JEFFREY JAUREGUI | Curriculum Vitae

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POSITIONS

UNION COLLEGE
Professor of Mathematics (2023 - present)
Associate Professor of Mathematics (2019 - 2023)
John D. MacArthur Assistant Professor (2015 - 2016)
Assistant Professor of Mathematics (2013 - 2015, 2016 - 2019)

2013 - present
Schenectady, NY

UNIVERSITY OF PENNSYLVANIA
Hans Rademacher Instructor of Mathematics (Postdoc)

2010 - 2013
Philadelphia, PA

EDUCATION

DUKE UNIVERSITY
Ph.D. in Mathematics
Thesis: Mass estimates, conformal techniques, and singularities in general relativity
Advisor: Hubert L. Bray

2005 - 2010
Durham, NC

HARVEY MUDD COLLEGE
B.S. in Mathematics and Physics
Graduated with High Distinction

2001 - 2005
Claremont, CA

AWARDS, FELLOWSHIPS, GRANTS

Co-PI, NSF grant DMS-2154896: 2022 Union College Mathematics Conference	2022
Union College MOSH Maker grant	2019
Union College Faculty Research Fund grant	2017
Union College Teaching with Technology grants	2015, 2016
Research member: MSRI, Berkeley	August 2013
Nominee for Dean's Award for Distinguished Teaching (UPenn)	2013
Math Department Good Teaching Award (UPenn)	2011, 2013
L.P. and Barbara Smith Award for Excellence in Teaching (Duke)	2009
James B. Duke Fellowship	2005 - 2009
NSF Graduate Research Fellowship	2006 - 2008, 2009 -2010

ARTICLES

19. (with R. Perales and J. Portegies) **Semicontinuity of capacity under pointed intrinsic flat convergence**. Preprint available at HTTPS://ARXIV.ORG/ABS/2204.09732

18. **ADM mass and the capacity-volume deficit at infinity**. To appear in Comm. Anal. Geom.

17. **Scalar curvature and the relative capacity of geodesic balls**. Proc. Amer. Math. Soc., Vol 149, No. 11, (2021), pp. 4907–4921.

16. (with D. Lee) **Lower semicontinuity of ADM mass under intrinsic flat convergence**. Calc. Var. Partial Differential Equations, Vol. 60, No. 2, (2021).

15. **Smoothing the Bartnik boundary conditions and other results on Bartnik's quasi-local mass**. J. Geom. Phys., Vol. 136, (2019), pp. 228–243.

14. **Lower semicontinuity of the ADM mass in dimensions two through seven**. Pacific J. Math., Vol. 301, No. 2, (2019), pp. 441–466.

13. (with M. Anderson) **Embeddings, immersions, and the Bartnik quasi-local mass conjectures**. Ann. Henri Poincaré, Vol. 20, No. 5, (2019), 1651–1698.

12. (with D. Lee) **Lower semicontinuity of mass under C^0 convergence and Huisken's isoperimetric mass**. J. Reine Angew. Math. (Crelle's Journal), Vol. 756 (2019), pp. 227–257.

11. **Penrose-type inequalities with a Euclidean background**. Ann. Global Anal. Geom., Vol. 54, No. 4 (2018), pp. 509–527.

10. **On the lower semicontinuity of the ADM mass**, Comm. Anal. Geom., Vol. 26, No. 1 (2018), pp. 85–111.

9. (with H. Bray and M. Mars) **Time flat surfaces and the monotonicity of the spacetime Hawking mass II**, Ann. Henri Poincaré, Vol. 17, No. 6 (2016), pp. 1457–1475.

8. (with W. Wylie) **Conformal diffeomorphisms of gradient Ricci solitons and generalized quasi-Einstein manifolds**, J. Geom. Anal., Vol. 25, No. 1 (2015), pp. 668–708.

7. (with H. Bray) **On curves with nonnegative torsion**, Arch. Math., Vol. 104, No. 6 (2015), pp. 561–575.

6. (with H. Bray) **Time flat surfaces and the monotonicity of the spacetime Hawking mass**, Comm. Math. Phys., Vol. 335, No. 1 (2015), pp. 285–307.

5. (with H. Li et al.) **Epilepsy Treatment Simplified through Mobile Ketogenic Diet Planning**, J. Mobile Technology, Vol. 3, No. 2 (2014).

4. (with P. Miao and L.-F. Tam) **Extensions and fill-ins with nonnegative scalar curvature**, Class. Quantum Grav. Vol. 30 (2013) 195007.

3. (with H. Bray) **A geometric theory of zero area singularities in general relativity**, Asian J. Math., Vol. 17, No. 3 (2013), pp. 525–560.

2. **Fill-ins of nonnegative scalar curvature, static metrics, and quasi-local mass**, Pacific J. Math., Vol. 261 , No. 2 (2013), pp. 417–444.

