

# Junehyuk Jung

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## Positions

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**Brown University, Department of Mathematics**

*Associate Professor of Mathematics*

**Providence, RI**

7/2022–

**Logical Intelligence**

*Advisory Board Member*

**Palo Alto, CA**

7/2025–

**Google DeepMind**

*Research Scientist*

**Mountain View, CA**

4/2024–

**Korea Institute for Advanced Study (KIAS)**

*KIAS Scholar*

**Seoul, South Korea**

7/2025–3/2026

**Brown University, Department of Mathematics**

*Assistant Professor of Mathematics*

**Providence, RI**

7/2020–6/2022

**Texas A&M University, Department of Mathematics**

*Assistant Professor*

**College Station, TX**

8/2017–6/2020

**KAIST, Department of Mathematical Science**

*Researcher*

**Daejeon, South Korea**

6/2013–7/2016

## Visiting Positions

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**University of California Berkeley, Department of Mathematics**

*Visitor*

**Berkeley, CA**

7/2023–7/2024

**Rice University, Department of Mathematics**

*Adjunct Assistant Professor*

**Houston, TX**

7/2019–3/2020

**Yale University, Department of Mathematics**

*Visitor*

**New Haven, CT**

4/2017–6/2017

**University of California Berkeley, Department of Mathematics**

*Visitor*

**Berkeley, CA**

2/2017–3/2017

**Northwestern University, Mathematics Department**

*Visitor*

**Evanston, IL**

10/2016–11/2016

**Institute for Advanced Study, School of Mathematics**

*Member*

**Princeton, NJ**

9/2014–12/2015

**Northwestern University, Mathematics Department**

*Visiting Postdoctoral Fellow*

**Evanston, IL**

9/2013–12/2013

## Education

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**Princeton University**

*Doctor of Philosophy*

Mathematics

Advisor: Peter C. Sarnak

**Princeton, NJ**

9/2008–6/2013

**University of Chicago**

*Master of Science*

Mathematics

**Chicago, IL**

9/2006–8/2008

**University of Chicago**

*Bachelor of Arts*

**Chicago, IL**

9/2005–8/2008

## Honors and Awards

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<b>National Science Foundation grant DMS-2522850</b> <i>Awarded, \$800,000</i>	9/2025–8/2028
<b>Simons Fellows in Mathematics</b> <i>Awarded</i>	7/2023–6/2024
<b>National Science Foundation grant DMS-1900993</b> <i>Awarded, \$150,000</i>	7/2019–6/2023
<b>Sloan Research Fellowship</b> <i>Awarded, \$ 70,000</i>	7/2019–8/2023
<b>Posco TJ Park Science Fellowship</b> <i>Awarded, \$ 35,000 per year</i>	3/2014–2/2016
<b>Samsung Scholarship for Graduate Studies</b> <i>Awarded, \$ 50,000 per year</i>	9/2008–6/2013
<b>Paul R. Cohen Memorial Prize</b> <i>Awarded</i>	6/2008
<b>Kwanjeong Scholarship for College Students</b> <i>Awarded, \$ 50,000 per year</i>	9/2005–8/2008
<b>Korea Science and Engineering Foundation Scholarship for Undergraduate Studies</b> <i>Gratefully declined in order to observe institutional regulation</i>	2005
<b>William Lowell Putnam Mathematics Competition</b> <i>One of three representatives of University of Chicago</i> Honorable Mention, Team Rank 5, and Top 24 Individuals in 2005, 2006, and 2007	2005–2007
<b>International Mathematical Olympiad</b> <i>Gold Medal</i>	7/2003

## Publications

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### Published/Accepted.....

- [21]: “Towards Robust Mathematical Reasoning”  
(as a corresponding author with Thang Luong, Dawsen Hwang, Hoang H. Nguyen, Golnaz Ghiasi, Yuri Chervonyi, Insuk Seo, Junsu Kim, Garrett Bingham, Jonathan Lee, Swaroop Mishra, Alex Zhai, Clara Huiyi Hu, Henryk Michalewski, Jimin Kim, Jeonghyun Ahn, Junhwi Bae, Xingyou Song, Trieu H. Trinh, Quoc V. Le)  
Proceedings of Empirical Methods in Natural Language Processing (EMNLP) (2025)
- [20]: “Gold-medalist Performance in Solving Olympiad Geometry with AlphaGeometry2”  
(with Yuri Chervonyi, Trieu H. Trinh, Miroslav Olšák, Xiaomeng Yang, Hoang Nguyen, Marcelo Menegali, Vikas Verma, Quoc V. Le, and Thang Luong)  
arXiv:2502.03544 [cs.AI], to appear *JMLR*
- [19]: “2-nodal domain theorems for higher dimensional circle bundles”  
(with Steve Zelditch)  
*J. Spectr. Theory* 14 (2024), no. 4, pp. 1451–1474.
- [18]: “Intersecting geodesics on the modular surface”  
(with Naser T. Sardari)  
*Algebra Number Theory* 17 (2023), no. 7, 1325–1357.
- [17]: “Non-vanishing of symmetric cube  $L$ -functions”  
(with Jeff Hoffstein and Min Lee)  
*J. Lond. Math. Soc.* (2) 107 (2023), no. 1, 153–188.

