Hyunju Kwon

CONTACT
INFORMATION

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ACADEMIC
POSITION

ETH Zürich, Zürich, Switzerland   **2022 - 2024**

Hermann-Weyl-Instructor

- Mentor: Alessio Figalli

Institute for Advanced Study, Princeton, NJ, USA   **2019 - 2022**

Member in School of Mathematics

- Mentor: Camillo De Lellis
- Participated in "H-principle and Flexibility in Geometry and PDEs"
  (Sep 2021 - Feb 2022)

EDUCATION

University of British Columbia, Vancouver, BC, Canada   **2013 - 2019**

Ph.D. in Mathematics

- Started with M.Sc. program and transferred to Ph.D. in 2014
- Advisors: Dong Li and Tai-Peng Tsai
- Thesis: Existence and ill-posedness for fluid PDEs with rough data

Sungkyunkwan University, Suwon, South Korea   **2009 - 2013**

B.S. in Mathematics

- Bachelor's essay: The derivation of the Boltzmann equation

RESEARCH AND
PUBLICATION

Preprints.

- The L^3-based strong Onsager theorem, *arXiv:2305.18509*, 2023
  (with Vikram Giri and Matthew Novack)
- A wavelet-inspired L^3-based convex integration framework for the Euler equations, *arXiv:2305.18142*, 2023 (with Vikram Giri and Matthew Novack)

Journal articles.

- The role of the pressure in the regularity theory for the Navier-Stokes equations, *Journal of Differential Equations*, 2023
- On non-uniqueness of continuous entropy solutions to the isentropic compressible Euler equations, *Archive for Rational Mechanics and Analysis*, 2022
  (with Vikram Giri)
- Local regularity of weak solutions of the hypodissipative Navier-Stokes equations, *Journal of Functional Analysis*, 2022 (with Wojciech S. Ożański)
- On non-uniqueness of Hölder continuous globally dissipative Euler flows, *Analysis and PDE*, 2022 (with Camillo De Lellis)

- Non-uniqueness of steady-state weak solutions to the surface quasi-geostrophic equations, *Communications in Mathematical Physics*, 2021
  (with Xinyu Cheng and Dong Li)
- On bifurcation of self-similar solutions of the stationary Navier-Stokes equations, *Communications in Mathematical Sciences*, 2021 (with Tai-Peng Tsai)
- Strong ill-posedness of logarithmically regularized 2D Euler equations in the critical Sobolev space, *Journal of Functional Analysis*, 2020
- Global Navier-Stokes flows for non-decaying initial data with slowly decaying oscillation, *Communications in Mathematical Physics*, 2020 (with Tai-Peng Tsai)

Lecture notes.

- Instability and nonuniqueness for the 2D Euler equations in vorticity form, after M. Vishik, *Annals of Mathematics Studies*, 2024
  (with D. Albritton, E. Brué, M. Colombo, C. De Lellis, V. Giri, and M. Janisch)

AWARDS AND
FELLOWSHIPS

- Stanley M Grant Scholarship in Mathematics, University of British Columbia, 2017
- Faculty of Science PhD Tuition Award, University of British Columbia, 2014 - 2017

TEACHING
EXPERIENCE

ETH Zürich

- Instructor — Mathematical Theory in Fluid Mechanics, Fall 2023
- Instructor — Topics in Fluid Dynamics (Seminar course), Fall 2022
- Master student supervisions
  — Reading course with Xiangyuan Li (joint with Mikaela Iacobelli), Fall 2023
  — Thesis of Yuxiu Zhang (joint with Mikaela Iacobelli), Fall 2023
  — Reading course with Yuxiu Zhang (joint with Mikaela Iacobelli), Fall 2022

University of British Columbia

- Instructor — Differential Calculus, Fall 2015
- Head teaching assistant of Math Exam Resource wiki, 2016-2018;
  I was in charge of managing a wiki page for math final exam resources.
- Teaching assistant — Applied Partial Differential Equations, Applied Nonlinear Dynamics and Chaos, Differential equations, Introduction to Mathematical Computing, Differential Calculus with Physical Applications, Differential Calculus with Applications to Physical Sciences and Engineering

ACADEMIC
SERVICE

- Co-organizer of Analysis Seminar at IAS (Fall 2020, Spring 2021)
- Referee reports for *Advances in Mathematics, Analysis and PDE, Annales Henri Poincaré, Annals of PDE, Archive for Rational Mechanics and Analysis, Communications in Mathematical Sciences, Communications in Partial Differential Equations, Journal of Differential Equations, SIAM Journal on Mathematical Analysis, Transactions of the American Mathematical Society, Advances in Mathematics.*

