

Osama Khalil

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Education & Academic Employment

- 2022 - Assistant Professor (tenure-track). University of Illinois Chicago.
- 2019-2022 Wylie Research Assistant Professor (postdoc). University of Utah.
- 2013-2019 PhD, Mathematics, The Ohio State University.
- 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 & Preprints

- 2023 Exponential Mixing Via Additive Combinatorics. Submitted.
- 2023 On the Space of Ergodic Measures for the Horocycle Flow on Moduli Spaces of Abelian Differentials. Joint with Jon Chaika and John Smillie. **Annales Scientifiques de l'ENS.**
- 2022 Random Walks, Spectral Gaps, and Khintchine Theorem on Fractals. Joint with Manuel Luethi. **Inventiones Mathematicae** .
- 2020 Singular Vectors on Fractals & Projections of Self-similar Measures. **Geom. Funct. Anal. (GAFA)**.
- 2020 Exceptional Trajectories for the Teichmüller Geodesic Flow and Hausdorff Dimension. Joint with H. Al-Saqban, P. Apisa, A. Erchenko, S. Mirzadeh, and C. Uyanik. **Journal of the Europ. Math. Soc. (JEMS)**.
- 2020 Bounded & Divergent Orbits and Expanding Curves on Homogeneous Spaces. **Transactions of the AMS**.
- 2019 Geodesic Planes in Geometrically Finite Manifolds. **Discrete & Continuous Dynamical Systems Series A**.
- 2018 Pointwise Ergodic Theorems and Translates of Measures on Homogeneous Spaces. **Ergodic Theory & Dynamical Systems**

Awards & Grants

- 2021-2024 NSF Grant DMS-2247713 (PI). Award Amount: \$143,738.
Title: Dynamical Methods in Counting Problems and Diophantine Approximation.
- 2022-2024 NSF Conference Grant DMS-2230827 (co-PI). Award Amount: \$39,756.
Title: Midwest Dynamical Systems Conferences: 2022 and 2023.

2021 Outstanding Postdoc Award. Utah Math Department.
 2019 The Ohio State Graduate School Presidential Fellowship.
 2016 The Ohio State Graduate Associate Teaching Award. Award Amount: \$1500.
 2017, 2018 Departmental Fellowships, Ohio State: 2 semesters teaching relief.

Select Invited Talks

Nov. 2023 Penn. State Annual Dynamics Workshop.
 Apr. 2023 Yale Group Actions and Dynamics Seminar.
 Feb. 2023 Big Ideas in Dynamics, AIMS Conference (virtual).
 Dec. 2022 IAS Special Year Seminar, Princeton.
 Dec. 2022 Ergodic Theory & Dynamical Systems Hybrid Conference.
 Conference in honor of Dani's 75th birthday, ICTS India (virtual).
 Nov. 2022 Chicago Action Now Rotating Seminar at Northwestern.
 Jun. 2022 Ergodic Geometry, Number Theory and Margulis' Legacy: the Next Generation.
 Conference in honor of Margulis' 75th birthday, University of Chicago.
 Mar. 2022 Maryland Annual Dynamics Workshop.
 Nov. 2021 Virtual Lecture Series at Tata Institute, India.
 Jun. 2021 UCSD Group Actions Seminar (virtual).
 Apr. 2021 Yale Geometry & Topology Seminar.
 Mar. 2021 Billiards and Surfaces á la Teichmuller and Riemann, Online (BiSTRO) seminar.

Earlier Seminar talks: Wisconsin, Yale, Warwick, Bristol, New England NT seminar, York
 Talks 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, Dynamics Workshops at Penn State and Maryland.

Service & Mentorship

2022 - Member of the Steering Committee for the Annual Midwest Dynamics Conference. With Roland Roeder and Daniel Thompson, we obtain NSF funding, select conference location, and assist local organizers.

Oct. '23 Co-organizer of the Midwest Dynamics Conference at UIC.
 Jun. '23 Co-organizer of the Summer School in Dynamical Systems at Northwestern.
 Apr. '23 Co-organizer of the Chicago Action Now Rotating Seminar at UIC.
 2022 - Co-organizer of the Departmental Colloquium, Dynamics Seminar, and Dynamics Learning Seminar at UIC.

2020, 2021 Candidacy Exam Committee: Rebekah Eichberg, Carlos Ospina. University of Utah.
 2021 TA for a minicourse at CMI-HIMR Dynamics and Geometry Online Summer School.
 2019 Co-organized the Annual Early Career Midwest Dynamics Conference, Ohio State.
 2018-2019 Department Colloquium 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

- Fall '22, '23 Instructor of record: Math 210 (Calc III). University of Illinois Chicago.
- 2019-2022 Instructor of record: Calc II, Discrete Mathematics. University of Utah.
- 2014-2019 TA: Calc I, II, III (7 semesters), Ohio State.
- Summer '15 Instructor of record: Calc II, Ohio State.

Graduate Teaching

- Fall '23 Instructor of record: Graduate Topics Course in Homogeneous Dynamics, UIC.
- Spring '22 Instructor of record: Graduate Topics Course in Homogeneous Dynamics, Utah.
- Aug. '17 TA: Analysis Qualifying Exam Prep. for incoming PhD students, Ohio State.

Professional Experience

- Feb-May '13 **INRIA** Rhone Alpes, Lyon, France, Research Assistant: Mathematical Neuroscience.
- 2011-2012 **Microsoft**, Cairo, Software Engineer: Machine Learning and Image Processing.

Earlier Awards & Scholarships

- 2013-2014 University Fellowship: 1 year teaching relief, Ohio State.
- May 2011 Microsoft Technology Transfer Award for contributing a research application 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.