

Curtis Wendlandt | Curriculum Vitae

Department of Mathematics and Statistics
University of Saskatchewan
205 McLean Hall
106 Wiggins Road
Saskatoon, SK S7N 5E6

Phone: 1-306-966-6083

Email: wendlandt@math.usask.ca **Website:** researchers.usask.ca/curtis-wendlandt/

Positions

University of Saskatchewan Assistant Professor Department of Mathematics and Statistics	Saskatoon, SK 2021/7 - Present
The Ohio State University Zassenhaus Assistant Professor NSERC Postdoctoral Fellow Department of Mathematics	Columbus, OH 2019/8 - 2021/7

Education

University of Alberta PhD in Mathematics Supervisor: Prof. Nicolas Guay Thesis: <i>Representations of Twisted Yangians of Types B, C and D</i>	Edmonton, AB 2014/9 - 2019/6
University of Alberta BSc with Honors in Mathematics With First Class Honors	Edmonton, AB 2009/9 - 2014/4

Fellowships, Grants and Awards

USSU Teaching Excellence Award <i>University of Saskatchewan Students' Union</i>	2024
NSERC Discovery Grant <i>Natural Sciences and Engineering Research Council of Canada</i>	2022/4 - 2027/3
NSERC Discovery Launch Supplement <i>Natural Sciences and Engineering Research Council of Canada</i>	2022/4
New Faculty Start-up Grant <i>Faculty Recruitment and Retention Fund</i> <i>University of Saskatchewan</i>	2021/9 - 2026/9
NSERC Postdoctoral Fellowship <i>Natural Sciences and Engineering Research Council of Canada</i>	2019/9 - 2021/7
Anton Alexander Cseuz Gold Medal in Mathematics <i>University of Alberta</i>	2019/10
Faculty of Science Dissertation Award	2019/7

Faculty of Science, University of Alberta

PIMS Graduate Prize 2019/4

Pacific Institute for Mathematical Sciences

Queen Elizabeth II Doctoral Level Scholarship 2018/9 - 2018/12

Faculty of Graduate Studies and Research

University of Alberta

Josephine Mitchell Prize 2017/12

Department of Mathematical and Statistical Sciences

University of Alberta

NSERC CGS D Postgraduate Research Award 2016/9 - 2019/9

Natural Sciences and Engineering Research Council of Canada

President's Doctoral Prize of Distinction 2016/9 - 2019/9

University of Alberta

Josephine Mitchell Scholarship 2015/12

Department of Mathematical and Statistical Sciences

University of Alberta

Queen Elizabeth II Doctoral Level Scholarship 2015/9 - 2016/5

Faculty of Graduate Studies and Research

University of Alberta

A Dean's Silver Medal in Science 2014/5

Faculty of Science, University of Alberta

Research

I am a representation theorist studying quantum groups, quantum symmetric pairs, quantum vertex algebras, Kac–Moody and toroidal Lie algebras, and their generalizations.

Publications

- 1) *Braid group actions, Baxter polynomials, and affine quantum groups*, with N. Friesen and A. Weekes. *Trans. Amer. Math. Soc.*, published online 2024, 1–44, doi:10.1090/tran/9279. arXiv:2401.06402.
- 2) *The R-matrix presentation for the rational form of a quantized enveloping algebra*, with M. Rupert. *J. Algebra* **647** (2024), 28–71. arXiv:2306.09971
- 3) *The restricted quantum double of the Yangian*. *Canad. J. Math* (2024), 1–72, doi:10.4153/S0008414X24000142. arXiv:2204.00983.
- 4) *The R-matrix formalism for quantized enveloping algebras*, with S. Gautam and M. Rupert. To appear in *Annales de l'Institut Fourier*. arXiv:2210.06770.
- 5) *Poles of finite-dimensional representations of Yangians*, with S. Gautam. *Selecta Math. (N.S.)* **29** (2023), no. 1, Paper No. 13. arXiv:2009.06427.
- 6) *On a conjecture of Khoroshkin and Tolstoy*, with A. Appel and S. Gautam. *Int. Math. Res. Not. IMRN* **2023**, no. 24, 21690–21706. arXiv:2206.14857.
- 7) *The formal shift operator on the Yangian double*. *Int. Math. Res. Not. IMRN*. **2022**, no. 14, 10952–11010. arXiv:2008.10590.

