Curriculum Vitae

Alexander Mramor

email: almr@math.ku.dk

website: https://aemramor.sites.ku.dk/

1. Research Interests:

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

2. Positions held since PhD:

- Postdoc at Copenhagen Centre for Geometry and Topology, University of Copenhagen, fall 2022 – present
- J.J. Sylvester Assistant Professor, Johns Hopkins University, fall 2019 – spring 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. Publications and preprints:

(1) (joint with Ao Sun) On the long-time limit of the mean curvature flow in closed manifolds. Submitted. arXiv: 2412.03475. (2024)

(2) A classification result for eternal mean convex flows of finite total curvature type. Under revision at Transactions of AMS. arXiv: 2403.12020. (2024)

(3) An unknottedness result for self shrinkers with multiple ends. Submitted. arXiv: 2011.09373. (2023)

(4) (joint with Theodora Bourni) Nonplanar ancient curve shortening flows in $\mathbb{R}^3$ from grim reapers. Math. Z. 305 (2023), no. 1, Paper No. 5, 9 pp.

(5) On self shrinkers of medium entropy in $\mathbb{R}^4$. Geom. Topol. 27 (2023), no. 9, 3715–3731.

(6) An unknottedness theorem for noncompact self shrinkers. J. Reine Angew. Math. 810 (2024), 189–215.

(7) Compactness and finiteness theorems for rotationally symmetric self shrinkers. J. Geom. Anal. 31 (2021), no. 5, 5094–5107.

(8) (joint with Theodora Bourni and Mat Langford) On the construction of closed nonconvex nonsoliton ancient mean curvature flows. Int. Math. Res. Not. IMRN(2021), no. 1, 757–768.

(9) (joint with Alec Payne) Ancient and Eternal Solutions to the Mean Curvature Flow from Minimal Surfaces. Math. Ann., 380 (2021), no. 1, 569-591.

(10) (joint with Alec Payne) Nonconvex Surfaces which Flow to Round Points. To appear in Comm. Anal. Geom. arXiv:1901.02863. (2019)

(11) (joint with Shengwen Wang) Low Entropy and the Mean Curvature Flow with Surgery. Calc. Var. Partial Differential Equations 60 (2021), no. 3, Paper No. 96, 28 pp.

(12) Regularity and stability results for the level set flow via the mean curvature flow with surgery. Comm. Anal. Geom. 29 (2021), no. 8, 1783–1811.

(13) (joint with Shengwen Wang) On the topological rigidity of self shrinkers in $\mathbf{R}^3$. Int. Math. Res. Not. IMRN(2020), no. 7, 1933–1941.

(14) Entropy and generic mean curvature flow in curved ambient spaces. Proc. Amer. Math. Soc. 146 (2018), 2663-2677.

(15) A finiteness theorem via the mean curvature flow with surgery. J Geometric Analysis 28 (2018), 3348–3372.

5. Talks given and planned:

(1) KTH Royal Institute of Technology, differential geometry seminar, 10/4/2024
(2) Istanbul University, International Workshop on Differential Geometry, 9/2/2024 – 9/5/2024
(3) University of Tubingen, Oberseminar "Geometrische Analysis, Differentialgeomtrie und Relativitätstheorie," 6/20/2024

(4) Tsinghua University, differential geometry seminar, 6/4/2024
(5) Istanbul University, International Workshop on Geometry of Submanifolds, 11/6/2023 – 11/8/2023
(6) 29th Nordic congress of mathematicians, geometry section, 7/1/2023 – 7/5/2023
(7) University of Warwick, analysis seminar, 6/15/2023
(8) Queen Mary University London, geometry, analysis, and gravitation seminar, 2/21/2023
(9) University of Oxford, geometric analysis seminar, 2/20/2023
(10) University of Grenada, Workshop on Differential Geometry, 1/16/2023 – 1/19/2023
(11) University of Hamburg, Joint UHH-UCPH Workshop on Geometry, 12/7/2022 – 12/8/2022
(12) University of Chicago, geometric analysis seminar, 5/24/2022
(13) University of Science and Technology of China, geometric analysis seminar, 5/19/2022
(14) University of Copenhagen, Conference on mean curvature flow and related topics, 3/7/2022 – 3/11/2022
(15) Differential geometry seminar Torino, 12/7/2021
(16) University of Tennessee–Knoxville, geometric analysis seminar, 10/19/2021
(17) Oberwolfach PDE seminar, 7/25/2021 –7/31/2021.
(18) Canadian Mathematical Society 75th + 1 Anniversary Summer Meeting, 6/7/2021–6/11/2021.
(19) Rutgers University, geometric analysis seminar, 2/2/2021.
(20) Jeonbuk National University, online workshop "An invitation to geometric analysis," 12/1/12020 – 12/5/2020.
(21) Cornell University, geometric analysis seminar, 10/16/2020
(22) AMS sectional meeting, Special session "Geometry of Submanifolds and Integrable Systems" 9/12/2020 – 9/13/2020
(23) Harvard University, differential geometry seminar, 4/16/2020
(24) Lafayette–Lehigh geometry-topology conference, Lafayette university, 3/21/2020 – canceled due to COVID-19
(25) University of Pennsylvania, differential geometry seminar, 3/5/2020
(26) University of Tennessee–Knoxville, geometric analysis seminar, 10/25/2019
(27) AMS sectional meeting, Special Session on "Geometric Partial Differential Equations and Variational Methods, II," 11/9/2019
(28) University of California, Santa Cruz, differential geometry seminar, 2/28/2019
(29) University of California, Irvine, differential geometry seminar, 10/16/2018
(30) Contributed talk at the 2018 Barrett lectures, University of Tennessee–Knoxville, 6/1/2018
(31) Contributed talk at math connections 2018, University of California, Riverside, 5/19/2018
(32) University of Tennessee–Knoxville, geometric analysis seminar, 11/29/2017

(33) California State University Fullerton, colloquium, 4/28/2017

6. Teaching experience:

I was/am the instructor for the following course at UCPH:

- NMAK16022U Partial Differential Equations
- NMAK24002U Partial Differential Equations 2 (joint with N.M. Møller)

I was the instructor for the following courses at JHU:

- math 110.107 Calculus 2 for Biological and Social Sciences
- math 110.302 Differential Equations and Applications
- 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
- math 110.800 Independent Study-Graduates (reading course on minimal surfaces)

7. Mentoring:

- At UCPH, PhD coadvisor for Harish Upadhyaya (joint w/N.M. Møller)

8. Outreach/synergetic activities:

At UCPH:

- Co-organizer for the masterclass "Recent Progress on Singularity Analysis and Applications of the Mean Curvature Flow" held at University of Copenhagen, 29/4/24 – 3/5/2024.
- Co-organizer for the upcoming masterclass "Geometry of Phase Transitions" to be held at University of Copenhagen, in spring 2025.
- Co-organizer for the geometry seminar
- Co-organizer for the geometry learning seminar

At JHU:

- 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 (fall 2020)

9. Past awards/support received:

Received at JHU:

- AMS-Simons travel grant, 2020-2023

Received at UC Irvine:

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

10. Article refereeing (some journals multiple times)

I have been a referee for: Advances in Mathematics, American Journal of Mathematics, Crelle's Journal, Communications in PDE, Differential Geometry and its Applications, Forum of Mathematics Pi, Geometriae Dedicata, IMRN, Journal of the AMS, Journal of Geometric Analysis, Journal of Topology and Analysis, Transactions of the AMS, Proceedings of the AMS.

I am also a reviewer for mathscinet.