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POSITIONS

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

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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*

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PUBLICATIONS

- **The relative Whitney trick and its applications**  
with C. Davis and P. Orson  
*Selecta Math. (N.S.) 28 (2022), no. 2, Paper No. 27.*
- **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. Kratovich.  
*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  
ACCEPTED

- 
- **The  $\mathbb{Z}$ -genus of boundary links**  
with P. Feller and M. Powell *arXiv:2012.14367*  
To appear in *Rev. Mat. Complut.*
  - **Non-simply connected symplectic fillings of lens spaces**  
with P. Aceto and D. McCoy *arXiv:2009.08964*  
To appear in *Bull. Lond. Math. Soc.*
  - **Linear independence of rationally slice knots**  
with J. Hom, S. Kang, and M. Stoffregen *arXiv:2011.07659*  
To appear in *Geom. Topol.*
  - **A note on the concordance  $\mathbb{Z}$ -genus**  
with A. Miller *arXiv:2103.01726*  
To appear in *Michigan Math. J.*
  - **A note on the four-dimensional clasp number of knots**  
with P. Feller *arXiv:2009.01815*  
To appear in *Math. Proc. Cambridge Philos. Soc.*
  - **A ribbon obstruction and derivatives of knots**  
with M. Powell *arXiv:1802.00582*  
To appear in *Israel J. Math.*
  - **Handle decompositions of ribbon disks and their complements**  
with J. Hom and S. Kang *arXiv:2003.02832*  
To appear in *Math. Res. Lett.*

PREPRINTS

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- **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

- 
- 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, 2019-2021*
  - 2011 Fulbright Graduate Study Award  
*Fulbright Korean-American Educational Commission, 2011-2013*
  - Rice Graduate Student Fellowship

*Rice University, 2011-2017*

- Special University Scholarship  
*The Korea Foundation for Advanced Studies 2006, 2009-2010*
- Excellent Achievement Scholarship for Natural Science Studies  
*Korean government 2005-2006, 2009-2010*

CONFERENCE  
ORGANIZATION

- 
- Topology and Geometry of 3- and 4-manifolds *Mar. 2021*  
*AMS Special Session, Georgia Institute of Technology*
  - Knots, surfaces, and 4-manifolds *Jun. 2020*  
*Nearly Carbon Neutral Geometric Topology Conference*
  - Smooth concordance classes of topologically slice knots *Jun. 2019*  
*American Institute of Mathematics*
  - Tech Topology Conference *Dec. 2020 / Dec. 2019 / Dec. 2018*  
*Georgia Institute of Technology*

TEACHING

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

- 
- Seokhyun Eum *Ph.D. expected 2027*
  - Kee Taek Kim *Ph.D. expected 2026*
  - Key-nyoung Lee *Ph.D. expected 2022*
  - Jaewon Lee *Masters expected 2022*