- 8) *The meromorphic R-matrix of the Yangian*, with S. Gautam and V. Toledano Laredo. In *Representation Theory, Mathematical Physics, and Integrable Systems: In Honor of Nicolai Reshetikhin*. Progress in Mathematics, vol. 340, Birkhäuser/Springer, Cham, 2021, pp. 201–269. arXiv:1907.03525.
- 9) *Vertex representations for Yangians of Kac-Moody algebras*, with N. Guay and V. Regelskis. J. Éc. polytech. Math. **6** (2019), 665–706. arXiv:1804.04081.
- 10) *Coproduct for Yangians of affine Kac-Moody algebras*, with N. Guay and H. Nakajima. Adv. Math. **338** (2018), 865–911. arXiv:1701.05288.
- 11) *Representations of twisted Yangians of types B, C, D: II*, with N. Guay and V. Regelskis. Transform. Groups **24** (2019), 1015–1066. arXiv:1708.00968.
- 12) *The R-matrix presentation for the Yangian of a simple Lie algebra*. Commun. Math. Phys. **363** (2018), no. 1, 289–332. arXiv:1709.08162.
- 13) *Equivalences between three presentations of orthogonal and symplectic Yangians*, with N. Guay and V. Regelskis. Lett. Math. Phys. **109** (2019), no. 2, 327–379. arXiv:1706.05176.
- 14) *Representations of twisted Yangians of types B, C, D: I*, with N. Guay and V. Regelskis. Selecta Math. (N.S.) **23** (2017), no. 3, 2071–2156. arXiv:1605.06733.
- 15) *Twisted Yangians of small rank*, with N. Guay and V. Regelskis. J. Math. Phys. **57**, 041703 (2016). arXiv:1602.01418.

Submitted for Publication

- 1) *The R-matrix of the affine Yangian*, with A. Appel and S. Gautam. Submitted for publication. arXiv:2309.02377.

Reports and Other Outputs

- 1) Report on the mini-workshop “*Three Facets of R-Matrices*” held at the Oberwolfach Research Institute for Mathematics (Mathematisches Forschungsinstitut Oberwolfach), with S. Gautam and M. Yamazaki. Workshop reporter: Andrea Appel. Oberwolfach Reports **18** (2021), no. 4, 2791–2825.
- 2) *Representations of Twisted Yangians of Types B, C and D*. Ph.D. Thesis completed at the University of Alberta, doi:10.7939/r3-nqb2-5958, 294 pp.

Supervision

Undergraduate Supervision

- 1) Hannah Ens, NSERC USRA student. Project title: *Towards a matrix formalism for quantum symmetric pairs*. May to August 2024.
- 2) Hannah Ens, NSERC USRA student. Project title: *On the Casimir presentation of a simple Lie algebra*. May to August 2023.
- 3) Karen Fletcher, PIMS Virtual Experimental Mathematics Lab student. Project title: *Subspaces Preserved by a Matrix*. Co-supervised by Alex Weekes and Steven Rayan. November 2022 to April 2023.
- 4) Soham Lakhi, PIMS Virtual Experimental Mathematics Lab student. Project title: *Subspaces Preserved by a Matrix*. Co-supervised by Alex Weekes and Steven Rayan. November 2022 to April 2023.
- 5) Bassam Nima, PIMS Virtual Experimental Mathematics Lab student. Project title: *Subspaces Preserved by a Matrix*. Co-supervised by Alex Weekes and Steven Rayan. November 2022 to April 2023.
- 6) Thomas Purdy, quanTA USRA student. Project title: *Quantum representation theory via q-Cartan matrices*. Co-supervised by Alex Weekes. May 2022 to August 2022.

Graduate Supervision

In progress

- 1) Hannah Ens, M.Sc. in Mathematics. September 2024 to present.
- 2) Noah Friesen, Ph.D. in Mathematics. Co-supervised by Alex Weekes. September 2024 to present.

Completed

- 1) Noah Friesen, M.Sc. in Mathematics. Thesis title: *Braid groups and Baxter polynomials*. Co-supervised by Alex Weekes. September 2022 to August 2024.
- 2) Dat Minh Ha, M.Sc. in Mathematics. Thesis title: *On a class of extended toroidal Lie algebras coming from untwisted affine Yangians*. Co-supervised by Alex Weekes. September 2022 to June 2024.

