Curriculum Vitae[1]

Keisuke Hoshino

Contact details

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Employment

Apr. 2026–present Researcher (part-time), RIMS, Kyoto University.

Funding

2023–2026 JSPS Research Fellowship for Young Scientists (DC1), JSPS KAKENHI Grant No. JP23KJ1365.

Education

Apr. 2023–Mar. 2026 D.Sc., Graduate School of Science, Kyoto University.

Thesis title: *A Homotopy Theory of Algebraic Higher Categories*

Supervisor: Masahito Hasegawa

Apr. 2021–Mar. 2023 M.Sc., Graduate School of Science, Kyoto University.

Thesis title: *Towards structures of higher dimensional categories*

Supervisor: Masahito Hasegawa

Apr. 2017–Mar. 2021 B.Sc., Faculty of Science, Kyoto University.

Publications

[1] T. Sanada, K. Hoshino, K. Hirai, and S.-y. Katsumata. “Programming Backpropagation with Reverse Handlers for Arrows”. In: *Proc. ACM Program. Lang.* 10.ICFP, 306 (Aug. 2026), pp. 921–949. DOI: 10.1145/3828704. URL: https://doi.org/10.1145/3828704.

[2] S. Fujii, K. Hoshino, and Y. Maehara. “ω-weak equivalences between weak ω-categories”. In: *Adv. Math.* 480 (2025), Paper No. 110490. ISSN: 0001-8708,1090-2082. DOI: 10.1016/j.aim.2025.110490. URL: https://doi.org/10.1016/j.aim.2025.110490.

[3] K. Hoshino and H. Nasu. “Double categories of relations relative to factorisation systems”. In: *Appl. Categ. Structures* 33.2 (2025), Paper No. 11, 70. ISSN: 0927-2852,1572-9095. DOI: 10.1007/s10485-025-09799-y. URL: https://doi.org/10.1007/s10485-025-09799-y.

[4] 眞田 嵩大, 平井 謙信, 星野 恵佑, and 勝股 審也. “逆微分圏に基づいたアローハンドラによるニューラルネットワークプログラミング言語に向けて. Towards a Neural Network Programming Language with Arrow Handlers Based on Reverse Differential Categories”. In: **日本ソフトウェア科学会第 *42* 回大会（*2025* 年度）講演論文集**. 査読なし論文（This is an unrefereed paper）. 日本ソフトウェア科学会. 2025. URL: https://jssst.or.jp/files/user/taikai/2025/papers/1a-1-R.pdf.

[5] S. Fujii, K. Hoshino, and Y. Maehara. “Weakly invertible cells in a weak ω-category”. In: *High. Struct.* 8.2 (2024), pp. 386–415. ISSN: 2209-0606. DOI: 10.21136/HS.2024.14.

[1] Last updated: November 19, 2026

Preprints

[1] S. Fujii, K. Hoshino, and Y. Maehara. *ω-equifibrations between strict and weak ω-categories*. 2025. arXiv: 2511.09849 [math.CT]. URL: https://arxiv.org/abs/2511.09849.

Talks

(Invited)

[1] K. Hoshino. **圏の二重圏、圏と二重圏 ——形式的圏論と図式**. Categories in Tokyo 3, Kabukiza Tower, Tokyo, Japan. Nov. 2026. URL: https://categories.tokyo/meetings/3.html#abstract-0-1000.

[2] K. Hoshino and H. Nasu. *Double categories of relations relative to factorisation systems*. Second Virtual Workshop on Double Categories, Online. Oct. 2024.

(non-refereed)

[1] K. Hoshino. *Strong subgenericity and the Structure-Semantics adjunction for T-operads*. Computer Science and Category Theory (CSCAT2026), Fukui, Japan. Mar. 2026.

[2] K. Hoshino. **代数的入射性と** *cellular replacement comonad*. Categories in Tokyo, National Institute of Informatics, Tokyo, Japan. Feb. 2026.

[3] K. Hoshino. *Bivirtual double categories and localisation of composing cells*. Computer Science and Category Theory (CSCAT2025), Kumamoto, Japan. Mar. 2025.

[4] K. Hoshino. *Factorisation systems and (virtual) equipments*. Computer Science Theory Seminar, Logic and Semantics Group in TTÜ, Tallinn, Estonia. Dec. 2024.

[5] K. Hoshino and H. Nasu. *Double categories of relations relative to factorisation systems*. 67th Annual Meeting of the Australian Mathematical Society (AustMS 2023), Brisbane, Australia. Dec. 2023.

[6] K. Hoshino. *Factorisation systems and equipments*. Australian Category Seminar, Macquarie University, Sydney, Australia. Nov. 2023.

[7] K. Hoshino. *Towards Structures of Higher Dimensional Categorical Structures*. Computer Science and Category Theory (CSCAT2023), Kyoto, Japan. Mar. 2023.

[8] K. Hoshino. *PCAs as algebras over operads*. Computer Science and Category Theory (CSCAT2022), Online. Mar. 2022.

Teaching Experience

2021 Teaching assistant in Faculty of Science, Kyoto University. Tutor for KTGU Faculty Seminar (KTGU 学部セミナー) reading *Introduction to the Theory of Computation* by Sipser, Michael.

2022 Teaching assistant in Faculty of Science, Kyoto University. Tutor for KTGU Faculty Seminar (KTGU 学部セミナー) reading プログラム意味論 *(Program Semantics)* by Yokouchi, Hirofumi.