

# NICHOLAS WILLIAMS

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## EDUCATION

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### PhD in Mathematics

*September 2018 – present*

University of Leicester

Supervisor: Sibylle Schroll

### 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

## PUBLICATIONS

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The combinatorics of tensor products of higher Auslander algebras of type  $A$ .

*July 2020*

(With Jordan McMahon.)

*Glasgow Mathematical Journal*. To appear.

## PREPRINTS

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The two higher Stasheff–Tamari orders are equal.

*June 2021*

arXiv:2106.01050

The first higher Stasheff–Tamari orders are quotients of the higher Bruhat orders.

*December 2020*

arXiv:2012.10371

New interpretations of the higher Stasheff–Tamari orders.

*July 2020*

arXiv:2007.12664

## PRIZES AND SCHOLARSHIPS

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### 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 TALKS

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### 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 TALKS

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- 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

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- The two higher Stasheff–Tamari 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

<b>Triangulations of odd-dimensional cyclic polytopes</b> PhD seminar University of Leicester Via Blackboard Collaborate	<i>June 2020</i>
<b>Fukaya categories and higher Auslander algebras of type <math>A</math></b> Working seminar in algebra and geometry University of Leicester Via Zoom	<i>April 2020</i>
<b>Cluster categories and crossing conditions</b> Working seminar in algebra and geometry University of Leicester	<i>February 2020</i>
<b>An algebraic interpretation of the higher Stasheff–Tamari orders</b> Pure mathematics seminar University of East Anglia	<i>November 2019</i>
<b>An algebraic interpretation of the higher Stasheff–Tamari orders</b> Working seminar in algebra and geometry University of Leicester	<i>November 2019</i>
<b>Nice triangulations of cyclic polytopes</b> PhD seminar University of Leicester	<i>October 2019</i>
<b>Higher analogues of Grassmannian clusters</b> Algebra and number theory seminar University of Graz	<i>April 2019</i>
<b>Alternating strand diagrams, plabic graphs, and Grassmannians</b> PhD seminar University of Leicester	<i>January 2019</i>
<b>Grassmannians</b> Working seminar in algebra and geometry University of Leicester	<i>October 2018</i>

## POSTERS

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<b>An algebraic interpretation of the higher Stasheff–Tamari orders</b> <i>Advances in Representation Theory of Algebras</i> Online	<i>May 2021</i>
<b>New interpretations of the higher Stasheff–Tamari orders</b> <i>Combinatorial algebra meets algebraic combinatorics</i> Université du Québec à Montréal Online	<i>January 2021</i>
<b>An algebraic interpretation of the higher Stasheff–Tamari orders</b> <i>International Conference on Representations of Algebras</i> “Research snapshot” Online	<i>November 2020</i>
<b>New interpretations of the higher Stasheff–Tamari orders</b> <i>Virtual Heidelberg Laureate Forum</i> Online	<i>September 2020</i>

**Representation theory and Grassmannians**

*March 2019*

*STEM for Britain*

Poster competition at UK Parliament

## **GRANTS**

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London Mathematical Society Scheme 8

*April 2020*

Postgraduate research conference grants

*Categorifications in Representation Theory* conference organised with Aran Tattar

GBP 2,500

## ORGANISATION

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### **Köln Algebra and Representation Theory seminar**

*April 2020 – present*

Co-organiser

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

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University of Graz

*April 2019*

Visiting: Jordan McMahon

Host: Karin Baur

1 week

## REVIEWING

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zbMATH

*September 2020 – present*

## REFEREEING

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Journal of Algebraic Combinatorics

## TEACHING

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### **Calculus & Analysis**

*October 2020 – December 2020*

Class teacher

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

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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

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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

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London Mathematical Society *June 2019 – present*  
Associate member

**Programming**      Python, Sage, Maple, node.js  
                                 Git

**Languages**

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

## OTHER EMPLOYMENT

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**Enders Analysis** *November 2016 – August 2018*  
Research analyst, Telecoms