

Curriculum Vitae

Mohammad Reza Pakzad

July 2020

Education:

Ph.D. in Mathematics, 2001, ENS de Cachan, France.

Advisor: Tristan Rivière.

Thesis: Study of topological singularities in function spaces between manifolds and applications in the calculus of variations.

B.Sc. in Pure Mathematics, 1996, Sharif University of Technology, Iran.

Positions:

09/2015 -	Tenured Associate Professor	Dept. of Math., Univ. of Pittsburgh
01/2008 - 08/2015	Assistant Professor	Dept. of Math., Univ. of Pittsburgh
10/2005 - 08/2007	Postdoctoral Fellow	MPI-MIS, Leipzig, Germany
09/2003 - 08/2005	Postdoctoral Fellow	Dept. of Math., U.B.C., Canada
10/2001 - 08/2003	Postdoctoral Fellow	MPI-MIS, Leipzig, Germany
09/2000 - 09/2001	Postdoctoral Assistant (ATER)	Université d'Évry, France

Visiting Positions:

07/2019 - 08/2020	Visiting Professor	IAM, Dept. of Math., Univ. of Bonn
09/2015 - 12/2015	Visiting Associate Professor	Dept. of Math., UC Berkeley
09/2010 - 12/2010	Visiting Assistant Professor	Courant Institute, NYU
09/2007 - 12/2007	Visiting Assistant Professor	School of Math., Univ. of Minnesota
09/2006 - 12/2006	Visiting Assistant Professor	School of Math., Univ. of Minnesota

Grants and Awards:

1. Principal Investigator, NSF Award DMS-1813738,
(Research Grant) July 2018-June 2021, Total Amount: US\$ 172,130,
Title: *Elastic rigidity and flexibility between differential geometry and analysis.*
2. Principal Investigator, NSF Award DMS-1210258,
(Research Grant) August 2012-August 2016, Total Amount: US\$ 138,533,
Title: *Calculus of variations on pre-strained elastic structures.*
3. Principal Investigator, NSF Award DMS-0907844,
(Research Grant) August 2009-August 2012, Total Amount: US\$ 126,828,
Title: *Calculus of variations on rigid elastic structures.*

4. Principal Investigator, Co-PI: Marta Lewicka, NSF Grant DMS-1400941, (Conference Grant) March 2014-March 2015, Total Amount: US\$ 24,500, Title: *Workshop on “Advances in Nonlinear Analysis”*.

5. Principal Investigator, The University of Pittsburgh CRDF research award 9003034, (Research Grant) July 2008-June 2010, Total Amount: US\$ 14,000, Title: *Derivation of shell theories from the 3d nonlinear elasticity*.

Research Activities:

- **Research fields :**

geometric analysis, PDEs in geometry and physics, geometric measure theory, geometric function theory, nonlinear analysis, non-convex calculus of variations, nonlinear elasticity theory and solid mechanics

- **Some research topics:**

non-convex spaces of functions and deformations, flexibility and rigidity problems, differential geometry at low regularity, dimension reduction in nonlinear elasticity, growing tissue models, inverse design problems

- **Jurys and refereeing:**

1. Research grant referee: NSF Panel invited Official Member (avril 2017), ISF (2011, 2019)
2. Thesis defence jury memberships: Bernardo Galvao Sousa (CMU, 2008), Daniel E. Spector (CMU, 2011), Pablo Ochoa (PITT, 2015), Luca Codenotti, Diego Ricciotti (PITT, 2017), Adrian Hagerty (CMU, 2019)
3. Ph.D. comprehensive exam: Ali Pakzad, Luca Codenotti (2015), Micheal Lindsley (2018)
4. Journal article referee: Ann I H Poinc.-AN, Ann Sc. Norm-Sci, ARMA, COCV, Calc Var & PDEs, CRM, DCDS-A, EECT, GAFA, J Elast., JEMS, Math. Zeit., Nonlin., SIAM JMA

