

Jang Soo Kim

Curriculum Vitae

Professor, Department of Mathematics
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Research Interests

Enumerative combinatorics and algebraic combinatorics.

Positions

Sep. 2022–present	Professor , Sungkyunkwan University.
Sep. 2015–Aug. 2022	Associate Professor , Sungkyunkwan University.
Mar. 2014–Aug. 2015	Assistant Professor , Sungkyunkwan University.
Jun. 2013–Feb. 2014	Research Fellow , KIAS.
Sep. 2010–May 2013	Dunham Jackson Assistant Professor , School of Mathematics, University of Minnesota.
Mar. 2009–Jul. 2010	CNRS Postdoctoral Researcher , LIAFA, University of Paris 7. Mentor: Sylvie Corteel.

Education

Mar. 2003–Jan. 2009	Ph.D. in Mathematical Sciences , KAIST. Advisor: Dongsu Kim.
Mar. 1999–Feb. 2003	B.S. in Mathematics , KAIST.

Professional Service

Jul. 2026	Co-chair, Program Committee, FPSAC 2026, Seattle.
Nov. 2025–Oct. 2027	Member, Research Board Committee, National Research Foundation of Korea.
Jan. 2024–Dec. 2025	Chair, Department of Mathematics, Sungkyunkwan University.
Nov. 2020–present	Associate Editor, <i>Discrete Mathematics</i> .
Nov. 2020–present	Handling Editor, <i>Combinatorial Theory</i> .
Sep. 2019–Dec. 2025	Editor, <i>Annals of Combinatorics</i> .
Sep. 2019–present	Member, Executive Committee, FPSAC.
Aug. 2016–present	Member, Organizing Committee, KIAS Combinatorics Workshop.

Student Supervision

- **Sun-mi Yun** (Ph.D., Feb. 2023). Thesis title: *Characteristic polynomials for the weak order on Coxeter groups*.
- **Jihyeug Jang** (Ph.D., Feb. 2024). Thesis title: *Lattice paths on flow polytopes, Grothendieck polynomials, and orthogonal polynomials*.
- **U-Keun Song** (Ph.D., Aug. 2026). Thesis title: *A combinatorial interpretation of refined Grothendieck polynomials via determinants*.

- **Hojoon Lee** (master's degree, Aug. 2026). Thesis title: *Algebraic and diagrammatic approaches to the four color theorem*.
- **Younggwang Cho** (student in the integrated master's and Ph.D. program since Mar. 2025).
- **Hojoon Lee** (Ph.D. student since Sep. 2026).

Postdoctoral Mentoring

- **Meesue Yoo** (Aug. 2016–Feb. 2019).
Current position: Associate Professor, Chungbuk National University.
- **JiSun Huh** (Mar. 2019–Feb. 2020).
Current position: Research Professor, University of Seoul.
- **Minho Song** (May 2020–Feb. 2026).
Current position: Postdoctoral Researcher, Yonsei University.
- **Byung-Hak Hwang** (Sep. 2020–Apr. 2021).
Current position: AI Fellow, Center for Artificial Intelligence and Natural Sciences, Korea Institute for Advanced Study (KIAS).
- **Donghyun Kim** (Jun. 2021–Feb. 2023).
Current position: Assistant Professor, Ewha Womans University.
- **Jihyeug Jang** (Mar. 2024–Dec. 2024).
Current position: Assistant Professor, Pusan National University.

Grants

- **Basic Research Grant** (2013). *Combinatorics of Askey–Wilson polynomials*.
Nov. 1, 2013–Oct. 31, 2016 (36 months); KRW 150 million.
- **Basic Research Grant** (2016). *Combinatorics of Askey–Wilson polynomials* (follow-up project).
Nov. 1, 2016–Oct. 31, 2019 (36 months); KRW 150 million.
- **Basic Research Grant** (2019). *Combinatorics of Koornwinder polynomials*.
Jun. 1, 2019–Feb. 28, 2022 (33 months); KRW 163 million.
- **Mid-Career Research Grant** (2022). *Combinatorics of refined Grothendieck polynomials*.
Mar. 1, 2022–Feb. 28, 2025 (36 months); KRW 355 million.
Recognized for outstanding research achievements.
- **STAR Grant (joint Korea–France project)** (2023). *Orthogonal polynomials and lecture hall partitions*.
Oct. 1, 2023–Sep. 30, 2025; KRW 30 million. Collaborator in France: Sylvie Corteel.
- **Mid-Career Research Grant** (2025). *Combinatorics of mixed moments of Askey–Wilson polynomials*.
Mar. 1, 2025–Feb. 28, 2030 (60 months); KRW 1 billion.

