

Curriculum Vitae

Personal Details

Name	Benjamin Sambale
Address	Institut für Algebra, Zahlentheorie und Diskrete Mathematik, Fakultät für Mathematik und Physik Leibniz Universität Hannover Welfengarten 1 30167 Hannover, Germany
Telephone	+49 (0)511 762 4495
Birthday	April 10, 1985
Birthplace	Leipzig
Nationality	German
Email address	sambale@math.uni-hannover.de
Homepage	https://www.iazd.uni-hannover.de/sambale.html
MathSciNet	ID 928720
ORCID	0000-0001-9914-1652

Education

Jun 23, 2004	General qualification for university entrance (“Abitur”) at the Marie-Curie-Gymnasium Blankenhain
Nov 19, 2008	Diploma with distinction in Mathematics at the Friedrich-Schiller-Universität Jena Title of the diploma thesis: <i>Konjugationsklassen und Charaktere in endlichen p-Gruppen</i>
Nov 26, 2010	Ph.D. with “summa cum laude” Title of the dissertation: <i>2-Blöcke mit metazyklischen und minimal nichtabelschen Defektgruppen</i> Advisor: Prof. Dr. Burkhard Külshammer
Nov 27, 2013	Habilitation Title of the habilitation thesis: <i>Blocks of finite groups and their invariants</i>

Employment

Dec 2008 – Dec 2011	Assistant at the University of Jena, partly supported by the DFG (German Research Foundation)
Jan 2012 – Jun 2012	Postdoc at the University of California, Santa Cruz, supported by the DAAD (German Academic Exchange Service)
Jul 2012 – Jun 2015	Postdoc at the University of Jena, supported by the DFG and the Carl Zeiss Foundation, since Dec 2013: Privatdozent

- Jul 2015 – Sep 2015 **Heisenberg scholar** at the University of Jena,
supported by the DFG
- Oct 2015 – Sep 2018 **Heisenberg scholar** at the University of Kaiserslautern,
supported by the DFG
- Apr 2018 – Jul 2019 **Interim professor** at the University of Jena
- Oct 2019 – Sep 2020 **Interim professor** at the Leibniz University of Hannover

Research stays

- Mar 2014 – Apr 2014 University of California, Santa Cruz, USA
supported by the Daimler and Benz Foundation
- Sep 2015 University of Valencia, Spain
supported by the Daimler and Benz Foundation
- Jan 2016 University of Auckland, New Zealand
supported by the Daimler and Benz Foundation
- Jul 2016 Academic Guest at Bernoulli Center (CIB),
EPFL Lausanne, Switzerland (invited)
- Jan 2018 – Mar 2018 Research member at the MSRI Berkley, USA (invited)

Teaching Experience

- Apr 2006 – Jul 2006 Corrector of homework in Linear Algebra
- Oct 2007 – Oct 2008 Tutor of preparatory courses in mathematics
- Oct 2008 – Dec 2011 Example classes in Linear Algebra, Group Theory, Algebra 1 & 2,
Ring Theory and Representation Theory
- Oct 2013 – Feb 2014 Lectures on **Character Theory**
- Apr 2015 – Jul 2015 Lectures on **Permutation Groups**
- Sep 2016 Lectures “Determination of block invariants”, CIB Lausanne
- Oct 2016 – Feb 2017 Lectures on **Group Theory** (held in English)
- Apr 2017 – Jul 2017 Organizer of the Oberseminar
- Oct 2017 – Feb 2018 Lectures on **Introduction to Algebra**
- Apr 2018 – Jul 2018 Lectures on **Algebra and Number Theory for Teachers**,
Character Theory and Seminar on Permutation Groups
- Oct 2018 – Feb 2019 Lectures on **Algebra 1** and **Combinatorics**,
Proseminar on Geometric Group Theory
- Apr 2019 – Jul 2019 Lectures on **Algebra 2** and **Algebra and Number Theory**
for Teachers, Seminar on Set Theory
- Oct 2019 – Apr 2020 Lectures on **Linear Algebra 1 for Computer Scientists**
and **Algebraic Combinatorics**, Seminar on Permutation Groups

- Apr 2020 – Jul 2020 Lectures on **Linear Algebra 2 for Computer Scientists** and **Discrete Mathematics**, Seminar on Lie Algebras
- Oct 2020 – Apr 2021 Lectures on **Linear Algebra 1 for Computer Scientists** and **Group Theory**, Seminar on Fusion systems

