Jeffrey S. Case

Curriculum Vitae

Contact Information

Department of Mathematics
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Research Interests

Conformal and CR geometry, geometric analysis, global Riemannian and Lorentzian geometry

Education

University of California, Santa Barbara, Santa Barbara, CA USA

Ph.D., Mathematics — June 2010

- Thesis: *Conformally warped manifolds and quasi-Einstein metrics*
- Advisor: Xianzhe Dai

M.A., Mathematics — June 2007

Minnesota State University, Mankato, Mankato, MN USA

B.S., Mathematics — May 2005

B.S., Computer Science — May 2005

Employment

Assistant Professor, The Pennsylvania State University — August 2015–
Instructor, Princeton University — September 2011–2015
NSF Postdoctoral Fellow, Princeton University — September 2010–2014

Fellowships & Awards

National Science Foundation
- Mathematical Sciences Postdoctoral Fellowship (DMS-1004394) — 2010–2014
- EAPSI Program, Visiting Monash University — Summer 2008

Department of Mathematics, Princeton University
- Junior Faculty Teaching Award — October 2014

University of California, Santa Barbara
- Lancaster Dissertation Award — June 2010
- Graduate Division Dissertation Fellowship — Fall 2009

Publications

1. "Singularity theorems and the Lorentzian splitting theorem for the Bakry-Emery-Ricci tensor," J. Geom. Phys., 60(3): 477–490, 2010.

2. "On the nonexistence of quasi-Einstein metrics," Pacific J. Math., 248(2): 277–284, 2010.

3. (with Y.-J. Shu and G. Wei) "Rigidity of quasi-Einstein metrics," Diff. Geo. Appl., 29(1): 93–100, 2011.

4. "Smooth metric measure spaces, quasi-Einstein metrics, and tractors," Cent. Eur. J. Math., 10(5):1733–1762, 2012.

5. "Smooth metric measure spaces and quasi-Einstein metrics," Internat. J. Math., 23(10): 1250110, 36 pp., 2012.

6. "Sharp metric obstructions for quasi-Einstein metrics," J. Geom. Phys., 64(2): 12–30, 2013.

7. "Conformal invariants measuring the best constants for Gagliardo-Nirenberg-Sobolev inequalities," Calc. Var. PDE, 48(3-4):507–526, 2013.

8. (with P. Yang) "A Paneitz-type operator for CR pluriharmonic functions," Bull. Inst. Math. Acad. Sin. (N.S.), 8(3): 285–322, 2013.

9. "The energy of a smooth metric measure space and applications," J. Geom. Anal., 25(1):616–667, 2015.

10. (with S. Chanillo and P. Yang) "A remark on the kernel of the CR Paneitz operator," Nonlinear Analysis, 126:153–158, 2015.

11. "A Yamabe-type problem on smooth metric measure spaces," J. Differential Geom., 101(3):467–505, 2015.

12. (with S. Chanillo and P. Yang) "The CR Paneitz operator and the stability of CR pluriharmonic functions," Adv. Math., 287:109–122, 2016.

13. (with S.-Y. A. Chang) "On the positivity of a class of fractional GJMS operators," Comm. Pure Appl. Math., 69(6):1017–1061, 2016.

14. (with C.-Y. Hsiao and P. Yang) "Extremal metrics for the Q'-curvature in three dimensions," C. R. Math. Acad. Sci. Paris, 354(4):407–410, 2016.

15. "A notion of the weighted σ_k-curvature for manifolds with density," Adv. Math., 295:150–194, 2016.

16. (with P. Wu) "A generalization of the Cai–Galloway splitting theorem to smooth metric measure spaces," arXiv:1307.0848.

17. "Boundary operators associated to the Paneitz operator ," arXiv:1509.08342.

18. "Some energy inequalities involving fractional GJMS operators," arXiv:1509.08347.

19. (with C.-Y. Hsiao and P. Yang) "Extremal metrics for the Q'-curvature in three dimensions," arXiv:1511.05013.

20. "A weighted renormalized curvature for manifolds with density," arXiv:1603.02989.

21. (with Y. Wang) "A fully nonlinear Sobolev trace inequality," arXiv:1606.00071.

22. (with R. Gover) "The P'-operator and Q'-curvature via CR tractors," in preparation.

