Nicholas Miller

CONTACT INFORMATION

Department of Mathematics, UC Berkeley
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RESEARCH INTERESTS

Hyperbolic geometry, low-dimensional topology, arithmetic lattices, and homogeneous dynamics.

POSITIONS

UC Berkeley, Berkeley, California — **Fall 2019 - present**
Morrey Visiting Assistant Professor

Mathematical Sciences Research Institute, Berkeley, California — **Fall 2020**
McDuff Postdoctoral Fellow

Indiana University, Bloomington, Indiana — **Fall 2017 - Spring 2019**
Zorn Postdoctoral Fellow

EDUCATION

Purdue University, West Lafayette, Indiana — **2017**
Ph.D., Mathematics (Advisor: David Ben McReynolds)

University of California, San Diego, La Jolla, California — **2011**
B.S., Mathematics
B.S., Physics

GRANTS

NSF Standard Grant, DMS–2005438, PI — **2020-2023**
Hyperbolic Manifolds, Geodesic Submanifolds, & Rigidity for Rank-1 Lattices, $146,424

NSF Conference Grant, DMS–2000885, Co-PI — **2020**
Beyond Hyperbolicity at the Ohio State University, $30,000

AWARDS

Max Zorn Teaching Award — **2019**
Purdue Bilsland Dissertation Fellowship — **Fall 2016 - Spring 2017**
Purdue Teaching Academy, Graduate Teaching Award — **2017**
Purdue Mathematics Department, Excellence in Teaching Award — **2016**

PUBLICATIONS & PREPRINTS

B. Linowitz, D. B. McReynolds, and N. Miller. **Locally equivalent correspondences**.
Ann. Inst. Fourier (Grenoble) **67** (2017), no. 2, 451–482.

J. DeBlois, N. Miller, and P. Patel. **Effective virtual and residual properties of some arithmetic hyperbolic 3-manifolds**.
Trans. Amer. Math. Soc. 373 (2020), no. 11, 8219-8257.

S. Garibaldi, D. B. McReynolds, N. Miller, and D. Witte Morris. Appendix to **Quasi-isometric embeddings of non-uniform lattices**, by D. Fisher and T. Nguyen.
Comment. Math. Helv. 95 (2020), no. 1, 37–78.

U. Bader, D. Fisher, N. Miller, and M. Stover. **Arithmeticity, superrigidity, and totally geodesic submanifolds**.
Ann. of Math. (2) 193 (2021), no. 3, 837–861.

D. Fisher, J.-F. Lafont, N. Miller, and M. Stover. **Finiteness of maximal geodesic submanifolds in hyperbolic hybrids**.
J. Eur. Math. Soc. (JEMS) 23 (2021), no. 11, 3591–3623.

B. Linowitz, D. B. McReynolds, and N. Miller. **Areas of totally geodesic surfaces of hyperbolic 3-orbifolds**.
Pure Appl. Math. Q. 17 (2021), no. 1, 1–25.

N. Miller. **Arithmetic progressions in the primitive length spectrum**.
Available at arXiv:1602.01869 [math.GT]

E. Albers and N. Miller. **On the genus of congruence surfaces from maximal orders**.
Available at arXiv:1901.07934 [math.GT]

U. Bader, D. Fisher, N. Miller, and M. Stover. **Arithmeticity, superrigidity and totally geodesic submanifolds of complex hyperbolic manifolds**.
Available at: arXiv:2006.03008 [math.DS]

C. Abbott, N. Miller, and P. Patel. **Infinite-type loxodromic isometries of the relative arc graph**.
Available at: arXiv: 2109.06106 [math.GT]

Mentorship

Research Experience for Undergraduates, Indiana University **Summer 2018**
Research Mentor (Student: Eric Albers)
– Advised and curated an eight week research program for an undergraduate summer student.
– Provided support on cultivating best research practices, effectively developing and maintaining work/life balance, and establishing healthy time management skills.

LOG(IU), Laboratory of Geometry, Indiana University **Spring 2019**
Faculty Mentor
– Was one of two inaugural faculty mentors for this semester-long course aimed at helping undergraduates transition from coursework into modern research level topics in mathematics, especially in geometry. Past projects listed at: https://sites.google.com/view/laboratory-of-geometry-iub.

Teaching Experience

Instructor of Record, UC Berkeley **Fall 2019 - present**
M185 Complex Analysis, Fall 2021
M185 Complex Analysis, Spring 2021
M199 Directed Reading Course (Measure Theory), Spring 2020
M104 Real Analysis, Spring 2020
M185 Complex Analysis, Fall 2019
M104 Real Analysis, Fall 2019

Instructor of Record, Indiana University **Fall 2017 - Spring 2019**
M391 Introduction to Mathematical Reasoning, Spring 2019
M211 Calculus I, Fall 2018
M211 Calculus I, Spring 2018
M118 Finite Mathematics, Fall 2017

Instructor of Record, Purdue University **Fall 2013 - Spring 2017**
MA16010 Applied Calculus I, Fall 2015
MA26600 Ordinary Differential Equations, Summer 2014
MA22100 Calculus for Technology I, Spring 2014
MA22300 Introductory Analysis I, Fall 2013

Teaching Assistant, Purdue University — **August 2011 - May 2013**
MA26200 Linear Algebra and Differential Equations, Spring 2013
MA16500 Analytic Geometry and Calculus II, Fall 2012
MA16200 Plane Analytic Geometry and Calculus II, Spring 2012
MA26100 Multivariate Calculus, Fall 2011

Service Experience

Topology Seminar, UC Berkeley — **Fall 2019 - Present**
Organizer

Beyond Hyperbolicity at OSU, Ohio State University — **Summer 2020**
Scientific Committee

Member's Research Seminar, MSRI — **Fall 2020**
Organizer

Bloomington Geometry Workshop, Indiana University — **Spring 2018 & Spring 2019**
Conference Co-Organizer

Colloquium Committee, Indiana University — **Fall 2018 - Spring 2019**
Co-Organizer

Geometry Seminar, Indiana University — **Fall 2017 - Spring 2019**
Co-Organizer

Basic Notions Seminar, Purdue University — **Fall 2015 - Spring 2017**
Organizer

Problem of the Week, Purdue University — **Fall 2015 - Spring 2017**
Organizer

Select Conference Talks

Random and Arithmetic Structures in Topology: Introductory Workshop
MSRI, Fall 2020

Ergodic Geometry and Margulis' Legacy: the Next Generation
University of Chicago, Summer 2022 (*Postponed from 2020*)

Complex Hyperbolic Geometry and Related Topics
CIRM, Summer 2022 (*Postponed from 2020*)

CMS Winter Meeting: Equidistribution on Arithmetic Manifolds
McGill University, Spring 2021

Thin Groups in Number Theory, Geometry, and Topology
Rice University, Spring 2017

Select Invited Talks

Max Dehn Seminar on Geometry, Topology, Dynamics, and Groups
University of Utah, Fall 2020

Colloquium
Haverford College, Spring 2020

Topology Seminar
UC Berkeley, Spring 2020

Geometry Seminar
Indiana University, Spring 2019

Geometric Group Theory Seminar
Ohio State University, Fall 2018

References

David Fisher: fisherdm@indiana.edu

Jean-François Lafont: jlafont@math.ohio-state.edu

David Ben McReynolds: dmcreyno@purdue.edu

Alan Reid: alan.reid@rice.edu

Ralf Spatzier: spatzier@umich.edu
Katrin Wehrheim (teaching): katrin@math.berkeley.edu