Supervision

- Sep 2012 (jointly with Külshammer) Diploma thesis *Blöcke mit der 2-Sylowgruppe von $PSU(3, 4)$ als Defektgruppe* by Julian Bertels, Jena
- May 2016 (jointly with Külshammer) Dissertation *2-Blöcke mit Defektgruppen mit genau drei Involutionen* by René Reichenbach, Jena
- Apr 2017 Bachelor thesis *Invariants of character tables of finite groups* by Jonathan Gruber, Kaiserslautern
- Sep 2017 Master thesis *On the Classification of p -Blocks of Finite Groups* by Christoph Lampe, Kaiserslautern
- Oct 2017 – Jul 2018 Ph.D. studies of Melvin Dauter (discontinued), Kaiserslautern
- Jan 2018 (jointly with Külshammer) Dissertation *Eine Klasse von Blöcken mit einer elementarabelschen Defektgruppe der Ordnung 16* by Pierre Landrock, Jena
- Apr 2019 (jointly with Külshammer) Bachelor thesis *Reed-Muller-Codes und Verallgemeinerungen* by Karl Konstantin Westphal, Jena
- Sep 2019 Bachelor thesis *Gruppentheoretische Beweise von Menons Identität*, by Robin Gießler, Jena
- Sep 2019 Bachelor thesis *Das Theorem von Kulakoff-Hall*, by Lucas Büchner Mayench, Jena
- Sep 2020 Bachelor thesis *Der Satz von Poincaré-Birkhoff-Witt*, by Sophie Friesen, Hannover
- 2020 (in preparation) Master thesis for teachers *Permutation puzzles*, by Nadja Klintworth, Hannover
- 2020 (in preparation) Bachelor thesis *Gruppenelemente maximaler Ordnung*, by Philipp Wellmann, Hannover
- 2020 (in preparation) Bachelor thesis *Permutationsgruppen mit regulären Bahnen*, by Julia Krivorutski, Hannover
- Oct 2019 – Now Mentor of Postdoc Ruwen Hollenbach, Hannover

Selected Talks

- Oct 01, 2009 *Konjugationsklassen und Charaktere in endlichen p -Gruppen*, Students' Conference of the DMV 2009, Bochum, Germany
- Nov 06, 2009 *Offene Probleme der Gruppentheorie*, Day of the faculty 2009, Jena, Germany

- Nov 14, 2009 *Blocks with metacyclic defect groups,*
Representation Theory Days 2009, Jena, Germany
- Dec 11, 2010 *Cartan matrices and Brauer's $k(B)$ -Conjecture,*
Nikolaus Conference 2010, Aachen, Germany
- May 02, 2011 *Block theory and fusion systems,*
Algebra Seminar, Copenhagen, Denmark
- Nov 11, 2011 *New inequalities concerning Olsson's Conjecture,*
Representation Theory Days 2011, Hannover, Germany
- Dec 09, 2011 *Donovan's Conjecture for certain defect groups,*
Nikolaus Conference 2011, Aachen, Germany
- Mar 29, 2012 *Survey on invariants of blocks of finite groups,*
Representations of Finite Groups 2012, MFO Oberwolfach, Germany
- Apr 24, 2012 *Calculating invariants of blocks of finite groups,*
Algebra and Number Theory Seminar, Santa Cruz, USA
- Sep 18, 2012 *Further evidence for conjectures in block theory,*
DMV annual meeting 2012, Saarbrücken, Germany
- Nov 15, 2012 *Around Brauer's $k(B)$ -Conjecture,*
Chevalley Seminar, Paris, France
- Jan 15, 2013 *Fusionssysteme in Gruppen- und Darstellungstheorie,*
Algebra Seminar, Halle, Germany
- Mar 26, 2013 *On Loewy lengths of blocks,* Annual conference of the DFG priority
program in representation theory 2013, Bad Boll, Germany
- Jul 16, 2013 *Finite groups with two conjugacy classes of p -elements,*
Algebra Seminar, Kaiserslautern, Germany
- Sep 05, 2013 *On the Brauer-Feit bound for abelian defect groups,*
Brauer's problems - 50 years on, Manchester, UK
- Mar 18, 2014 *The Alperin-McKay Conjecture for a special class of defect groups,*
Global/Local Conjectures in Representation Theory of Finite Groups,
BIRS Banff, Canada
- Apr 09, 2014 *Rank and Exponent of finite p -groups and applications,*
Algebra and Number Theory Seminar, Santa Cruz, USA
- Jun 10, 2014 *Loewy lengths of blocks revisited,*
Young Algebraists' Conference, Lausanne, Switzerland
- Feb 12, 2015 *Blocks with transitive fusion systems,*
Representations of Finite and Algebraic Groups, Les Houches, France
- Jul 23, 2015 *Cartan matrices and Brauer's $k(B)$ -Conjecture,*
Blocks of Finite Groups and Beyond, Jena, Germany
- Sep 17, 2015 *Broué's Conjecture for the sporadic groups,*
Algebra Seminar, Valencia, Spain
- Jan 22, 2016 *Computation of isotypies in finite simple groups,*
Mathematics Seminar, Auckland, New Zealand

