Yoon-Joo Kim

Mathematics department
Columbia University
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FIELD OF INTEREST

Algebraic geometry; symplectic varieties (compact hyper-Kähler manifolds, Hitchin fibrations, or general set-ups) and their Lagrangian fibrations.

POSITIONS

Ritt Assistant Professor, Columbia University.	2023 – current
Postdoctoral researcher, ERC HyperK team, Universität Bonn.	2022 – 2023

EDUCATION

Ph.D. Mathematics, Stony Brook University.	2016 – 2022
Advisor: Radu Laza.	
B.S. Mathematics, Seoul National University.	2008 – 2015
B.S. Computer science, Seoul National University.	2008 – 2015

HONORS AND AWARDS

The Presidential Science Scholarship, Korea Student Aid Foundation.	2008 – 2012
Silver Medal, International Mathematical Olympiad.	2007

PAPERS AND PREPRINTS

1. *A conjectural bound on the second Betti number for hyper-Kähler manifolds* (with R. Laza), Bull. Soc. Math. France **148** (2020), no. 3, 467–480.
2. *The LLV decomposition of hyper-Kähler cohomology* (with M. Green, R. Laza and C. Robles), Math. Ann. **382** (2022), 1517–1590.
3. *The dual Lagrangian fibration of known hyper-Kähler manifolds*, to appear in Alg. Geom., arXiv:2109.03987.
4. *Isotrivial Lagrangian fibrations of compact hyper-Kähler manifolds*, submitted, arXiv:2312.15147.
5. *The Néron model of a higher-dimensional Lagrangian fibration*, submitted, arXiv:2410.21193.

RESEARCH TALKS

1. AMS Fall 2020 Southeast meeting, October 2020.
2. Stony Brook University, Algebraic geometry seminar, November 2020.
3. University of Connecticut, Algebra seminar, February 2021.
4. KIAS (Korea), Algebraic geometry seminar, February 2021.
5. Michigan State University, Algebra seminar, September 2021.
6. IBS CCG (Korea), Algebraic geometry seminar, September 2021.
7. UC Santa Barbara, Geometry & arithmetic seminar, October 2021.
8. University of Massachusetts Amherst, Valley geometry seminar, October 2021.

9. Institut de Mathématiques de Jussieu, Séminaire de géométrie algébrique, October 2021.
10. University of Michigan, Algebraic geometry seminar, November 2021.
11. Derived seminar, December 2021.
12. University of Georgia, Algebraic geometry seminar, January 2022.
13. Yale University, Geometry, symmetry & physics seminar, February 2022.
14. Seoul National University, August 2022.
15. Universität Bonn, ERC HyperK seminar, October 2022.
16. IST Austria, November 2022.
17. IBS CCG (Korea), Algebraic geometry seminar, February 2023.
18. KIAS (Korea), Algebraic geometry seminar, February 2023.
19. KdV University of Amsterdam, Algebraic geometry seminar, March 2023.
20. Laboratoire Paul Painlevé at University of Lille, Algebraic geometry seminar, March 2023.
21. Western Hemisphere Virtual Symplectic Seminar, April 2023.
22. Columbia University, Algebraic geometry seminar, September 2023.
23. Stony Brook University, Algebraic geometry seminar, September 2023.
24. IBS-CCG (Korea), Moduli, K-trivial varieties, and related topics, February 2024.
25. Princeton University, Algebraic geometry seminar, March 2024.
26. Johns Hopkins University, Algebraic geometry seminar, March 2024.
27. KIAS (Korea), June 2024.
28. Fordham University, Algebra seminar, September 2024.
29. Harvard University, Harvard – MIT joint algebraic geometry seminar, February 2025.
30. University of Sheffield, HK days workshop, February 2025.
31. University of Pennsylvania, Math – Physics seminar, February 2025.
32. IBS CCG (Korea), Workshop on hyperkähler varieties and related topics, March 2025.
33. Yonsei University (Korea), Algebraic geometry seminar, March 2025.

SERVICES

- Organizer, Student algebraic geometry seminar, Fall 2018 – Fall 2019.
- Organizer, Student stacks seminar, Spring 2020.
- Co-organizer, Algebraic geometry learning seminar, Spring 2024.
- Co-organizer, Columbia algebraic geometry seminar, Fall 2024 – Spring 2025.
- Co-organizer, Algebraic geometry learning seminar, Spring 2025.

TEACHING

- Calculus III (TA), Fall 2016.
- Calculus C (grader), Fall 2017.
- Calculus III (TA), Fall 2018.
- Precalculus (TA), Fall 2019.
- Applied algebra (TA), Fall 2020.
- Calculus III (TA), Fall 2021.
- Calculus II, Fall 2023.
- Calculus III, Fall 2024.
- Calculus B (TA), Spring 2017.
- Calculus II (TA), Spring 2018.
- Linear Algebra (TA), Spring 2019.
- Calculus III (TA), Spring 2020.
- Calculus B (TA), Spring 2021.
- Calculus IV (TA), Spring 2022.
- Number theory and cryptography, Spring 2024.
- Algebraic curves, Spring 2025

OTHERS

Skilled at computer programming, especially with C/C++.