

# Osama Khalil

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## Employment & Education

- 2019 - Wylie Research Assistant Professor. University of Utah.
- 2013-2019 PhD, Mathematics, The Ohio State University.  
Advisor: Nimish Shah.  
Thesis title: On the Dimension of Certain Divergent Trajectories on Homogeneous Spaces and Diophantine Approximation.
- 2006-2013 M.D., Kasr Alainy School of Medicine, Cairo University, Egypt.
- 2006-2011 B.Sc., Mathematics and Computer Science, The American University in Cairo, Egypt.

## Publications

- My research is partially supported as PI on NSF grant DMS-2055364.
- 2021 On the Space of Ergodic Measures for the Horocycle Flow on Moduli Spaces of Abelian Differentials. With Jon Chaika and John Smillie. Preprint (submitted).
- 2021 Random Walks, Spectral Gaps, and Khintchine Theorem on Fractals. With Manuel Luethi. Preprint (submitted).
- 2021 Mixing, Resonances, and Spectral Gaps on Geometrically Finite Locally Symmetric Spaces. Preprint. <https://www.math.utah.edu/~khalil/publications/mixing.pdf>
- 2020 Singular Vectors on Fractals and Projections of Self-similar Measures. **GAFA**.
- 2020 Exceptional Trajectories for the Teichmüller Geodesic Flow and Hausdorff Dimension. **Journal of Europ. Math. Soc. (JEMS)**. With Al-Saqban, Apisa, Erchenko, Mirzadeh, Uyanik.
- 2020 Bounded & Divergent Orbits and Expanding Curves on Homogeneous Spaces. **Transactions of the AMS**.
- 2019 Geodesic Planes in Geometrically Finite Manifolds. **Discrete & Contin. Dyn. Syst. Series A**.
- 2018 Pointwise Ergodic Theorems and Translates of Measures on Homogeneous Spaces. **Ergodic Theory Dyn. Syst.**

## Awards & Grants

- 2021-2024 NSF Grant DMS-2055364 (sole PI). Analysis Program. Award Amount: \$143,738.
- 2021 Outstanding Postdoc Award. Utah Math Department.
- 2019 The Ohio State Graduate School Presidential Fellowship.
- 2016 Graduate Associate Teaching Award (GATA). Highest university-wide teaching distinction for graduate TAs.
- 2017, 2018 Departmental Fellowships, Ohio State: 2 semesters without teaching.

## Selected Invited Talks

- Jun. 2022 Ergodic Geometry, Number Theory and Margulis' Legacy: the Next Generation (in honor of Margulis' 75th birthday).
- Nov. 2021 Virtual Lecture Series at Tata Institute, India.
- Jun. 2021 UCSD Group Actions Seminar.
- April 2021 Yale Geometry & Topology Seminar.
- March 2021 Billiards and Surfaces á la Teichmüller and Riemann, Online (BiSTRO) seminar.
- Nov. 2020 Yale Group Actions and Dynamics Seminar.

Earlier Talks Seminar talks: Wisconsin, Warwick, Bristol, New England NT seminar, York DAHD Seminar, Tel Aviv, Maryland, Penn State, Michigan, Chicago, Northwestern, Indiana, Purdue, Utah, Ohio State.

Conference talks: Homogeneous Dynamics Conference at Hausdorff Institute Bonn, Midwest Early Career Conference, Semi-annual Dynamics Workshop at Penn State and at Maryland.

## Service & Mentorship

- 2019 - Referee for: Annals of Math, Crelle, Journal of Modern Dynamics, Compositio, American Journal of Math, Disc. & Cont. Dyn. Sys.
- 2020, 2021 Candidacy Exam Committee: Rebekah Eichberg, Carlos Ospina. University of Utah.
- 2020 Co-advised (unofficially) Masters Thesis of Itamar Cohen, Tel Aviv University.
- 2021 TA for a minicourse at CMI-HIMR Dynamics and Geometry Online Summer School.
- 2020 - Reviewer for MathSciNet.
- 2019 Co-organized the Annual Early Career Midwest Dynamics Conference, Ohio State.
- 2018-2019 Department Colloquium Organizing Committee, Ohio State.
- 2018 Mentor: TA training for incoming PhD Students, Ohio State.

## Outreach

- 2021 Undergraduate Colloquium. University of Utah.  
Talk title: From Quantum Donuts to Coloring the Primes, What is Ergodic Theory?
- 2021 Professional development panel on careers in STEM. Achievement First University Prep High School, Brooklyn, New York.
- 2021 pre-REU Colloquium talk for undergraduates at the University of Utah.  
Talk title: On the Shape of Numbers.
- 2020 AWM K-12 Outreach Lecture. East High School, Salt Lake City.  
Talk title: What is hyperbolic about hyperbolic geometry?

## Undergraduate Teaching

2019 - Instructor of record: Calc II, Discrete Mathematics. University of Utah.  
2014-2019 TA: Calc I, II, III (7 semesters), Ohio State.  
Summer 2015 Instructor of record: Calc II, Ohio State.

## Graduate Teaching

Spring '22 Instructor of record: Graduate Topics Course in Homogeneous Dynamics, Utah.  
2017 TA: Analysis Qualifying Exam Prep. for incoming PhD students, Ohio State.

## Professional Experience

Feb-May 2013 **INRIA** Rhone Alpes, Lyon, France, Research Assistant: Mathematical Neuroscience.

Summer '10,  
Jun. '11 - **Microsoft**, Cairo, Software Engineer: Machine Learning and Image Processing.  
Oct. '12

## Earlier Awards & Scholarships

2013-2014 University Fellowship: 1 year without teaching, Ohio State.  
May 2011 Microsoft Technology Transfer Award for contributing an application of my research to Bing Search.  
June 2011 Microsoft nomination to attend Lindau 61st Nobel Laureates Meeting, Germany (includes full travel and lodging support).  
Fall 2009 Full Scholarship: study abroad at SUNY New Paltz.  
2006-2011 LEAD Scholarship: tuition, housing and stipend for 5 years of study at the American University in Cairo.