- Feb 03, 2016 *Orthogonality relations for character and blocks*,
Mathematics & Statistics Colloquium, Maynooth, Ireland
- Feb 24, 2016 *Broué's Conjecture for some finite simple groups*,
Algebra and Geometry Seminar, Bristol, UK
- Dec 15, 2016 *On defects of characters and decomposition numbers*, Finite Simple Groups,
their Fusion Systems and Representations, CIB Lausanne, Switzerland
- Feb 09, 2017 *The number of characters in a block of a finite group*,
Mathematics Colloquium, Santa Cruz, USA
- Oct 04, 2017 *On the blockwise modular isomorphism problem*,
Algebra Seminar, Brussels, Belgium
- Oct 19, 2017 *On the blockwise modular isomorphism problem*,
Perspectives in Representation Theory of Finite Groups,
BIRS Banff, Canada
- Nov 10, 2017 *Brauer's Conjecture for π -blocks of π -separable groups*,
Representation Theory Days 2017, Eichstätt, Germany
- Feb 16, 2018 *On the projective height zero conjecture*,
Algebra and Number Theory Seminar, Santa Cruz, USA
- Feb 21, 2018 *Fusion systems of groups and blocks*,
Young Researchers Seminar, MSRI Berkeley, USA
- Apr 09, 2018 *Characters and Sylow 2-subgroups of maximal class*,
Representations of Finite and Algebraic Groups, MSRI Berkeley, USA
- Sep 05, 2018 *Regular orbits of coprime linear groups in large characteristic*,
Group Theory in Florence II, Florence, Italy
- Sep 13, 2018 *Bounding the number of characters in a block*,
Representation Theory Days 2018, Hannover, Germany
- Mar 28, 2019 *Character counting conjectures for π -separable groups*,
Representations of Finite Groups, MFO Oberwolfach, Germany
- May, 2020 *tba*, Counting conjectures and beyond, Isaacs Newton Institute,
Cambridge, UK (postponed)
- Aug, 2020 *tba*, Representations of Finite Groups: Explicit, Canonical and Functorial,
Istanbul Center for Mathematical Sciences, Turkey (postponed)

Coauthors

C. G. Ardito, A. Bächle, C. W. Eaton, E. Giannelli, L. Héthelyi, I. M. Isaacs, R. Kessar,
S. Koshitani, B. Külshammer, P. Landrock, G. Malle, G. Navarro, Y. Otokita, N. Rizo,
A. A. Schaeffer Fry, P. H. Tiep

Books

- *2-Blöcke mit metazyklischen und minimal nichtabelschen Defektgruppen*, Südwestdeutscher
Verlag für Hochschulschriften, Saarbrücken, 2011 (PhD thesis)

- *Blocks of finite groups and their invariants*, Springer Lecture Notes in Math. Vol. 2127, Springer-Verlag, Cham, 2014 (Habilitation thesis)
- *Endliche Permutationsgruppen*, Springer Spektrum, Wiesbaden, 2017 (textbook)

