

# Florian Eisele

## Curriculum Vitae

City, University of London  
Northampton Square, London EC1V 0HB, United Kingdom  
☎ +44 (0) 20 7040 4347  
✉ [florian.eisele@city.ac.uk](mailto:florian.eisele@city.ac.uk)  
🌐 <https://feisele.github.io>

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## Personal Details

**Email:** [florian.eisele@city.ac.uk](mailto:florian.eisele@city.ac.uk)  
**Address:** City, University of London  
Northampton Square  
London EC1V 0HB  
United Kingdom

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## 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: Prof. Gabriele Nebe  
Awarded “Borchers medal” 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: Prof. Gabriele Nebe

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## Employment

- 2020–present **Postdoctoral researcher**, *City, University of London*.  
with Prof. Radha Kessar
- 2019 **Lecturer in Mathematics**, *University of Glasgow*.  
Fixed-term position (1 year)
- 2015–2018 **Postdoctoral researcher**, *City, University of London*.  
with Prof. Markus Linckelmann (3 years)
- 2012–2015 **Postdoctoral researcher**, *Vrije Universiteit Brussel*, Brussels, Belgium.  
Research group of Prof. 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

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## Publications

### Preprints

- [1] F. Eisele, M. Livesey, *Arbitrarily large Morita Frobenius numbers*, preprint, [arXiv:2006.13837](#) (2020)
- [2] F. Eisele, *On the geometry of lattices and finiteness of Picard groups*, preprint, [arXiv:1908.00129](#) (2019)

### Published or accepted for publication

- [3] F. Eisele, *The Picard group of an order and Külshammer reduction*, preprint (2018), to appear in *Algebr. Represent. Th.* [arXiv:1807.05110](#)
- [4] F. Eisele, T. Raedschelders, *On solvability of the first Hochschild cohomology of a finite-dimensional algebra*, preprint (2019), to appear in *Trans. Amer. Math. Soc.*, [arXiv:1903.07380](#)
- [5] C. W. Eaton, F. Eisele, M. Livesey, *Donovan's conjecture, blocks with abelian defect groups and discrete valuation rings*, *Math. Z.* (2019), [arXiv:1809.08152](#)
- [6] F. Eisele, L. Margolis, *A Counterexample to the First Zassenhaus Conjecture*, *Adv. Math.*, Vol. 339 (2018), pp 599–641
- [7] F. Eisele, G. Janssens and T. Raedschelders, *A reduction theorem for  $\tau$ -rigid modules*, *Math. Z.*, Vol. 290 (2018), Issue 3–4, pp 1377–1413
- [8] F. Eisele, M. Geline, R. Kessar, M. Linckelmann, *On Tate duality and a projective scalar property for symmetric algebras*, *Pac. J. Math.* Vol. 293 (2018), No. 2, pp 27–300
- [9] F. Eisele, *Blocks with a generalized quaternion defect group and three simple modules over a 2-adic ring*, 2015, *J. Algebra* 456 (2016), pp 294–322
- [10] F. Eisele, A. Kiefer, I. Van Gelder, *Describing units of integral group rings up to commensurability*, *J. Pure Appl. Algebra*, Volume 219 (2015), Issue 7, pp 2901–291
- [11] F. Eisele, *The  $p$ -adic group ring of  $SL_2(p^f)$* , *J. Algebra* 410 (2014), pp 421–459
- [12] F. Eisele, *Defect Two Blocks of  $\mathbb{Z}_p\Sigma_n$* . *Comm. Algebra* 42 (2014), no. 7, pp 2890–290
- [13] F. Eisele, *On the IYB-property in some solvable groups*, *Arch. Math. (Basel)*, Volume 101 (2013), Issue 4, pp 309–318
- [14] F. Eisele,  *$p$ -Adic lifting problems and derived equivalences*, *J. Algebra* 356 (2012), pp 90–114

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## Teaching Experience

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

- W 2019/20 Lecture “Engineering Mathematics 1” (first block, two sections comprising  $\sim 200$  students each); tutorials for “Algebra”, marking first year feedback assignments and participation in “Maths hub” (1st and 2nd year)
- W 2019 Lecture “1S” (*first year algebra & calculus module; I was lecturing the calculus section;  $\sim 100$  students*), tutorials for “1S”, “1Y” (similar to 1S) and “Methods in Complex Analysis”.
- W 2018 Lecture “Number Theory & Cryptography” (*sole responsible;  $> 60$  students; student feedback results: 4.2/5 overall; lecture for first year BSc students and all associated responsibilities*)
- W 2016/17 Lecture “Number Theory & Cryptography” (*sole responsible;  $> 60$  students; student feedback results: 4.1/5 overall*)
- W 2014/15 “Algebra II” tutorials (as in 2013/14) and “Affine and projective geometry” tutorials

- W 2013/14 “Algebra II” (ring and module theory) tutorials (*tutorials & drafting and administering the written exam*)
- S 2013 Supervised bachelor student’s thesis project. Title “Discrete valuatierungen” (*“Discrete valuation rings”*)
- W 2010/11–  
W 2011/12 Maple lab classes (*administering weekly oral exams for first year mathematics students*)
- W 2008/09 Invariant theory tutorials (*giving weekly tutorials & setting homework exercise sheets & marking homework*)
- S 2008 Maple lab classes (*answering students’ questions about their assignments; covered wide range of mathematical topics*)
- W 2007/08 “Linear algebra II” tutorials (*holding weekly tutorials & marking homework*)
- S 2007 Linear algebra for computer scientists tutorials (*giving weekly tutorials & marking homework*)

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## Invited Talks

- 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*
- 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

- 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

- 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 Darstellungstheorietage, 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*

## Other Responsibilities

- I have refereed articles for: *Journal of Algebra*, *Proceedings 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.* and *Archiv der Mathematik*.
- I was a 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)