1. **Invariants of the harmonic conformal class of an asymptotically flat manifold**, Comm. Anal. Geom., Vol. 20, No. 1 (2012), pp. 163–202.

TEACHING

UNION COLLEGE
Math 062*: Mathematics of Elections and Polls
Math 100: Calculus with Precalculus
Math 110: Differential Calculus
Math 113: Accelerated Single-Variable Calculus
Math 115: Differential Multivariable Calculus
Math 117: Integral Multivariable Calculus
IMP 120/121: Integrated Math and Physics I and II
Math 130: Ordinary Differential Equations
Math 140*: Applied Linear Algebra
Math 199: Introduction to Logic and Set Theory
Math 248*: Intermediate Topics in Mathematics
Math 340: Linear Algebra
Math 336: Real Analysis
Math 437*: Real Analysis II
Math 448: Differential Geometry
Math 49X: Senior Thesis
* indicates a newly-designed (or co-designed) course

UNIVERSITY OF PENNSYLVANIA
Math 104: Calculus I
Math 180: Analytical Methods in Economics, Law, and Medicine
Math 312: Linear Algebra
Math 313/513: Computational Linear Algebra
Math 500: Point-Set Topology
Math 501: Differential Geometry of Curves and Surfaces
Math 660: Riemannian Geometry

TALKS

Joint Mathematics Meetings Special Session on Riemannian Manifolds with Scalar Curvature Lower Bounds	Boston, MA January 4, 2023
GNOSC Seminar **G**romov, Hanke, Sormani, and Yu's **N**ot **O**nly **S**calar **C**urvature Seminar (virtual talk)	Zoom October 28, 2022
Fields Institute Mathematical Relativity, Scalar Curvature and Synthetic Lorentzian Geometry (virtual talk)	Toronto, Canada October 6, 2022
Joint Mathematics Meetings Special Session on Scalar Curvature and Convergence (virtual talk)	Zoom April 9, 2022
Universität Regensburg Mathematical Physics working seminar (virtual talk)	Regensburg, Germany November 19, 2021
Mathematisches Forschungsinstitut Oberwolfach Workshop: Mathematical Aspects of General Relativity (virtual talk)	Oberwolfach, Germany September 3, 2021
Duke University Geometry and General Relativity Group Seminar (virtual talk)	Durham, NC October 27, 2020
Harvard University CMSA General relativity seminar (virtual talk)	Cambridge, MA October 23, 2020
Virtual Workshop on Ricci and Scalar Curvature Online seminar (virtual talk)	Zoom September 2020
Rutgers Univeresity Geometric analysis seminar	New Brunswick, NJ March 10, 2020
University of Tokyo Conference: Geometric Analysis and General Relativity	Tokyo, Japan November 21, 2019
CUNY Graduate Center New York General Relativity Seminar	New York, NY November 29, 2018
Institute for Advanced Study Emerging Topics Working Group: Scalar Curvature and Convergence	Princeton, NJ October 18, 2018
Humboldt Universität Conference: Stability Phenomena in Mathematical Physics	Berlin, Germany October 11, 2018
Mathematisches Forschungsinstitut Oberwolfach Workshop: Mathematical General Relativity	Oberwolfach, Germany August 7, 2018
Simons Center for Geometry and Physics Workshop: Mass in General Relativity	Stony Brook, NY March 30, 2018
CMS Winter Meeting Scientific session on geometric analysis	Waterloo, CA December 10, 2017
CUNY Graduate Center CUNY Flat Convergence Workshop 2017	New York, NY June 13, 2017
Rutgers University Geometric analysis seminar	New Brunswick, NJ April 25, 2017
AMS Southeastern Section Meeting Special session on geometric analysis and general relativity	Charleston, SC March 12, 2017
Pacific Northwest Geometry Seminar Lewis and Clark College	Portland, OR March 5, 2017
CUNY ADM Mass and $\mathcal{F}$ convergence reading seminar CUNY Graduate Center	New York, NY January 10, 2017
University of Connecticut PDE and Differential Geometry Seminar	Storrs, CT November 14, 2016
Banff International Research Station Geometric Analysis and General Relativity	Banff, Canada July 18, 2016
Universität Tübingen Static Metrics and Bartnik's Quasi-local Mass Conjecture	Tübingen, Germany May 17, 2016
St. Michael's College Hudson River Undergraduate Mathematics Conference	Colchester, VT April 2, 2016

AMS Eastern Section Meeting
Special Session on Mathematical and General Relativity
Stony Brook, NY
March 19, 2016

Williams College
FrankFest 2016: Conference on Isoperimetric Problems
Williamstown, MA
February 6, 2016

Joint Mathematics Meetings
Special Session on Analytic Methods in Geometry
Seattle, WA
January 9, 2016