- [16]: “Embedding closed totally geodesic surfaces in Bianchi orbifolds”  
(with Alan Reid)  
arXiv:2003.05427 [math.NT], to appear *Math. Res. Lett.*
- [15]: “Topology of the nodal set of random equivariant spherical harmonics on  $\mathbb{S}^3$ ”  
(with Steve Zelditch)  
*Int. Math. Res. Not. IMRN*(2021), no. 11, 8521–8549.
- [14]: “Asymptotic trace formula for the Hecke operators”  
(with Simon Marshall and Naser T. Sardari)  
*Math. Ann.* 378 (2020), no. 1-2, 513–557.
- [13]: “Boundedness of the number of nodal domains for eigenfunctions of generic Kaluza–Klein 3-folds”  
(with Steve Zelditch)  
*Ann. Inst. Fourier (Grenoble)* 70 (2020), no. 3, 971–1027.
- [12]: “Bounding the number of nodal domains of eigenfunctions without singular points on the square”  
*Israel J. Math.* 238 (2020), no. 1, 1–11.
- [11]: “On the growth of the number of totally geodesic surfaces in some hyperbolic 3-manifolds”  
*J. Number Theory* 202 (2019), 160–175.
- [10]: “Sign Changes of the Eisenstein Series on the Critical Line”  
(with Matthew Young)  
*Int. Math. Res. Not. IMRN*(2019), no. 3, 641–672.
- [9]: “Discrete behavior in information-constrained tracking problems and portfolio choice”  
(with Jeong-ho Kim, Filip Matejka, and Christopher A. Sims)  
*Rev. Econ. Stud.* 86 (2019), no. 6, 2643–2667.
- [8]: “On tiling the integers with 4-sets of the same gap sequence”  
(with Ilkyoo Choi and Minki Kim)  
*Discrete Math.* 341 (2018), no. 4, 957–964.
- [7]: “Quantum unique ergodicity and the number of nodal domains of eigenfunctions”  
(with Seung uk Jang)  
*J. Amer. Math. Soc.* 31 (2018), no. 2, 303–318.
- [6]: “On sparsity of positive-definite automorphic forms within a family”  
(Appendix A by Junehyuk Jung and Sug Woo Shin)  
*J. Anal. Math.* 129 (2016), 105–138.
- [5]: “Quantitative quantum ergodicity and the nodal domains of Maass-Hecke cusp forms ”  
*Comm. Math. Phys.* 348 (2016), no. 2, 603–653.
- [4]: “Number of nodal domains and singular points of eigenfunctions of negatively curved surfaces with an isometric involution”  
(with Steve Zelditch)  
*J. Differential Geom.* 102 (2016), no. 1, 37–66.
- [3]: “Number of nodal domains of eigenfunctions on non-positively curved surfaces with concave boundary”  
(with Steve Zelditch)  
*Math. Ann.* 364 (2016), no. 3-4, 813–840.
- [2]: “Sharp bounds for the intersection of nodal lines with certain curves ”  
*J. Eur. Math. Soc. (JEMS)* 16 (2014), no. 2, 273–288.
- [1]: “Pretentiously detecting power cancellation”  
(with Robert J. Lemke Oliver)  
*Math. Proc. Cambridge Philos. Soc.* 154 (2013), no. 3, 481–498.

## Selected Preprints

- [6]: “Aletheia tackles FirstProof autonomously”  
Tony Feng, Junehyuk Jung, Sang-hyun Kim, Carlo Pagano, Sergei Gukov, Chiang-Chiang Tsai, David Woodruff, Adel Javanmard, Aryan Mokhtari, Dawsen Hwang, Yuri Chervonyi, Jonathan N. Lee, Garrett Bingham, Trieu H.