Peer reviewed articles

1. (with L. Héthelyi and B. Külshammer), *Conjugacy classes and characters of finite p -groups*, Comm. Algebra **39** (2011), 657–685
2. *Cartan matrices and Brauer's $k(B)$ -conjecture*, J. Algebra **331** (2011), 416–427
3. *Cartan matrices and Brauer's $k(B)$ -conjecture II*, J. Algebra **337** (2011), 345–362
4. *2-Blocks with minimal nonabelian defect groups*, J. Algebra **337** (2011), 261–284
5. *Fusion systems on metacyclic 2-groups*, Osaka J. Math. **49** (2012), 325–329
6. *Blocks with defect group $D_{2^n} \times C_{2^m}$* , J. Pure Appl. Algebra **216** (2012), 119–125
7. (with C. W. Eaton and B. Külshammer), *2-Blocks with minimal nonabelian defect groups II*, J. Group Theory **15** (2012), 311–321
8. (with B. Külshammer), *The 2-blocks of defect 4*, Represent. Theory **17** (2013), 226–236
9. *Brauer's Height Zero Conjecture for metacyclic defect groups*, Pacific J. Math. **262** (2013), 481–507
10. *Blocks with central product defect group $D_{2^n} * C_{2^m}$* , Proc. Amer. Math. Soc. **141** (2013), 4057–4069
11. *Blocks with defect group $Q_{2^n} \times C_{2^m}$ and $SD_{2^n} \times C_{2^m}$* , Algebr. Represent. Theory **16** (2013), 1717–1732
12. *Further evidence for conjectures in block theory*, Algebra Number Theory **7** (2013), 2241–2273
13. (with L. Héthelyi and B. Külshammer), *A note on Olsson's Conjecture*, J. Algebra **398** (2014), 364–385
14. (with C. W. Eaton, R. Kessar and B. Külshammer), *2-blocks with abelian defect groups*, Adv. Math. **254** (2014), 706–735
15. *On the Brauer-Feit bound for abelian defect groups*, Math. Z. **276** (2014), 785–797
16. (with B. Külshammer, G. Navarro and P. H. Tiep), *Finite groups with two conjugacy classes of p -elements and related questions for p -blocks*, Bull. London Math. Soc. **46** (2014), 305–314
17. (with S. Koshitani and B. Külshammer), *On Loewy lengths of blocks*, Math. Proc. Cambridge Philos. Soc. **156** (2014), 555–570
18. *Exponent and p -rank of finite p -groups and applications*, Arch. Math. (Basel) **103** (2014), 11–20
19. (with L. Héthelyi, R. Kessar and B. Külshammer), *Blocks with transitive fusion systems*, J. Algebra **424** (2015), 190–207
20. *Cartan matrices and Brauer's $k(B)$ -Conjecture III*, Manuscripta Math. **146** (2015), 505–518

21. *The Alperin-McKay Conjecture for metacyclic, minimal non-abelian defect groups*, Proc. Amer. Math. Soc. **143** (2015), 4291–4304
22. *Broué’s isotopy conjecture for the sporadic groups and their covers and automorphism groups*, Internat. J. Algebra Comput. **25** (2015), 951–976
23. *2-Blocks with minimal nonabelian defect groups III*, Pacific J. Math. **280** (2016), 475–487
24. *Fusion systems on bicyclic 2-groups*, Proc. Edinb. Math. Soc. **59** (2016), 989–1018
25. (with P. Landrock), *On centers of blocks with one simple module*, J. Algebra **472** (2017), 339–368
26. *On blocks with abelian defect groups of small rank*, Results Math. **71** (2017), 411–422
27. (with G. Navarro), *A counterexample to Feit’s Problem VIII on decomposition numbers*, J. Algebra **477** (2017), 494–495
28. *Cartan matrices and Brauer’s $k(B)$ -Conjecture IV*, J. Math. Soc. Japan **69** (2017), 735–754
29. *Isotypies for the quasisimple groups with exceptional Schur multiplier*, J. Algebra Appl. **16** (2017), 1750078
30. *On a theorem of Blichfeldt*, Expo. Math. **35** (2017), 221–225
31. (with G. Malle and G. Navarro), *On defects of characters and decomposition numbers*, Algebra Number Theory **11** (2017), 1357–1384
32. *A counterexample to a conjecture of Wada*, J. Algebra **489** (2017), 582–585
33. *Refinements of the orthogonality relations for blocks*, Algebr. Represent. Theory **20** (2017), 1109–1131
34. *Regular orbits of coprime linear groups in large characteristic*, Bull. Aust. Math. Soc. **96** (2017), 438–444
35. (with A. Bächle), *Groups whose elements are not conjugate to their powers*, Arch. Math. **110** (2018), 447–454
36. (with G. Navarro and P. H. Tiep), *Characters and Sylow 2-subgroups of maximal class revisited*, J. Pure Appl. Algebra **222** (2018), 3721–3732
37. *Solution of Brauer’s $k(B)$ -Conjecture for π -blocks of π -separable groups*, Forum Math. **30** (2018), 1061–1064
38. (with G. Navarro), *On the blockwise modular isomorphism problem*, Manuscripta Math. **157** (2018), 263–278
39. (with B. Külshammer), *Loewy lengths of centers of blocks*, Q. J. Math. **69** (2018), 855–870
40. *Remarks on Harada’s Conjecture*, Israel J. Math. **228** (2018), 513–526
41. *Morita equivalent blocks of symmetric groups*, SIGMA **14** (2018), 100, 8 pages
42. *On the projective height zero conjecture*, Proc. Amer. Math. Soc. **147** (2019), 487–488
43. *Pseudo Sylow numbers*, Amer. Math. Monthly **126** (2019), 60–65
44. (with B. Külshammer and Y. Otokita), *Loewy lengths of centers of blocks II*, Nagoya Math. J. **234** (2019), 127–138

