

NICHOLAS WILLIAMS

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EDUCATION

Doctorate in Mathematics *September 2018 – May 2022*
University of Cologne *April 2021 – May 2022*
Started at University of Leicester *September 2018 – April 2021*
Supervisor: Sibylle Schroll
Thesis title: *Higher-dimensional combinatorics in representation theory*
Summa cum laude

Graduate Diploma in Quantitative Economics *October 2017 – June 2018*
Birkbeck, University of London
Distinction

MMathPhil in Mathematics & Philosophy *October 2012 – June 2016*
Worcester College, Oxford
Double First Class Honours

EMPLOYMENT

Postdoctoral Research Associate *September 2022 – March 2025*
Lancaster University
With David Pauksztello

JSPS Short Term Postdoctoral Research Fellow *May 2022 – August 2022*
University of Tokyo
With Osamu Iyama

Graduate Teaching Assistant *September 2021 – December 2021*
King's College London

Guest Teacher *September 2021 – December 2021*
London School of Economics

Feedback session leader *January 2019 – December 2020*
University of Leicester

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.

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** 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
New Connections and Directions in Representation Theory
University of Leeds

April 2019

Higher analogues of Grassmannian clusters
Tropical Geometry meets Representation Theory
University of Leicester

April 2019

CONTRIBUTED CONFERENCE TALKS (VIRTUAL)

The first higher Stasheff–Tamari orders are quotients of the higher Bruhat orders
Formal Power Series and Algebraic Combinatorics
Bar-Ilan University

January 2022

The higher Stasheff–Tamari orders on triangulations of cyclic polytopes
London Mathematical Society Graduate Student Meeting

June 2021

Vertex figures of cubillages of cyclic zonotopes
London Mathematical Society Graduate Student Meeting

November 2020

SEMINAR TALKS (IN PERSON)

Equivalence of maximal green sequences
Working seminar in algebra and geometry
University of Cologne

April 2022

Equivalence of maximal green sequences
Paris algebra seminar
Institut de Mathématiques de Jussieu-Paris Rive Gauche

February 2022

Cluster categories and crossing conditions
Working seminar in algebra and geometry
University of Leicester

February 2020

An algebraic interpretation of the higher Stasheff–Tamari orders
Pure mathematics seminar
University of East Anglia

November 2019

An algebraic interpretation of the higher Stasheff–Tamari orders
Working seminar in algebra and geometry
University of Leicester

November 2019

Nice triangulations of cyclic polytopes
PhD seminar
University of Leicester

October 2019

Higher analogues of Grassmannian clusters
Algebra and number theory seminar
University of Graz

April 2019

Alternating strand diagrams, plabic graphs, and Grassmannians
PhD seminar
University of Leicester

January 2019

Grassmannians
Working seminar in algebra and geometry
University of Leicester

October 2018

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
- KP solitons** *October 2020*
PhD seminar
University of Leicester
- KP solitons and the higher Stasheff–Tamari orders II** *October 2020*
Working seminar in algebra and geometry
University of Leicester
- KP solitons and the higher Stasheff–Tamari orders I** *September 2020*
Working seminar in algebra and geometry
University of Leicester
- Triangulations of odd-dimensional cyclic polytopes** *June 2020*
PhD seminar
University of Leicester
- Fukaya categories and higher Auslander algebras of type A** *April 2020*
Working seminar in algebra and geometry
University of Leicester

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 – present*
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
Visiting: Sibylle Schroll and Aran Tattar
1 week

April 2021

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

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	<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