

Taehun Lee

Contact Information

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Research Interests

geometric analysis

Employment

Assistant Professor Department of Mathematics, Konkuk University	Mar. 2025 - Present
Project Research Fellow (with Sejong Science Fellowship) School of Mathematics, Korea Institute for Advanced Study Mentor: Kyeongsu Choi	Mar. 2023 - Feb. 2025 (possibly up to Feb. 2028)
Research Fellow School of Mathematics, Korea Institute for Advanced Study Mentor: Kyeongsu Choi	Sep. 2020 - Feb. 2023

Education

Ph.D. in Mathematics , Seoul National University, Seoul, Korea Thesis: Curvature flows with obstacles Advisor: Ki-Ahm Lee	Aug. 2020
B.S. in Mathematics , Seoul National University, Seoul, Korea Graduation with honors (Summa Cum Laude)	Aug. 2013

Fellowships and Awards

Outstanding Teaching Award, Konkuk University	2025
Sejong Science Fellowship	Mar. 2023 - Feb. 2028

Global Ph.D. Fellowship	Mar. 2014 -Feb. 2019
Outstanding Teaching Assistant Award, Seoul National University	2015
Gold Prize, College Mathematics Competition	2010, 2012

Publications

- [13] **Fractional degree centrality for directed networks.**
With Woong Kook, Kang-Ju Lee, and Ki-Ahm Lee, *Phys. Rev. E* (American Physical Society) 113 (2026), Paper No. 064310. [[journal](#)]
- [12] **α -mean curvature flow of non-compact complete convex hypersurface**
With Hyunsuk Kang and Ki-Ahm Lee, *Adv. Nonlinear Anal.* (2025) [[journal](#)]
- [11] **Ancient mean curvature flows with finite total curvature**
With Kyeongsu Choi and Jiuzhou Huang, *Trans. Amer. Math. Soc.* (2025) [[journal](#)|[arxiv](#)]
- [10] **Curvature bound for L_p Minkowski problem**
With Kyeongsu Choi and Minhyun Kim, *Adv. Math.* (2024) [[journal](#)|[arxiv](#)]
- [9] **Gauss curvature flow with shrinking obstacle**
With Ki-Ahm Lee, *Math. Ann.* (2023) [[journal](#)|[arxiv](#)]
- [8] **An eigenvalue problem for prescribed curvature equations**
Int. Math. Res. Not. (2023) [[journal](#)|[arxiv](#)]
- [7] **Diameter estimate for planar L_p dual Minkowski problem**
With Minhyun Kim, *Proc. Amer. Math. Soc.* 152 (2024), 3035-3049 [[journal](#)|[arxiv](#)]
- [6] **Fractional centralities on networks: Consolidating the local and the global.**
With Woong Kook, Kang-Ju Lee, and Ki-Ahm Lee, *Phys. Rev. E* (American Physical Society) 106 (2022), no. 3, Paper No. 034310, 13 pp. [[journal](#)]
- [5] **The obstacle problem for parabolic Monge-Ampère equation.**
With Ki-Ahm Lee and Jinwan Park, *J. Differential Equations* 309 (2022), 608-649. [[journal](#)]
- [4] **Gauss curvature flow with an obstacle.**
With Ki-Ahm Lee, *Calc. Var. Partial Differential Equations* 60 (2021), no. 5, Paper No. 166, 23 pp. [[journal](#)]
- [3] **The obstacle problem for the Monge-Ampère equation with the lower obstacle.**
With Ki-Ahm Lee and Jinwan Park, *Nonlinear Anal.* 210 (2021), Paper No. 11237, 23 pp. [[journal](#)]
- [2] **Optimal configuration and symmetry breaking phenomena in the composite membrane problem with fractional Laplacian.**

With María del Mar González and Ki-Ahm Lee, *J. Differential Equations*, 274 (2021), 1165-1208. [[journal](#)|[arxiv](#)]

