

Hyunwoo Kwon (Will Kwon)

Ph. D. student
Division of Applied Mathematics
Brown University
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Education

Brown University Providence, RI, USA
Ph. D. candidate in the Division of Applied Mathematics Aug. 2022 – Present
Thesis Advisor : Prof. Hongjie Dong

Sogang University Seoul, Korea
M.S. in Mathematics Feb. 2017 – Feb. 2019
Thesis Advisor : Prof. Hyunseok Kim
Thesis: Dirichlet and Neumann problems for elliptic equations with singular drifts on Lipschitz domains

Sogang University Seoul, Korea
B.S. in Mathematics, *Summa Cum Laude* Feb. 2013 – Feb. 2017

Employment

Researcher Seoul, Korea
Sogang University Jun. 2022 – July. 2022

Full-time lecturer with the rank Lieutenant Cheongju, Korea
Republic of Korea Air Force Academy Aug. 2019 – May. 2022

Research Interests

Partial differential equations, Real variable methods in harmonic analysis

Publication and Preprints

1. *Global solutions to Stokes-Magneto equations with fractional dissipations*, with H. Bae and J. Shin, [arXiv:2310.03255 \[math.AP\]](#)
2. *Interior and boundary mixed derivative estimates for nonstationary Stokes equations*, with H. Dong, [arXiv:2308.09220 \[math.AP\]](#)
3. *Global existence and uniqueness of weak solutions of a Stokes-Magneto system with fractional diffusions*, with H. Kim, *J. Differential Equations* 374(2023), 497–547, [arXiv:2302.02046 \[math.AP\]](#)

4. *Elliptic equations in divergence form with drifts in L^2* , *Proc. Amer. Math. Soc.* 150(2022), no. 8, 3415–3429, [arXiv:2104.01300 \[math.AP\]](#)
5. *Existence and uniqueness of weak solution in $W^{1,2+\varepsilon}$ for elliptic equation with drifts in weak- L^n spaces*, *J. Math. Anal. Appl.* 500(1) (2021) 125165, [arXiv:2011.07524 \[math.AP\]](#)
6. *Dirichlet and Neumann problems for elliptic equations with singular drifts on Lipschitz domains*, with H. Kim, *Trans. Amer. Math. Soc.* 375 (2022), 6537-6574, [arXiv:1811.12619 \[math.AP\]](#)

Awards, Grants & Honours

BK Plus Scholarship, Sogang University	2017
Albatross Fellowship (full funding support, 2 years), Sogang University	2017
President prize for highest achievement in academic(1%), Sogang University	2015
Dean's List of Natural Science, Sogang University for highest achievement in academic	2014
Full Funding Scholarship(7 semesters) from Hyundai Chung Mong-Koo Foundation	2013

Teaching

Recitation Instructor and Grader Providence, RI, USA
 Brown University Sep. 2023 – Present
 – 2023-Fall APMA 1210 Operational Research: deterministic models (Dr. Amalia Culiuc)

Lecturer Cheongju, Korea
 Republic of Korea Air Force Academy Sep. 2019 – May. 2022.
 – 2022-1 Calculus (2 classes), Engineering Mathematics II
 – 2021-2 Linear Algebra (Humanities, 2 classes), (Science, 1 class)
 – 2021-1 Calculus (Science, 2 classes), Engineering Mathematics I
 – 2020-2 Linear Algebra (Humanities), Engineering Mathematics I, Engineering Mathematics II
 – 2020-1 Calculus (Humanities), Engineering Mathematics I (2 classes)
 – 2019-2 Linear Algebra (Science, 3 classes), Engineering Mathematics I

Coordinator of Undergraduate Seminar in Sogang Math Honors Club Seoul, Korea
 Sogang University Apr. 2017 – Aug. 2017
 – 2017-1 Introduction to Hilbert Spaces

