

NICHOLAS WILLIAMS

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EDUCATION

Doctorate in Mathematics

University of Cologne
Started at University of Leicester
Supervisor: Sibylle Schroll
Summa cum laude

September 2018 – May 2022

April 2021 – May 2022

September 2018 – April 2021

Graduate Diploma in Quantitative Economics

Birkbeck, University of London
Distinction

October 2017 – June 2018

MMathPhil in Mathematics & Philosophy

Worcester College, Oxford
Double First Class Honours

October 2012 – June 2016

EMPLOYMENT

Postdoctoral Research Associate

Lancaster University
With David Pauksztello

September 2022 – March 2025

JSPS Short Term Postdoctoral Research Fellow

University of Tokyo
With Osamu Iyama

May 2022 – August 2022

Graduate Teaching Assistant

King's College London

September 2021 – December 2021

Guest Teacher

London School of Economics

September 2021 – December 2021

Feedback Session Leader

University of Leicester

January 2019 – December 2020

JOURNAL PUBLICATIONS

3. Quiver combinatorics and triangulations of cyclic polytopes *To appear*
Algebraic Combinatorics
2. New interpretations of the higher Stasheff–Tamari orders *2022*
Advances in Mathematics, Volume 407, 108552
1. The combinatorics of tensor products of higher Auslander algebras of type A *2021*
(With Jordan McMahon)
Glasgow Mathematical Journal, 63(3), pp. 526–546.

CONFERENCE PROCEEDINGS

3. Triangulations of cyclic polytopes and the higher Auslander algebras of type A *To appear*
Various issues on representation theory and related topics, RIMS Kōkyūroku
2. The higher Stasheff–Tamari orders in representation theory *To appear*
Proceedings of the 2020 International Conference on Representations of Algebras

1. The first higher Stasheff–Tamari orders are quotients of the higher Bruhat orders 2021
Proceedings of the 33rd International Conference on Formal Power Series and Algebraic Combinatorics, Séminaire Lotharingien de Combinatoire 85B, Art. 6, 12.

OTHER PUBLICATIONS

2. Microthesis: Triangulations of cyclic polytopes in representation theory 2022
London Mathematical Society Newsletter, No. 501, 33-34.
1. Higher-dimensional combinatorics in representation theory 2022
 Doctoral thesis, University of Cologne

PREPRINTS

4. Stability spaces of string and band modules 2022
 (With Sibylle Schroll, Aran Tattar, Hipolito Treffinger, and Yadira Valdivieso)
 arXiv:2208.15000
3. Triangulations of prisms and preprojective algebras of type A 2022
 (With Osamu Iyama)
 arXiv:2208.12957
2. The two higher Stasheff–Tamari orders are equal 2021
 arXiv:2106.01050
1. The first higher Stasheff–Tamari orders are quotients of the higher Bruhat orders 2020
 arXiv:2012.10371

PRIZES AND SCHOLARSHIPS

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| Gibbs prize for Mathematics & Philosophy
University of Oxford
For top performance in Mathematics papers | 2016 |
| Gibbs prize for Mathematics & Philosophy
University of Oxford
For top performance in Mathematics papers | 2015 |
| Academic scholarship
Worcester College, Oxford | 2013 |
| Honorary scholarship
Westminster School | 2007 |

INVITED CONFERENCE TALKS (IN PERSON)

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| A structural approach to maximal green sequences
<i>Silting theory, algebras and representations</i>
Charles University, Prague | September 2022 |
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INVITED CONFERENCE TALKS (VIRTUAL)

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| An algebraic interpretation of the higher Stasheff–Tamari orders
<i>International Conference on Representations of Algebras</i>
Selected to give talk by scientific committee based on research snapshot
Via BigBlueButton | November 2020 |
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CONTRIBUTED CONFERENCE TALKS (IN PERSON)

- Cyclic polytopes and representation theory** *December 2022*
Representation theory of algebras session
Canadian Mathematical Society Winter Meeting, Toronto
- Algebraic interpretation of the higher Stasheff–Tamari orders** *July 2022*
Representation theory and various issues on related topics
Research Institute for Mathematical Sciences, Kyoto University
- Nice triangulations of cyclic polytopes** *June 2019*
London Mathematical Society Graduate Student Meeting
- Higher analogues of Grassmannian clusters** *April 2019*
Maurice Auslander Distinguished Lectures and International Conference
- Higher analogues of Grassmannian clusters** *April 2019*
New Connections and Directions in Representation Theory
University of Leeds
- Higher analogues of Grassmannian clusters** *April 2019*
Tropical Geometry meets Representation Theory
University of Leicester

CONTRIBUTED CONFERENCE TALKS (VIRTUAL)

- The first higher Stasheff–Tamari orders are quotients of the higher Bruhat orders** *January 2022*
Formal Power Series and Algebraic Combinatorics
Bar-Ilan University
- The higher Stasheff–Tamari orders on triangulations of cyclic polytopes** *June 2021*
London Mathematical Society Graduate Student Meeting
- Vertex figures of cubillages of cyclic zonotopes** *November 2020*
London Mathematical Society Graduate Student Meeting

SEMINAR TALKS (IN PERSON)

- The higher Stasheff–Tamari orders on triangulations of cyclic polytopes** *November 2022*
Séminaire du LaCIM
Université du Québec à Montréal
- Cyclic polytopes and representation theory** *November 2022*
Geometry and mathematical physics seminar
University of Birmingham
- Cyclic polytopes and representation theory** *October 2022*
Pure mathematics seminar
Lancaster University
- Mutation in higher cluster categories** *October 2022*
Seminar@Aarhus
Aarhus University
- Equivalence of maximal green sequences** *February 2022*
Paris algebra seminar
Institut de Mathématiques de Jussieu-Paris Rive Gauche

