

Zihui ZHAO

PERSONAL DATA

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EMPLOYMENT

2019 - | NSF Postdoc and L.E. Dickson Instructor, **University of Chicago**
2018 - 2019 | Member, **Institute for Advanced Study**

EDUCATION

2013 - 2018 Ph.D. in Mathematics, **University of Washington**
Thesis: Analytic and geometric aspects of the elliptic measure on non-smooth domains
Advisor: Prof. Tatiana TORO
Spring 2017 Program associate at the Harmonic Analysis program, **MSRI Berkeley**
2011 - 2013 M.S. in Mathematics, **École Normale Supérieure/Université Paris-Sud XI**
Thesis: Minimal mass blow-up for the critical generalized Korteweg-de Vries Equation
Advisor: Prof. Yvan MARTEL
2007 - 2011 B.S. in Mathematics, **Peking University**

PUBLICATIONS & PREPRINTS

1. (with Camillo De Lellis) Dirichlet energy-minimizers with analytic boundary, submitted. arXiv:1906.10097
2. (with Joseph Feneuil, Svitlana Mayboroda) Dirichlet problem in domains with lower dimensional boundaries, submitted. arXiv:1810.06805
3. (with Svitlana Mayboroda) Square function estimates, BMO Dirichlet problem, and absolute continuity of harmonic measure on lower-dimensional sets, accepted for publication in *Anal. PDE*. arXiv:1802.09648
4. (with Steve Hofmann, José María Martell, Svitlana Mayboroda, Tatiana Toro) Uniform rectifiability and elliptic operators with small Carleson norm, submitted. arXiv:1710.06157
5. (with Tatiana Toro) Boundary rectifiability and elliptic operators with $W^{1,1}$ coefficients, to appear in *Adv. Calc. Var.* doi:10.1515/acv-2017-0044
6. BMO solvability and the A_∞ condition of the elliptic measure in uniform domains. *J. Geom. Anal.* **28** (2018), no. 2, 866-908.

Manuscripts in Preparation

1. (with Steve Hofmann, José María Martell, Svitlana Mayboroda, Tatiana Toro) Uniform rectifiability and elliptic operators with big Carleson norm
2. (with Simon Bortz, Max Engelstein, Max Georing, Tatiana Toro) Reifenberg flatness from small oscillation of normal vector, with an application to harmonic measure two-phase problem

INVITED TALKS

- (*upcoming*) Prairie analysis seminar, Nov. 2019
- Harmonic analysis and PDEs, University of Helsinki, Jun. 2019
- AMS special session on *Topics at the Interface of Analysis and Geometry*, Honolulu HI, Mar. 2019
- AMS special session on *Interactions between GMT, PDE and Harmonic Analysis*, Honolulu HI, Mar. 2019
- IAS analysis seminar, Feb. 2019
- IAS mathematical conversations, Feb. 2019
- Princeton/IAS GMT seminar, Dec. 2018
- Analysis seminar, University of Pennsylvania, Nov. 2018
- AMS special session on *Harmonic Analysis and Partial Differential Equations*, Nov. 2018
- Harmonic analysis and PDE's seminar, CUNY Graduate Center, Sep. 2018
- Research program seminar, PCMI Harmonic Analysis program, Jul. 2018
- Rainwater seminar, University of Washington, May. 2018
- AMS special session on *Regularity of PDEs on Rough Domains*, Boston MA, Apr. 2018
- AMS special session on *Geometric Measure Theory and Partial Differential Equations*, Portland OR, Apr. 2018
- Seminario de análisis y aplicaciones, ICMAT Madrid, Sep. 2017
- Graduate student seminar, University of Connecticut, Jun. 2017
- Analysis seminar, Nankai University, Jun. 2017
- Student harmonic analysis and PDE seminar, University of California, Berkeley, Mar. 2017
- Graduate student seminar at MSRI, Berkeley, Mar. 2017
- AMS special session on *Geometric Aspects of Harmonic Analysis*, Brunswick ME, Sep. 2016