Awards

- **POSCO Science Fellow**, POSCO TJ Park Foundation (2012).
- **SKKU Teaching Award** (2026).

Software Development

- Developer of **Newbiemacs**, a preconfigured GNU Emacs distribution for mathematicians new to Emacs, with tools for $\text{\LaTeX}$ editing and managing research papers.
<https://jangsookim.github.io/newbiemacs/newbiemacs-home.html>

Publications

Preprints

- P1. Note on adjacency spectra for twice punctured hypercubes (with Victor Reiner, Laura Schoenzeit), arXiv:2608.27887.
- P2. An explicit formula for Koornwinder moments and Rains' positivity conjecture (with Younggwang Cho, Donghyun Kim, Hojoon Lee, Jing Liu, Minh Song), arXiv:2606.14241.
- P3. Thrall's problem for two rows (with JiSun Huh, Woo-Seok Jung, Meesue Yoo), arXiv:2605.17880.
- P4. Bijections for rhombic alternative tableaux (with Sylvie Corteel, Olya Mandelshtam, Philippe Nadeau), arXiv:2603.12700.
- P5. Hadamard Products of dual Jacobi-Trudi matrices (with Robert Angarone, Jaeseong Oh, Daniel Soskin), arXiv:2511.08969.
- P6. Bott manifolds of Bott–Samelson type and assemblies of ordered partitions (with Junho Jeong, Eunjeong Lee), arXiv:2511.09380.
- P7. Hall-Littlewood expansions of chromatic quasisymmetric functions using linked rook placements (with Seung Jin Lee and Meesue Yoo), arXiv:2506.23082.
- P8. Hilbert polynomials of configuration spaces over graphs of circumference at most 1 (with Byung Hee An), arXiv:2505.24416.
- P9. Refinement of Hikita's e -positivity theorem via Abreu-Nigro's g -functions and restricted modular law (with JiSun Huh, Byung-Hak Hwang, Donghyun Kim, and Jaeseong Oh), arXiv:2504.09123.
- P10. Combinatorics of generalized orthogonal polynomials of type R_{II} (with Minh Song), arXiv:2411.12345.

Published Papers

2026

- 1. Bounded Littlewood identities with fixed number of odd rows or odd columns (with JiSun Huh, Christian Krattenthaler, Soichi Okada), *Electronic J. Combin.* 33 (2026), no. 3, P3.5, arXiv:2510.11054.
- 2. Lecture hall graphs and the Askey scheme (with Sylvie Corteel, Bhargavi Jonnadula, Jonathan Keating), *Adv. Math.*, 499 (2026) 111056, arXiv:2311.12761.
- 3. Enumeration of multiplex juggling card sequences using generalized q -derivatives (with Yumin Cho, Jaehyun Kim, and Nakyoung Lee), *Enumerative Combinatorics and Applications* 6:2 (2026) Article S2R12, arXiv:2402.09903.
- 4. Hook-valued tableau uncrowding and tableau switching (with Jihyeug Jang, Jianping Pan, Joseph Pappe, Anne Schilling), *SIAM J. Discrete Math.* 40 (2026), no. 1, 32–51, arXiv:2410.18343, Extended Abstract in FPSAC 2025.

2025

- 5. Bounded Littlewood identities for cylindric Schur functions (with JiSun Huh, Christian Krattenthaler, Soichi Okada), *Trans. Amer. Math. Soc.* 378 (2025), 6765–6829, arXiv:2301.13117.
- 6. Refined canonical stable Grothendieck polynomials and their duals, Part 2 (with Byung-Hak Hwang, Jihyeug Jang, Minh Song, and U-Keun Song), *European J. Combin.* 127 (2025), 104166, arXiv:2404.02483.

