Omar Melikechi

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EMPLOYMENT

Assistant Professor, Duke University   July 2025 – Present
Department of Statistical Science
Department of Mathematics (secondary)

Postdoctoral Fellow, Harvard T.H. Chan School of Public Health   September 2023 – June 2025
Department of Biostatistics
Supervisor: Jeffrey W. Miller

Associate in Research, Duke University   January 2023 – August 2023
Department of Statistical Science
Supervisor: David B. Dunson

EDUCATION

Ph.D. in Mathematics, Duke University   August 2017 – December 2022
Thesis: "Random splitting of fluid models: Ergodicity, convergence, and chaos"
Advisor: Jonathan C. Mattingly

Postgraduate studies, University of Arizona   May 2015 – May 2017
Department of Mathematics

B.A. in Government, Dartmouth College   September 2009 – June 2013

AWARDS

Rudin Prize nominee (did not win)   2023
Awarded annually for most outstanding Ph.D. dissertation in the Duke Math Department

L.P. Smith Award for Teaching Excellence   2020
Presented annually to one or two graduate students in the Duke Math Department who have demonstrated a long-term commitment to teaching and reached a consistent level of excellence

PUBLICATIONS

Integrated path stability selection   2025
O. Melikechi and J.W. Miller
Journal of the American Statistical Association

Nonparametric IPSS: Fast, flexible feature selection with false discovery control   2025
O. Melikechi, D.B. Dunson, and J.W. Miller
Bioinformatics

Identification of blood plasma protein ratios for distinguishing   2025
Alzheimer's disease from healthy controls using machine learning
A.Safi, E. Giunti, O. Melikechi, W. Xia, N. Melikechi
Heliyon

Ellipsoid fitting with the Cayley transform   2023
O. Melikechi and D.B. Dunson
IEEE Transactions on Signal Processing

Random splitting of fluid models: Ergodicity and convergence	2022

A. Agazzi, J.C. Mattingly, and O. Melikechi
Communications in Mathematical Physics

Limits of epidemic prediction using SIR models	2022

O. Melikechi, A.L. Young, T. Tang, T. Bowman, D.B. Dunson, and J. Johndrow
Journal of Mathematical Biology

Hitting time of Brownian motion subject to shear flow	2022

D. Chouliara, Y. Gong, S. He, A. Kiselev, J. Lim, O. Melikechi, and K. Powers
Involve: A Journal of Mathematics

PREPRINTS

Local graph estimation: Interpretable network discovery for complex data	2025

O. Melikechi, D.B. Dunson, N. Melikechi, and J.W. Miller
https://arxiv.org/abs/2507.17172

Sequential Gibbs posteriors with applications to principal component analysis	2023

S. Winter, O. Melikechi, and D.B. Dunson
https://arxiv.org/abs/2310.12882

Random splitting of fluid models: Positive Lyapunov exponents	2022

A. Agazzi, J.C. Mattingly, and O. Melikechi
https://arxiv.org/abs/2210.02958

TEACHING

Teaching assistant, Duke University	Spring 2021

Stochastic calculus (Math 545)

Instructor, Duke University	Fall 2020

Probability (Math/Stat 230)

Teaching assistant, Duke University	Spring 2020

Multivariable calculus and linear algebra (Math 202)

Instructor, Duke University	Fall 2019

Calculus I (Math 106L)

Instructor, Duke University	Fall 2018

Calculus I (Math 105L)

Teaching assistant, Duke University	Fall 2017

Calculus I (Math 105L)

Teaching assistant, University of Arizona	Spring 2017

Ordinary differential equations (Math 254)

Teaching assistant, University of Arizona	Fall 2016

Calculus I seminar (Math 196M)

Teaching assistant, University of Arizona	Spring 2016

Introduction to number theory and modern algebra (Math 315)

UNDERGRADUATE MENTORING

REU project manager, Duke University	Spring 2022

Fluid mixing and conservative flows
Participants: Sara Azimi, Daniel Block, Rachel Odonkor, Keenan Powers, and Marie-Helene Tome

DOmath project manager, Duke University   Summer 2021
Parameter inference in epidemiological models
Participants: Trevor Bowman, Jenny Huang, Greg Orme, and Pranay Pherwani

DOmath project manager, Duke University   Summer 2020
PDE modeling of collective motion
Participants: Despina Chouliara, James Lim, and Keenan Powers

INVITED TALKS

Invited speaker, Dominici Lab group meeting   Boston, MA, August 2025
Harvard T.H. Chan School of Public Health

Invited speaker, Statistics and data science seminar   Amherst, MA, September 2024
University of Massachusetts Amherst

Invited speaker, Cancer working group seminar   Boston, MA, September 2024
Harvard School of Public Health and the Dana-Farber Cancer Institute

Invited speaker, Mathematics of machine learning   Cortona, Italy, September 2024
The National Institute for Advanced Mathematics (INdAM)

Accepted talk (unable to attend), ISBA World Meeting   Venice, Italy, July 2024
International Society for Bayesian Analysis

Session organizer, New England Statistics Symposium   Storrs, CT, May 2024
Session title: New methods for robust inference and selection

PROFESSIONAL SERVICE

Reviewer   2025
Journal of Computational and Graphical Statistics, Briefings in Functional Genomics

Student research awards judge   May 2024
New England Statistics Symposium

Math Department Teaching Committee, Duke University   August 2020 – December 2022

First year Ph.D. bootcamp, Duke University   August 2022
Linear algebra instructor and research panelist

New Connections in Math, Duke University   October 2021
Panelist for undergraduate students interested in applied math

OTHER RESEARCH ACTIVITIES

Short term visitor, Institute for Advanced Study   December 2021

MSRI summer school, Cortona, Italy   Summer 2019
Homotopy principle

Undergraduate summer school, Park City Math Institute   Summer 2016
The mathematics of data

Independent study, University of Arizona   Spring 2016
Finite reflection groups with an emphasis on Coxeter groups
Supervisor: Klaus Lux

Independent study, University of Arizona   Fall 2015
Structure of the space of Laurent polynomials over arbitrary fields
Supervisor: Bryden Cais

Research intern, Delaware State University   Summers 2008 and 2010
Department of Physics

OTHER WORK EXPERIENCE

The Advisory Board Company, Washington D.C.   October 2014 – March 2015
Revenue associate, Member Services Strategy and Operations

International Rescue Committee, Phoenix, AZ   February 2014 – September 2014
AmeriCorps VISTA, employment retention specialist

Omar's Rickshaw, Dewey Beach, DE   Summers 2012, 2013, and 2017
Owner and operator

Cape Henlopen State Park, Lewes, DE   Summer 2012
Tour guide and museum manager