

# Paula Burkhardt-Guim

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## Curriculum Vitae

Current as of October 31, 2023

Courant Institute of Mathematical Sciences  
New York University  
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Citizenship: U.S.A.

## Academic Positions

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2021– **New York University**  
NSF Postdoctoral Associate, Courant Institute of Mathematical Sciences

## Education

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2021 **University of California, Berkeley**  
Ph.D., Mathematics  
Advisor: Richard Bamler

2016 **Pomona College**  
B.A., Mathematics  
*Cum laude*

## Publications

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### Journal Articles

- 2022 ADM mass for  $C^0$  metrics and distortion under Ricci-DeTurck flow  
*Journal für die reine und angewandte Mathematik* (Crelle's Journal), to appear.
- 2020 Defining pointwise lower scalar curvature bounds for  $C^0$  metrics with regularization by Ricci flow  
*Symmetry, Integrability and Geometry: Methods and Applications* (SIGMA) **16** (2020), 128, 10 pages, doi: 10.3842/SIGMA.2020.128.
- 2019 Pointwise lower scalar curvature bounds for  $C^0$  metrics via regularizing Ricci flow  
*Geometric and Functional Analysis* **29**:1703 - 1772, doi: 10.1007/s00039-019-00514-3.
- 2018 Random matrix ensembles with split limiting behavior  
*Random Matrices: Theory and Applications* (as P. Burkhardt, with P. Cohen, J. Dewitt, M. Hlavacek, S.J. Miller, C. Sprunger, Y. N. Truong Vu, R. Van Peski, K. Yang, and an appendix joint with M. Fernandez and N. Sieger) **7** No. 3, doi.org/10.1142/S2010326318500065.
- 2017 One-level density for holomorphic cusp forms of arbitrary level  
*Research in Number Theory* (as P. Burkhardt, with O. Barrett, J. DeWitt, R. Dorward, S. J. Miller) **3**, doi: 10.1007/s40993-017-0091-9.
- 2016 Visual properties of generalized Kloosterman sums  
*Journal of Number Theory* (as P. Burkhardt, with A. Z.-Y. Chan, G. Currier, S. R. Garcia, F. Luca, H. Suh) **160**:237-253.

## Conference Proceedings

- 2021 Pointwise lower scalar curvature bounds for  $C^0$  metrics via regularizing Ricci flow  
*Oberwolfach Report 30/2021: Analysis, Geometry and Topology of Positive Scalar Curvature Metrics (hybrid meeting)* 43–46.
- 2015 An exhibition of exponential sums: visualizing supercharacters  
*Proceedings of Bridges 2015: Mathematics, Music, Art, Architecture, Culture* (as P. Burkhardt, with G. Currier, S. R. Garcia, M. de Langis, B. Lutz, H. Suh) 475–478.

## Awards and Fellowships

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- 2021 National Science Foundation Mathematical Sciences Postdoctoral Research Fellowship
- 2018 National Science Foundation Graduate Research Fellowship
- 2018 Outstanding Graduate Student Instructor, UC Berkeley
- 2016 National Science Foundation Graduate Research Fellowship Honorable Mention
- 2016 Hugh J. Hamilton Senior Mathematics Prize, Pomona College
- 2016 Distinction in the Senior Exercise, Pomona College
- 2016 Phi Beta Kappa, Pomona College Chapter (Gamma of California)
- 2016 Sigma Xi, Claremont Colleges Chapter
- 2015 Bruce Jay Levy Prize in Mathematics, Pomona College
- 2014 Llewellyn Bixby Mathematics Prize, Pomona College
- 2013 – 2015 Pomona College Scholar

## Invited Talks

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- 2023 **Ricci-DeTurck flow,  $C^0$  ADM mass, and nonnegative scalar curvature**  
Rutgers Geometric Analysis Seminar
- 2023 **ADM mass for  $C^0$  metrics and distortion under Ricci-DeTurck flow**  
Beijing International Center for Mathematical Research Geometric Analysis Seminar
- 2023 Notre Dame Geometry and Analysis Seminar
- 2023 Oberwolfach Workshop: Differentialgeometrie im Grossen
- 2023 CMS Summer Meeting Scientific Session on Geometry for Partial Differential Equations
- 2023 Upper New York State Geometric Analysis Workshop
- 2023 University of Toronto Geometry and Topology Seminar
- 2023 Brown University Geometric Analysis Seminar
- 2023 JMM AMS Special Session on Riemannian Manifolds with Scalar Curvature Lower Bounds
- 2022 Rutgers-New Brunswick Geometric Analysis Seminar
- 2022 The Chinese University of Hong Kong Geometric Analysis Seminar
- 2022 Stanford Geometry Seminar
- 2022 UC Berkeley Differential Geometry Seminar
- 2022 Fields Inst. Workshop: Math. Relativity, Scalar Curvature, and Synthetic Lorentzian Geometry
- 2022 Columbia Geometry and Analysis Seminar
- 2023  **$C^0$  metrics and lower scalar curvature bounds with regularization by Ricci flow**  
JMM AMS Special Session on Geometric PDEs
- 2023 **Lower scalar curvature bounds for  $C^0$  metrics: a Ricci flow approach**  
Cornell Analysis and Geometric Analysis Seminar
- 2022 Young Mathematicians in Noncommutative Geometry and Analysis
- 2022 Simons Center for Geometry and Physics Workshop: Forty Years of Ricci Flow
- 2022 Harvard CMSA General Relativity Workshop on Scalar Curvature and Minimal Surfaces
- 2022 Metric Measure Spaces (MMS) & Convergence Seminar