2024

7. Characteristic polynomials of the weak order on classical and affine Coxeter groups (with Sun-mi Yun), *Order*, 41 (2024), no. 2, 319–334, arXiv:2204.01310.
8. Refined canonical stable Grothendieck polynomials and their duals, Part 1 (with Byung-Hak Hwang, Jihyeug Jang, Minhong Song, and U-Keun Song), *Adv. Math.* 446 (2024), 109670, arXiv:2104.04251, Extended Abstract in FPSAC 2023.
9. Extended commonality of paths and cycles via Schur convexity (with Joonkyung Lee), *J. Combin. Theory Ser. B* 166 (2024), 109–122, arXiv:2210.00977.

2023

10. Three families of q -Lommel polynomials (with Dennis Stanton), *Sém. Lothar. Combin.* 87B (2023), Art. 8, 25 pp., arXiv:2105.10096.
11. Combinatorics of orthogonal polynomials of type R_I (with Dennis Stanton), *Ramanujan Journal* 61 (2023), no. 2, 329–390, arXiv:2009.14475.
12. Enumeration of standard barely set-valued tableaux of shifted shapes (with Michael Schlosser and Meesue Yoo), *European Journal of Combinatorics* 112 (2023), Paper No. 103727, arXiv:2006.03253.
13. Negative moments of orthogonal polynomials (with Jihyeug Jang, Donghyun Kim, Minhong Song, U-Keun Song), *Forum of Mathematics, Sigma* 11 (2023), Paper No. e22, 34 pp, arXiv:2201.11344.
14. Weight multiplicities and Young tableaux through affine crystals (with Kyu-Hwan Lee and Se-jin Oh), *Memoirs of the American Mathematical Society*, Volume 283 (2023), no. 1401, arXiv:1703.10321, Extended Abstract in FPSAC 2017.

2022

15. Symmetric Pascal matrices and related graphs (with Gi-Sang Cheon, Seyed Ahmad Mojallal, Meesue Yoo), *Linear and Multilinear Algebra* 70 (2022), no. 21, 6345–6357.
16. Jacobi–Trudi formulas for flagged refined dual stable Grothendieck polynomials, *Algebraic Combinatorics*, Volume 5 (2022) no. 1, pp. 121–148, arXiv:2008.12000.
17. Enumeration of Gelfand–Cetlin type reduced words (with Yunhyung Cho and Eunjeong Lee), *Electronic J. Combin.* 29(1)(2022), #P1.27, arXiv:2009.06906.

2021

18. Generalized Schur function determinants using the Bazin identity (with Meesue Yoo), *SIAM J. Discrete Math.* 35 (2021), no. 3, 1650–1672, arXiv:2012.08741.
19. Whitney numbers for poset cones (with Galen Dorpalen-Barry and Vic Reiner), *Order* 38 (2021), no. 2, 283–322, arXiv:1906.00036.
20. Jacobi–Trudi formula for refined dual stable Grothendieck polynomials, *J. Combin. Theory Ser. A* 180 (2021), 105415, arXiv:2003.00540.
21. Volumes of generalized Chan–Robbins–Yuen polytopes (with Sylvie Corteel and Karola Mészáros), *Discrete & Computational Geometry*, 65, 510–530 (2021), arXiv:1704.02701.

2020

22. Volumes of flow polytopes related to caracol graphs (with Jihyeug Jang), *Electronic J. Combin.* 27(4)(2020), #P4.21, arXiv:1911.10703.
23. Lecture hall tableaux (with Sylvie Corteel), *Adv. Math.* 371 (2020) 107266, arXiv:1804.02489.
24. On linearization coefficients of q -Laguerre polynomials (with Byung-Hak Hwang, Jaeseong Oh and Sang-Hoon Yu), *Electronic J. Combin.* 27(2)(2020), #P2.22, arXiv:2001.01930, Extended Abstract in FPSAC 2020.