- **Selected Invited Talks and Seminars:**

1. *On the geometry of flat isometric immersions with Hölder type regularity*, Augsburg-München Analysis seminar, Institut für Mathematik, Universität Augsburg, Feb. 2020.
2. *Regularity dependent anomalous solutions in select PDEs*, Geometry and Analysis seminar, School of Mathematical Sciences, Queen Mary University of London, Dec. 2018.
3. *Monge-Ampère equations and isometric immersions in between two opposite regimes*, Dynamical Systems Seminar, Division of Applied Mathematics, Brown University, Oct. 2017.
4. *Very weak solutions to the Monge-Ampère equation are dense in the space of continuous functions*. Département de Mathématiques, Université Paul Sabatier, Toulouse, March 2016.
5. *Anomalous solutions to the Monge-Ampère equation in two dimensions and pre-strained elasticity*, Séminaire de Laboratoire (Colloquium), Laboratoire Pierre Louis Lions, Université Pierre et Marie Curie (Paris 6), Paris, March 2016.

6. *h-principle for the Monge-Ampère equation*, Séminaire de Géométrie, Département de Mathématiques, Université de Nantes, January 2016.
7. *Energy Scaling of Prestrained Thin Plates and Monge-Ampère Anomalies*, Mini-Workshop: Scales in Plasticity, MFO, Oberwolfach, Germany, Nov. 2015.
8. *Rigidity of weak solutions to Monge-Ampère equations*, Analysis and PDE seminar, Department of Mathematics, UC Berkeley, October 2015.
9. *Rigidity and flexibility for the Monge-Ampère equation*, Department of Mathematics, ETH and FIM, Zurich, Switzerland, March 2015.
10. *Convex Integration for the Monge-Ampère equation*, Dept. of Mathematics, Charles University, Prague, Czech Republic, March 2015.
11. *Rigidity of Sobolev isometric immersions and of degenerate Sobolev mappings*, Courant Institute for Mathematical Sciences, NYU, New York, May 2014.
12. *Regularity, rigidity and matching properties of Sobolev isometries*, Rutgers University, Department of Mathematics, Analysis Seminar, Dec. 2010.
13. *Morphogenesis of growing tissues, nonlinear elasticity and Sobolev isometric immersions*, Colloquium, University of Indiana, Department of Mathematics, 29 Jan. 2010.
14. *Elastic models for growing tissues: scaling laws and derivation by Gamma convergence*, University of Oxford, Mathematical Institute, PDEs Seminar, Nov. 2009.

PhD Students:

1. Ph.D. Thesis Advising: Zhuomin Liu, (with Co-advisor: Piotr Hajłasz). University of Pittsburgh, Graduation Fall 2012.
2. Ph.D. Thesis Mentoring: Luca Codenotti (Advisor: Marta Lewicka), University of Pittsburgh, Graduation Fall 2017.

Conference and Seminar Organizing:

1. Organized the SIAM Minisymposium on “Convex integration and degenerate solutions to nonlinear PDEs in geometry and physics”, Dec 7-10, 2015, in Scottsdale, Arizona. With M. Lewicka.
2. Organized the workshop on “Advances in Nonlinear Analysis”, Department of Mathematics, University of Pittsburgh. March 13-15, 2014. With P. Hajłasz, M. Lewicka and J. Manfredi.
3. Organized the “Theme Semester on Analysis and Convex Integration”, Department of Mathematics, University of Pittsburgh, Spring 2014. With P. Hajłasz, M. Lewicka and J. Manfredi.
4. Organized the Special Session for the AMS meeting, “*Analysis of weakly differentiable maps with constraints and applications*”, Worcester, MA. April 25-26, 2009. With Fengbo Hang.

Teaching Experience:

01/2008 - Present date	University of Pittsburgh	Calculus I, II & III Differential Equations Finite Mathematics Introduction to Theoretical Math Introduction to 1-Variable Calculus Introduction to Abstract Algebra Introduction to Analysis (HNR) Partial Differential Equations Graph Theory Graduate Linear Algebra Graduate Ordinary Differential Equations Graduate Analysis I-IV Topic Course on Optimal Transport
Fall 2015	UC Berkeley	Introduction to Analysis
2006 - 2008	University of Minnesota	Introduction to Topology Linear Algebra and Differential Equations
2003 - 2005	University of British Columbia	Elementary Partial Differential Equations Linear Systems, Matrix Algebra
2000 - 2001	Université d'Évry, France	Équations différentielles élémentaires Algèbre linéaire