

Prof. Charles Eaton

CV

PERSONAL INFORMATION

Charles William Eaton

Date of birth: 28th May 1974

Education: 1996-1999 University of Leicester
 1992-1996 University of Warwick
 1985-1992 Bournemouth School

Qualifications: Ph.D. Mathematics, University of Leicester, 1999
 M.Sc. Mathematics, University of Warwick, 1996
 B.Sc. Mathematics (1st class), University of Warwick, 1995

Appointments held:

9/2021-present	Professor, University of Manchester
9/2016 – 8/2021	Reader, University of Manchester
8/2009 – 9/2016	Senior Lecturer, University of Manchester
10/2004 – 7/2009	Lecturer, University of Manchester
10/2003 – 9/2011	Royal Society University Research Fellow, University of Manchester (previously UMIST)
4/2003 – 9/2003	Honourary Research Fellow, University of Birmingham
1/2003 – 3/2003	Lecturer, University of Birmingham
1/2000 – 12/2002	Research Fellow, University of Birmingham
9/1999 – 12/1999	Teaching Assistant, University of Leicester
7/1999 – 9/1999	Visiting Department of Mathematics, University of Auckland
10/1996 – 7/1999	EPSRC-funded Ph.D. student, University of Leicester

Present appointment: Professor of Mathematics, in Department of Mathematics, School of Natural Sciences, University of Manchester.

RESEARCH CONTRIBUTIONS

Publications (all peer reviewed or submitted awaiting review)

- [32] C.W.Eaton and M.Livesey, *Donovan's conjecture and extensions by the centralizer of a defect group*, J. Algebra **582** (2021), 157-176.
- [31] C.W.Eaton, *Morita equivalence classes of blocks with elementary abelian defect groups of order 16*, arXiv 1612.03485
- [30] C.W.Eaton and M.Livesey, *Some examples of Picard groups of blocks*, J. Algebra **558** (2020), 350-370.

- [29] C.W.Eaton, F.Eisele and M.Livesey, *Donovan's conjecture, blocks with abelian defect groups and discrete valuation rings*, Math. Z. **295** (2020), 249-264.
- [28] C.W.Eaton and M.Livesey, *Donovan's conjecture and blocks with abelian defect groups*, Proc. AMS. **147** (2019), 963-970.
- [27] C.W.Eaton and M.Livesey, *Towards Donovan's conjecture for abelian defect groups*, J. Algebra. **519** (2019), 39-61.
- [26] C.W.Eaton and M.Livesey, *Classifying blocks with abelian defect groups of rank 3 for the prime 2*, J. Algebra **515** (2018), 1-18.
- [25] C.W.Eaton and M.Livesey, *Loewy lengths of blocks with abelian defect groups*, Proc. AMS Ser. B **4** (2017), 21-30.
- [24] C.W.Eaton, *Morita equivalence classes of 2-blocks of defect three*, Proc. AMS **144** (2016), 1961-1970.
- [23] C.W.Eaton and A.Moreto, *Extending Brauer's height zero conjecture to blocks with nonabelian defect groups*, Int. Math. Res. Not. **20** (2014), 5581-5601.
- [22] C.W.Eaton, R. Kessar, B. Külshammer and B. Sambale, *2-blocks with abelian defect groups*, Adv. Math. **254** (2014), 706-735.
- [21] J. An and C.W.Eaton, *Nilpotent blocks of quasisimple groups for the prime two*, Alg. Rep. Theory **16** (2013), 1-28.
- [20] C.W.Eaton, B.Külshammer and B.Sambale, *2-Blocks with minimal nonabelian defect groups II*, J. Group Theory **15** (2012), 311-321.
- [19] J. An and C.W.Eaton, *Blocks with extraspecial defect groups of finite quasisimple groups*, J. Algebra **328** (2011), 301-321
- [18] D.Craven, C.W.Eaton, R.Kessar and M.Linckelmann, *The structure of blocks with a Klein four defect group*, Math. Z. **268** (2011), 441-476.
- [17] J. An and C.W.Eaton, *Nilpotent blocks of quasisimple groups for odd primes*, to appear, J. Reine Angew. Math. **656** (2011), 131-177.
- [16] C.W.Eaton, *Heights of characters in blocks*, conference proceedings for "Modules and Representation Theory, Cluj-Napoca, 2009.
- [15] C.W.Eaton, *Perfect generalized characters inducing the Alperin-McKay conjecture*, J. Algebra **320** (2008), 2301-2327.
- [14] C.W.Eaton, *Perfect isometries and the Alperin-McKay conjecture*, Proceedings of the 39th Symposium on Ring Theory and Representation Theory, Hiroshima (2007), 49-64.
- [13] C.W.Eaton, *A class of blocks behaving like blocks of p -solvable groups*, J. Algebra **301** (2006), 337-343.
- [12] C.W.Eaton, *Vertices for irreducible characters of a class of blocks*, J. Algebra **286** (2005), 492-499.
- [11] J. An and C.W.Eaton, *Modular representation theory of blocks with trivial intersection defect groups*, Algebras and Representation Theory **8** (2005), 427-448.
- [10] J. An and C.W.Eaton, *Blocks with trivial intersection defect groups*, Math. Z. **247** (2004), 461-486.
- [9] C.W.Eaton, *The equivalence of some conjectures of Dade and Robinson*, J. Algebra **271** (2004), 638-651
- [8] C.W.Eaton, "Generalisations of conjectures of Brauer and Olsson," Archiv der Mathematik **81** (2003), 621-626
- [7] C.W.Eaton and B.Höfling, *Dade's conjecture and wreath products*, J. Group Theory **5**(2002), 409-428

