

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

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

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

5. Stability spaces of string and band modules 2022
(With Sibylle Schroll, Aran Tattar, Hipolito Treffinger, and Yadira Valdivieso)
[arXiv:2208.15000](#)
4. Triangulations of prisms and preprojective algebras of type A 2022
(With Osamu Iyama)
[arXiv:2208.12957](#)
3. Quiver combinatorics for higher-dimensional triangulations 2021
[arXiv:2112.09189](#)
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

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

INVITED CONFERENCE TALKS (IN PERSON)

- A structural approach to maximal green sequences** September 2022
Silting theory, algebras and representations
Charles University, Prague

INVITED CONFERENCE TALKS (VIRTUAL)

- An algebraic interpretation of the higher Stasheff–Tamari orders** November 2020
International Conference on Representations of Algebras
Selected to give talk by scientific committee based on research snapshot
Via BigBlueButton

CONTRIBUTED CONFERENCE TALKS (IN PERSON)

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

CONTRIBUTED CONFERENCE TALKS (VIRTUAL)

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

SEMINAR TALKS (IN PERSON)

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| Cyclic polytopes and representation theory
Pure mathematics seminar
Lancaster University | <i>October 2022</i> |
| Mutation in higher cluster categories
Seminar@Aarhus
Aarhus University | <i>October 2022</i> |
| Equivalence of maximal green sequences
Paris algebra seminar
Institut de Mathématiques de Jussieu-Paris Rive Gauche | <i>February 2022</i> |
| An algebraic interpretation of the higher Stasheff–Tamari orders
Pure mathematics seminar
University of East Anglia | <i>November 2019</i> |
| Higher analogues of Grassmannian clusters
Algebra and number theory seminar
University of Graz | <i>April 2019</i> |

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

University of Cologne

April 2021

Visiting: Sibylle Schroll and Aran Tattar

1 week

University of Cambridge

December 2021

Isaac Newton Institute for Mathematical Sciences

Cluster algebras and representation theory programme

Invited participant

1 week

University of Graz

April 2019

Visiting: Jordan McMahon

Host: Karin Baur

1 week

REVIEWING

AMS MathSciNet
1 review written

October 2022 – present

zbMATH
5 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

September 2022 – present

Mathematics & Philosophy Representative
Joint Consultative Committee with Undergraduates
University of Oxford

2015 – 2016

Undergraduate Representative
Joint Committee for Mathematics and Philosophy
University of Oxford

2015 – 2016

Undergraduate Representative
Mathematics Department Art Committee
University of Oxford

2015 – 2016

OUTREACH

University of Leicester Representative
Research in the UK afternoon
University of Cambridge

November 2018, 2019, 2020

Student Helper
Oxford and Cambridge Student Conferences

March 2013, 2014, 2015

OTHER

London Mathematical Society
Associate member
3 reports on conferences written for the LMS newsletter

June 2019 – present

Programming Python, Sage, Maple, node.js, Haskell
 Git
 \LaTeX

Languages

	(CEFR levels)
English	Native
German	B1
French	B1
Japanese	A2
Spanish	A1