

# DONGRYUL M. KIM

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## RESEARCH INTEREST

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### **Homogeneous dynamics & Hyperbolic geometry**

- Discrete subgroups of Lie groups – Kleinian groups and Anosov representations
- Deformations and Rigidity
- Dynamical systems and Ergodic theory

### **Geometric topology & Low-dimensional topology**

- Hyperbolic 3-manifolds
- Mapping class groups and dynamics on Teichmüller spaces and Complexes of curves
- Geometric group theory
- Random walks on groups and their stationary measures

## EDUCATION

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Sep. 2021 – Present	<b>Yale University</b> , United States
	○ Ph.D. in Mathematics, Advisor: Prof. Hee Oh
Mar. 2015 – Feb. 2021	<b>KAIST</b> – Korea Advanced Institute of Science and Technology, South Korea
	○ B.S. in Mathematical Sciences (Advanced Major), Summa Cum Laude
	○ Left for mandatory military service (Mar. 2017 – Dec. 2018)

## PUBLICATIONS

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23. Classification of horospherical invariant measures in higher rank (with Inhyeok Choi),  
Preprint (arXiv:2510.23365), Submitted.
22. Invariant Radon measures on the space of measured laminations for subgroups of mapping class group  
(with Inhyeok Choi),  
Preprint (arXiv:2510.23256), Submitted.
21. A note on the singularity conjecture for infinite covolume discrete subgroups (with Andrew Zimmer),  
Preprint (arXiv:2508.05756), Submitted.
20. Rigidity for Patterson–Sullivan systems with applications to random walks and entropy rigidity  
(with Andrew Zimmer),  
Preprint (arXiv:2505.16556), Submitted.
19. Horocycles in hyperbolic 3-manifolds with round Sierpiński limit sets (with Minju Lee),  
To appear in *Groups, Geometry, and Dynamics*.
18. Conformal measure rigidity and ergodicity of horospherical foliations,  
Preprint (arXiv:2404.13727), Submitted.
17. Relatively Anosov groups: finiteness, measure of maximal entropy and reparameterization  
(with Hee Oh),  
*Journal für die reine und angewandte Mathematik (Crelle's Journal)*, Vol. 826 (2025), 91–142.
16. Ahlfors regularity of Patterson-Sullivan measures of Anosov groups and applications  
(with Subhadip Dey, Hee Oh),  
Preprint (arXiv:2401.12398), Revision sent to *Compositio Mathematica*.

15. Ergodic dichotomy for subspace flows in higher rank (with Hee Oh, Yahui Wang), *Communications of the American Mathematical Society*, Vol. 5 (2025), 1–47.
14. Properly discontinuous actions, growth indicators and conformal measures for transverse subgroups (with Hee Oh, Yahui Wang), *Mathematische Annalen*, Vol. 393 (2025), 2391–2450.
13. Non-concentration property of Patterson-Sullivan measures for Anosov subgroups (with Hee Oh), *Ergodic Theory and Dynamical Systems*, Vol. 45 (2025), no. 3, 884–893.
12. Conformal measure rigidity for representations via self-joinings (with Hee Oh), *Advances in Mathematics*, Vol. 458 (2024), Paper No. 109992.
11. Rigidity of Kleinian groups via self-joinings: measure theoretic criterion (with Hee Oh), *Journal of Topology*, Vol. 18 (2025), no. 3, Paper No. e70035.
10. Rigidity of Kleinian groups via self-joinings (with Hee Oh), *Inventiones Mathematicae*, Vol. 234 (2023), no. 3, 937–948.
9. Reducible normal generators for mapping class groups are abundant (with Hyungryul Baik, Chenxi Wu), *Journal of Topology and Analysis*, Vol. 17 (2025), no. 5, 1313–1323.
8. Hausdorff dimension of directional limit sets for self-joinings of hyperbolic manifolds (with Yair N. Minsky, Hee Oh), *Journal of Modern Dynamics*, Vol. 19 (2023), 433–453.
7. Tent property of the growth indicator functions and applications (with Yair N. Minsky, Hee Oh), *Geometriae Dedicata* (Labourie's volume) Vol. 218 (2024), no. 1, Paper No. 14, 18 pp.
6. Minimal asymptotic translation lengths on curve complexes and homology of mapping tori (with Hyungryul Baik, Chenxi Wu), *Michigan Mathematical Journal*, Vol. 75 (2025), no. 5, 927–942.
5. Linear growth of translation lengths of random isometries on Gromov hyperbolic spaces and Teichmüller spaces (with Hyungryul Baik, Inhyeok Choi), *Journal of the Institute of Mathematics of Jussieu*, Vol. 23 (2024), no. 4, 1751–1795.
4. Simple length spectra as moduli for hyperbolic surfaces and Rigidity of length identities (with Hyungryul Baik, Inhyeok Choi), To appear in *Annales de l'Institut Fourier*.
3. On the asymptotic translation lengths on the sphere complexes and the generalized fibered cone (with Hyungryul Baik, Chenxi Wu), *Transactions of the American Mathematical Society*, Vol. 378 (2025), no. 7, 4739–4764.
2. On the surjectivity of the Symplectic representation of the mapping class group (with Hyungryul Baik, Inhyeok Choi), *Topology and its Applications*, Vol. 322 (2022), Paper No. 108334.
1. Topological entropy of pseudo-Anosov maps from a typical Thurston's construction (with Hyungryul Baik, Inhyeok Choi), *International Mathematical Research Notices* (2022), no. 24, 19862–19904.