- [6] C.W.Eaton and G.R.Robinson, *On a minimal counterexample to Dade's projective conjecture*, J. Algebra **249** (2002), 453-462
- [5] J. An and C.W.Eaton, *On TI and TI defect blocks*, J. Algebra **243** (2001), 123-130
- [4] C.W.Eaton, *On the connectivity of the subpair complex of a block*, J. Algebra **238** (2001), 665-668
- [3] C.W.Eaton, *On finite groups of p -local rank one and some conjectures of Dade and Robinson*, J. Algebra **238** (2001), 623-642
- [2] J. An and C.W.Eaton, *The p -local rank of a block*, J. Group Theory **3** (2000), 369-380
- [1] C.W.Eaton, *Dade's inductive conjecture for the Ree groups of type G_2 in the defining characteristic*, J. Algebra **226** (2000), 614-620

Grants awarded

- EPSRC standard grant EP/T004606/1 "Representation theory over local rings" **£363,116.64**, to start October 2019, three years
- EPSRC standard grant EP/M015548/1 "Morita equivalence classes of blocks." **£316,276.80**, started September 2015, three years.
- LMS Scheme 1 grant to organise "Brauer's Problems" conference in September 2013, **£5000**. Also funding from Heilbronn Institute, **£7500**
- Three-year extension to Royal Society University Research Fellowship (to 2011) **£267,424**.
- LMS Scheme 2 grant, visit of Prof. Andrei Marcus (2009), £1150
- Royal Society University Research Fellowship (10/2003-9/2008), **£211,026**.
- LMS Scheme 3 grant, Group theory and its applications (2004), £1200.
- LMS Programme Committee Scheme 4 grant, to visit University of Copenhagen (2002), £500.
- Royal Society Short Visit award, to visit University of Auckland (1999), £700.
- EPSRC funding for MSc and PhD.

Supervision of research students

PhD students:

- (i) Meizheng Fu. Started September 2020.
- (ii) Claudio Marchi. Started September 2018. Co-supervised M. Livesey
- (iii) Elliot McKernon. Completed Spring 2020.
- (iv) Cesare Ardito. Completed Spring 2020.
- (v) Inga Schwabrow. Completed Spring 2016.
- (vi) Stavros Apostolou. Completed August 2009.
- (vii) Pornrat Ruengrot. Completed December 2011. Externally funded.

Organisation, promotion and management of research

- Set up and management of wiki site collecting and presenting data on blocks of finite groups.
- Recruitment and management of PDRAs, 2015-2018 and 2019-2022.
- PI on EPSRC standard grants listed above.