Preprints

- [4] **Liouville-type theorems for Lane–Emden inequalities involving nonlocal operators**
With Takwon Kim [[arxiv](#)]
- [3] **Nodal set comparison for Allen–Cahn solutions with conical asymptotics**
With Sanghoon Lee [[arxiv](#)]
- [2] **On the uniqueness of energy-minimizing curves in constrained spaces**
With Ki-Ahm Lee [[arxiv](#)]
- [1] **The discrete logarithmic Minkowski problem for the electrostatic p -capacity**
With Minhyun Kim [[arxiv](#)]

Conference Organization

- 2026 Workshop on Geometric Analysis, Konjiam Resort, Gwangju (June 19-21) 2026
- Korean-Japanese workshop on elliptic and parabolic equations, Seoul National University (Nov. 15-16) 2024
- 2023 Workshop on Elliptic & Parabolic PDEs and Related Topics, Jeju (Dec. 18-20) 2023
- KIAS Workshop on Nonlinear Analysis, Online (Dec. 2-4) 2021

Talks

Lecture Series

- 19th KIAS Geometry Winter School, Jeongseon 2024
On Morse index of minimal surfaces I,II
- 2023 Summer School on Elliptic and Parabolic Equations and Related Topics, Pusan 2023
Alexandrov–Bakelman–Pucci estimate and applications to geometric inequalities I,II
- Geometric Flow Winter School, Online 2022
Asymptotic behavior of complete graphical curves under the curve shortening flow I,II,III
- Workshop on Elliptic and Parabolic PDEs and Related Topics, Online 2022
Minkowski-type problems I,II,III
- Seminar (Submanifold Geometry Lab, PNU), Online 2021
Free boundary problems in curvature flows I,II

Invited Seminar and Conference Talks

- (scheduled) MATRIX-RIMS Tandem Workshop: Geometric Flows and Related Phenomena, RIMS, Kyoto, Japan 2026
- (scheduled) Workshop on Nonlinear PDEs, Harmonic Analysis, and Free Boundary Problems, KTH, Stockholm, Sweden 2026
- Seminar, Changwon National University, Korea 2026
- The 15th AIMS Conference, Athens, Greece 2026
- Korea-China 2026 PDE Workshop, SNU, Seoul, Korea 2026
- Colloquium, UNIST, Korea 2026
- Colloquium, Sogang University, Korea 2026
- Hanyang University, Korea, Seminar 2026
- Seminar on Regularity in Elliptic and Parabolic Problems (REPP), Online 2025
- 2025 KSIAM Fall Meetings, Gyeongju 2025
- RIMS, Kyoto, Japan, Workshop 2025
- Colloquium Sookmyung Women's University 2025
- NCTS, Online, Taiwan 2025
- 2025 KMS Annual Meeting: Special Session-11, ST Center 2025
- KIAS, Seoul, Korea, APP Seminar 2025
- Konkuk University, Seoul, Korea, KSIAM 2025
- Hanyang University, Seoul, Korea, Diving into PDEs without Screens 2025
- UNIST, Ulsan, Korea, The 11th Korea PDE Winter School 2025
- SKKU, Suwon, Korea, 2024 KMS Annual Meeting: Special Session-08 2024
- POSTECH, Pohang, Korea, CM2LA seminar 2024
- Seoul, Korea, Summer School on Elliptic & Parabolic PDEs and Related Topics 2024
- Pusan National University, Korea, PNU Geometry and Topology seminar 2024
- University of Tokyo, Japan, East Asia Workshop on Nonlinear Evolution Equations 2024
- Jeongseon, Korea, Winter Workshop on Elliptic and Parabolic Problems and Related Topics 2024
- Upsala University, Sweden, Seminar 2023
- Autonomous University of Madrid, Spain, Seminar 2023
- Seoul, Korea, KMS Special Conference with 2022 Fields Medalists: Focus Sessions-01 2023
- KIAS, Korea, Young Geometers Meeting 2023
- Chung-Ang University, Korea, Analysis and PDE Seminar 2023
- Daejeon, Korea, KMS Annual Meeting: Special Session-16 2023
- Daejeon, Korea, KMS Annual Meeting: Special Session-06 2023
- Hanyang University, Korea 2023

