

# Daesung Kim

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## Employment

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| <b>Visiting Assistant Professor</b><br><i>Georgia Institute of Technology</i>                       | July 2022–Present     |
| <b>J. L. Doob Research Assistant Professor</b><br><i>University of Illinois at Urbana–Champaign</i> | August 2019–July 2022 |

## Education

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| <b>Purdue University</b><br><i>Ph.D. Mathematics, Advisor: Rodrigo Bañuelos</i>                    | August 2019 |
| <b>Seoul National University, South Korea</b><br><i>M.A. Mathematics, Advisor: Prof. Panki Kim</i> | August 2013 |
| <b>Seoul National University, South Korea</b><br><i>B.S. Mathematics &amp; B.A. Economics</i>      | August 2011 |

## Publications and Preprints

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- Curie–Weiss model under  $\ell^p$ -constraint**  
(with Partha S. Dey) preprint
- Collaboration of Random Walks on Graphs**  
(with Partha S. Dey and Grigory Terlov) arXiv:2302.14241, submitted
- Sharp  $\ell^p$  inequalities for discrete singular integrals**  
(with Rodrigo Bañuelos and Mateusz Kwaśnicki) arXiv:2209.09737, submitted
- Fluctuation results for size of the vacant set for random walks on discrete torus**  
(with Partha S. Dey) arXiv:2108.06450, submitted
- Quantitative Inequalities for the Expected Lifetime of Brownian Motion**  
*Michigan Math. J.* **70** (2021), no. 3, 615–634
- Instability results for the logarithmic Sobolev inequality and its application to related inequalities**  
*Discrete Contin. Dyn. Syst.* **42** (2022), no. 9, 4297–4320
- Deficit estimates for the logarithmic Sobolev inequality**  
(with Emanuel Indrei) *Differential Integral Equations* **34** (2021), no. 7-8, 437–466
- Hardy–Stein identity for non-symmetric Lévy processes and Fourier multipliers**  
(with Rodrigo Bañuelos) *J. Math. Anal. Appl.* **480** (2019), no. 1, 123383–123403
- Martingale transforms and the Hardy–Littlewood–Sobolev inequality for semigroups**  
*Potential Anal.* **45** (2016), no. 4, 795–807

## Talks

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SIAM Great Lakes Meeting <i>Michigan State University</i> <i>Mini-Symposium: Modern themes in calculus of variations</i>	October 2023
Stochastic Seminar <i>Georgia Institute of Technology</i>	September 2023
Probability seminar <i>Purdue University</i>	May 2023
Probability seminar <i>University of Illinois at Urbana-Champaign</i>	May 2023
Stochastic Seminar <i>Georgia Institute of Technology</i>	November 2022
Analysis, PDE and Probability Seminar <i>KIAS, South Korea</i>	June 2022
Probability Seminar <i>Seoul National University, South Korea</i>	May 2022
Undergraduate Seminar <i>University of Illinois at Urbana-Champaign</i>	April 2022
AMS Spring Central Virtual Sectional Meeting <i>Special session on the Interface Between Nonlinear PDEs, Harmonic Analysis, and Quantitative Geometric and Functional Inequalities</i>	March 2022
AMS Spring Central Virtual Sectional Meeting <i>Special session on Spectral Estimation and Optimization</i>	March 2022
Analysis seminar <i>University of Illinois at Chicago</i>	March 2022
Probability seminar <i>University of Illinois at Urbana-Champaign</i>	October 2021
AMS Spring Central Sectional Meeting <i>University of Cincinnati, in Zoom</i> <i>mini session on Probabilistic and diffusion methods in analysis and geometry</i>	April 2021
Theory of Markov Semigroups and Schrödinger Operators <i>Wroclaw University of Technology, in Zoom</i>	March 2021
Geometric and functional inequalities and recent topics in nonlinear PDEs <i>Purdue University, in Zoom</i>	March 2021
Seminar on Non-local operators, probability and singularities <i>in Zoom</i>	October 2020
AIMS Conference on Dynamical Systems, Differential Equations and Applications <i>Atlanta, USA</i> <i>Special session on PDEs and related topics (invited and canceled due to Covid)</i>	June 2020
International Conference on Elliptic and Parabolic Problems <i>Gaeta, Italy</i>	May 2019

AMS Spring Eastern Sectional Meeting <i>University of Connecticut Hartford</i> <i>Special session on Stochastic processes</i>	April 2019
Probability seminar <i>University of Illinois at Urbana–Champaign</i>	April 2019
Probability seminar <i>Purdue University</i>	February 2019
Probability seminar <i>Seoul National University, South Korea</i>	March 2018
Probability seminar <i>Purdue University</i>	September 2017
Probability seminar <i>University of Illinois at Urbana–Champaign</i>	March 2017
Probability seminar <i>Purdue University</i>	February 2016

## Grants

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AMS–Simons Travel Grant	2022–2024
Graduate Student International Travel Grant, <i>Purdue University</i>	2019
Purdue University Graduate School Summer Research Grant	2015–2018
BK21 Grant, <i>National Research Foundation of Korea</i>	2011–2012
National Science Scholarship, <i>Korean Student Aid Foundation</i>	2006–2011

## Service

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Referees for several journals	
Co-organizer of UIUC Probability Seminar	Spring 2019–Spring 2022
Mentor of Illinois Geometry Lab <i>undergraduate research program</i>	Fall 2021, Spring 2022
Graduate reading course <i>Topic: Stability for spectral inequalities</i>	Fall 2021

## Teaching

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### Georgia Institute of Technology

MATH 1554: Linear Algebra (2 sections)	Fall 2023
MATH 3215: Intro to Probability and Statistics	Summer 2023
MATH 1554: Linear Algebra (2 sections)	Spring 2023

### University of Illinois at Urbana-Champaign

MATH 595: Topic in Functional and Geometric Inequalities	Spring 2022
MATH 461: Probability Theory	Spring 2022

MATH 403: Euclidean Geometry	Fall 2021
MATH 461: Probability Theory (2 sections)	Spring 2021
MATH 285: Differential Equations	Fall 2020
MATH 285: Differential Equations (2 sections)	Spring 2020
MATH 416: Abstract Linear Algebra	Fall 2019