Trinh, Vahab Mirrokni, Quoc V. Le, Thang Luong  
arXiv:2602.21201 [cs.AI]

[5]: “Towards Autonomous Mathematics Research”

Tony Feng, Trieu H. Trinh, Garrett Bingham, Dawsen Hwang, Yuri Chervonyi, Junehyuk Jung, Joonkyung Lee, Carlo Pagano, Sang-hyun Kim, Federico Pasqualotto, Sergei Gukov, Jonathan N. Lee, Junsu Kim, Kaiying Hou, Golnaz Ghiasi, Yi Tay, YaGuang Li, Chenkai Kuang, Yuan Liu, Hanzhao Lin, Evan Zheran Liu, Nigamaa Nayakanti, Xiaomeng Yang, Heng-Tze Cheng, Demis Hassabis, Koray Kavukcuoglu, Quoc V. Le, Thang Luong  
arXiv:2602.10177 [cs.LG]

[4]: “Semi-Autonomous Mathematics Discovery with Gemini: A Case Study on the Erdős Problems”

Tony Feng, Trieu Trinh, Garrett Bingham, Jiwon Kang, Shengtong Zhang, Sang-hyun Kim, Kevin Barreto, Carl Schildkraut, Junehyuk Jung, Jaehyeon Seo, Carlo Pagano, Yuri Chervonyi, Dawsen Hwang, Kaiying Hou, Sergei Gukov, Cheng-Chiang Tsai, Hyunwoo Choi, Youngbeom Jin, Wei-Yuan Li, Hao-An Wu, Ruey-An Shiu, Yu-Sheng Shih, Quoc V. Le, Thang Luong  
arXiv:2601.22401 [cs.AI]

[3]: “Gemini 2.5: Pushing the Frontier with Advanced Reasoning, Multimodality, Long Context, and Next Generation Agentic Capabilities”

(one of the 3309 authors from Gemini Team, Google)  
arXiv:2507.06261 [cs.CL]

[2]: “Gemini 1.5: Unlocking multimodal understanding across millions of tokens of context”

(one of the 1136 authors from Gemini Team, Google)  
arXiv:2403.05530 [cs.CL]

[1]: “Linnik problem for Maass–Hecke cusp forms and effective multiplicity one theorem”

(with Min Lee)  
arXiv:2502.16046 [math.NT], submitted

## Patents

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[1]: “Neuro-symbolic system for solving reasoning tasks”

(with Yuri Chervonyi, Trieu H. Trinh, Miroslav Olšák, Xiaomeng Yang, Hoang Nguyen, Quoc V. Le, and Thang Luong)

US Patent Pending No. 19/041.882, filed Jan 30, 2025

## Talks and lecture series

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### Public Lectures

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**08/21/2025:** “RAINES Summer Seminar : Recent Advances in AI Problem Solving”

Korean Consulate General in Boston, Newton, MA, USA

**08/07/2025:** “AlphaGeometry and automated reasoning”

Korea Institute for Advanced Study (KIAS), Seoul, South Korea

**03/18/2025:** “ICERM Public Lecture: AlphaGeometry: a step toward automated math reasoning”

ICERM, Providence, RI, USA

**02/08/2020:** “Aggieland Saturday”

Texas A&M University, College Station, TX, USA

**08/17/2018:** “Summer Educational Enrichment in Math (SEE-Math)”

Texas A&M University, College Station, TX, USA

### Panelist

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**03/04/2026:** Brainstorm: AI Crossing the Disciplines Conversation Series

JNBC, Providence, RI, USA

**07/16/2025:** International Mathematical Olympiad 2025

Sunshine Coast Convention Centre, Sunshine Coast, Australia

**12/14/2024:** 4th MATH-AI Workshop at NeurIPS'24  
Vancouver Convention Centre, Vancouver, BC, Canada

### Invited Talks.....

**03/04/2026:** "Mathematical research using AI: where we are now and where we are headed"  
Math Department Colloquium

Brown University, Providence, RI, USA

**09/16/2025:** "AlphaGeometry: a step toward automated math reasoning"  
The Geometry of Machine Learning

CMSA, Harvard University, Cambridge, MA, USA

**01/22/2024:** "Zelditch's trace formula and effective Bowen's theorem"  
Analytic Number Theory Seminar

Stanford University, Palo Alto, CA, USA

**12/19/2023:** "Zelditch's trace formula and effective Bowen's theorem"  
Conference: Hyperbolic Geometry of Numbers

KIAS, Seoul, South Korea

**11/07/2023:** "Zelditch's trace formula and effective Bowen's theorem"  
Arizona Algebra and Number Theory Seminar

University of Arizona, Tucson, AZ, USA

**10/14/2023:** "Zelditch's trace formula and effective Bowen's theorem"  
Spectral Theory and Applications

Texas A&M University, College Station, TX, USA

**09/25/2023:** "On the sparsity of positive-definite automorphic forms"  
Arithmetic Geometry and Number Theory RTG Seminar