Postdoctoral Supervision

- 1) Matthew Rupert, PIMS Postdoctoral Fellow. Co-supervised by Alex Weekes and Steven Rayan. July 2022 to July 2024.

Teaching Experience

University of Saskatchewan

2021/7 - Present

Instructor of record for the following courses:

- 2024 – 2025 Academic Year:
 - Math 460 & 872 Multilinear Algebra (T2)
 - Math 266 Linear Algebra II (T1)
 - Math 361 Group Theory (T1)
- 2023 – 2024 Academic Year:
 - Math 258 Euclidean Geometry (T2)
 - Math 266 Linear Algebra II (T1)
 - Math 361 Group Theory (T1)
- 2022 – 2023 Academic Year:
 - Math 872 Representation Theory and Yangians (T3)
 - Math 266 Linear Algebra II (T2)
 - Math 872 Hopf Algebras and Quantum Groups (T2)
 - Math 361 Group Theory (T1)
- 2021 – 2022 Academic Year:
 - Math 361 Group Theory (T1)

The Ohio State University

2020/1 - 2021/6

Instructor of record for the following courses:

- Spring 2020: Math 2568 Linear Algebra (2 sections)
- Spring 2021: Math 2568 Linear Algebra (2 online sections)

University of Alberta

2014/9 - 2016/4

Teaching Assistant in the Decima Robinson Support Centre and for the following courses:

- Fall 2014: Math 114 Elementary Calculus I
- Winter 2015: Math 125 Linear Algebra I
- Winter 2016: Math 228 Introduction to Ring Theory

Organization and Professional Activities

Conference and Seminar Organization

Co-organizer, <i>PIMS Geometry, Algebra and Physics Seminar</i> University of Saskatchewan	2022/1 - Present
Co-organizer, Scientific session: <i>The Representation Theory and Geometry of Quantum Algebras</i> Canadian Mathematical Society Summer Meeting	2024/6
Co-organizer, <i>Mini-workshop: Three Facets of R-Matrices</i> Mathematical Research Institute of Oberwolfach	2021/10
Co-organizer, <i>Representations and Lie Theory Seminar</i> The Ohio State University	2019/9 - 2021/6
Co-organizer, <i>Affine Quantum Groups Reading Seminar</i> University of Alberta	2018/9 - 2018/12

Referee work

I have served as a reviewer for the following research journals:

- Selecta Mathematica
- Annales de l'Institut Fourier
- International Mathematics Research Notices
- Communications in Mathematical Physics
- Letters in Mathematical Physics
- Israel Journal of Mathematics
- Journal of the London Mathematical Society
- Journal of Mathematical Physics
- Symmetry, Integrability and Geometry: Methods and Applications

Event Participation

I have attended or will be attending the following conferences and workshops:

The Representation Theory and Geometry of Quantum Algebras 2024 Canadian Mathematical Society Summer Meeting <i>University of Saskatchewan, Saskatoon, Canada</i>	June 2024
Fifth Canada–Mexico–US Conference in Representation Theory, Noncommutative Algebra, and Categorification <i>Centre de recherches mathématiques, Montreal, Canada</i>	August 2023

Fourth Canada–Mexico–US Conference in Representation Theory, Noncommutative Algebra, and Categorification <i>Northeastern University, Boston, USA</i>	June 2022
Integrability, Symmetry and Physics <i>AMS Sectional Meeting, Purdue University, West Lafayette, USA</i>	March 2022 (Virtual)
<i>Mini-workshop: Three Facets of R-Matrices</i> <i>Mathematical Research Institute of Oberwolfach, Germany</i>	October 2021
Integrability, Symmetry and Physics <i>AMS Sectional Meeting, Purdue University, West Lafayette, USA</i>	April 2020 (Cancelled)
Quantum Structures in Algebra and Geometry <i>Northeastern University, Boston, USA</i>	August 2019
Interactions between Representation Theory and Algebraic Geometry <i>University of Chicago, Chicago, USA</i>	August 2017
CMS Summer Meeting, Session on Representation Theory <i>University of Alberta, Edmonton, Canada</i>	June 2016
Workshop on Hecke Algebras and Lie Theory <i>University of Ottawa, Ottawa, Canada</i>	May 2016
Vertex Algebras and Quantum Groups <i>Banff International Research Station, Banff, Canada</i>	February 2016
12 th PIMS Young Researchers Conference <i>University of Calgary, Calgary, Canada</i>	May 2015
Canadian Undergraduate Mathematics Conference <i>Carleton University, Ottawa, Canada</i>	July 2014
10 th PIMS Young Researchers Conference <i>University of Alberta, Edmonton, Canada</i>	May 2013