- Organiser for 1-week conference “Morita equivalence problems for blocks of finite groups”, CIB, EPFL, Switzerland, September 2016
- Local organiser for 1-week conference “Brauer’s problems – 50 years on”, Manchester, September 2013.

Conferences and talks

I have been invited speaker at seminars and colloquia at the following, often on multiple occasions: Universities of Aberdeen, Auckland, Birmingham, Bristol, Cambridge, Chiba, Glasgow, Jena, Kaiserslautern, Kent, Leeds, Leicester, Lincoln, Liverpool, Manchester, Nottingham, Osaka Kyoiku, Oxford, Tokyo, Valencia, York, National University of Ireland (Maynooth), University College Dublin and RWTH Aachen, as well as the London Algebra Colloquium.

I have attended the following conferences:

- **Invited plenary speaker** “Counting conjectures and beyond”, in “Groups, representations and applications: new perspectives”, Isaacs Newton Institute, Cambridge, May 2020
- **Invited plenary speaker** “Introductory workshop” of “Groups, representations and applications: new perspectives”, Isaacs Newton Institute, Cambridge, January 2020
- “Groups and Representation Theory”, Warwick University, September 2019
- “Groups, Rings and Associated Structures”, Spa, Belgium, June 2019
- **Invited speaker** at British Mathematical Colloquium, Lancaster University, April 2019
- **Plenary speaker** “Representations of Finite Groups”, MFO Oberwolfach, March 2019
- “Representations of groups and Hecke algebras”, University of Birmingham, September 2018
- **Plenary speaker** “Representation Theory Days”, Universität Hannover, Germany, September 2018
- “Group Theory in Florence II”, Florence, Italy, September 2018
- **Invited plenary speaker** at BLOC meeting, University of Leicester, August 2018
- **Invited morning speaker** at British Mathematical Colloquium, University of St. Andrews, June 2018
- “Group Representation Theory and Applications”, MSRI (Berkeley), February-March 2018
- “Nikolaus Conference”, RWTH Aachen, December 2017
- **Plenary speaker** “Representation Theory of Finite Groups”, BIRS, Canada, October 2017
- **Invited plenary speaker** “Some problems in the theory of simple groups”, CIB, Lausanne, Switzerland, December 2016.
- **Organiser** “Morita equivalence problems for blocks of finite groups”, CIB, Lausanne, Switzerland, September 2016.

- “Endo-p-permutation and trivial source modules in the representation theory of finite groups”, CIB, Lausanne, Switzerland, September 2016.
- “Advanced lectures on local representation theory”, CIB, Lausanne, Switzerland, July 2016.
- **Invited lecture series** on modular representation theory, University of Valencia, February 2016.
- “Finite Simple Groups: Thirty Years of the Atlas and Beyond”, Princeton, USA, November 2015
- **Invited plenary speaker** “Blocks of Finite Groups and Beyond”, Jena, July 2015
- “Groups, Representations, Cohomology”, Skye, June 2015
- “Representations of Finite Groups”, Oberwolfach, April 2015
- “Computations in Groups and Algebras”, Jena, Germany, February 2015
- **Invited plenary speaker** “Representations of Finite and Algebraic Groups”, Les Houches, France, February 2015
- “Global/Local Conjectures in Representation Theory of Finite Groups”, BIRS, Canada, March 2014
- **Organiser** “Brauer’s Problems in Representation Theory– 50 Years On”, Manchester, September 2013
- **Invited plenary speaker** “The Third International Symposium on Groups, Algebras and Related Topics” in Beijing, celebrating the 50th anniversary of the Journal of Algebra, June 2013
- “Finite Groups, Representations, and Related Topics”, Oxford, August 2012.
- **Invited plenary speaker** “Modular Algebra: Representations, Invariants, Lie Algebras”, Jena, Germany, May 2012
- “Representations of finite groups”, Oberwolfach, March 2012
- **Plenary speaker** at “Global/Local Conjectures in Representation Theory of Finite Groups,” BIRS, Canada, March 2011.
- “Group Representation Theory and Related Topics,” EPFL, Switzerland, June 2010
- “Local theory, finite groups and representations”, Luminy, France, October 2009
- “Combinatorial and Geometric Structures in Representation Theory”, Durham, July 2009
- **Speaker** at “Conference on Algebraic Topology, Group Theory and Representation Theory”, Skye, June 2009
- **Plenary speaker** at “Representation Theory of Finite Groups,” Oberwolfach, Germany, March 2009
- **Invited plenary speaker** at ARTIN meeting, Manchester, December 2008
- **Invited plenary speaker** at “Modules and Representation Theory,” Cluj-Napoca, Romania, July 2008
- “Representation Theory of Finite Groups and Related Topics”, MSRI (Berkeley), March-April 2008
- Peter Cameron’s birthday conference, Ambleside, August 2007
- **Invited plenary speaker** at “Around Broué’s Conjecture”, Luminy, France, May 2007
- Hall-Higman conference, Oxford, January 2007

