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Positions

- **Korea Advanced Institute of Science and Technology** *2024-present*
  Associate Professor
- **Korea Advanced Institute of Science and Technology** *2021-2024*
  Assistant Professor
- **Georgia Institute of Technology** *2018-2020*
  Visiting Assistant Professor
- **Max Planck Institute for Mathematics** *2017-2018*
  Postdoctoral Fellow

Education

- **Ph.D. in Mathematics**, Rice University *2011-2017*
  Advisors: Dr. Tim Cochran, Dr. Shelly Harvey
  Research area : Knot theory and low-dimensional topology
- **Visitor, Junior Hausdorff Trimester Program** *Fall 2016*
  Hausdorff Research Institute for Mathematics
- **B.S. in Mathematics**, POSTECH *2005-2011*
- **Study Abroad**, University of California, Berkeley *2009-2010*

Preprints accepted

- **Torsion in the knot concordance group and cabling**
  with S. Kang *arXiv:2207.11870*
  To appear in *J. Eur. Math. Soc. (JEMS)*
- **A note on the concordance $\mathbb{Z}$-genus**
  with A. Miller *arXiv:2103.01726*
  To appear in *Michigan Math. J.*

Publications

- **The $\mathbb{Z}$-genus of boundary links**
  with P. Feller and M. Powell
  Rev. Mat. Complut. 36 (2023), no. 1, 1–25.
- **Linear independence of rationally slice knots**
  with J. Hom, S. Kang, and M. Stoffregen
  Geom. Topol. 26 (2022), no. 7, 3143–3172.
- **A ribbon obstruction and derivatives of knots**
  with M. Powell
  Israel J. Math. 250 (2022), no. 1, 265–305.
- **Non-simply connected symplectic fillings of lens spaces**
  with P. Aceto and D. McCoy
  Bull. Lond. Math. Soc. 54 (2022), no. 3, 1010–1026.
- **A note on the four-dimensional clasp number of knots**
  with P. Feller
  Math. Proc. Cambridge Philos. Soc. 173 (2022), no. 1, 213–226.
- **The relative Whitney trick and its applications**
  with C. Davis and P. Orson
  Selecta Math. (N.S.) 28 (2022), no. 2, Paper No. 27.
- **Ribbon knots, cabling, and handle decompositions**
  with J. Hom and S. Kang
  Math. Res. Lett. 28 (2021), no.5, 1441–1457.
- **Branched covers bounding rational homology balls**
  with P. Aceto, J. Meier, A. Miller, M. Miller, and A. Stipsicz
  Algebr. Geom. Topol. 21 (2021), no. 7, 3569–3599.
- **Pretzel links, mutation, and the slice-ribbon conjecture**
  with P. Aceto, M. H. Kim, and A. Ray
  Math. Res. Lett. 28 (2021), no. 4, 945–966.

- **On distinct finite covers of 3-manifolds**
  with S. Friedl, B. Petri, J. Raimbault, and A. Ray.
  Indiana Univ. Math. J. 70 (2021), no. 2, 809–846.
- **Linear independence of cables in the knot concordance group**
  with C. Davis and A. Ray.
  Trans. Amer. Math. Soc. 374 (2021), no. 6, 4449–4479.
- **Homology spheres and property R**
  with M. H. Kim.
  Proc. Amer. Math. Soc. 149 (2021), no. 3, 1323–1328.
- **Concordance to links with an unknotted component**
  with C. Davis.
  Math. Proc. Cambridge Philos. Soc. 170 (2021), no. 1, 155–160.
- **Genus one cobordisms between torus knots**
  with P. Feller.
  Int. Math. Res. Not. IMRN (2021), no. 1, 521–548.
- **Rational cobordisms and integral homology**
  with P. Aceto and D. Celoria.
  Compos. Math. 156 (2020), no. 9, 1825–1845.
- **Smooth and topological almost concordance**
  with M. Nagel, P. Orson, and M. Powell.
  Int. Math. Res. Not. IMRN (2019), no. 23, 7324–7355.
- **Every genus one algebraically slice knot is 1-solvable**
  with C. Davis, T. Martin, C. Otto.
  Trans. Amer. Math. Soc. 372 (2019), no. 5, 3063–3082.
- **On the Upsilon invariant and satellite knots**
  with P. Feller and A. Ray.
  Math. Z. 292 (2019), no. 3-4, 1431–1452.
- **Links with nontrivial Alexander polynomial which are concordant to the Hopf link**
  with M. H. Kim and D. Krcatovich.
  Trans. Amer. Math. Soc. 371 (2019), no. 8, 5379–5400.
- **Concordance of knots in $S^1 \times S^2$**
  with C. Davis, M. Nagel, and A. Ray.
  J. Lond. Math. Soc. (2) 98 (2018), no. 1, 59–84.
- **A construction of slice knots via annulus modifications**
  Topology Appl. 238 (2018), 1-19.
- **A family of topologically slice links with arbitrarily large smooth slice genus**
  with A. Ray.
  Proc. Amer. Math. Soc. 146 (2018), 439-448.
- **Inequality on $t_\nu(K)$ defined by Livingston and Naik and its applications**
  Proc. Amer. Math. Soc. 145 (2017), 889-891.

