Junichiro Matsuda / 松田 隼一朗

Current Address

Department of Pure Mathematics,
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Personal Data

Born in Osaka, Japan, May 1996
Email: jmatsuda@uwaterloo.ca
Homepage: junichiromatsuda.github.io
Post-doc at University of Waterloo

Research Interests

Quantum Graph Theory and related topics, including Operator Algebra Theory, Quantum Group Theory, Tensor Category Theory, Quantum Information Theory, Expander Graphs, etc.

Diploma

Ph.D.	Department of Mathematics, Graduate School of Science, Kyoto University	2024 March 25
MSc	Department of Mathematics, Graduate School of Science, Kyoto University	2021 March 23
BSc	Faculty of Science, Kyoto University	2019 March 26

Education

PhD	Department of Mathematics, Graduate School of Science, Kyoto University, supervisor Benoît Collins / 京都大学大学院 理学研究科 数学・数理解析専攻 数学系	2021 April – 2024 March
MSc	Department of Mathematics, Graduate School of Science, Kyoto University, supervisor Benoît Collins / 京都大学大学院 理学研究科 数学・数理解析専攻 数学系	2019 April – 2021 March
BSc	Faculty of Science, Kyoto University / 京都大学 理学部 数理科学系	2015 April – 2019 March
	Osaka Prefectural Otemae High School / 大阪府立 大手前高等学校	2012 April – 2015 March

Employment

University of Waterloo	Postdoctoral Scholar	2025 April – 2026 April
(University of Waterloo	Postdoctoral Fellow (formal, funded by JSPS)	2024 June – 2025 March)
Kyoto University	Research Fellow	2022 July – 2022 December
Kyoto University	Research Assistant	2021 April – 2022 February
Kyoto University	Teaching Assistant	2019 April – 2023 July
Kyoto University	Office Assistant of Prof. Benoît Collins	2018 November – 2023 November

Teaching

University of Waterloo	Calculus 3 (MATH 207)	2026 January – 2026 April
University of Waterloo	Calculus 1 (MATH 137)	2025 September – 2025 December

TA in detail

Teacher (without honorifics)	Lecture	Semester
高棹 圭介 / Keisuke Takasao	解析学 I / Analysis I (Measure Theory)	2023 April – 2023 July
筒井 容平 / Yohei Tsutsui	解析学 II / Analysis II (Fourier Analysis)	2022 October – 2023 January
泉 正己 / Masaki Izumi	函数解析学 / Functional Analysis	2021 October – 2022 January
吉川 謙一 / Ken-Ichi Yoshikawa	複素函数論 / Function Theory of A Complex Variable	2021 April – 2021 July
川越 大輔 / Daisuke Kawagoe	解析学入門演習 / Exercises in Basic Analysis	2020 October – 2021 January
荒野 悠輝 / Yuki Arano	解析学演義 I / Exercises in Analysis I	2020 May – 2020 July
佐藤 康彦 / Yasuhiko Sato	解析学入門演習 / Exercises in Basic Analysis	2019 October – 2020 January
Benoît Collins	線形代数学 A / Linear Algebra A	2019 April – 2019 July

Funding

2024 April – 2025 March	PD, JSPS KAKENHI Grant Number JP23KJ1270	900,000(research expense) + 4,344,000 (support) JPY
2023 April – 2024 March	DC2, JSPS KAKENHI Grant Number JP23KJ1270	900,000 (research expense) + 2,400,000 (support) JPY
2021 April – 2023 March	JST, the establishment of university fellowships towards the creation of science technology innovation, Grant Number JPMJFS2123	300,000 (research expense) + 1,800,000 (support) JPY/yr

Language

Japanese My native language. I can speak, read, write, and catch Japanese fluently at an academic level.
English I speak and understand English sufficiently for mathematical discussions, though not as fluently as native speakers. I'm better at writing and reading than speaking.

Papers

Preprints

Publications

Michael Brannan, Daniel Gromada, Junichiro Matsuda, Adam Skalski, Mateusz Wasilewski: *A quantum Frucht's theorem and quantum automorphisms of quantum Cayley graphs*, Proceedings of the London Mathematical Society, **131**, no. 5 (2025): e70102. doi:0.1112/plms.70102 arxiv:2503.11149

Junichiro Matsuda: *Algebraic connectedness and bipartiteness of quantum graphs*, Communications in Mathematical Physics **405**, no. 185 (2024). doi:10.1007/s00220-024-05046-y arxiv:2310.09500

Junichiro Matsuda: *Classification of quantum graphs on M_2 and their quantum automorphism groups*, Journal of Mathematical Physics **63**, no. 9 (2022): 092201. doi:10.1063/5.0081059 arxiv:2110.09085

Ph.D. Thesis

Junichiro Matsuda: *Classification of Quantum Graphs on M_2 and algebraic characterization of properties of quantum graphs*, Department of Mathematics, Graduate School of Science, Kyoto University. doi:10.14989/doctor.k25089

Presentations

Talks

2025 December 1. *Skeletal description of 1- and 2-regular quantum graphs.* Operator Algebraic Quantum Groups: Structure, Dynamics, and Geometry, Banff International Research Station, Banff, Canada.