- “Conference on the Occasion of Michel Broue’s 60th Birthday,” Paris, October 2006
- **Key-note speaker** at “39th Symposium on Ring Theory and Representation Theory,” Hiroshima, Japan, September 2006 (three lectures)
- “Representation of Finite Groups”, Oberwolfach, Germany, March 2006
- “Group Representation Theory”, EPFL, Switzerland, April 2005
- **Speaker** at BMC, University of Birmingham, April 2003
- **Plenary speaker** at “Darstellungen endlicher Gruppen,” Oberwolfach, March 2003
- **Speaker** at “Groups, Representations and Cohomology,” Mount Holyoke College, USA, June 2002
- Representation Theory of Finite Groups and Related Algebras, Durham, July 2002
- **Invited plenary speaker** at Bristol-Leicester-Oxford Colloquium, University of Oxford, March 2002
- BMC, University of Warwick, April 2002
- **Invited plenary speaker** at “Darstellungstheoretage,” Magdeburg, Germany, November 2001
- **Plenary speaker** at “Representation Theory of Finite Groups,” Oberwolfach, Germany, March 2001
- “Richard Brauer – Taking his ideas into the 21st century,” University of Stuttgart, March 2001
- “Algebra 2000,” University of Alberta, June – July 2000
- **Speaker** at “Representation Theory and Computational Algebra,” University of Georgia, May 2000
- BMC, University of Leeds, April 2000
- **Plenary speaker** at “Modular Representation Theory of Finite Groups,” University of Virginia, May 1998
- “Algebraic Groups and Their Representations,” 4 weeks of 6 month conference, Newton Institute, Cambridge, Jan – Jul 1997

Other research visits:

- RWTH Aachen, 1 week, December 2017 (G. Hiss)
- Universität Kaiserslautern, 1 week, February 2017 (G. Malle)
- University of Valencia, 1 week, February 2016 (G. Navarro)
- University of Jena, 1 week, May 2012 (B. Külshammer)
- University of Auckland, 3 weeks, November 2010 (J. An)
- Chiba University, 4 days, November 2010 (S. Koshitani)
- Osaka Kyoiku University, 5 days, October 2010 (K. Uno)
- RWTH Aachen, 8 days, February 2009 (G. Hiss and R. Narasaki)
- University of Auckland, 4 weeks, October-November 2007 (A. An)
- University of Aberdeen, 1 week, September 2007 (R. Kessar and M. Linckelmann)
- University of Aberdeen, 1 week, January 2007 (R. Kessar and M. Linckelmann)
- Chiba University, 5 days, September 2006 (S. Koshitani)

- University of Aberdeen, 5 weeks, May-June 2006 (R. Kessar and M. Linckelmann)
- University of Valencia, 2 weeks, September 2005 (A. Moreto)
- RWTH Aachen, 2 weeks, June 2004 (G. Hiss)
- University of Auckland, 4 weeks, February 2004 (J. An)
- University of Copenhagen, 1 week, August 2002. (J. Olsson)
- University of Jena, 2 weeks, Oct 2001. (B. Höfling and B. Külshammer)
- University of Auckland, 4 weeks, Jul – Aug 2001. (J. An)
- University of Jena, 2 weeks, Nov 2000. (B. Höfling and B. Külshammer)
- University College Dublin, 1 week, Apr 2000. (J. Murray and R. Gow)
- University of Auckland, 7 weeks, Jul – Sep 1999. (J. An, E. O’Brien, M. Conder)