PROFESSIONAL ACTIVITIES & SERVICE

- Held the review sessions alongside the Terng lectures at the Women and Mathematics program *Topics in geometric analysis*, May. 2019
- Co-organizer of AMS special session on *Regularity Theory of PDEs and Calculus of Variations on Domains with Rough Boundaries*, Hartford CT, Apr. 2019
- TA for PCMI Graduate Summer School, Jul. 2018
- Referred papers for multiple journals, including Int. Math. Res. Notices, Potential Anal. etc.
- Co-organizer of Graduate Student Analysis Seminar, University of Washington, Sep. 2015 - Dec. 2016
- Student analysis seminar, École Normale Supérieure, 2012

HONORS & AWARDS

- College of Arts and Sciences Graduate Medalist in Natural Sciences, University of Washington, Jun. 2018
- Tanzi-Egerton Fellowship, University of Washington, Sep. 2017
- Academic Excellence Award, University of Washington, Sep. 2015
- Microsoft Scholar Award, University of Washington, 2013-2016
- Sophie Germain International Master scholarship, Jacques Mathematics Foundation (FMJH), 2011-2013
- Academic Innovation Award, Peking University, 2010

CONFERENCES & WORKSHOPS

- Nonlinear PDEs discussion group at Courant Institute, Apr. 19, 2019
- Workshop on Variational methods in geometry, IAS, Nov. 5-9, Mar. 4-8, 2019
- Allen-Cahn/Ginzburg-Landau reading group, IAS, Sep.-Dec. 2019
- PCMI summer session on harmonic analysis, Jul. 1-21, 2018
- *Harmonic analysis and geometric measure theory*, in honor of Guy David, CIRM Marseille, Oct. 2-6, 2017
- Recent developments in harmonic analysis, MSRI, May. 15-19, 2017
- *Harmonic analysis and elliptic equations on real Euclidean spaces and on rough sets*, MSRI summer graduate school, Jun. 13-24, 2016
- Introductory workshop: *Randomness and long-time dynamics in nonlinear evolution differential equations*, MSRI, Aug. 24-28, 2015
- *Reflectionless measures, Wolff's potentials and rectifiability*, NSF-CBMS Regional Conference in the Mathematical Sciences, North Dakota State University, Jul. 27-31, 2015
- Workshop for women in analysis and PDE, Institute for Mathematics and its Applications, May. 28-31, 2015
- The eighteenth Rivière-Fabes symposium on Analysis and PDE & Spring 2015 Midwest PDE conference, University of Minnesota, Apr. 17-19, 2015
- *Uniqueness in analysis and geometry*, Massachusetts Institute of Technology, Dec. 10-11, 2014
- *Harmonic analysis and PDEs recent developments and future directions*, in honor of Carlos Kenig, University of Chicago, Sep. 19-21, 2014
- *Dispersive partial differential equations*, MSRI summer graduate school, Jun. 16-27, 2014
- International conference on nonlinear PDEs and satellite workshop *Free surface & interface problems*, University of Oxford, Sep. 10-15, 2012
- Inverse problems and partial differential equations summer school, University of Washington, Jul. 2-20, 2012
- Hadamard lectures on *Error estimates in stochastic homogenization* by Prof. Felix Otto, University of Paris-Sud XI, Mar.-Apr. 2012
- Summer school on applied mathematics, Peking University, Jul. 19-Aug. 20, 2010

SELECTED TEACHING EXPERIENCES

- Instructor of Math 307 *Introduction to Differential Equations* Summer 2018
- Instructor of Math 307 *Introduction to Differential Equations* Fall 2016
- Grader of Math 424 *Fundamental Concepts of Analysis* Fall 2015
- TA of Math 126 *Calculus with Analytic Geometry III* Spring 2015
- TA of Math 112 *Application of Calculus to Business and Economics* Winter 2014
- TA of Math 125 *Calculus with Analytic Geometry II* Spring 2014