Presentations

- 1) *On Lie bialgebras and derivations arising from affine Yangians*, April 2024. Talk given at the *Representations and Lie Theory Seminar*, The Ohio State University, Columbus, USA.
- 2) *Affine Yangians and toroidal Lie bialgebras*, March 2024. Talk given at the *Séminaire d'Algèbre*, Laval University, Québec, Canada.
- 3) *Affine Yangians and toroidal Lie bialgebras*, February 2024. Talk given at the *Ottawa-Carleton Joint Algebra Seminar*, Carleton University, Ottawa, Canada.
- 4) *The R-matrix presentation for the rational form of a quantized enveloping algebra*, November 2023. Talk given at the *Purdue Mathematical Physics Seminar*, Purdue University, West Lafayette, USA.
- 5) *The restricted quantum double of the Yangian*, June 2022. Talk given at the *Canada–Mexico–US Conference in Representation Theory, Noncommutative Algebra, and Categorification*, Northeastern University, Boston, USA.
- 6) *The restricted quantum double of the Yangian*, April 2022. Talk given at the *Purdue Mathematical Physics Seminar*, Purdue University, West Lafayette, USA.

- 7) *Quantum Cartan matrices, cyclicity conditions and poles of Yangian representations*, April 2022. Talk given at the *Utah State Pure Math Seminar*, Utah State University, Logan, USA.
- 8) *Poles of finite-dimensional representations of Yangians*, March 2022. Talk given at the *Integrability, Symmetry and Physics* session of the AMS Spring Central Sectional Meeting, Purdue University, West Lafayette, USA.
- 9) *Poles of finite-dimensional representations of Yangians*, April 2021. Talk given at the *Geometry and Representation Theory (GRT) at Home* seminar. <http://grt-home.org>
- 10) *The singularities of finite-dimensional representations of Yangians*, February 2021. Talk given at the Department of Mathematics and Statistics *Colloquium*, University of Saskatchewan, Saskatoon, Canada.
- 11) *The singularities of finite-dimensional representations of Yangians*, November 2020. Talk given at the *UVA Algebra Seminar*, University of Virginia, Charlottesville, USA.
- 12) *The Yangian double of a Kac-Moody algebra*, April 2020 (Cancelled). *Integrability, Symmetry and Physics* special session of the AMS Spring Central Sectional Meeting, Purdue University, West Lafayette, USA.
- 13) *From Yangians to Yangian doubles*, April 2019. Talk given at the seminar *Representations and Lie Theory*, The Ohio State University, Columbus, USA.
- 14) *From Yangians to Yangian doubles*, January 2019. Talk given at the University of Hertfordshire in Hatfield, UK.
- 15) *Yangians, twisted Yangians, and Drinfeld polynomials*, April 2018. Talk given at the MIT *Infinite Dimensional Algebra Seminar*, Massachusetts Institute of Technology, Cambridge, USA.
- 16) *Twisted Yangians of symplectic and orthogonal Lie algebras*, March 2018. Talk given at the *Geometric Representation Theory Seminar*, Fields Institute, University of Toronto, Canada.
- 17) *The R-matrix formalism for Yangians*, November 2017. Talk given at the seminar *Representations and Lie Theory*, The Ohio State University, Columbus, USA.
- 18) *A brief introduction to Yangians and Hall algebras*, August 2017. Preparatory talk given at the 2017 conference *Interactions between Representation Theory and Algebraic Geometry*, University of Chicago, Chicago, USA.
- 19) *Representations of twisted Yangians of types B, C and D*, June 2016. Talk given at the 2016 *CMS Summer Meeting, Session on Representation Theory*, University of Alberta, Edmonton, Canada.
- 20) *An Introductory Detour Into Quantum Groups*, July 2014. Talk given at the 2014 *Canadian Undergraduate Mathematics Conference*, Carleton University, Ottawa, Canada.