OTHER EVIDENCE OF ACADEMIC AND PROFESSIONAL STANDING

- Member of editorial board for LMS Bulletin, Journal and Transactions (2019-present)
- External examiner for pure mathematics, University of Kent (2018-2022)
- Royal Society Newton Advanced Fellowship Panel (2015-2021)
- Royal Society Newton International Fellowship Panel (2009-2015)
- LMS representative for University of Manchester (2012-2019)
- JSPS Postdoctoral Fellowship Panel (occasional)
- Editor, special issue of Journal of Algebra (2013).
- Regular referee for international journals, including: Journal of the European Mathematical Society; Advances in Mathematics; Mathematisches Zeitschrift; LMS Journal of Computation and Mathematics; LMS journals; Algebra and Number Theory; Journal of Group Theory; Acta Mathematica; Algebras and Representation theory; Pacific Journal of Mathematics; Journal of Algebra; Quarterly Journal of Mathematics; Science in China; Glasgow Mathematical Journal; Proc. EMS; Communications in Algebra; Nagoya Mathematical Journal; Journal of Pure and Applied Algebra; Rocky Mountain Journal of Mathematics; Proceedings of the European Congress of Mathematics; International Electronic Journal of Algebra
- Referee for EPSRC grant proposals
- Reviewer for American Mathematical Society Mathematical Reviews (for 81 articles)
- Panel member for Royal Society Summer Studentship grants

Major conference organisation roles

- “Morita equivalence problems for blocks of finite groups”, CIB, EPFL, Switzerland, one week, September 2016
- “Brauer’s problems – 50 years on”, one week, Manchester, September 2013.

TEACHING AND LEARNING

NAP programme completed, 2008.

Lecture courses: All involving full responsibility for writing and delivery of lectures, production of examples sheets, examination setting and marking, and administration of coursework. Year indicates start of academic year.

- Linear Algebra A (with M. Kambites, 1st year core undergraduate course, University of Manchester), **2018**
- Sets, Numbers and Functions B, later called Foundations B (1st year core undergraduate course, University of Manchester), **2011-2016**. Approx 200 students.
- Modular Representation Theory (graduate course, University of Manchester), **2009**.
- Algebraic Structures I (2nd year core undergraduate course, University of Manchester), **2008**. Approx. 410 students.
- Representation of Groups (4th year undergraduate course, UMIST and University of Manchester), **2003, 2004, 2005, 2007**. Student feedback excellent (always above 4.1/5).
- Quantitative Methods (mathematics element of engineering foundation year, University of Birmingham) **2003**. Approx 105 students.
- Mathematics for Physicists II (core mathematics course for 1st year physics undergraduates, University of Birmingham), **2001, 2002**. Approx. 75 students.
- Mathematics for Scientists II (service course for meteorology M.Sc. students, University of Birmingham), **2000**. Approx. 25 students
- Further Real Analysis (core 2nd year undergraduate course at University of Leicester), **1999**. Approx. 80 students.

Supervision of small group and support classes:

- All core 1st year undergraduate courses, University of Warwick, 1995-1996
- Weekly 3rd year undergraduate Lie algebras examples classes, two groups, sizes 20 and 30, University of Warwick, 1995
- 1st year undergraduate pure mathematics, and probability and statistics, University of Leicester, 1996-1999
- 1st year and 2nd year undergraduate pure mathematics, University of Birmingham, 2000-2002
- 1st year undergraduate Sets, Numbers and functions, University of Manchester, 2009
- 1st year undergraduate Sets, Numbers and functions, now Foundations, University of Manchester, 2011-present
- 1st year undergraduate Linear Algebra, University of Manchester, 2016-present
- 2nd year algebraic structures, tutorials, University of Manchester, 2018-present
- Service teaching support classes 2011-2016, University of Manchester 1M1, 2M1

Supervision of projects: Many 1- and 2-semester projects at foundation, undergraduate (3rd and 4th year) and MSc level, on topics in combinatorics, representation theory of finite groups, fusion in finite groups and quantum computation.