#### **Expository writings:**

3. Normal generators for mapping class groups (with Hyungryul Baik)

For inclusion in *In the Tradition of Thurston: Geometry and Topology*, Vol. 4.

2. Rigidity theorems for hyperbolic 3-manifolds: from finite volume to infinite volume (in Korean)  
*Horizon*, a scientific magazine published by KIAS
1. Kleinian Groups from the Sphere at Infinity and Their Self-Joinings,  
*Handbook of Visual, Experimental and Computational Mathematics*

## TALKS

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### Invited Talks:

25. University of Michigan–Ann Arbor Topology Seminar, Dec. 05, 2025
24. University of Michigan–Ann Arbor RTG Geometry, Topology and Dynamics Seminar, Dec. 03, 2025
23. University of Wisconsin–Madison Group Actions and Dynamics Seminar, Oct. 20, 2025
22. Penn State Anatole Katok Center for Dynamical Systems and Geometry Seminar, Sep. 29, 2025
21. Yale Geometry and Topology Seminar, Sep. 09, 2025
20. Yale Undergraduate Math Society Seminar, Sep. 10, 2025
19. KIAS One-day Festival of Group actions, Geometry and Dynamics, Aug. 06, 2025
18. Yale Group Actions and Dynamics Seminar, Apr. 28, 2025
17. Cornell Dynamics Seminar, Apr. 24, 2025
16. Yale Visiting day for Prospective Ph.D. students, Mar. 08, 2025
15. Seoul National University Dynamics seminar, Feb. 19, 2025
14. GT GAPS (Geometric Topology Grad and Postdoc Seminar), Dec. 06, 2025
13. University of Illinois Chicago Ergodic Theory and Dynamical Systems Seminar, Oct. 29, 2024
12. University of Chicago Dynamics Seminar, Oct. 28, 2024
11. University of Wisconsin–Madison Group Actions and Dynamics Seminar, Oct. 21, 2024
10. Meeting with Young Geometric Topologists at KAIST, Jun. 25, 2024
9. Yale Group Actions, Geometry and Dynamics Seminar, Mar. 04, 2024
8. Yale Visiting day for Prospective Ph.D. students, Mar. 10, 2023
7. Yale Group Actions, Geometry and Dynamics Seminar, Oct. 19, 2022
6. Seoul National University Dynamics seminar, Aug. 10, 2022
5. Seoul National University Dynamics seminar, Aug. 09, 2022
4. Yale Visiting day for Prospective Ph.D. students, Mar. 11, 2022
3. CUNY Geometry and Topology Seminar, Nov. 02, 2021
2. Yale Geometry and Topology Seminar, Sep. 21, 2021
1. KIAS Virtual Seminar on Geometry and Topology, Apr. 22, 2020