○ Jeongseon, Korea, KIAS Geometry Winter School	2023
○ Jeongseon, Korea, Workshop on Geometric Analysis and Related Topics	2023
○ Online, Analysis and PDE Seminar (CUHK, HKU, UNIST)	2022
○ Yangpyeong, Korea, Rookies Workshop	2022
○ Online, Asia-Pacific Analysis and PDE Seminar	2022
○ Hanyang University, Korea HY-PDE Workshop 2022	2022
○ KIAS, Korea, KIAS pseudo-New Member Seminar	2022
○ Daegu, Korea, KNU Seminar	2022
○ Online, CAU Nonlinear PDE Center Workshop	2022
○ Busan, Korea, PDE Workshop	2022
○ Online, KMS Annual Meeting: Special Session-08	2021
○ Online, HY-PDE Workshop 2021	2021
○ Online, The 16th KIAS Workshop on Geometry	2021
○ Online, 2020 Seoul-Tokyo Conference - Partial Differential Equations	2020
○ Jeju, Korea, 2020 Partial Differential Equation Camp	2020
○ Sol Beach Yangyang, Korea, Workshop on Elliptic and Parabolic PDEs and Related Topics 2020	
○ Universidad Autónoma de Madrid, Spain, Seminar	2017
○ Seoul National University, Korea, 2016 Workshop on Nonlinear Elliptic and Parabolic Equations 2016	
○ Universitat Politècnica de Catalunya, Spain, Seminari D'EDP'S I Aplicacions	2015
○ Jeju, Korea, NPDE workshop	2014

Posters

○ Hokkaido University, Japan, The 10th HU and SNU Symposium on Mathematics - Recent progress on theory of probability and partial differential equations - as part of the 17th HU-SNU Joint Symposium	2014
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Teaching Experiences

Teaching

○ Introduction to Analysis 1 (Undergraduate, at Konkuk University)	Spring 2026
○ Real Analysis 1 (Graduate, at Konkuk University)	Spring 2026
○ Introduction to Analysis 2 (Undergraduate, at Konkuk University)	Fall 2025
○ Topics in Analysis 2 (Graduate, at Konkuk University)	Fall 2025
○ Introduction to Analysis 1 (Undergraduate, at Konkuk University)	Spring 2025
○ College Mathematics 1 (at Konkuk University)	Spring 2025
○ Differential Geometry (at Seoul National University)	Spring 2024

Teaching Assistant

○ Calculus for Life Science 2, Undergraduate Independent Study 1	Spring 2019
○ Calculus for Life Science 1	Fall 2019
○ Differential Equations	Spring 2019
○ Differential Equations	Fall 2018
○ Real Analysis (Graduate)	Spring 2018
○ Partial Differential Equations	Spring 2017
○ Differential Equations	Fall 2016
○ Calculus for Life Science 1, Differential Equations	Spring 2016
○ Honor Calculus and <u>Practice</u> 1, Differential Equations	Spring 2015
○ Differential Equations and <u>Practice</u>	Fall 2014

Research Visits

○ University of Tokyo, Tokyo, Japan	Nov. 1 - 4, 2025
○ Autonomous University of Madrid, Madrid, Spain	Oct. 3 - 11, 2025
○ Nanyang Technological University, Singapore	Jun. 26 - 30, 2025
○ University of Barcelona, Barcelona, Spain	Nov. 16 - 20, 2023
○ Uppsala University, Uppsala, Sweden	Nov. 13 - 14, 2023
○ Autonomous University of Madrid, Madrid, Spain	Nov. 6 - 11, 2023
○ Autonomous University of Madrid, Madrid, Spain	Jan. 1 - Feb. 27, 2019
○ Autonomous University of Madrid, Madrid, Spain	Sep. 28 - Dec. 15, 2017
○ Polytechnic University of Catalonia, Barcelona, Spain	Sep. 1 - Dec. 22, 2015