

# Florian Eisele

## Curriculum Vitae

University of Manchester  
Oxford Road, Manchester, M13 9PL, United Kingdom  
☎ +44 161 275 5838  
✉ [florian.eisele@manchester.ac.uk](mailto:florian.eisele@manchester.ac.uk)  
🌐 <https://feisele.github.io>

### Education

- 2008–2012 **PhD in mathematics**, *RWTH Aachen University*,  
graduated “mit Auszeichnung” (with distinction).  
Thesis title: “*Group Rings over the  $p$ -Adic Integers*”, defended in March 2012.  
Supervisor: Professor Gabriele Nebe  
Awarded “Borchers Badge” for an outstanding dissertation in mathematics.
- 2004–2008 **Student of mathematics**, *RWTH Aachen University*,  
graduated “mit Auszeichnung” (with distinction).  
Thesis title: “*Algorithmische Behandlung  $p$ -adischer ganzzahliger Gruppenringe*” (“*Algorithmic treatment of  $p$ -adic integral group rings*”)  
Supervisor: Professor Gabriele Nebe

### Employment

- 2021– **Lecturer in Pure Mathematics**, *University of Manchester*.
- 2020–2021 **Postdoctoral researcher**, *City, University of London*.  
with Professor Radha Kessar
- 2019 **Lecturer in Mathematics**, *University of Glasgow*.  
Fixed-term position (1 year)
- 2015–2018 **Postdoctoral researcher**, *City, University of London*.  
with Professor Markus Linckelmann (3 years)
- 2012–2015 **Postdoctoral researcher**, *Vrije Universiteit Brussel*, Brussels, Belgium.  
with Professor Eric Jespers (3.5 years)
- 2009–2012 **Research assistant**, *RWTH Aachen University*.  
Funded by the German Research Foundation (DFG) in the framework of the priority program *Representation Theory*, 0.75 FTE
- 2010–2012 **Teaching assistant**, *RWTH Aachen University*.  
In addition to the above, 0.25 FTE
- 2008–2009 **Teaching assistant**, *RWTH Aachen University*.  
Invariant theory tutorials, 0.5 FTE
- 2007–2008 **Student teaching assistant**, *RWTH Aachen University*.  
Linear algebra tutorials for two terms and Maple tutorials for one term

### Awards and Distinctions

- 2020 **Reinhold Baer Prize**  
awarded annually by *AGTA - Advances in Group Theory and Applications*.

## Publications

- [1] *Units in Blocks of Defect 1 and the Zassenhaus Conjecture*, with L. Margolis  
preprint (2022), [arxiv.org/abs/2212.06634](https://arxiv.org/abs/2212.06634)
- [2] *Arbitrarily large Morita Frobenius numbers*, with M. Livesey  
**Algebra & Number Theory**, Vol. 16 (2022), No. 8, 1889—1904
- [3] *Bijections of silting complexes and derived Picard groups*  
**J. London Math. Soc.**, 106: 1008-1060 (2022)
- [4] *On the geometry of lattices and finiteness of Picard groups*  
**J. Reine Angew. Math. (Crelle's Journal)**, vol. 2022, no. 782 (2022), pp. 219-233.
- [5] *The Picard group of an order and Külshammer reduction*  
**Algebr. Represent. Th.** 24, pages 505–518 (2021)
- [6] *On solvability of the first Hochschild cohomology of a finite-dimensional algebra*, with T. Raedschelders  
**Trans. Amer. Math. Soc.** 373, 7607–7638 (2020)
- [7] *Donovan's conjecture, blocks with abelian defect groups and discrete valuation rings*, with C.W. Eaton, M. Livesey  
**Math. Z.**, Vol. 295 (2020)
- [8] *A Counterexample to the First Zassenhaus Conjecture*, with L. Margolis  
**Adv. Math.**, Vol. 339 (2018), pp 599–641
- [9] *A reduction theorem for  $\tau$ -rigid modules*, with G. Janssens, T. Raedschelders  
**Math. Z.**, Vol. 290 (2018), Issue 3–4, pp 1377–1413
- [10] *On Tate duality and a projective scalar property for symmetric algebras*, with M. Geline, R. Kessar, M. Linckelmann  
**Pac. J. Math.** Vol. 293 (2018), No. 2, pp 27–300
- [11] *Blocks with a generalized quaternion defect group and three simple modules over a 2-adic ring*  
**J. Algebra** 456 (2016), pp 294–322
- [12] *Describing units of integral group rings up to commensurability*, with A. Kiefer, I. Van Gelder  
**J. Pure Appl. Algebra**, Volume 219 (2015), Issue 7, pp 2901–291
- [13] *The  $p$ -adic group ring of  $SL_2(p^f)$*   
**J. Algebra** 410 (2014), pp 421–459
- [14] *Defect Two Blocks of  $\mathbb{Z}_p \Sigma_n$*   
**Comm. Algebra** 42 (2014), no. 7, pp 2890–290
- [15] *On the IYB-property in some solvable groups*  
**Arch. Math. (Basel)**, Volume 101 (2013), Issue 4, pp 309–318
- [16]  *$p$ -Adic lifting problems and derived equivalences*  
**J. Algebra** 356 (2012), pp 90–114