Postgraduate supervision:

- Claudio Marchi (PhD)
- Cesare Ardito (PhD)
- Elliot McKernon (PhD)
- Peter Lloyd (MSc), completed 2017
- Stuart Hearn (MSc) completed 2017
- Inga Schwabrow (PhD), completed 2016
- Piotr Szostak (MSc), completed 2016
- Ranran Chao (MSc), completed 2015
- Jamie Phillips (MSc), completed 2012
- Pornrat Reungrot (PhD), completed 2011
- Stavros Apostolou (PhD), completed 2009
- Azra Emami Shaharbak (MSc), completed 2008
- John Balantyne (MSc), completed 2008
- John Marshall (MSc), completed 2006

Contributions to reform and development of curriculum:

I was part of a small group reviewing and reforming the 1st year undergraduate curriculum, 2015.

Teaching/assessment undertaken outside of the University of Manchester:

- External examiner for pure mathematics, University of Kent (2018-2022)
- External examiner for Noelia Rizo, PhD, University of Valencia (2019)
- External examiner for Ryan Davies, PhD, University of Birmingham (2018)
- External examiner for Niamh Farrell, PhD, City, University of London (2017)
- External examiner for Joan Tent, PhD, University of Valencia (2012)
- External examiner for MPhil theses at University of Warwick and University of Birmingham. (MPhil examination at Warwick involved oral examination).

LEADERSHIP AND/OR MANAGEMENT ROLES

- Head of Pure Mathematics Group, August 2019-present.
- Line Manager of up to 10 academic staff in School of Mathematics, 2019-present.
- Pure Group Research Lead, 2018-2019.
- Year One Tutor, 2015-2017. Oversight of 1st year of all undergraduate mathematics students.
- School Board Representative on Research Committee, 2015-2018.
- Assessment Committee, School of Mathematics, 2015 onwards.
- Mathematics admissions tutor, 2012-2015.
- Organisation of weekly University of Manchester Algebra Seminar series 2004-2014. Involves organising and chairing approx. **250 seminars**. The task involves strong contacts with the UK and world mathematics communities,

and is a large time commitment, involving the organisation of visiting academics.

- MIMS Eprints committee member since foundation in 2005
- MIMS Committee member, 2008-2011
- Member of search committee to select Head of School, 2008
- Regular membership of selection and interview panels, including for Fielden Chair and Turing Fellowships

KNOWLEDGE AND TECHNOLOGY TRANSFER, OUTREACH AND PUBLIC ENGAGEMENT

- Mathematics Masterclass at Whitworth Art Gallery. Planning and running day of activities for Year 9 pupils, as part of a group of three mathematicians in collaboration with artists, to take place 2019.
- Mathematics and Art at Whitworth Art Gallery. Planning and running four days of activities for Year 7 pupils, as part of group of four mathematicians in collaboration with artists, 2018. **Highly commended** in Outstanding Public Engagement Initiative category of University of Manchester Better World Showcase, 2019.
- Outreach at school in Nantwich, 2010. “Frieze patterns and wallpaper patterns”. Setting up and assessing mathematics projects for infants and juniors on “Gifted and Talented” scheme. Involved two visits to school.
- Participation in **Royal Society MP-Scientist Pairing Scheme**, 2005.

I spent one week in Westminster, learning about the workings of parliament and government, with specific reference to science and technology, and shadowing Dr. Brian Iddon MP in his constituency and parliamentary work. I had the opportunity to speak to several MP’s and others concerning my work and academia in general, as well as media figures (Adam Hart Davis, Johnny Ball) and science journalists.

Organised visit of Dr. Brian Iddon MP to the School of Mathematics for one day.

I gave a brief presentation to the **Parliamentary and Scientific Committee** reporting on this scheme.