25. Enumeration of bounded lecture hall tableaux (with Sylvie Corteel), *Séminaire Lotharingien de Combinatoire* B81f (2020), 28 pp, arXiv:1904.10602.
26. Product formulas for certain skew tableaux (with Meesue Yoo), *European J. Combin.* 84 (2020), 103038, arXiv:1806.01525.

2019

27. Reverse plane partitions of skew staircase shapes and q -Euler numbers (with Byung-Hak Hwang, Meesue Yoo and Sun-mi Yun), *J. Combin. Theory Ser. A* 168 (2019), 120–163, arXiv:1711.02337, Extended Abstract in FPSAC 2018.
28. Hook length property of d -complete posets via q -integrals (with Meesue Yoo), *J. Combin. Theory, Ser. A* 162 (2019), 167–221, arXiv:1708.09109, Extended Abstract in FPSAC 2018.

2018

29. Proof of Chapoton’s conjecture on Newton polygons of q -Ehrhart polynomials (with U-Keun Song), *Electronic J. Combin.* 25(2)(2018), #P2.51, arXiv:1704.05621, Extended Abstract in FPSAC 2018.
30. Spectral properties of Pascal graphs (with Gi-Sang Cheon and Seyed Ahmad Mojallal), *Linear and Multilinear Algebra* 66 (2018), 1403–1417.
31. On the f -vectors of Gelfand-Cetlin polytopes (with Byung Hee An and Yunhyung Cho), *European J. Combin.* 67 (2018), 61–77, arXiv:1606.05957.

2017

32. Colored permutations with no monochromatic cycles (with Dongsu Kim and Seunghyun Seo), *J. Korean Math. Soc.* 54 (2017), No. 4, pp. 1149–1161.
33. Flow polytopes with Catalan volumes (with Sylvie Corteel and Karola Meszaros), *Comptes Rendus Mathématique* 355(3) (2017), 248–259, arXiv:1612.00102.
34. On q -integrals over order polytopes (with Dennis Stanton), *Adv. Math.* 308(21) (2017), 1269–1317, arXiv:1608.03342, Extended Abstract in FPSAC 2016.
35. A new q -Selberg integral, Schur functions, and Young books (with Soichi Okada), *Ramanujan Journal* 42 (2017), 43–57, arXiv:1412.7914.
36. The Selberg integral and Young books (with Suho Oh), *J. Combin. Theory Ser. A* 145 (2017), 1–24, arXiv:1409.1317, Extended Abstract in FPSAC 2014.

2016

37. Moments of orthogonal polynomials and combinatorics (with Sylvie Corteel and Dennis Stanton), a book chapter, *IMA Volumes in Mathematics and its Applications* Vol. 159, Springer.
38. Combinatorial proof of a partial theta function identity of Warnaar (with Kathy Ji and Byungchan Kim), *Int. J. Number Theory* 12, 1475–1482 (2016).
39. Generalized Dyck tilings (with Matthieu Josuat-Vergès), *European J. Combin.* 51 (2016), 458–474, arXiv:1410.1270, Extended Abstract in FPSAC 2014.

2015

40. The combinatorics of associated Laguerre polynomials (with Dennis Stanton), *SIGMA* 11 (2015), 039, arXiv:1501.03880.
41. Bootstrapping and Askey-Wilson polynomials (with Dennis Stanton), *J. Math. Anal. Appl.*, 421 (2015), 501–520, arXiv:1403.0053.

2014

- 42. Moments of Askey-Wilson polynomials (with Dennis Stanton), *J. Combin. Theory Ser. A* 125 (2014), 113–145, arXiv:1207.3446, Extended Abstract in FPSAC 2013.
- 43. Annular noncrossing permutations and minimal transitive factorizations (with Seunghyun Seo and Heesung Shin), *J. Combin. Theory Ser. A* 124 (2014), 251–262, arXiv:1201.5703, Extended Abstract in FPSAC 2012.
- 44. Dyck tilings, increasing trees, descents, and inversions (with Karola Mészáros, Greta Panova, David B. Wilson), *J. Combin. Theory Ser. A* 122 (2014), 9–27, arXiv:1205.6578, Extended Abstract in FPSAC 2012.