University of California, Berkeley, Berkeley, CA, USA

**09/25/2023:** "Background on automorphic forms, L-functions, and equidistribution."  
Arithmetic Geometry and Number Theory RTG Seminar: Pre-talk

University of California, Berkeley, Berkeley, CA, USA

**09/18/2023:** "Nodal domains of equivariant eigenfunctions on Kaluza-Klein 3-folds"  
Analysis & PDE Seminar

University of California, Berkeley, Berkeley, CA, USA

**05/23/2023:** "Chaos and the geometry of the nodal set of eigenfunctions of the Laplacian"  
PDT Research Colloquium

PDT Partners, New York, NY, USA

**05/19/2023:** "The arithmetic of totally geodesic surfaces on Bianchi orbifolds"  
Dynamics, Rigidity and Arithmetic in Hyperbolic Geometry

ICERM, Providence, RI, USA

**03/23/2023:** "Equidistribution problems of closed geodesics on hyperbolic surfaces"  
QVNTS

Concordia University, Montreal, Quebec, Canada

**02/28/2023:** "The arithmetic of totally geodesic surfaces on Bianchi orbifolds"  
Algebra and Number Theory seminar

Dartmouth College, Hanover, NH, USA

**10/27/2022:** "Ergodicity and the number of nodal domains of eigenfunctions of the Laplacian"  
Brandeis-Harvard-MIT-Northeastern Joint Mathematics Colloquium

Brandeis University, Waltham, MA, USA

**01/27/2020:** "Ergodicity and the number of nodal domains of eigenfunctions of the Laplacian"  
Special Colloquium

Brown University, Providence, RI, USA

**12/13/2019:** "Ergodicity and the number of nodal domains of eigenfunctions of the Laplacian"

Colloquium

Rice University, Houston, TX, USA

**10/11/2019:** "Nodal domains of equivariant eigenfunctions on Kaluza-Klein 3-folds"

Analysis and Mathematical Physics Seminar Series

Institute for Advanced Study, Princeton, NJ, USA

**10/02/2019:** "Classification of embedded closed totally geodesic surfaces in Bianchi 3-folds"

Topology Seminar

Korea Institute for Advanced Study (KIAS), Seoul, South Korea

**09/25/2019:** "Topology of the nodal set of spherical harmonics on  $S^3$ "

Dynamics and Number Theory Seminar

Seoul National University, Seoul, South Korea

**05/21/2019:** "On the sparsity of positive-definite automorphic forms"

Heilbronn Number Theory Seminar

University of Bristol, Bristol, UK

**02/19/2019:** "Nodal geometry of Maass-Hecke eigenforms on compact arithmetic hyperbolic triangles"

Algebraic Geometry and Number Theory Seminar

Rice University, Houston, TX, USA

**01/15/2019:** "Large discrepancy in the vertical Sato-Tate theorem"

Analytic Number Theory Seminar

Stanford University, Stanford, CA, USA

**01/07/2019:** "Distribution of Hecke eigenvalues: large discrepancy"

Korea University Algebra Seminar

Korea University, Seoul, South Korea

**12/28/2018:** "Counting immersed totally geodesic surfaces via arithmetic means"

Contemporary Number Theory Workshop

KAIST, Daejeon, South Korea

**12/27/2018:** "Distribution of Hecke eigenvalues: large discrepancy"

Contemporary Number Theory Workshop

KAIST, Daejeon, South Korea

**12/21/2018:** "Nodal counting of eigenfunctions of Laplace-Beltrami operator on a principal  $S^1$ -bundle with Kaluza-Klein metrics"