45. *Pseudo Frobenius numbers*, Expo. Math. **37** (2019), 200–206
46. *Bounding the number of characters in a block of a finite group*, Adv. Math. **358** (2019), 106861, 20 pp.
47. *Landau’s Theorem for π -blocks of π -separable groups*, Adv. Group Theory Appl. **8** (2019), 103–115
48. (with I. M. Isaacs and G. Navarro), *Irreducible extensions of characters*, Israel J. Math. **234** (2019), 629–644
49. (with A. Bächle), *Orders generated by character values*, Monatsh. Math. **191** (2020), 665–678
50. (with E. Giannelli), *On restriction of characters to defect groups*, J. Algebra **558** (2020), 423–433
51. *Character tables and defect groups*, J. Algebra **562** (2020), 323–340
52. (with E. Giannelli, N. Rizo and A. A. Schaeffer Fry) *Groups with few p' -character degrees in the principal block*, Proc. Amer. Math. Soc. **148** (2020), 4597–4614
53. (with G. Navarro), *Weights and nilpotent subgroups*, to appear in Int. Math. Res. Not., DOI: 10.1093/imrn/rnz195
54. *Survey on perfect isometries*, to appear in Rocky Mountain J. Math.
55. *On a theorem of Ledermann and Neumann*, to appear in Amer. Math. Monthly
56. *Blocks with small-dimensional basic algebra*, to appear in Bull. Aust. Math. Soc.
57. (with C. G. Ardito) *Cartan matrices and Brauer’s $k(B)$ -Conjecture V*, submitted
58. *The reciprocal character of the conjugation action*, submitted
59. *Generalized bases of finite groups*, submitted

Contributions to proceedings

- *Survey on invariants of blocks of finite groups*, in: Representations of Finite Groups, Oberwolfach Reports **9** (2012), EMS Publishing House, Zürich, 1003–1006
- *Character counting conjectures for π -separable groups*, in: Representations of Finite Groups, Oberwolfach Reports **14** (2019), EMS Publishing House, Zürich

Referee/Reviewer service

Represent. Theory, Math. Z., J. Algebra, J. Group Theory, Proc. Amer. Math. Soc., J. London Math. Soc., Q. J. Math., J. Aust. Math. Soc., J. Algebra Appl., J. Pure Appl. Algebra, C. R. Math. Acad. Sci. Paris, Comm. Algebra, Algebra Colloq., Arch. Math. (Basel), Proc. Roy. Soc. Edinburgh, Acta Math. Sin., Publ. Math. Debrecen, RACSAM, Vietnam J. Math., Afr. Mat., MathSciNet, DFG, Friedrich-Naumann-Stiftung

Organized conferences

(jointly with S. King and J. Müller) *Computations in Groups and Algebras*, 16th–19th February, 2015, Jena

Fellowships, Grants and Awards

- 6-months **DAAD** postdoc scholarship (2012, 17.690 EUR)
- (jointly with B. Külshammer) 1-year **DFG** postdoc grant (2012–2015, my part: 64.000 EUR)
- 2-years postdoc grant by the **Carl Zeiss Foundation** (2013–2014, 160.000 EUR)
- 3-years postdoc grant by the **Daimler and Benz Foundation** (2014–2017, 40.000 EUR)
- 5-years **Heisenberg fellowship** by the DFG (2015–2020, \approx 315.000 EUR)
- 3-years **DFG** grant for a Ph.D. student (2017–2020, 190.000 EUR)
- **Exam award** of the Faculty for Mathematics and Computer Science (2009)
- among the best three applicants for a professorship at the UCSC (2017)

Hannover, September 3, 2020