An algebraic interpretation of the higher Stasheff–Tamari orders*November 2019*

Pure mathematics seminar

University of East Anglia

Higher analogues of Grassmannian clusters*April 2019*

Algebra and number theory seminar

University of Graz

SEMINAR TALKS (VIRTUAL)

Cyclic polytopes and higher Auslander–Reiten theory III*July 2022*

Tokyo–Nagoya algebra seminar

University of Tokyo and Nagoya University

Cyclic polytopes and higher Auslander–Reiten theory II*June 2022*

Tokyo–Nagoya algebra seminar

University of Tokyo and Nagoya University

Mutating cluster-tilting objects in $(d + 2)$ -angulated cluster categories*June 2022*

FD seminar

Cyclic polytopes and higher Auslander–Reiten theory I*June 2022*

Tokyo–Nagoya algebra seminar

University of Tokyo and Nagoya University

An algebraic interpretation of the higher Stasheff–Tamari orders*January 2022*

Aachen–Bochum–Cologne Darstellungstheorie Seminar

RWTH Aachen University, Ruhr-University Bochum, and University of Cologne

Cyclic polytopes and higher Auslander–Reiten theory*December 2021*

Tokyo–Nagoya algebra seminar

University of Tokyo and Nagoya University

The two higher Stasheff–Tamari orders are equal*May 2021*

Working seminar in algebra and geometry

University of Cologne

The higher Stasheff–Tamari orders in representation theory*April 2021*

Paris algebra seminar

Institut de Mathématiques de Jussieu-Paris Rive Gauche

New interpretations of the higher Stasheff–Tamari orders*March 2021*

Diskrete Mathematik / Geometrie Forschungsseminar

TU Berlin

The Tamari lattice in representation theory*March 2021*

Junior Algebra Colloquium

University of Bristol

POSTERS

An algebraic interpretation of the higher Stasheff–Tamari orders*June 2021**Young Researchers in Mathematics*

Online

Winner of 1st prize in poster competition**An algebraic interpretation of the higher Stasheff–Tamari orders***May 2021**Advances in Representation Theory of Algebras*

Online

New interpretations of the higher Stasheff–Tamari orders*January 2021**Combinatorial algebra meets algebraic combinatorics*

Université du Québec à Montréal

Online

An algebraic interpretation of the higher Stasheff–Tamari orders*November 2020**International Conference on Representations of Algebras*

“Research snapshot”

Online

New interpretations of the higher Stasheff–Tamari orders*September 2020**Virtual Heidelberg Laureate Forum*

Online

Representation theory and Grassmannians*March 2019**STEM for Britain*

Poster competition at UK Parliament

GRANTS

London Mathematical Society Scheme 8

April 2020

Postgraduate research conference grants

Categorifications in Representation Theory conference organised with Aran Tattar

GBP 2,500

ORGANISATION

Köln Algebra and Representation Theory seminar*April 2021 – May 2022*

Co-organiser

University of Cologne

Online

Categorifications in Representation Theory conference*September 2020*

Co-organised with Aran Tattar

Online

Mathematics PhD seminar*September 2019 – August 2020*

University of Leicester

Representation theory and mirror symmetry conference*May 2019*

Local organising committee

University of Leicester

RESEARCH STAYS

Université du Québec à Montréal

November 2022

Visiting: Hugh Thomas

2 weeks

University of Aarhus

October 2022

Visiting: Raphael Bennett-Tennenhaus and Amit Shah

1 week

University of Cologne

April 2021

Visiting: Sibylle Schroll and Aran Tattar

1 week

University of Cambridge
Isaac Newton Institute for Mathematical Sciences
Cluster algebras and representation theory programme
Invited participant
1 week

December 2021

University of Graz
Visiting: Jordan McMahon
Host: Karin Baur
1 week

April 2019

REVIEWING

AMS MathSciNet
1 review written

October 2022 – present

zbMATH
6 reviews written

September 2020 – present

REFEREEING

Journal of Algebraic Combinatorics

TEACHING

Real analysis
Class teacher (online)
King's College London

September 2021 – December 2021

MA107: Quantitative methods
Class teacher
London School of Economics

September 2021 – December 2021

Calculus & analysis
Class teacher (online)
University of Leicester

October 2020 – December 2020

Second-year algebra
Class teacher
University of Leicester

January 2020 – April 2020

Calculus & analysis
Class teacher
University of Leicester

October 2019 – April 2020

Elements of number theory
Class teacher
University of Leicester

October 2019 – December 2019

Calculus & analysis
Class teacher
University of Leicester

January 2019 – March 2019

COMMITTEE ROLES

Small Grants Committee The Leathersellers' Company	<i>September 2022 – present</i>
Mathematics & Philosophy Representative Joint Consultative Committee with Undergraduates University of Oxford	<i>2015 – 2016</i>
Undergraduate Representative Joint Committee for Mathematics and Philosophy University of Oxford	<i>2015 – 2016</i>
Undergraduate Representative Mathematics Department Art Committee University of Oxford	<i>2015 – 2016</i>

OUTREACH

University of Leicester Representative <i>Research in the UK afternoon</i> University of Cambridge	<i>November 2018, 2019, 2020</i>
Student Helper <i>Oxford and Cambridge Student Conferences</i>	<i>March 2013, 2014, 2015</i>

OTHER

London Mathematical Society Associate member 3 reports on conferences written for the LMS newsletter	<i>June 2019 – present</i>
Programming	Python, Sage, Maple, node.js, Haskell Git L ^A T _E X
Languages	(CEFR levels) English Native German B1 French B1 Japanese A2 Spanish A1