## Teaching Experience

$W$  = autumn/winter,  $S$  = spring/summer

- W 2022 **Lecture “Real Analysis B”** (first half)  
(co-lead, ~ 110 students)  
Tutorials “Algebraic Structures 1”, Supervision “Mathematical Foundation & Analysis”
- S 2022 **Lecture “Sequences and Series”** (second half)  
(unit lead, ~ 400 students, student evaluation “Dr. –’s teaching was excellent”: 4.54 / 5)  
Supervision “Linear Algebra B”

- W 2021 Supervision for “Foundations of Pure Mathematics A”.  
Organised reading group on profinite groups.
- W 2020 **Lecture “Mathematics for Economists Post A-Level”**  
(unit lead, ~ 175 students, taught remotely).
- 2020/21 Organised reading groups on deformation theory (in spring ’20),  $A_\infty$ -algebras (autumn ’20) and tilting theory (spring ’21).
- W 2019 **Lecture “Engineering Mathematics 1”**  
(first block, two sections comprising ~ 200 students each).  
Tutorials for “Algebra”.  
Marking first year feedback assignments and participation in “Maths hub” (1st and 2nd year).
- S 2019 **Lecture “1S”**  
(first year algebra & calculus module; I was lecturing the calculus section; ~ 100 students).  
Tutorials for “1S”, “1Y” (similar to “1S”) and “Methods in Complex Analysis”.
- S 2018 **Lecture “Number Theory & Cryptography”**  
(unit lead; ~ 60 students; student feedback results: **4.2 / 5** overall; 1st year course).
- W 2016 **Lecture “Number Theory & Cryptography”**  
(unit lead; ~ 60 students; student feedback results: **4.1 / 5** overall; 1st year course).
- W 2014 Tutorials for “Algebra II” and “Affine and projective geometry”.
- W 2013 Tutorials for “Algebra II” (included drafting and invigilating the written exam).
- W 2010–W 2011 Maple lab classes (administered weekly oral exams for first year mathematics students).
- W 2008 Tutorials for “Invariant theory” (included setting homework exercise sheets).
- S 2008 Maple lab classes  
(assisted students with their assignments; covered wide range of mathematical topics).
- W 2007 Tutorials for “Linear algebra II”.
- S 2007 Tutorials for “Linear algebra for computer scientists”.

## Supervision

### BSc

- 2013 BSc project: Doryan

### MSc

- 2022 MSc projects: Junyue, Luke; MSc dissertations: Junyue, Luke  
2022 MSc project: Bhakti

### PhD

- 2022- Joel (main supervisor)  
2022- Junaid (main supervisor)

## Invited Talks

- Dec 2022 Pure Colloquium, University of Manchester: *Modular representations of finite groups*
- Jun 2022 ARTIN New Arrivals meeting, Edinburgh: *What we know about Donovan’s conjecture*
- Apr 2022 Group Theory Seminar, ICMAT Madrid: *What we know about Donovan’s conjecture*
- Jan 2022 Greek Algebra & Number Theory Seminar: *Bijections of silting complexes and derived Picard groups* (virtual)
- Oct 2021 Algebra Seminar, University of Manchester: *Blocks of group algebras and silting theory*
- Jul 2021 Oberseminar Algebra, University of Stuttgart: *Bijections of silting complexes and derived Picard groups* (virtual)
- Jun 2021 Reinhold Baer Prize 2020 - Awards Ceremony: *Units of group algebras and automorphism groups* (virtual)

