NICHOLAS WILLIAMS

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EDUCATION

Doctorate in Mathematics *September 2018 – May 2022*
University of Cologne *April 2021 – June 2022*
(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

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

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

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

The first higher Stasheff–Tamari orders are quotients of *January 2022*
the higher Bruhat orders
Formal Power Series and Algebraic Combinatorics
Bar-Ilan University
Via Zoom

The higher Stasheff–Tamari orders on triangulations of cyclic polytopes *June 2021*
London Mathematical Society Graduate Student Meeting
Via Zoom

Vertex figures of cubillages of cyclic zonotopes *November 2020*
London Mathematical Society Graduate Student Meeting
Via Zoom

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

SEMINAR TALKS

Cyclic polytopes and higher Auslander–Reiten theory III *July 2022*
Tokyo–Nagoya algebra seminar
University of Tokyo and Nagoya University
Via Zoom

Cyclic polytopes and higher Auslander–Reiten theory II *June 2022*
Tokyo–Nagoya algebra seminar
University of Tokyo and Nagoya University
Via Zoom

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

Cyclic polytopes and higher Auslander–Reiten theory I *June 2022*
Tokyo–Nagoya algebra seminar
University of Tokyo and Nagoya University
Via Zoom

Equivalence of maximal green sequences *April 2022*
Working seminar in algebra and geometry
University of Cologne
In person

Equivalence of maximal green sequences *February 2022*
Paris algebra seminar
Institut de Mathématiques de Jussieu-Paris Rive Gauche
In person

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
Via Zoom

Cyclic polytopes and higher Auslander–Reiten theory *December 2021*
Tokyo–Nagoya algebra seminar
University of Tokyo and Nagoya University
Via Zoom

The two higher Stasheff–Tamari orders are equal *May 2021*
Working seminar in algebra and geometry
University of Cologne
Via Zoom

The higher Stasheff–Tamari orders in representation theory *April 2021*
Paris algebra seminar
Institut de Mathématiques de Jussieu-Paris Rive Gauche
Via Zoom

New interpretations of the higher Stasheff–Tamari orders *March 2021*
Diskrete Mathematik / Geometrie Forschungsseminar
TU Berlin
Via Zoom

The Tamari lattice in representation theory *March 2021*
Junior Algebra Colloquium
University of Bristol
Via Zoom

KP solitons   *October 2020*
PhD seminar
University of Leicester
Via Microsoft Teams

KP solitons and the higher Stasheff–Tamari orders II   *October 2020*
Working seminar in algebra and geometry
University of Leicester
Via Zoom

KP solitons and the higher Stasheff–Tamari orders I   *September 2020*
Working seminar in algebra and geometry
University of Leicester
Via Zoom

Triangulations of odd-dimensional cyclic polytopes   *June 2020*
PhD seminar
University of Leicester
Via Blackboard Collaborate

Fukaya categories and higher Auslander algebras of type A *April 2020*
Working seminar in algebra and geometry
University of Leicester
Via Zoom

Cluster categories and crossing conditions   *February 2020*
Working seminar in algebra and geometry
University of Leicester

An algebraic interpretation of the higher Stasheff–Tamari orders   *November 2019*
Pure mathematics seminar
University of East Anglia

An algebraic interpretation of the higher Stasheff–Tamari orders   *November 2019*
Working seminar in algebra and geometry
University of Leicester

Nice triangulations of cyclic polytopes   *October 2019*
PhD seminar
University of Leicester

Higher analogues of Grassmannian clusters   *April 2019*
Algebra and number theory seminar
University of Graz

Alternating strand diagrams, plabic graphs, and Grassmannians   *January 2019*
PhD seminar
University of Leicester

Grassmannians   *October 2018*
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 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

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 *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

zbMATH   *September 2020 – present*
4 reviews written

REFEREEING

Journal of Algebraic Combinatorics

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   A1
                      Spanish   A1