Recitation Instructor and Grader Seoul, Korea
 Sogang University Mar. 2017 – Feb. 2019
 – 2018-2 Advanced calculus II (Recitation instructor, Grading)
 – 2018-1 Advanced calculus I, Theory of complex variable I (Grading)
 – 2017-2 Advanced calculus II (Recitation instructor, Grading)
 – 2017-1 Advanced calculus I (Recitation instructor)

Mathematics Tutor Seoul, Korea
 Sogang University Mar. 2016 – Dec. 2016
 – Worked as a tutor at Sogang Mathematics Learning Center
 – Helped several subjects which use mathematics

Talks in Mathematics

Interior and boundary mixed derivative estimates for nonstationary Stokes equations	Jan. 2024
2024 Joint Mathematical Meeting	
Elliptic equations with singular drifts on Lipschitz domains	Nov. 2023
Analysis seminar, Temple University	
Interior and boundary mixed derivative estimates for nonstationary Stokes equations	Nov. 2023
Poster session in Prairie Analysis Seminar, Kansas State University	
Interior and boundary mixed derivative estimates for nonstationary Stokes equations	Oct. 2023
PDE and Differential Geometry seminar, University of Connecticut	
Interior mixed derivative estimates for nonstationary Stokes equations	Jun. 2023
PDE & Applied Analysis Seminar, Sogang University	
On global weak solutions of a Stokes-Magneto system with fractional diffusions	Mar. 2023
2023 AMS Spring Southeastern Sectional Meeting	
On global weak solutions of a Stokes-Magneto system with fractional diffusions	Mar. 2023
APMA Graduate students seminar	
A role of pressure in the regularity theory of Navier-Stokes equations	Feb. 2023
GLESPA seminar at Brown	
Elliptic equations with singular drifts on planar domains	Oct. 2022
APMA Graduate students seminar	
Elliptic equations with singular drifts	Jun. 2022
PDE seminar, UNIST	
Survey on Landau damping	Jun. 2022
PDE and Applied Analysis Seminar, POSTECH	
Elliptic equations in divergence form with drifts in L^2	Apr. 2022
Contribution talks in Analysis session, 2022 Spring Meeting of KMS	
Elliptic equations with singular drifts on planar domains	Jan. 2022
Workshop for young mathematicians in Korea	
$W^{1,2+\varepsilon}$-results for elliptic equations with singular drifts in weak L^n-spaces	Apr. 2021
Contribution talks in Analysis session, 2021 Spring Meeting of KMS	
$W^{1,2+\varepsilon}$-results for elliptic equations with drifts in weak L^n-spaces	Jan. 2021
KIAS Analysis, PDE & Probability Seminar	
Elliptic equations with singular drifts on Lipschitz domains	Sep. 2020
HA-GMT-PDE seminar at University of Minnesota	
Elliptic equations with singular drifts on Lipschitz domains	Dec. 2019
KIAS Analysis, PDE & Probability Seminar	

Neumann problems for elliptic equations with singular drifts on Lipschitz domains

Contribution talks in Analysis session, 2019 Spring Meeting of KMS Oct. 2019

Elliptic equations with singular drifts on Lipschitz domains

IBS-CGP Seminar Jan. 2019

L^2 -boundedness of the Cauchy integral operator on Lipschitz curves

KIAS Analysis&PDE Learning seminar Oct. 2018

Dirichlet problems for elliptic equations with singular drifts in Lipschitz domains

Contribution talks in Analysis session, 2018 Joint Meeting of KMS and DMV Oct. 2018

Dirichlet problems for elliptic equations with singular drifts in Lipschitz domains

Graduate student seminar, Yonsei University Sep. 2018

The resolution of Hilbert's 19th problem

Graduate student seminar, Sogang University Sep. 2018

Elliptic equations with singular drifts on Lipschitz domains

Workshop for students in Analysis and PDE Jul. 2018

Work Experience

L^AT_EX Technician

Freelancer

Seoul, Korea

Mar. 2014 – Feb. 2019

- Made several books with Kyungmoon Publisher and the others
- Technical Editor for Publication of ICM 2014 Seoul, Korea

Academic Services

Journal Referee

Comm. Pure. Appl. Anal.(1)