- Oct 2019 Number Theory Seminar, University of Exeter: *Picard groups of group algebras*
- Jun 2019 **Keynote address** at conference “Groups, Rings and Associated Structures 2019”, Spa: *On the first Zassenhaus conjecture*
- Mar 2019 Oberwolfach workshop “Representations of Finite Groups”: *Self-equivalences of blocks*
- Feb 2019 17th Triangle meeting, University of Birmingham: *Picard groups of blocks and Donovan’s conjecture*
- Feb 2019 Algebra and Number Theory Seminar, University of Glasgow: *A counterexample to the first Zassenhaus conjecture*
- Oct 2018 Algebra Seminar, University of Cambridge: *A counterexample to the first Zassenhaus conjecture*
- Jun 2018 79th BLOC meeting, University of Oxford: *A counterexample to the first Zassenhaus conjecture*
- Feb 2018 Algebra Seminar, University of Manchester: *Blocks as orders over a  $p$ -adic ring*
- Jan 2018 Seminar on Groups and Representations, University of Kaiserslautern: *A counterexample to the first Zassenhaus conjecture*
- Dec 2017 London Algebra Colloquium: *A counterexample to the first Zassenhaus conjecture*
- Oct 2017 Algebra Seminar, University of Aberdeen: *On the Zassenhaus Conjecture*
- Nov 2016 London Algebra Colloquium: *Tame blocks*
- Oct 2016 Algebra Seminar, University of York: *Tame blocks*
- Sep 2016 Algebra Seminar, University of Murcia: *Tame blocks*
- Feb 2016 Workshop “Computational Methods for Representations and Group Rings”, Stuttgart: *Virtually irreducible lattices for symmetric orders*
- Jan 2015 Oberseminar Algebra/Zahlentheorie, University of Jena: *Basic algebras of blocks over a  $p$ -adic ring*
- Nov 2014 Algebra Seminar, University of Antwerp: *Representation theory of finite groups over a  $p$ -adic ring*
- Dec 2013 Colloquium of the “Graduiertenkolleg”, RWTH Aachen University: *Einheitengruppen von ganzzahligen Gruppenringen endlicher Gruppen*
- June 2010 Representation Theory Seminar, University of Oxford: *Defect two blocks of symmetric groups over the  $p$ -adic integers*
- July 2009 Oberseminar Algebra, University of Stuttgart:  *$p$ -adische Gruppenringe mit Zerlegungszahlen 0 und 1*

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## Research Stays

- 18–23 Apr 2022 ICMAT Madrid, hosted by L. Margolis (work on unit groups)
- 5–9 Mar 2018 University of Glasgow, collaboration with T. Raedschelders and G. Janssens (work on  $\tau$ -tilting theory)
- 6–8 Feb 2018 University of Manchester, hosted by C. Eaton und M. Livesey (work on Donovan’s conjecture for abelian defect groups)
- 15–21 Oct 2017 University of Murcia, hosted by Leo Margolis (work on Zassenhaus conjecture)
- 18–24 Sep 2016 As part of the semester program “Local representation theory and simple groups”, EPFL, Lausanne
- 10–16 Sep 2017 University of Murcia, hosted by Leo Margolis (work on Zassenhaus conjecture)
- Apr–Oct 2010 Research stay with Karin Erdmann, University of Oxford

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## Attended Conferences & Contributed Talks

- Aug 2022 Conference “Structure of Group Algebras over Local Rings”  
Expository lectures (2× 1 hour): *Rigidity and Lifting to Local Rings*

