

Paula Burkhardt-Guim

Curriculum Vitae

Current as of September 13, 2024

Department of Mathematics

Stony Brook University

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Citizenship: U.S.A.

Academic Positions

- 2024– **Stony Brook University**
Assistant Professor, Department of Mathematics
- 2021– 2024 **New York University**
NSF Postdoctoral Associate, Courant Institute of Mathematical Sciences

Education

- 2021 **University of California, Berkeley**
Ph.D., Mathematics
Advisor: Richard Bamler
- 2016 **Pomona College**
B.A., Mathematics
Cum laude

Publications

Journal Articles

- 2023 ADM mass for C^0 metrics and distortion under Ricci-DeTurck flow
Journal für die reine und angewandte Mathematik (Crelle's Journal) **2024** (2023) 806, 187 - 245,
doi: 10.1515/crelle-2023-0085.
- 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.

Preprints

- 2024 Smoothing L^∞ Riemannian metrics with nonnegative scalar curvature outside of a singular set
submitted, arXiv: 2406.04564.

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

- 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

- 2024 **ADM mass for C^0 metrics and distortion under Ricci-DeTurck flow**
CRM Workshop: Current Trends in Geometric Flows
- 2024 University of Rochester Geometry Seminar
- 2024 BIRS-IASM Conference: Recent Advances in Comparison Geometry
- 2023 Stony Brook Geometry / Topology Seminar
- 2023 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 **Ricci-DeTurck flow, C^0 ADM mass, and nonnegative scalar curvature**
Rutgers Geometric 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
- 2022 **A C^0 mass with well-controlled distortion under Ricci-DeTurck flow**
JMM AMS Special Session on Intersections of Geometric Analysis and Mathematical Physics
- 2022 **Pointwise lower scalar curvature bounds for C^0 metrics via regularizing Ricci flow**
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
- 2019 **Lower bounds on scalar curvature and regularization via Ricci flow**
NYU Courant Geometric Analysis and Topology Seminar

Departmental Talks

- 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

Stony Brook University

Fa. 2024 Linear Algebra

New York University

Sp. 2024 Analysis
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

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

2024 – Stony Brook Mathematics Colloquium Committee
2024 – Organizer for Stony Brook Geometry / Topology Seminar
2021 – 2024 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