2013

- 45. Crossings of signed permutations and q -Eulerian numbers of type B (with Sylvie Corteel and Matthieu Josuat-Vergès), *Journal of Combinatorics* 4 (2013), no. 2, 191–228, arXiv:1203.0154.
- 46. Cyclic sieving phenomenon on annular noncrossing permutations, *Seminaire Lotharingien de Combinatoire* B69b (2013), 20 pp, arXiv:1210.7353.
- 47. Bijections on rooted trees with fixed size of maximal decreasing subtrees, *Annals of Combinatorics* 17 (2013), no. 2, 339–352, arXiv:1108.6038.
- 48. Touchard-Riordan formulas, T-fractions, and Jacobi’s triple product identity (with Matthieu Josuat-Vergès), *Ramanujan J.* 30 (2013), no. 3, 341–378, arXiv:1101.5608, Extended Abstract in FPSAC 2011.

2012

- 49. Enumeration formulas for generalized q -Euler numbers, *Adv. App. Math.* 49 (2012), 326–350, arXiv:1104.4584.
- 50. Proofs of two conjectures of Kenyon and Wilson on Dyck tilings, *J. Combin. Theory Ser. A* 119 (2012), 1692–1710, arXiv:1108.5558, Extended Abstract in FPSAC 2012.

2011

- 51. Combinatorial rigidity of 3-dimensional simplicial polytopes (with Suyoung Choi), *Int. Math. Res. Notices* 2011 (2011), 1935–1951, arXiv:1002.0828.
- 52. Bijections on two variations of noncrossing partitions, *Discrete Math.*, 311 (2011), 1057–1063, arXiv:0812.4091.
- 53. Front representation of set partitions, *SIAM J. Discrete Math.* 25 (2011), 447–461, arXiv:0907.1485.
- 54. Combinatorics on permutation tableaux of type A and type B (with Sylvie Corteel), *European J. Combin.* 32 (2011), 563–579, arXiv:1006.3812.
- 55. New interpretations for noncrossing partitions of classical types, *J. Combin. Theory Ser. A* 118 (2011), 1168–1189, arXiv:0910.2036.
- 56. q -analog of tableau containment, *J. Combin. Theory Ser. A* 118 (2011), 1021–1038, arXiv:0812.1256.
- 57. Chain enumeration of k -divisible noncrossing partitions of classical types, *J. Combin. Theory Ser. A* 118 (2011), 879–898, arXiv:0908.2641, Extended Abstract in FPSAC 2010.

2010

- 58. A note on 2-distant noncrossing partitions and weighted Motzkin paths (with Ira M. Gessel), *Discrete Math.* 310 (2010), 3421–3425, arXiv:1003.5301.
- 59. A combinatorial approach to the power of 2 in the number of involutions (with Dongsu Kim), *J. Combin. Theory Ser. A* 117 (2010), 1082–1094, arXiv:0902.4311.

- 60. A note on the total number of cycles of even and odd permutations, *Discrete Math.* 310 (2010), 1398–1400, arXiv:0909.0683.
- 61. A combinatorial proof of a formula for Betti numbers of a stacked polytope (with Suyoung Choi), *Electron. J. Combin.* 17 (2010), #R9, arXiv:0902.2444.
- 62. Skew domino Schensted algorithm and sign-imbalance, *European J. Combin.* 31 (2010), 210–229, arXiv:0711.1035, Extended Abstract in FPSAC 2008.

2009

- 63. k -distant crossings and nestings of matchings and partitions (with Dan Drake), *DMTCS proc., AK (FPSAC 2009)* 349–360, arXiv:0812.2725.

2007

- 64. The initial involution patterns of permutations (with Dongsu Kim), *Electron. J. Combin.* 14 (2007), #R2.

Unpublished Manuscripts

- U1. Total positivity of Hadamard product of dual Jacobi–Trudi matrices (with Jaeseong Oh), arXiv:2504.12583.
- U2. Ratios of Hahn–Exton q -Bessel functions and q -Lommel polynomials (with Dennis Stanton), arXiv:2006.08120.