- Jul 2022 Conference “Groups St Andrews”, Newcastle  
Talk: *On Donovan’s conjecture and Picard groups*
- Sep 2019 Conference “Groups and Representation Theory, a Conference in Memory of Kay Magaard”, Warwick
- Jun 2019 Conference “Groups, Rings and Associated Structures 2019”, Spa  
Talk: *On the first Zassenhaus conjecture*
- Mar 2019 Workshop “Representations of Finite Groups”, Oberwolfach  
Talk: *Self-equivalences of blocks*
- Aug 2018 ICRA, Prague  
Talk: *Picard groups of orders and Külshammer reduction*
- Apr 2018 Workshop “Representations of Finite and Algebraic Groups”, Berkeley
- Aug 2017 Conference “Groups St Andrews”, Birmingham  
Talk: *Tame blocks*
- June 2017 Conference “Groups, Rings and the Yang-Baxter equation”, Spa  
Talk: *Computing with lattices over group rings of finite groups*
- Jan 2017 Conference “Darstellungstheoretage”, Wuppertal
- Aug 2016 “17th Workshop and International Conference on Representations of Algebras”, Syracuse  
Talk: *Knoerr lattices for symmetric orders*
- Jul 2016 Workshop “Advanced lectures on local representation theory”, Lausanne
- Feb 2016 Workshop “Computational Methods for Representations and Group Rings”, Stuttgart
- Feb 2016 Conference “Representation Theory of Symmetric Groups and Related Topics”, Kaiserslautern
- Nov 2015 Darstellungstheoretage, Stuttgart
- July 2015 Conference “Blocks of Finite Groups and Beyond”, Jena
- Sep 2014 Conference “DMV-PTM Joint Meeting”, Poznań  
Talk: *Involutive Yang-Baxter groups*
- Aug 2014 “XVI International Conference on Representations of Algebras”, Sanya  
Talk: *Lifting group rings and tame blocks*
- July 2014 Conference “Brock International Conference on Groups, Rings and Group Rings”, St. Catharines  
Talk: *Units of integral group rings of finite groups up to commensurability*
- Dec 2013 Darstellungstheoretage and Nikolaus Conference, Aachen
- Aug 2013 Conference “Groups St Andrews”, St Andrews
- July 2013 LMS/EPSRC Short Instructional Course “Computational Group Theory”, St Andrews
- July 2013 Conference “Classical Aspects of Ring Theory and Module Theory”, Bedlewo  
Talk: *On the Involutive Yang-Baxter Property in Finite Groups*
- June 2013 Conference “Advances in Group Theory and Applications”, Porto Cesareo
- June 2013 Conference “Recent Trends in Rings and Algebras”, Murcia  
Talk: *On the Involutive Yang-Baxter Property in Finite Groups*
- Nov 2012 Darstellungstheoretage, Magdeburg
- Oct 2012 Symposium in honor of F. Van Oystaeyen, Antwerp
- Jun 2012 Workshop “Group Rings and related topics”, Stuttgart
- Sep 2011 DMV Jahrestagung, Köln  
Talk: *Lifting Algebras to Orders*
- Aug 2011 Summer School on Computational Group Theory, Kirchberg/Hunsrück
- Aug 2011 Summer School on Polynomial Representations of the General Linear Group, Bad Driburg  
Talk: *Definition of  $V_{\lambda, K}$  and its Properties as a Weyl Module*

- July 2011 Groups, Rings, and Group-Rings, Edmonton  
Talk: *Lifting Algebras to Orders*
- Mar 2011 Darstellungstheorie Schwerpunkttagung, Münster
- May 2010 Conference on Arithmetic of Group Rings and Related Objects, Aachen  
Talk: *Defect two blocks of symmetric groups over the  $p$ -adic integers*
- Apr 2010 Darstellungstheorie Schwerpunkttagung, Bad Honnef
- May 2009 CMS session on Groups & Hopf algebras, St. John's  
Talk: *Algorithms for  $p$ -Adic Group Rings*
- Sep 2007 Summer School on Algorithmic D-Module Theory, Kleinwalsertal  
Talk: *Very basic intersection theory and Serre's formula*

## Leadership and administrative roles

- 2022- UG admissions tutor

## Service

- I have refereed articles for: *Journal of Algebra*, *Proceedings of the LMS*, *Bulletin of the LMS*, *Quarterly Journal of Mathematics*, *Osaka Journal of Mathematics*, *Journal of Pure and Applied Algebra*, *Proceedings of the AMS*, *Transactions of the AMS*, *Math. Proc. Camb. Philos. Soc.*, *Annals of Combinatorics*, *Pacific Journal of Mathematics*, *Archiv der Mathematik*.
- **Co-organiser** of the workshop “Structure of Group Algebras over Local Rings” in Ambleside, 2022.
- **Local organiser** for the conference “Arithmetic of Group Rings and Related Objects” in Aachen, 2010.

## Computer Algebra

- I have experience with the following computer algebra systems: GAP, MAPLE, MAGMA.
- I wrote a GAP-package that deals with orders over the  $p$ -adic integers, and lattices over such orders. The package can be downloaded here: <https://github.com/feisele/orders/>

## Languages

- German (native)
- English (fully proficient)
- Dutch (fully proficient; CNaVT certificate C1)
- French (fluent)