Organizer of workshop

2023 Guide to admissions to graduate schools for Sogang alumni

Seoul, Korea (hybrid)

Jan. 2023 – Jul. 2023

About 300 participants with 9 independent sessions

Organizer of seminar

Graduate Lecture series in Analysis and PDEs (GLESPA)

Providence, RI, USA

Jan. 2023 – Present

Co-organized with T. G. Borges: [homepage](#)

Organizer of workshop

Workshop for young mathematicians in Korea

Cheongju, Korea

Jan. 2022

Co-organized with D.-Y. Ko (Rutgers Univ.) and B. Sohn (SNU) : [homepage](#)

Organizer of workshop

Workshop for students in Analysis and PDE

Seoul, Korea

Jul. 2018

Co-organized with H. Kim (Sogang Univ.), Y.-R. Lee (Sogang Univ.) and S. W. Ryou (SNU) : [homepage](#)

Conference and Workshop Attended (will attend)

- Fluids in Seoul 2024, KIAS, Seoul, Korea, Jan. 15 – Jan. 19, 2024.
- Joint Mathematics Meetings 2024, San Fransisco, CA, USA, Jan. 3 – Jan 6, 2024.
- 19th Prairie Analysis Seminar, Kansas State University, KS, USA, Nov. 3 – Nov. 4, 2023.
- Summer School: Fluid Dynamics, University of Maryland, MD, USA, Jul. 17 – Jul. 21, 2023.
- PDE in Seoul 2023: Conference in honor of Professor Mikhail Safonov's 70th birthday, Yonsei University, Seoul, Korea, Jun. 19 – Jun. 23, 2023.
- 2023 AMS Spring Southeastern Sectional Meeting, Georgia Tech, Atlanta, GA, USA, Mar. 18 – Mar. 19, 2023.
- Joint Mathematics Meetings 2023, Boston, MA, USA, Jan. 4 – Jan 7, 2023.
- Intensive lectures on the Cauchy problems for quasilinear PDEs by Prof. Sung-Jin Oh, Online via Zoom, Jul. 26, 2021 – Jul. 30, 2021.
- Yonsei Ewha Sogang Seminar on Analysis & PDEs, Online via Zoom, Jan. 20, 2021.
- Workshop on Harmonic Analysis Techniques for PDEs, JBNU, Jeonju, Korea, Feb. 13, 2019 – Feb. 14, 2019.
- The 3rd meeting of Young PDE researchers in PDEs, KIAS, Seoul, Korea, Dec. 13, 2018 – Dec. 14, 2018.
- Workshop for students in Analysis and PDE(as a orgainzer and speaker), Sogang Univ., Seoul, Korea, Jul. 12, 2018 – Jul. 13, 2018.
- Dynamics of partial differential equations, KAIST, Daejeon, Jun. 27, 2018 – Jun. 29, 2018.
- 2018 Korea PDE School #8, NIMS, Daejeon, Jan. 29, 2018 – Feb. 02, 2018.
- Minicourse: General relativity in spherical symmetry, KIAS, Apr. 07, 2017 – Apr. 28, 2017.
- Lecture Series on various topics in PDEs, KIAS, Seoul, Korea, Feb. 13, 2017 – Feb. 17, 2017 / Feb. 20, 2017 – Feb. 24, 2017.
- 2017 Korea PDE School #7, NIMS, Daejeon, Jan. 16, 2017 – Jan. 20, 2017.
- 2016 CMC Foundations for Mathematical Challenge: Solitons in the Korteweg-de Vries equations, inverse scattering approaches, KIAS, Seoul, Korea, Aug. 22, 2016 – Aug. 26, 2016.
- IBS-CGP Mathematics Festival 2016, IBS Center for Geometry and Physics, Pohang, Jul. 18, 2016 – Jul. 22, 2016.
- 7th Workshop on PDEs of Mathematical Physics, UNIST, Ulsan, Jan. 14, 2016 – Jan. 16, 2016.

Updated: November 11, 2023