

SÉBASTIEN F. PICARD

PERSONAL

Citizenship: Canadian
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Address: Department of Mathematics, Harvard University,
One Oxford Street, Cambridge MA 02138.

EMPLOYMENT

Benjamin Peirce Fellow, Harvard University, 2018-present.

EDUCATION

Ph.D., Mathematics.
Columbia University, 2013-2018.
Advisor: Prof. Duong H. Phong

M.Sc., Mathematics.
McGill University, 2011-2013.
Advisor: Prof. Pengfei Guan

B.Sc., Physics and Mathematics.
University of Victoria, 2006-2011.

RESEARCH INTERESTS

Differential geometry, nonlinear PDE, and complex geometry.

PUBLICATIONS

17. *The Dirichlet problem for the k -Hessian equation on a complex manifold*
(with T.C. Collins), preprint 2019.
16. *Parabolic complex Monge-Ampere equations on compact Kähler manifolds*
(with X.-W. Zhang), preprint 2019.
15. *Anomaly flow and T -duality*
(with T. Fei), preprint 2019.
14. *The Anomaly flow over Riemann surfaces*
(with T. Fei, Z. Huang), to appear in IMRN.
13. *A construction of infinitely many solutions to the Strominger system*
(with T. Fei, Z. Huang), to appear in J. Differential Geom.
12. *Fu-Yau Hessian equations*
(with D.H. Phong, X.-W. Zhang), to appear in J. Differential Geom.
11. *A flow of conformally balanced metrics with Kähler fixed points*
(with D.H. Phong, X.-W. Zhang), Math. Ann. 374, no. 3-4 (2019), 2005-2040.
10. *The Anomaly flow on unimodular Lie groups*
(with D.H. Phong, X.-W. Zhang), Contemp. Math. (2019), Vol. 735, Advances in Complex Geometry.
9. *On estimates for the Fu-Yau generalization of a Strominger system*
(with D.H. Phong, X.-W. Zhang), J. Reine Angew. Math (2019), No. 751, 243-274.
8. *Anomaly flows*
(with D.H. Phong, X.-W. Zhang), Comm. Anal. Geom. 26 (2018) No. 4, 955-1008.
7. *The Anomaly flow and the Fu-Yau equation*
(with D.H. Phong, X.-W. Zhang), Annals of PDE 4 (2018), No. 2.

6. *Geometric flows and Strominger systems*
(with D.H. Phong, X.-W. Zhang), *Math. Z.* 288 (2018), 101-113.
5. *New curvature flows in complex geometry*
(with D.H. Phong, X.-W. Zhang), *Surveys in Differential Geometry* 22 (2017), No. 1, 331-364.
4. *Concavity of the Lagrangian phase operator and applications*
(with T. Collins, X. Wu), *Calc. Var. Partial Differential Equations* 56 (2017), No. 4, Art. 89.
3. *The Fu-Yau equation with negative slope parameter*
(with D.H. Phong, X.-W. Zhang), *Inventiones mathematicae* 209 (2017), No. 2, 541-576.
2. *A second order estimate for general complex Hessian equations*
(with D.H. Phong, X.-W. Zhang), *Analysis and PDE* 9 (2016), No. 7, 1693-1709.
1. *A priori estimates of the degenerate Monge-Ampère equation on Kähler manifolds of non-negative bisectional curvature*
Math. Res. Lett. 20 (2013), No 6, 1145-1156.

INVITED TALKS

- Trends in Modern Geometry (June 2020). TBA
- Geometric Analysis Session at CMS Meeting (June 2020). TBA
- Bridging the gap between Kahler and non-Kahler geometry, Banff (October 2020). TBA
- AdIMOM Conference in Toronto (April 2019). *Calabi-Yau manifolds with torison and geometric flows*
- Snapshots of Math at Harvard (February 2019). *Calabi-Yau manifolds with torison and geometric flows*
- Harvard Differential Geometry Seminar (October 2018). *Calabi-Yau manifolds with torison and geometric flows*
- CIME school on complex non-Kähler geometry (July 2018). *Lectures on the Anomaly flow and the Hull-Strominger system*
- Boston University Geometry and Physics Seminar (April 2018). *The Fu-Yau equation in complex geometry*
- AMS Sectional Meeting at Ohio State (March 2018). *The Anomaly flow and the Hull-Strominger system*
- U Waterloo Geometry and Topology Seminar (February 2018). *The Anomaly flow over Riemann surfaces*
- Fields Geometric Analysis Colloquium (February 2018). *The Fu-Yau equation in complex geometry*
- AMS Sectional Meeting at UC Riverside (November 2017). *The Anomaly flow and the Hull-Strominger system*
- Conference on New Directions in Kähler Geometry at Notre Dame (June 2017). *The Hull-Strominger system on fibrations over a Riemann surface*
- UC Irvine Differential Geometry Seminar (May 2017). *The Dirichlet problem for the Lagrangian phase operator*
- Ohio State PDE Seminar (January 2017). *Geometric flows and Strominger systems*
- Harvard Differential Geometry Seminar (November 2016). *Geometric flows and Strominger systems*
- Syracuse Analysis Seminar (October 2016). *Geometric flows and Strominger systems*
- Northwestern Analysis Seminar (May 2016). *On the Fu-Yau generalization of a Strominger system*

TEACHING

Harvard University

- Fall 2019 - Math 230A: Graduate Differential Geometry
- Fall 2019 - Math 136: Differential Geometry of Curves and Surfaces
- Spring 2019 - Math 269Y: Topics in Parabolic PDE
- Spring 2019 - Math 21B: Linear Algebra
- Fall 2018 - Math 136: Differential Geometry of Curves and Surfaces

Columbia University

- Fall 2016 - Math UN1101: Calculus I
- Summer 2015 - Math UN1201: Calculus III

AWARDS

- Distinguished paper award (2018) for paper [3] by the International Consortium of Chinese Mathematicians
- Columbia Mathematics Department Graduate Student Teaching Award 2016-2017
- McGill Mathematics and Statistics Teaching Assistant Award for the Winter term (2013)

SERVICE

- Co-organizer, Harvard Differential Geometry Seminar, 2018-present
 - Co-organizer, Brandeis-Harvard-MIT-Northeastern Joint Mathematics Colloquium, 2018-present
 - Co-organizer, Harvard Open Neighborhood Seminar, 2019-present
 - Canadian Natural Sciences and Engineering Research Council (NSERC): member of Scholarships and Fellowships Selection Committee, 2019-present
 - Served on Harvard University graduate students admission committee 2018-2019
 - Co-organizer, Informal Complex Geometry and PDE Seminar at Columbia University 2015-2018
 - Columbia Mathematics Department Graduate Student Representative 2016-2018
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- Referee for: J. Reine. Angew., Journal of Differential Geometry, Journal of the London Mathematical Society, Mathematical Research Letters, IMRN, Annali della Scuola Normale Superiore di Pisa, Pure and Applied Mathematics Quarterly, Geometry and Topology, Ann. Sci. Ec. Norm. Super.