Hyunwoo Kwon (Will Kwon)

Ph. D. student
Division of Applied Mathematics
Brown University
hyunwoo_kwon@brown.edu

Education

Brown University   Providence, RI, USA
Ph. D. candidate in the Division of Applied Mathematics   Aug. 2022 – Present

   Thesis Advisor : Prof. Hongjie Dong

Brown University   Providence, RI, USA
Sc. M. in Applied Mathematics   Aug. 2022 – May. 2024

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

Assistant Professor with the rank First Lieutenant   Cheongju, Korea
Republic of Korea Air Force Academy   Sep. 2020 – May. 2022

Lecturer with the rank Second Lieutenant   Cheongju, Korea
Republic of Korea Air Force Academy   Aug. 2019 – Sep. 2020

Research Interests

Partial differential equations, Real variable methods in harmonic analysis

Publication and Preprints

1. *Spatial C^1, C^2, and Schauder estimates for Nonstationary Stokes equations with Dini mean oscillation coefficients*, with H. Dong, arXiv:2412.20125 [math.AP]

2. *Boundary mixed norm estimates for nonstationary Stokes equations on domains with curved boundary*, with H. Dong, arXiv:2408.17321 [math.AP]

3. *Scattering of the Vlasov-Riesz system in three dimensions*, with W. Huang, arXiv:2407.16919 [math.AP]

4. *Global solutions to Stokes-Magneto equations with fractional dissipations*, with H. Bae and J. Shin, arXiv:2310.03255 [math.AP]

5. *Interior and boundary mixed derivative estimates for nonstationary Stokes equations*, with H. Dong, arXiv:2308.09220 [math.AP]

6. *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]

7. *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]

8. *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]

9. *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 2017–2019
Albatross Fellowship (full funding support, 2 years), Sogang University 2017–2019
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 from Hyundai Chung Mong-Koo Foundation 2013–2017

Teaching

Instructor — Providence, RI, USA
Brown University — Jun. 2025 – Jul. 2025
  – 2025-Summer APMA 1210 Operational Research: deterministic models

Recitation Instructor and Grader — Providence, RI, USA
Brown University — Sep. 2023 – Present
  – 2025-Spring
  – 2024-Summer APMA Bridge Course in Analysis (Dr. Peyam Tabrizian)
  – 2024-Spring APMA 0360 Applied Partial Differential Equations I (Dr. Timur Yastrzhembskiy)
  – 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

Winter School: Boundary and Singularity in Fluid Mechanics, Stony Brook University	Jan. 2025
GLESPA seminar at Brown	Nov. 2024
PDE and Applied Analysis Seminar, POSTECH (online)	Sep. 2024
Poster session in Spectral Analysis of Schrödinger operators, ICERM	Aug. 2024
PDE seminar, Yonsei University (online)	Aug. 2024
Nonlinear PDEs Summer School, UC Berkeley	Jun. 2024
Poster session in Rivière-Fabes Symposium on Analysis and PDE, University of Minnesota	Apr. 2024
2024 AMS New England Graduate Student Conference	Apr. 2024
BK Seminar for Graduate Students, Yonsei University	Mar. 2024
GLESPA seminar at Brown	Mar. 2024
AMS Special Session on Dynamics and Regularity of PDEs, 2024 Joint Mathematical Meeting	Jan. 2024
Analysis seminar, Temple University	Nov. 2023

Poster session in Prairie Analysis Seminar, Kansas State University	Nov. 2023
PDE and Differential Geometry seminar, University of Connecticut	Oct. 2023
PDE & Applied Analysis Seminar, Sogang University	Jun. 2023
Special Session on Dynamics of Partial Differential Equations, 2023 AMS Spring Southeastern Sectional Meeting	Mar. 2023
APMA Graduate students seminar	Mar. 2023
GLESPA seminar at Brown	Feb. 2023
APMA Graduate students seminar	Oct. 2022
PDE seminar, UNIST	Jun. 2022
PDE and Applied Analysis Seminar, POSTECH	Jun. 2022
Contribution talks in Analysis session, 2022 Spring Meeting of KMS (online)	Apr. 2022
Workshop for young mathematicians in Korea (online)	Jan. 2022
Contribution talks in Analysis session, 2021 Spring Meeting of KMS (online)	Apr. 2021
KIAS Analysis, PDE & Probability Seminar (online)	Jan. 2021
HA-GMT-PDE seminar at University of Minnesota (online)	Sep. 2020
KIAS Analysis, PDE & Probability Seminar	Dec. 2019
Contribution talks in Analysis session, 2019 Spring Meeting of KMS	Oct. 2019
IBS-CGP Seminar	Jan. 2019
KIAS Analysis&PDE Learning seminar	Oct. 2018
Contribution talks in Analysis session, 2018 Joint Meeting of KMS and DMV	Oct. 2018
Graduate student seminar, Yonsei University	Sep. 2018
Graduate student seminar, Sogang University	Sep. 2018
Workshop for students in Analysis and PDE	Jul. 2018

Work Experience

LaTeX Technician　　　　　　　　　　　　　　　　　　　　　　　Seoul, Korea
Freelancer　　　　　　　　　　　　　　　　　　　　　　　Mar. 2014 – Feb. 2019
  – Made several books with Kyungmoon Publisher and the others
  – Technical Editor for Publication of ICM 2014 Seoul, Korea

Academic Services

APMA committee
– Graduate Student Representative in APMA (2024–2025)
– Graduate Student Council member as a reprsentative of APMA (2024–)
– DEI committee member (graduate student subcommittee) (2024–)

Journal Referee
J. Math. Anal. Appl., Comm. Pure. Appl. Anal., J. Differential Equations, Comm. PDEs(2)

Organizer of learning seminar   Providence, RI, USA
Recent developments in surface water waves   Sep. 2024 – Dec. 2024

Organizer of seminar   Providence, RI, USA
Graduate Lecture series in Analysis and PDEs (GLESPA)   Jan. 2023 – Present
 Co-organized with T. G. Borges: homepage

Organizer of learning seminar   Providence, RI, USA
Harmonic analysis related to PDEs   Sep. 2023 – Dec. 2023

Organizer of workshop   Cheongju, Korea
Workshop for young mathematicians in Korea   Jan. 2022
 Co-organized with D.-Y. Ko (Rutgers Univ.) and B. Sohn (SNU) : homepage

Organizer of workshop   Seoul, Korea
Workshop for students in Analysis and PDE   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   Seoul, Korea
United Mathematics club in Korea : Stupid Mathematics Seminar   Feb. 2014 – Feb. 2016

Conference and Workshop Attended (will attend)

- Rivière-Fabes Symposium on Analysis and PDE, University of Minnesota, MN, USA, Apr. 25 – Apr. 27, 2025.

- 2025 AMS Spring Eastern Sectional Meeting, University of Connecticut, CT, USA, Apr. 5 – Apr. 6, 2025.

- Workshop on Kinetic Theory and Fluids, University of Wisconsin-Madison, WI, USA, Mar. 28 – Mar. 30, 2025.

- Winter School: Boundary and Singularity in Fluid Mechanics, Stony Brook University, NY, USA, Jan. 6 – Jan. 10, 2025.

- Spectral Analysis of Schrödinger Operators, ICERM, RI, USA, Aug. 19 – Aug. 23, 2024.

- Nonlinear PDEs Summer School at UC Berkeley, UC Berkeley, CA, USA, Jun. 12 – Jun. 14, 2024.

- Recent Advances in Nonlinear Partial Differential Equations, University of Minnesota, MN, USA, May 13 – May 17, 2024.

- Rivière-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: January 1, 2025