CMC Seminar

KIAS, Seoul, South Korea

**12/14/2018:** "Ergodicity and nodal counting of eigenfunctions on 3-manifolds"

Geometry, Topology & Dynamics Seminar

Seoul National University, Seoul, South Korea

**07/23/2018:** "Ergodicity and the number of nodal domains of Laplacian eigenfunctions"

Analytic Number Theory and Quantum Chaos Workshop

Queen Mary University of London, London, UK

**07/17/2018:** "Boundedness of the number of nodal domains of eigenfunctions"

18w5002 Around Quantum Chaos

BIRS, Banff, Canada

**07/04/2018:** "Quantum Unique Ergodicity and the number of nodal domains of automorphic forms"

Analytic Number Theory Seminar

EPFL, Laussane, Switzerland

**04/11/2018:** "Quantum Unique Ergodicity and the number of nodal domains of automorphic forms"

Number Theory Seminar

University of Wisconsin - Madison, Madison, WI, USA

**01/24/2017:** "On nodal domains of eigenfunctions in chaotic quantum systems"

Colloquium

Texas A&M University, College Station, TX, USA

**01/09/2017:** "Quantitative Quantum Ergodicity on the modular surface and its applications"

Number Theory Seminar

Stanford University, Stanford, CA, USA

**11/14/2016:** "Eigenfunctions on arithmetic hyperbolic surfaces"

Analysis Seminar

Northwestern University, Evanston, IL, USA

**07/12/2016:** "On nodal domains of eigenfunctions in chaotic quantum system"

Second French-Korean Conference in Mathematics

Université de Bordeaux, Bordeaux, France

**03/16/2016:** "Nodal domains of eigenfunctions on chaotic billiards"

SNU Geometry and Topology Seminar

Seoul National University, Seoul, South Korea

**02/15/2016:** "On arithmetic quantum chaos: introduction and recent progress"

The 5th Number Theory Festival

Kyungnam University, Changwon, South Korea

**08/27/2015:** "Quantum Unique Ergodicity and the number of nodal domains of eigenfunctions"

East Asia Number Theory Conference

Elysian Gangchon Resort, Chuncheon, South Korea

**06/21/2015:** "Quantum Ergodicity and the number of nodal domains of eigenfunctions"

ASARC Number Theory Workshop

Tongyeong Marina Resort, Tongyeong, South Korea

**06/04/2015:** "Quantum Ergodicity and the number of nodal domains of eigenfunctions"

Montreal Analysis Seminar

McGill University, Montréal, QC, Canada

**04/07/2015:** "Quantum ergodicity and the number of nodal domains of eigenfunctions"

TAMU number theory seminar

Texas A&M University, College Station, TX, USA

**02/21/2015:** "Quantum ergodicity and the number of nodal domains of eigenfunctions"

Special day on Complex Geometry and Analysis on real analytic Riemannian manifolds

Northwestern University, Evanston, IL, USA

**08/05/2014:** "An upper bound for intersection of nodal lines with a fixed horocycle"

Pan Asia Number Theory 2014

Postech, Pohang, South Korea

**03/03/2014:** "Nodal Domains and Eigenfunctions of Negatively Curved Surfaces"

Quantum Monday

Institute for Basic Science, Pohang, South Korea

**02/28/2014:** "Nodal Domains and Eigenfunctions of Negatively Curved Surfaces"

Lecture Series on Geometry and Analysis

Korea Institute for Advanced Study (KIAS), Seoul, South Korea

**02/22/2014:** "Lindelof Hypothesis on average for triple product L-functions and its application"

Number Theory Festival

KAIST, Daejeon, South Korea

**01/22/2014:** "On the sparsity of positive-definite automorphic forms within a family"

East Asia Number Theory Conference

Nishijin Plaza, Fukuoka, Japan

**01/17/2014:** "Zero density estimates for families of automorphic L-functions of  $GL_1$  and  $GL_2$  over  $\mathbb{Q}$ "

Applications of homotopy method in number theory

Yonsei University, Seoul, South Korea

**12/16/2013:** "Nodal Domains and Eigenfunctions of Negatively Curved Surfaces"

The 17th Midrasa Mathematicae

Israel Institute for Advanced Studies (IIAS), Jerusalem, Israel

**11/25/2013:** "Nodal Domains and Eigenfunctions of Negatively Curved Surfaces"

Algebra Seminar

Brown University, Providence, RI, USA

**10/29/2012:** "An upper bound for intersection of nodal lines with a fixed horocycle"

NU Number Theory Seminar

Northwestern University, Evanston, IL, USA

**07/26/2012:** "On the sparsity of positive-definite automorphic forms within a family"

Number Theory Seminar

Korea Institute for Advanced Study (KIAS), Seoul, South Korea

### Contributed Talks

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**09/15/2025:** "On the dimension of joint eigenspaces of Hecke operators"