Preprints

- **A note on rational band moves**
  with D. Chen, J. Hom, M. H. Kim and Z. Wu *arXiv:2311.11507*
- **Doubled Disks and Satellite Surfaces**
  with G. Guth, K. Hayden, and S. Kang *arXiv:2310.19713*
- **Concordance to boundary links and the solvable filtration**
  with C. Davis and S. Harvey *arXiv:2305.11268*
- **Topologically and rationally slice knots**
  with J. Hom and S. Kang *arXiv:2304.06265*
- **Slice obstructions from genus bounds in definite 4-manifolds**
  with P. Aceto, N. Castro, M. Miller, and A. Stipsicz *arXiv:2303.10587*
- **Handle decomposition complexibility and representation spaces**
  with P. Aceto, A. Daemi, J. Hom, and T. Lidman *arXiv:2210.06607*

- **Definite fillings of lens spaces**
  with P. Aceto and D. McCoy *arXiv:2208.02586*
- **The $(2,1)$-cable of the figure-eight knot is not smoothly slice**
  with I. Dai, S. Kang, A. Mallick, and M. Stoffregen *arXiv:2207.14187*
- **Unknotting number and cabling**
  with J. Hom and T. Lidman *arXiv:2206.04196*
- **Seifert surfaces in the 4-ball**
  with K. Hayden, S. Kim, M. Miller, and I. Sundberg *arXiv:2205.15283*
- **Isotopy and equivalence of knots in 3-manifolds**
  with P. Aceto, C. Bregman, C. Davis, and A. Ray *arXiv:2007.05796*
- **Embedding lens spaces in definite 4-manifolds**
  with P. Aceto. *arXiv:1903.01260*
- **Milnor's triple linking number and derivatives of genus three knots**
  arXiv:1603.09163

Awards and Grants

- Member of Young Korean Academy of Science and Technology
  The Korean Academy of Science and Technology, 2023-present
- TJ Park Science Fellowship
  POSCO TJ Park Foundation, 2022-present
- Samsung Science and Technology Foundation Grant
  Samsung Science and Technology Foundation, 2021-present
- Sangsan Prize for Young Mathematicians
  Korean Mathematical Society, 2021
- AMS-Simons travel grant
  American Mathematical Society and Simons Foundation, 2020-2022
- AIM SQuaRE Grant (with P. Aceto, N. Castro, M. Miller, and A. Stipsicz)
  Fibered ribbon knots and Casson–Gordon exotic 4-spheres, 2019-present
- 2011 Fulbright Graduate Study Award
  Fulbright Korean-American Educational Commission, 2011-2013

Teaching

- **Korea Advanced Institute of Science and Technology**

MAS 101: Calculus I	*Spring 2024*
MAS 109: Introduction to Linear Algebra	*Spring 2024*
MAS 430: Combinatorial Topology	*Fall 2023*
MAS 101: Calculus I	*Spring 2023*
MAS 331: Topology	*Spring 2023*
MAS 532: Algebraic Topology II	*Fall 2022*
MAS 531: Algebraic Topology I	*Spring 2022*
MAS 532: Algebraic Topology II	*Fall 2021*
MAS 531: Algebraic Topology I	*Spring 2021*

- **Georgia Institute of Technology**

Math 1554: Linear Algebra	*Fall 2020*
Math 2106: Foundations of Mathematical Proof	*Spring 2020*
Math 1551: Differential Calculus	*Fall 2019*
Math 1552: Integral Calculus	*Spring 2019*
Math 1551: Differential Calculus	*Fall 2018*

- **Rice University**

Math 355: Linear algebra	*Summer 2014*
Math 211: Ordinary differential equations and linear algebra	*Fall 2013*

Students

Yunseo Jo	*Ph.D. expected 2027*
Dongjun Lee	*Ph.D. expected 2027*
Seokhyun Eum	*Ph.D. expected 2027*
Kee Taek Kim	*Ph.D. expected 2026*
Key-nyoung Lee	*Ph.D. expected 2024*
Jaewon Lee	*Masters 2022, Ph.D. expected 2026*

Postdocs

- Dongsoo Lee — *Fall 2023-present*
- Hayato Imori — *Spring 2024-present*

Last updated: March 26, 2024