Pennsylvania State University
General Relativity and Gravitation Conference
State College, PA
June 8, 2015

Siena College
Math Department Colloquium
Albany, NY
February 18, 2015

CUNY Graduate Center
Differential Geometry Seminar
New York, NY
February 10, 2015

Joint Mathematics Meetings
Special session on Ricci curvature and homogeneous spaces
San Antonio, TX
January 12, 2015

AMS Southeastern Section Meeting
Special session on geometric analysis
Greensboro, NC
November 8, 2014

Syracuse University
Geometry/topology seminar
Syracuse, NY
April 17, 2014

Fordham University
Analysis seminar
Bronx, NY
March 5, 2014

Lehigh University
Lehigh University Conference on Geometry and Topology
Bethlehem, PA
May 25, 2013

M.I.T.
Workshop on minimal surfaces and related topics
Cambridge, MA
April 28, 2013

Penn Undergraduate Math Society
Colloquium
Philadelphia, PA
April 3, 2013

Swarthmore College
Math Department Colloquium
Swarthmore, PA
February 15, 2013

Reed College
Math Department Colloquium
Portland, OR
February 12, 2013

Bucknell University
Math Department Colloquium
Lewisburg, PA
February 7, 2013

Joint Mathematics Meetings
Session on Differential and Hyperbolic Geometry
San Diego, CA
January 10, 2013

Syracuse University
Analysis seminar
Syracuse, NY
April 19, 2012

University of Miami
Geometry and physics seminar
Coral Gables, FL
April 11, 2012

CUNY Graduate Center
Differential Geometry Seminar
New York, NY
November 1, 2011

University of Tennessee at Knoxville
UTK Barrett Lectures on Mathematical Relativity
Knoxville, TN
May 14, 2011

AMS Eastern Section Meeting
Special Session on Topics in PDE and Geometric Analysis
Worcester, MA
April 10, 2011

Lafayette College
Lafayette–Lehigh Geometry–Topology Seminar
Easton, PA
March 25, 2011

SUNY Stony Brook/Simons Center
Columbia/Stony Brook joint General Relativity Seminar
Stony Brook, NY
March 18, 2011

Haverford College
Haverford/Bryn Mawr Bi-College Colloquium
Haverford, PA
February 14, 2011

Temple University
Global Analysis Seminar
Philadelphia, PA
September 29, 2010

AMS Eastern Section Meeting
Special Session on Elliptic and Parabolic Problems in Geometry
Newark, NJ
May 23, 2010

Johns Hopkins University	Baltimore, MD
Workshop on Mean Curvature Flows and Related Topics	March 15, 2010
Joint Mathematics Meetings	San Francisco, CA
Special Session on Mathematical Challenges of Relativity	January 13, 2010
University of North Carolina	Chapel Hill, NC
Analysis / PDE Seminar	December 2, 2009
AMS Southeastern Section Meeting	Boca Raton, FL
Special Session on General Relativity and Related PDE	October 30, 2009
AMS Mathematical Research Communities	Snowbird, UT
Mathematical Challenges of Relativity	June 18, 2009

CONFERENCE ORGANIZATION

Union College Math Conference	Union College
Co-organizer	2016, 2019, 2022
Convergence and Low Regularity in General Relativity	Simons Center for Geometry and Physics
Co-organizer of workshop	April 2019
General Relativity and Geometric Analysis	Portland State University
Co-organizer of AMS Special Session	April 2018
Hudson River Undergraduate Math Conference	Union College
Co-organizer	April 2015

COLLEGE SERVICE

FACULTY COMPENSATION COMMITTEE	September 2022 - present
Appointed Position	Union College
Serving as chair September 2023 - present	
ACADEMIC AFFAIRS COUNCIL	September 2020 - August 2023
Elected Position	Union College
Served as chair March 2021 - August 2022	
RETIREMENT PLAN COMMITTEE	October 2017 - October 2023
Appointed Position	Union College
LIBRARY LIAISON COMMITTEE	September 2017 - June 2019
Elected Position	Union College
FACULTY REVIEW BOARD	September 2015 - June 2016
Elected Position	Union College

PROFESSIONAL SERVICE

Journal referee
Advances in Geometry
Asian Journal of Mathematics
Calculus of Variations and Partial Differential Equations
Classical and Quantum Gravity
Differential Geometry and its Applications
International Mathematics Research Notices
Journal für die reine und angewandte Mathematik (Crelle's Journal)
Journal of Geometric Analysis
Journal of Geometry and Physics
Journal of Nonlinear Analysis
Mathematical Research Letters
Mathematische Nachrichten

Pacific Journal of Mathematics
SIGMA (Symmetry, Integrability and Geometry: Methods and Applications)

Reviewer
AMS Mathematical Reviews (MR)   17 reviews