CONFERENCE/
WORKSHOP
TALKS

2024

Nonlinear Waves and Fluids, University College London, London, UK, Jun

The Equadiff conferences, Karlstad University, Karlstad, Sweden, Jun

Analysis of Dissipation in Compressible and Inviscid Fluid Dynamics, University of Konstanz, Germany, Jun

Nonlinear PDEs in honor of Vladimir Sverak's 65th birthday, University of Minnesota-Twin Cities, USA, May

Workshop: Differential Inclusions and Continuum Mechanics, ETH Zurich, Zurich, Switzerland, Feb

SwissMap Conference "Phase mixing, kinetic theory and fluid mechanics," Les Diablerets, Switzerland, Feb

2023

"Enjoying Probability and Fluids in Lausanne" workshop, EPFL, Lausanne, Switzerland, Sep

International Congress on Industrial and Applied Mathematics, Waseda University, Tokyo, Japan, Aug

VII RISM school "Exotic solutions and well posedness in ODE's and PDE's," Villa Toeplitz, Varese, July

2022

AMS Fall Western Sectional Meeting, University of Utah, UT, USA, Oct

Oberwolfach Workshop Calculus of Variations, Mathematisches Forschungsinstitut Oberwolfach, Germany, Aug

International Workshop on PDEs arising in Fluid Dyamics, Zoom meeting, Jun

2022 Korean Mathematical Society Spring Meeting, Zoom meeting, April

Joint Mathematics Meetings AMS Special Session, Zoom meeting, April

Quasi-linear PDEs in Fluids II, Zoom meeting, Feb

Before 2021

Build a network of young researchers in mathematics II, Zoom meeting, Oct 2021

AMS Fall Western Sectional Meeting, Zoom meeting, Oct 2020

Workshop on Analysis and PDE, Tianjin university, China, Aug 2019

International Congress on Industrial and Applied Mathematics, Universitat de València, Spain, Jul 2019

PIMS Mini-workshop on calculus of variations and partial differential equations around the work of Alessio Figalli, University of British Columbia, BC, Canada, Feb 2019

AMS Fall Southeastern Sectional Meeting, University of Arkansas, AR, USA, Nov 2018

Canadian Mathematical Society Summer Meeting, P.E.I., Canada, Jun 2015.

COLLOQUIUM/
SEMINAR TALKS

2024

Job colloquium, Stanford university, Jan

Job colloquium, University of Toronto, Jan

2023

Job colloquium, Brown university (Online), Dec

Special talks, ETH Zurich, Dec

Job colloquium, University of Maryland, Dec

SPDE reading group/seminar, Bielefeld university, Nov

Applied PDEs seminar, Imperial College London, Nov

PDE Seminar, GSSI, Oct

Symposium on Advances in Mathematical Analysis, Universität Zürich, Sep

PDE Seminar, Shanghai Jiao Tong University (Online), Aug

PDE Seminar, Central South University (Online), Jul

BK PDE seminar, Yonsei University (Online), May

2022

Analysis seminar, University of Basel, Dec

Bath Analysis seminar, University of Bath, Nov

PDE Seminar, Chung-Ang University, Jul

PDE Seminar, Seoul National University, Jul

PDE Seminar, Sungkyunkwan University, Jul

TIFR-CAM Colloquium, TIFR-CAM (Online), Apr

Seminar of Analysis, EPFL, Apr

SKKU Colloquium, Sungkyunkwan University (Online), Mar

Seminar in Analysis and Geometry, IAS, Feb

PDE Seminar, Yonsei University (Online), Jan

2021

Analysis seminar, Oregon State University (Online), Nov

UCLA-USC joint Analysis and PDE Seminar, UCLA, Oct

PDE Seminar, Seoul National University (Online), Jul

PDE Seminar, Chung-Ang University (Online), Jun

Virtual Maxwell Analysis Seminar, The University of Edinburgh (Online), Feb

2020

PDE seminar, POSTECH (Online), Dec

Applied Math and Analysis seminar, Duke University (Online), Dec

PDE seminar, Tianjin University (Online), Dec

PDE seminar, KAIST (Online), Dec

Differential Geometry/PDE seminar, University of Washington (Online), Dec

Analysis seminar, Institute for Advanced Study, Nov

PDE seminar, Brown University (Online), Apr

PDE seminar, ShanghaiTech University (Online), Apr

Analysis of fluids and related topics, Princeton University, Feb

2019

Analysis Seminar, Institute for Advanced Study, Oct

Analysis seminar, University of Pennsylvania, Oct

Nonlinear Analysis Seminar, Rutgers University, Oct

PDE Seminar, Yonsei University, Aug

Seminar in Mathematics, Chung-Ang University, Aug

2018

Seminar on PDE, HKUST, Nov

Differential Geometry, Mathematical Physics, PDE Seminar, UBC, Oct

Seminar on PDE, HKUST, Jun