

Matthew Spencer

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Personal Profile

I recently completed my Ph.D. in pure mathematics in the Number Theory group at the University of Warwick under the supervision of Dr Alex Bartel. My research is mainly concerned with relations between permutation modules in various representation rings and the applications of such relations.

Education

2013-present University of Warwick, Mathematics institute.

PhD in Mathematics (Funded by EPSRC).

Thesis title: Induction theorems, Brauer relations, and applications.

Supervisor: Dr Alex Bartel.

Submitted on the 4th May 2017, and defended on the 11th July 2017.

2009-2013 University of Durham, Mathematics department.

M.Math First class honours (supported by The Ogden Trust).

2002-2009 Hessle High School (2002-2007), Hymers College (2007-2009).

Seven 'A'-levels: Maths, Further Maths, Physics, Chemistry, History, General Studies A-grade, English Literature B-grade.

STEP papers 2 and 3 with grades 1 and 2 respectively.

Research Interests

My primary area of research is concerned with induction theorems and classifying the kernel of maps from the Burnside ring of a finite group and various representation rings associated to the group. Classifications of such kernels have proven useful in Number Theory and differential topology amongst other areas. I investigate these maps using various methods, more recently by using the theory of Mackey and Green Functors.

Papers and Preprints

- A note on Green Functors with inflation (joint with Alex Bartel) (*J.Algebra vol 483 pages 230-244*).
- Relations between permutation representations in positive characteristic (joint with Alex Bartel) (*in preparation*).
- Brauer Relations for finite groups in the ring of semi simplified modular representations. (*In preparation, submitted*)

Teaching Experience

- Weekly supervisions with undergraduates in groups of five, giving feedback from homework and developing areas covered in the main course in detail.
- Marked homework of supervision groups.
- TA for Galois Theory, Term 1 2016-17.

Administration

- Report writing; I have written annual reports on progress during my PhD programme as well as reports to funding bodies summarising summer research internships.
- Student assessment and review; as part of supervising undergraduates I give weekly feedback to them, as well as submitting reports every term.
- Organised a six-week postgraduate study group on Modular Representation Theory in term 1 2015-16.

Talks Given

- Various study group talks.
- Postgraduate Group Theory Conference 2014, Birmingham University.
- Taught Course Centre Number Theory Day 2015, Imperial College London.
- Journées Arithmétiques 2015, University of Debrecen.
- Young Researchers in Mathematics 2015, Oxford University.
- Algebra Seminar 2016, University of Warwick, November 2016.
- Junior Algebra Seminar 2017, University of Cambridge, March 2017.
- Number theory Seminar 2017, University of Warwick, March 2017.

Other Conferences Attended

- Young Researchers in Mathematics 2014, University of Warwick.
- STNB 2015, Universitat de Barcelona.
- Postgraduate Group Theory Conference 2016, Imperial College London.

Awards

- Ogden Trust sixth form scholarship.
- Ogden Trust undergraduate scholarship.

Other Research

- Ogden Trust Summer Internship, Panstarrs project, Durham University Physics Department, summer 2011.
- Nuffield Foundation Summer internship, Computing and comparing tessellations of Hyperbolic 3-space, Durham University Mathematics Department, Summer 2012.