

Curriculum Vitae

Alexander Mramor

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1. Research Interests:

My research interests are in geometric analysis. My work thus far has involved mean curvature flow and minimal surfaces but my interests in the field are broad.

2. Current Position:

J.J. Sylvester Assistant Professor, Johns Hopkins University, 2019-2022.

3. Education:

- PhD in mathematics, June 2019
University of California, Irvine
Thesis advisor: Richard Schoen
- BS with honors in mathematics, May 2013
University of Missouri–Columbia
Magna Cum Laude (3.89/4)

4. Current awards/support:

AMS-Simons travel grant, 2020-2022

5. Publications and preprints:

- (1) An unknottedness theorem for noncompact self shrinkers. Submitted. arXiv:2005.01688. (2020)
- (2) Compactness and finiteness theorems for rotationally symmetric self shrinkers. To appear in J. Geometric Analysis. arXiv:2002.03465. (2020)

- (3) (joint with Theodora Bourni and Mat Langford) On the construction of closed nonconvex nonsoliton ancient mean curvature flows. To appear in *Int. Math. Res. Not.* (2019)
- (4) (joint with Alec Payne) Ancient and Eternal Solutions to the Mean Curvature Flow from Minimal Surfaces. To appear in *Math Annalen*. arXiv:1904.08439.
- (5) (joint with Alec Payne) Nonconvex Surfaces which Flow to Round Points. Submitted arXiv:1901.02863.
- (6) (joint with Shengwen Wang) Low Entropy and the Mean Curvature Flow with Surgery. Submitted arXiv:1804.04115.
- (7) Regularity and stability results for the level set flow via the mean curvature flow with surgery. To appear in *Com. Anal. Geom.* (2018)
- (8) (joint with Shengwen Wang) On the topological rigidity of self shrinkers in \mathbf{R}^3 . *Int. Math. Res. Not.* (2018). <https://doi.org/10.1093/imrn/rny050>.
- (9) Entropy and generic mean curvature flow in curved ambient spaces. *Proc. Amer. Math. Soc.* 146 (2018), 2663-2677. <https://doi.org/10.1090/proc/13964>
- (10) A finiteness theorem via the mean curvature flow with surgery. *J Geom Anal* (2017). <https://doi.org/10.1007/s12220-017-9962-5>.

6. Talks given and planned:

- (1) Cornell University, geometric analysis seminar, 10/16/2020
- (2) AMS sectional meeting, Special session “Geometry of Submanifolds and Integrable Systems” 9/12/2020 – 9/13/2020
- (3) Canadian Mathematical Society 75th Anniversary Summer Meeting, 6/5/2020–6/8/2020 **Postponed due to COVID-19**
- (4) Harvard University, differential geometry seminar, 4/16/2020
- (5) Lafayette–Lehigh geometry-topology conference, Lafayette university, 3/21/2020 **Postponed due to COVID-19**
- (6) University of Tennessee–Knoxville, geometric analysis seminar, 3/11/2020 **Postponed due to COVID-19**
- (7) University of Pennsylvania, differential geometry seminar, 3/5/2020
- (8) University of Tennessee–Knoxville, geometric analysis seminar, 10/25/2019
- (9) AMS sectional meeting, Special Session on “Geometric Partial Differential Equations and Variational Methods, II,” 11/9/2019
- (10) University of California, Santa Cruz, differential geometry seminar, 2/28/2019
- (11) University of California, Irvine, differential geometry seminar, 10/16/2018

- (12) Contributed talk at the 2018 Barrett lectures, University of Tennessee–Knoxville, 6/1/2018
- (13) Contributed talk at math connections 2018, University of California, Riverside, 5/19/2018
- (14) University of Tennessee–Knoxville, geometric analysis seminar, 11/29/2017
- (15) California State University Fullerton, colloquium, 4/28/2017

7. Teaching experience:

I have been/will be the instructor for the following courses at JHU:

- math 110.304 Introduction to Number Theory
- math 110.405 Real Analysis 1
- math 110.406 Real Analysis 2
- math 110.416: Honors Analysis 2
- math 110.439: Intro to Differential Geometry
- math 110.619: Lie Groups and Lie Algebras
- math 110.745 Introduction to Curvature Flows

I have been a teaching assistant for the following courses at UCI, most multiple times:

- math 2B: single variable integration
- math 2E: multivariable integration
- math 3A: introduction to linear algebra
- math 3D: elementary differential equations
- math 118: theory of differential equations
- math 121B: linear algebra 2
- math 140A: elementary analysis 1
- math 140B: elementary analysis 2
- math 147: complex analysis
- math 161: modern geometry
- math 162A: differential geometry 1

My duties as a TA at UCI were to lead discussion twice a week for typically two courses a quarter, hold office hours, design and grade quizzes, and proctor exams.

8. Past awards/support received:

Received at UC Irvine:

- 2019 Kovalevsky award for outstanding thesis,
- 2017-2018 Connelly award for excellence in research and teaching,
- 2013-2014 GAANN fellowship

Received in undergraduate:

- Hazel Shelton Grabosch award in mathematics,
- Brian W. Dellande scholarship,
- Anthony W. Rollins scholarship,
- Mizzou A&S scholarship,
- Honorable mention in the 2011 mathematical contest in modeling (with Bach Tran and Devin Smittle)

9. Outreach/synergetic activities:

- Co-organizer for the JHU analysis seminar
- Co-organizer for the JHU junior colloquium
- Volunteer for stemcx: tutoring over zoom for K-12 students in Baltimore during the COVID-19 epidemic.

At UCI:

- Co-organizer for the departmental working seminar in geometric analysis: weekly or biweekly talks given by students and faculty on areas of their current research interest.
- Volunteer for the outreach programs math CEO, UCI math circle, math-counts: these are programs for K-12 students, including those in underserved areas, to foster early interest in mathematics.

10. Article refereeing

I have been a referee for: American Journal of Mathematics, Transactions of the AMS, IMRN, Geometriae Dedicata.