Invited Talks

AMS Spring Western Sectional Meeting, University of Utah	April 2016
Analysis and PDE Seminar, Johns Hopkins University	February 2016
Geometry Luncheon Seminar, The Pennsylvania State University	December 2015
Pacific Northwest Geometry Seminar, University of Washington	October 2015
Partial Differential Equations, Oberwolfach	August 2015
Int'l Workshop on Conformal Geometry and Geometric PDE, Beijing	June 2015
Princeton–Tokyo Workshop on Geometric Analysis, Tokyo	March 2015
Workshop on Analysis and Geometry in SCV, Taipei	December 2014
Geometric Analysis Seminar, Rutgers University	November 2014
AMS Fall Western Sectional Meeting, San Francisco State University	October 2014
Geometry Seminar, Lehigh University	October 2014
PDEs in Geometry and Physics Conference, Notre Dame	June 2014
Differential Geometry Seminar, CUNY	April 2014
AMS Spring Eastern Sectional Meeting, UM Baltimore Country	March 2014
Complex Analysis and Geometry Seminar, Rutgers University	February 2014
RU-CUNY Symposium on Geometric Analysis, Rutgers University	December 2013
Partial Differential Equations, Oberwolfach	August 2013
Geometrical Analysis Conference, CRM, Barcelona	July 2013
Analysis Seminar, Cornell University	April 2013
PDE and Differential Geometry Seminar, University of Connecticut	April 2013
VI Workshop on Geometric Analysis, UFC, Fortaleza	February 2013
NCTS/TPE Geometry Seminar, Academia Sinica, Taipei	January 2013

AMS Fall Western Sectional Meeting, University of Arizona	October 2012
Conformal and CR Geometry, Banff	August 2012
Workshop on Geometric Partial Differential Equations 2012, Taiwan	June 2012
Geometry/Topology Seminar, SUNY Stony Brook	April 2012
Geometry Seminar, University of Rochester	April 2012
AMS Fall Eastern Sectional Meeting, Cornell University	September 2011
Geometry and Physics Seminar, University of Miami	September 2011
String Theory Seminar, UC Davis	May 2011
Geometry-Topology Seminar, University of Pennsylvania	April 2011
Ricci Solitons Days, Di Giorgi Center, Pisa, Italy	April 2011
Geometry/Topology Seminar, McMaster University	March 2011
Geometric Analysis Seminar, Princeton University	February 2010
AMS Fall 2009 Western Section Meeting, UC Riverside	November 2009

Talks

Cartan Geometries, Erwin Schrödinger Institute, Vienna	July 2011
Analysis Geometry Seminar, Monash University	June 2008, July 2008
Differential Geometry Seminar, UC Santa Barbara	Janurary 2008, October 2008

Service

Refereed For:

- Advances in Mathematics
- American Journal of Mathematics
- Annali di Matematica Pura ed Applicata
- Annali Scuola Normale Superiore
- Calculus of Variations and Partial Differential Equations
- Differential Geometry and its Applications
- Geometriae Dedicata
- Glasgow Mathematical Journal
- Mathematische Annalen
- Mathematische Nachrichten
- Mathematische Zeitschrift
- Mathematical Research Letters
- Mathematical Physics, Analysis and Geometry
- Monatschefte für Mathematik
- Journal für die Reine und Angewandte Mathematik
- Journal of Differential Geometry
- Journal of Geometric Analysis
- Journal of Geometry and Physics
- Journal of Mathematical Physics
- Pacific Journal of Mathematics
- Proceedings of the American Mathematical Society
- Reviews in Mathematical Physics
- Taiwanese Journal of Mathematics

Conference Organization:

- Geometric Properties of Local and Non-local PDEs, CMO, Oaxaca — May 2017
- AMS Special Session on PDEs in Geometric Analysis, Rutgers — November 2015

Seminar Organization:

- Geometric Analysis Seminar, Princeton — 2014–2015
- Student Geometry Seminar, UC Santa Barbara — Fall 2009

Teaching

Penn State University

- Math 311W, Discrete Math — Spring 2016

- Math 436, Linear Algebra — Fall 2015

Princeton University

- MAT 215, Intro to Real Analysis — Spring 2015
- MAT 201, Multivariable Calculus — Fall 2014 (Course Head)
- MAT 982, Junior Seminar — Spring 2014
- MAT 175, Calculus for Economics/Life Science — Fall 2013 (Course Head)
- MAT 330, Complex Variables and Applications — Fall 2012
- MAT 104, Integral Calculus — Fall 2011, Spring 2012 (Course Head)

UCSB (Teaching Associate)

- Math 3B, Integral Calculus — Summer 2009
- Math 34A, Calculus for Life and Social Sciences — Summer 2007, Spring 2009

UCSB (Teaching Assistant)

- Math 3A, Differential Calculus — Fall 2006
- Math 3B, Integral Calculus — Winter 2007
- Math 5A, ODEs and Linear Algebra — Spring 2006
- Math 5B, Multivariable Calculus — Fall 2007, Winter 2008
- Math 34A, Calculus for Life and Social Sciences — Winter 2006, Spring 2007, Spring 2008, Fall 2008
- Math 34B, Calculus for Life and Social Sciences II — Fall 2005
- Math 8, Introduction to Proof — Summer 2006