- 2022 CUNY Geometric Analysis Seminar  
 2022 Not Only Scalar Curvature (GNOSC) Seminar  
 2022 Plenary for the 2022 Midwest Geometry Conference  
 2021 Yale Geometric Analysis & Applications Seminar
- A  $C^0$  mass with well-controlled distortion under Ricci-DeTurck flow**  
 2022 JMM AMS Special Session on Intersections of Geometric Analysis and Mathematical Physics
- Pointwise lower scalar curvature bounds for  $C^0$  metrics via regularizing Ricci flow**  
 2022 JMM MSRI Special Session on Metric Geometry and Topology  
 2021 Banff International Research Station Workshop: New Directions in Geometric Flows  
 2021 Institut Fourier Summer School: Curvature Constraints and Spaces of Metrics  
 2021 Oberwolfach Workshop on Analysis, Geometry, and Topology of Positive Scalar Curvature Metrics  
 2021 AMS Western Sectional Meeting Special Session on Differential Geometry and Geometric PDE  
 2021 UC Santa Barbara Differential Geometry Seminar  
 2021 UC Riverside Differential Geometry Seminar  
 2021 University of Oregon Topology - Geometry Seminar  
 2020 Arizona State University Differential Geometry Seminar  
 2020 University of Toronto Geometry and Topology Seminar  
 2020 Yale Geometry and Topology Seminar  
 2020 Plenary for the 2020 Virtual Workshop on Ricci and Scalar Curvature  
 2020 [cancelled due to COVID-19] Geometric Analysis at Fordham  
 2019 UC Irvine Differential Geometry Seminar  
 2019 Women and Mathematics Program at the Institute for Advanced Study
- Lower bounds on scalar curvature and regularization via Ricci flow**  
 2019 NYU Courant Geometric Analysis and Topology Seminar

## Departmental Talks

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- 2022 **Studying lower scalar curvature bounds in low regularity via Ricci flow**  
 NYU Courant Postdoc Day
- 2019 **Pointwise lower scalar curvature bounds for  $C^0$  metrics via regularizing Ricci flow**  
 UC Berkeley Differential Geometry Seminar
- 2019 **Pointwise lower scalar curvature bounds via Ricci-DeTurck flow**  
 NRing Lunch Lecture Series (UC Berkeley)
- 2019 **An Introduction to Ricci Flow**  
 Math Undergraduate Student Association Math Monday (UC Berkeley)
- 2018 **The Ricci-DeTurck flow with rough initial data**  
 Student Differential Geometry Seminar (UC Berkeley)

## Teaching

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### New York University

- Fa. 2023 Graduate Linear Algebra I (at Tandon School of Engineering)  
 Sp. 2023 Graduate Linear Algebra II  
 Fa. 2022 Calculus II

## UC Berkeley Directed Reading Program (as mentor)

Sp. 2019     Metric Geometry; mentee: James Leng  
Fa. 2018     Differential Geometry; mentee: Andres Franco Valiente

## UC Berkeley (as graduate student instructor)

Sp. 2018     Analytic Geometry and Calculus  
Fa. 2017     Analytic Geometry and Calculus  
Sp. 2017     Calculus  
Fa. 2016     Calculus

## Pomona College (as course mentor)

Sp. 2016     Linear Algebra  
Fa. 2014     Linear Algebra

## Pomona College (as learning community mentor)

Fa. 2015     Real Analysis I  
Sp. 2015     Linear Algebra

## Service

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Referee for: *Nonlinear Analysis, Commentarii Mathematici Helvetici, International Mathematics Research Notices, Association for Women in Mathematics: The First Fifty Years*

2023 –       Organizer for Empowering New York Gender Minority Mathematicians (ENYGMMa)  
2021 –       Organizer for Courant Geometric Analysis and Topology Seminar  
2021 – 2022   Organizer for NYU Courant Association for Women in Mathematics (AWM) Chapter  
2020 – 2021   Mentor for UC Berkeley Mathematics Peer Mentor Program; mentee: Yuchen Mao  
2020         Organizer for The Noetherian Ring  
2017–2018   Organizer for Unbounded Representation  
2017 – 2018   Facilitator for Respect is Part of Research  
2015 – 2016   President, Pomona College Student Chapter of the Association for Women in Mathematics