2025 October 17. *Quantum graphs violate the classical characterization of the existence of d-regular quantum graphs.* NMSU Analysis Seminar, New Mexico State University, Las Cruces (online), US.

2025 May 28. *Regular quantum graphs have an integral degree that admits non-classical values.* Canadian Operator Symposium 2025, University of Waterloo, Waterloo, Canada.

2025 May 24. *Algebraic approach to regular quantum graphs.* COMPhY 2025, University of Waterloo, Waterloo, Canada.

2025 February 21. *Quantum graphs violate the classical characterization of the existence of regular graphs.* Workshop on Quantum Graphs, Saarland University, Saarbrücken, Germany.
2024 December 3. *On the degree of regular quantum graphs.* New trends at the intersection of quantum information theory, quantum groups and operator algebras, Isaac Newton Institute, Cambridge, UK.
2024 July 8. *On the degree of regular quantum graphs.* Banach Algebras and Operator Algebras 2024, University of Waterloo, Waterloo, Canada.
2024 January 16. *On the degree of regular quantum graphs.* KOAS, RIMS, Kyoto, Japan.
2024 January 9. *Algebraic connectedness and bipartiteness of quantum graphs.* UCSD Functional Analysis Seminar, UCSD, San Diego, US.
2023 November 30. *Algebraic connectedness and bipartiteness of quantum graphs.* Waterloo Analysis Seminar, University of Waterloo, Waterloo, Canada.
2023 September 6. *Introduction to expander graphs.* Functional Analysis Junior Workshop 2023, Kyoto Institute of Technology, Kyoto, Japan.
2023 January 30. *Algebraic connectedness and bipartiteness of regular quantum graphs.* The 8th KTGU Mathematics Workshop for Young Researchers, Kyoto University, Kyoto, Japan.
2022 November 8. *Algebraic connectedness and bipartiteness of regular quantum graphs.* KOAS, RIMS, Kyoto, Japan.
2022 September 20. *Spectral approaches to quantum graphs and applications to quantum information.* Focus Semester on Quantum Information: Preparatory seminar, Saarland University, Saarbrücken, Germany.
2022 September 7. *Spectral characterization of some properties of quantum graphs.* Recent Developments in Operator Algebras, RIMS, Kyoto, Japan.
2022 September 1. *Spectral approaches to quantum graphs.* Functional Analysis Junior Workshop 2022, Campus Plaza Kyoto, Kyoto,Japan.
2022 June 9. *Spectral characterization of some properties of quantum graphs.* Summer School on Free Probability, Random Matrices, and Applications, University of Wyoming, Laramie, US.
2022 June 2. *Spectral characterization of some properties of quantum graphs.* Canadian Operator Symposium, 50th anniversary, University of Ottawa, Ottawa, Canada.
2022 May 25. *Classification of Quantum Graphs on M_2 and their Quantum Automorphism Groups.* Topological Quantum Groups, C^*-Tensor Categories, and Subfactors, University of Waterloo, Waterloo, Canada.
2022 March 2. *Classification of Quantum Graphs on M_2 and their Quantum Automorphism Groups.* The 18th Mathematics Conference for Young Researchers, Hokkaido University, Hokkaido (online), Japan.
2021 December 7. *Classification of Quantum Graphs on M_2 and their Quantum Automorphism Groups.* Tokyo-Kyoto Joint Online Operator Algebra Seminar, Zoom (online), Janan.
2021 November 23. *Classification of Quantum Graphs on M_2 and their Quantum Automorphism Groups.* Workshop on “Non-commutative Probability and Related Fields 2021”, Nagoya University, Nagoya (hybrid), Japan.
2021 November 4. *Introduction to quantum graphs.* Student Colloquium, Kyoto University, Kyoto (online), Japan.
2021 September 27. *Quantum Graphs on M_2 and their Quantum Automorphism Groups.* Future Advanced Quantum Technology Workshop 2021, Kyoto University, Kyoto (online), Japan.
2021 September 23. *On the spectra of regular quantum graphs.* Functional Analysis Junior Workshop 2021, Zoom (online), Japan.
2020 September 16. *Quantum graphs on finite dimensional C^*-algebras.* Functional Analysis Junior Meeting 2020 Online, Zoom (online), Japan.

Poster Presentations

2023 March 14. *Algebraic connectedness and bipartiteness of quantum graphs.* International Symposium on Advanced Quantum Technology for Future 2023, Kyoto University, Kyoto, Japan.
2022 October 29. *Spectral characterization of some properties of quantum graphs.* Exchange Meeting for Different Fields and Industries 2022, The Mathematical Society of Japan (online), Japan.
2022 March 8. *Spectral bound for regular quantum graphs.* International Symposium on Advanced Quantum Technology for Future 2022, Kyoto University, Kyoto (online), Japan.

Ph.D. defense talk

2024 January 25. *Classification of Quantum Graphs on M_2 and algebraic characterization of properties of quantum graphs.* , Kyoto University, Kyoto, Japan.

Seminar Organizations

Catch-all Mathematical Colloquium of Japan (Operational Assistant) October 2021 – October 2023