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
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

JOURNAL PUBLICATIONS

4. Quiver combinatorics and triangulations of cyclic polytopes   *2023*
   Algebraic Combinatorics, Volume 6, no. 3, pp. 639–60.

3. The first higher Stasheff–Tamari orders are quotients of the higher Bruhat orders   *2023*
   Electronic Journal of Combinatorics, Volume 30, no. 1, P1.29.

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

4. The higher Stasheff–Tamari orders in representation theory   *To appear*
   Proceedings of the 2020 International Conference on Representations of Algebras

3. Studying triangulations of even-dimensional cyclic polytopes via directed graphs   *2023*
Proceedings of the 35th International Conference on Formal Power Series and Algebraic Combinatorics, Séminaire Lotharingien de Combinatoire 89B, Art. 4

2. Triangulations of cyclic polytopes and the higher Auslander algebras of type A *2022*
Various issues on representation theory and related topics
RIMS Kōkyūroku No.2234

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

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

6. A survey of congruences and quotients of partially ordered sets   *2023*
`arXiv:2303.03765`

5. A geometric perspective on the τ-cluster morphism category   *2023*
With Sibylle Schroll, Aran Tattar, and Hipolito Treffinger
`arXiv:2302.12217`

4. A structural view of maximal green sequences   *2023*
With Mikhail Gorsky
`arXiv:2301.08681`

3. Stability spaces of string and band modules   *2022*
With Sibylle Schroll, Aran Tattar, Hipolito Treffinger, and Yadira Valdivieso
`arXiv:2208.15000`

2. Triangulations of prisms and preprojective algebras of type A *2022*
With Osamu Iyama
`arXiv:2208.12957`

1. The two higher Stasheff–Tamari orders are equal   *2021*
`arXiv:2106.01050`

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 view of maximal green sequences *June 2023*
Cluster structures in the North
University of Central Lancashire

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

CONTRIBUTED CONFERENCE TALKS (IN PERSON)

A structural view of maximal green sequences *April 2023*
Maurice Auslander Distinguished Lectures and International Conference

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*
Various issues on representation theory and related topics
Research Institute for Mathematical Sciences, Kyoto University

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

SEMINAR TALKS (IN PERSON)

A structural view of maximal green sequences *February 2023*
Algebra group seminar
University of Cologne

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 *April 2022*
Working seminar in algebra and geometry
University of Cologne

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

POSTERS

An algebraic interpretation of the higher Stasheff–Tamari orders *June 2021*
Young Researchers in Mathematics
Online
Winner of 1$^{\text{st}}$ 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 AND AWARDS

Japan Society for the Promotion of Science *December 2021*
Short Term Postdoctoral Research Fellowship
JPY 5,384,000
12 months awarded but 3 months taken

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-organised with Daniel Schaefer
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

Max Planck Institute for Mathematics, Bonn *February 2023*
Visiting: Guillaume Laplante-Anfossi
1 week

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 *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

REFEREEING

Communications in Algebra, Discrete Mathematics, Electronic Research Archive, Journal of Algebraic Combinatorics

REVIEWING

AMS MathSciNet *October 2022 – present*
3 reviews written

zbMATH *September 2020 – present*
9 reviews written

TEACHING

Real analysis *September 2021 – December 2021*
Class teacher (online)
King's College London

MA107: Quantitative methods *September 2021 – December 2021*
Class teacher
London School of Economics

Calculus & analysis *October 2020 – December 2020*
Class teacher (online)
University of Leicester

Second-year algebra *January 2020 – April 2020*
Class teacher
University of Leicester

Calculus & analysis *October 2019 – April 2020*
Class teacher
University of Leicester

Elements of number theory *October 2019 – December 2019*
Class teacher
University of Leicester

Calculus & analysis *January 2019 – March 2019*
Class teacher
University of Leicester

COMMITTEE ROLES

Mathematics & Philosophy Representative *2015 – 2016*
Joint Consultative Committee with Undergraduates
University of Oxford

Undergraduate Representative *2015 – 2016*
Joint Committee for Mathematics and Philosophy
University of Oxford

Undergraduate Representative *2015 – 2016*
Mathematics Department Art Committee
University of Oxford

OUTREACH

University of Leicester Representative *November 2018, 2019, 2020*
Research in the UK afternoon
University of Cambridge

Student Helper *March 2013, 2014, 2015*
Oxford and Cambridge Student Conferences

OTHER

London Mathematical Society *June 2019 – present*
Associate member
3 reports on conferences written for the LMS newsletter

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

Languages

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