## **Contributed Talks:**

12. Lightning talk at Geometry and Topology Seminar at Brown and Yale (GATSBY), Nov. 08, 2025
11. Lightning talk at Midwest Summer School in Geometry, Topology, and Dynamics at Madison, Jun. 02, 2025
10. Lightning talk at Geometry and Topology Seminar at Brown and Yale (GATSBY), Apr. 26, 2025
9. Lightning talk at Geometry and Topology Seminar at Brown and Yale (GATSBY), Nov. 16, 2024
8. Moving to higher rank: from hyperbolic to Anosov, A conference in honor of Dick Canary, Jul. 16, 2024
7. Lightning talk at Geometry and Topology Seminar at Brown and Yale (GATSBY), Apr. 20, 2024
6. Workshop on Dynamical systems and related topics at University of Maryland, College Park: in a celebration of Giovanni Forni's 60th birthday, Apr. 07, 2024
5. Graduate Student Seminar at Yale, Jan. 27, 2023
4. Graduate Student Seminar at Yale, Sep. 23, 2022
3. Graduate Student Seminar at Yale, Feb. 11, 2022
2. Graduate Student Seminar at Yale, Sep. 17, 2021
1. Lightning talk at Geometric Group Theory in East Asia, Oct. 30, 2020

## **MENTORING**

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***Directed Reading Program*** (led reading groups, suggested exercises, assigned projects and presentations)

### **Yale University:**

2025 Fall	Mapping class groups and Graphs of curves
2024 Fall	Mostow's rigidity theorem

## **TEACHING**

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### **Yale University:**

#### *Primary Instructor*

2025 Spring	MATH 115 Calculus of Functions of One Variable II
2024 Spring	MATH 115 Calculus of Functions of One Variable II

#### *Teaching Fellow*

2025 Fall	MATH 5260 Introduction to Differentiable Manifolds
2024 Fall	MATH 526 Introduction to Differentiable Manifolds
2023 Fall	MATH 302 Vector Analysis and Integration on Manifolds
2023 Spring	MATH 435 Differential Geometry
2023 Spring	MATH 244 Discrete Mathematics
2022 Fall	MATH 302 Vector Analysis and Integration on Manifolds
2022 Fall	MATH 120 Calculus of Functions of Several Variables

### **KAIST:**

#### *Tutor for freshmen*

2020 Fall	MAS102 Calculus II
2020 Spring	MAS101 Calculus I
2019 Fall	MAS102 Calculus II

## HONORS & AWARDS

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Jul. 2021 – Present	Overseas PhD Scholarship, Korea Foundation for Advanced Studies
Sep. 2020 – Jul. 2021	Training for Overseas PhD Scholarship, Korea Foundation for Advanced Studies
Mar. 2020	College of Natural Sciences Dean's List, College of Natural Sciences, KAIST
Mar. 2019 – Sep. 2020	Undergraduate Scholarship, Korea Foundation for Advanced Studies
Mar. 2015 – Feb. 2021	Korea Presidential Science Scholarship, Korea Student Aid Foundation
Mar. 2015 – Feb. 2021	KAIST Presidential Fellowship (KPF), KAIST

## ORGANIZATIONAL ACTIVITIES

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Sep. 2022 – Dec. 2022	Yale Graduate Students Seminars
	○ Organizer
Jun. 2022 – May. 2023	Yale Korean Graduate Student Association (KGSA)
	○ President
Aug. 2021 – Jun. 2022	Yale Korean Graduate Student Association (KGSA)
	○ Treasurer
Feb. 2016 – Jun. 2021	KAIST Undergraduate Math Colloquium
	○ Organizer
Jan. 2016 – Jan. 2017	KAIST Presidential Fellowship Student Society
	○ Student President

## SERVICES

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### Referee for *Trans. Amer. Math. Soc.*

Sep. 2024 – Present	Climate Committee, Dept. of Mathematics at Yale University
Mar. 2017 – Dec. 2018	Republic of Korea Army
	○ Mandatory military service, Sentinel & Programmer
Mar. 2016 – Dec. 2016	Notices of the KAIST College of Natural Sciences
	○ Editor, Student Reporter