Brown Algebra Seminar

Brown University

**10/20/2022:** "Non-vanishing of symmetric cube automorphic L-functions"

2022 Global KMS International Conference

Online

**05/02/2022:** "The arithmetic of totally geodesic surfaces on Bianchi orbifolds"

Brown Algebra Seminar

Brown University

**08/12/2021:** "Boundedness of the number of nodal domains of equivariant eigenfunctions"

International Workshop on Operator Theory and its Applications 2021 Special Session 5

Online

**02/01/2021:** "Intersecting geodesics on the modular surface"

Brown Algebra Seminar

Brown University

**12/08/2020:** "Intersections of geodesics on the modular surface"

2020 CMS Winter Meeting Scientific Session on Equidistribution on Arithmetic Manifolds

Online

**09/21/2020:** "On the sparsity of positive-definite automorphic forms"

Brown Algebra/Number Theory Seminar

Brown University

**09/03/2020:** "Geometry and analytic number theory"

Meet the faculty!

Brown University

**01/16/2020:** "On the sparsity of positive-definite automorphic forms"

AMS Special Session on Analytic Theory of Automorphic Forms and L-Functions, I

Colorado Convention Center, Denver, CO, USA

**09/15/2019:** "Bounding the dimension of a joint eigenspace of Laplacian and finitely many Hecke operators"

AMS Sectional Meeting-Automorphic Forms and L-Functions, III

University of Wisconsin-Madison

**05/03/2018:** "Boundedness of the number of nodal domains of eigenfunctions"

Mathematical Physics and Harmonic Analysis Seminar

Texas A&M University

**10/18/2017:** "Counting immersed totally geodesic surfaces via arithmetic means"

Number Theory Seminar

Texas A&M University

**01/30/2017:** "Quantum Unique Ergodicity and the number of nodal domains of eigenfunctions"

Group actions and Dynamics seminar

Yale University

**01/08/2016:** "Quantum unique ergodicity and the number of nodal domains of eigenfunctions"

AMS Special Session on Global Harmonic Analysis

Washington State Convention Center, Seattle, WA, USA

**03/16/2015:** "Quantum ergodicity and the number of nodal domains of eigenfunctions"

IAS Spectral Geometry Seminar

Institute for Advanced Study, Princeton, NJ, USA

**03/03/2015:** "Quantum ergodicity and the number of nodal domains of eigenfunctions"

Berkeley Harmonic Analysis and Differential Equation Student Seminar

University of California, Berkeley, Berkeley, CA, USA

**09/25/2014:** "Counting the nodal domains of the Laplacian eigenfunctions on surfaces"

Short talks by postdoctoral members

Institute for Advanced Study, Princeton, NJ, USA

**05/26/2014:** "Automorphic  $L$ -functions and conjectures"

Colloquium for undergraduate students

KAIST, Daejeon, South Korea

**10/22/2013:** "Number of Nodal Domains of Eigenfunctions of Negatively Curved Surfaces with an Isometric Involution"

ASARC Seminar

KAIST, Daejeon, South Korea

**06/28/2013:** "Restricted  $L^p$  estimates and the zero set of Maass forms"

ASARC Seminar

KAIST, Daejeon, South Korea

## Lecture Series

**03/2021:** 'Equidistribution problems of closed geodesics on hyperbolic surfaces (part 1&2)'

Geometry, Topology & Dynamics Seminar

Korea Institute for Advanced Study (KIAS), Seoul, South Korea

**03/2019:** "Counting primitive totally geodesic submanifolds 1&2"

Number Theory Lecture Series

Korea Institute for Advanced Study (KIAS), Seoul, South Korea

**06/2016:** "Recent theory on arithmetic quantum chaos"

Number Theory Lecture Series

Korea Institute for Advanced Study (KIAS), Seoul, South Korea

**05/2015:** "Introduction to quantum ergodicity and the number of nodal domains of eigenfunctions"

Colloquium

Korea University, Seoul, South Korea

**07/2014:** "Spectral theory of hyperbolic surfaces: arithmetic surfaces and Selberg's eigenvalue conjecture"

PMI Intensive Lecture series in Number Theory

Postech, Pohang, South Korea

**05/2014–06/2014:** "Spectral theory of hyperbolic surfaces: arithmetic surfaces and Selberg's eigenvalue conjecture"

Special Lecture Series

Yonsei University, Seoul, South Korea