pp. 948–964.

[19] A. Ray. "Casson towers and filtrations of the smooth knot concordance group". In: *Algebr. Geom. Topol.* 15.2 (2015), pp. 1119–1159.

[20]   A. Ray. "Satellite operators with distinct iterates in smooth concordance". In: *Proc. Amer. Math. Soc.* 143.11 (2015), pp. 5005–5020.

[21]   T. D. Cochran and A. Ray. "Shake slice and shake concordant knots". In: *J. Topol.* 9.3 (2016), pp. 861–888.

[22]   C. W. Davis and A. Ray. "Satellite operators as group actions on knot concordance". In: *Algebr. Geom. Topol.* 16.2 (2016), pp. 945–969.

[23]   C. W. Davis and A. Ray. "A new family of links topologically, but not smoothly, concordant to the Hopf link". In: *J. Knot Theory Ramifications, memorial volume for T. Cochran* 26.2 (2017), pp. 1740002, 12.

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