

Hyunwoo Kwon (Will Kwon)

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

Brown University

Ph. D. candidate in the Division of Applied Mathematics

Thesis Advisor : Prof. Hongjie Dong

Providence, RI, USA

Aug. 2022 – Present

Sogang University

M.S. in Mathematics

Thesis Advisor : Prof. Hyunseok Kim

Thesis: Dirichlet and Neumann problems for elliptic equations with singular drifts on Lipschitz domains

Seoul, Korea

Feb. 2017 – Feb. 2019

Sogang University

B.S. in Mathematics, *Summa Cum Laude*

Seoul, Korea

Feb. 2013 – Feb. 2017

Employment

Researcher

Sogang University

Seoul, Korea

Jun. 2022 – July. 2022

Assistant Professor with the rank First Lieutenant

Republic of Korea Air Force Academy

Cheongju, Korea

Sep. 2020 – May. 2022

Lecturer with the rank Second Lieutenant

Republic of Korea Air Force Academy

Cheongju, Korea

Aug. 2019 – Sep. 2020

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

Brown University

Providence, RI, USA

Sep. 2023 – Present

- 2024-Spring APMA 0360 Applied Partial Differential Equations I (Dr. Timur Yastrzhembskiy)
- 2023-Fall APMA 1210 Operational Research: deterministic models (Dr. Amalia Culiuc)

Lecturer

Republic of Korea Air Force Academy

Cheongju, Korea

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

Sogang University

Seoul, Korea

Apr. 2017 – Aug. 2017

- 2017-1 Introduction to Hilbert Spaces

Recitation Instructor and Grader

Sogang University

Seoul, Korea

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

Sogang University

Seoul, Korea
Mar. 2016 – Dec. 2016

- Worked as a tutor at Sogang Mathematics Learning Center
- Helped several subjects which use mathematics

Talks in Mathematics**Boundary mixed norm estimates for non- stationary Stokes equations under no-slip conditions**

2024 AMS New England Graduate Student Conference

Apr. 2024

Interior and boundary mixed derivative estimates for nonstationary Stokes equations

2024 Joint Mathematical Meeting

Jan. 2024

Elliptic equations with singular drifts on Lipschitz domains

Analysis seminar, Temple University

Nov. 2023

Interior and boundary mixed derivative estimates for nonstationary Stokes equations

Poster session in Prairie Analysis Seminar, Kansas State University

Nov. 2023

Interior and boundary mixed derivative estimates for nonstationary Stokes equations

PDE and Differential Geometry seminar, University of Connecticut

Oct. 2023

Interior mixed derivative estimates for nonstationary Stokes equations

PDE & Applied Analysis Seminar, Sogang University

Jun. 2023

On global weak solutions of a Stokes-Magneto system with fractional diffusions

2023 AMS Spring Southeastern Sectional Meeting

Mar. 2023

On global weak solutions of a Stokes-Magneto system with fractional diffusions

APMA Graduate students seminar

Mar. 2023

A role of pressure in the regularity theory of Navier-Stokes equations

GLESPA seminar at Brown

Feb. 2023

Elliptic equations with singular drifts on planar domains

APMA Graduate students seminar

Oct. 2022

Elliptic equations with singular drifts

PDE seminar, UNIST

Jun. 2022

Survey on Landau damping

PDE and Applied Analysis Seminar, POSTECH

Jun. 2022

Elliptic equations in divergence form with drifts in L^2

Contribution talks in Analysis session, 2022 Spring Meeting of KMS

Apr. 2022

Elliptic equations with singular drifts on planar domains

Workshop for young mathematicians in Korea

Jan. 2022

 $W^{1,2+\varepsilon}$ -results for elliptic equations with singular drifts in weak L^n -spaces

Contribution talks in Analysis session, 2021 Spring Meeting of KMS

Apr. 2021

$W^{1,2+\varepsilon}$-results for elliptic equations with drifts in weak L^n-spaces	
KIAS Analysis, PDE & Probability Seminar	Jan. 2021
Elliptic equations with singular drifts on Lipschitz domains	
HA-GMT-PDE seminar at University of Minnesota	Sep. 2020
Elliptic equations with singular drifts on Lipschitz domains	
KIAS Analysis, PDE & Probability Seminar	Dec. 2019
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

About 300 participants with 9 independent sessions

Seoul, Korea (hybrid)

Jan. 2023 – Jul. 2023

Organizer of seminar

Graduate Lecture series in Analysis and PDEs (GLESPA)

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

Providence, RI, USA

Jan. 2023 – Present

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. Ryoo (SNU) : [homepage](#)**Founder and Organizer of Undergraduate Mathematics Seminar**United Mathematics club in Korea : [Stupid Mathematics Seminar](#)

Seoul, Korea

Feb. 2014 – Feb. 2016

Conference and Workshop Attended (will attend)

- Rivi re-Fabes Symposium on Analysis and PDE, University of Minnesota, MN, USA, Apr. 19 – Apr. 21, 2024.
- AMS New England AMS Grad Student Conference, Brown University, RI, USA, Apr. 13, 2024.
- 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: March 3, 2024