
List of publications Meinolf Geck

Diploma thesis, Ph.D. thesis, Habilitation:

- Eine Anwendung von MAPLE in der Darstellungstheorie der unitären Gruppen. Diplomarbeit, Lehrstuhl D für Mathematik, RWTH Aachen, 1987.
- Verallgemeinerte Gelfand-Graev Charaktere und Zerlegungszahlen endlicher Gruppen vom Lie-Typ. RWTH Aachen, Math.-Naturwiss. Fak./FB 1, Dissertation, 1990, 134 pp.
- Beiträge zur Darstellungstheorie von Iwahori-Hecke-Algebren. Habilitationsschrift, Aachener Beiträge zur Mathematik **11**, Verlag der Augustinus Buchhandlung, Aachen, 1995. x+171 pp., ISBN: 3-86073-420-2.

Co-Editor of Proceedings:

- (with R. W. Carter (eds.)) *Representations of reductive groups*. Publ. Newton Inst., Cambridge Univ. Press, Cambridge, 1998. viii+191 pp., ISBN: 0-521-64325-2.
- (with D. Testerman and J. Thévenaz (eds.)) *Group representation theory*, Presses Polytechniques et Universitaires Romandes, EPFL-Press, Lausanne, 2007. x+454 pp., ISBN: 978-0-8493-9243-6.

Books:

- (with G. Pfeiffer) *Characters of finite Coxeter groups and Iwahori-Hecke algebras*. London Math. Soc. Monographs, New Series **21**, Oxford University Press, New York 2000. xvi+446 pp., ISBN: 0-19-850250-8.
- *An introduction to algebraic geometry and algebraic groups*. Oxford Graduate Texts in Mathematics **10**, Oxford University Press, New York 2003. ix+307pp., ISBN: 0-19-852831-0.
- (with N. Jacon) *Representations of Hecke algebras at roots of unity*. Algebra and Applications **15**, Springer-Verlag, 2011. xii+401pp., ISBN: 978-0-85729-715-0.
- *Algebra: Gruppen, Ringe, Körper – Mit einer Einführung in die Darstellungstheorie endlicher Gruppen*. Edition Delkhofen, 2014. vi+150pp., EAN 978-3936413-15-1.

Software:

- (with G. Hiss, F. Lübeck, G. Malle, J. Michel and G. Pfeiffer), CHEVIE – A computer algebra system for computing and processing generic character tables for finite groups of Lie type and Hecke algebras; homepage at:

<http://www.math.rwth-aachen.de/~CHEVIE>

(See also publications [18], [67]).

- PyCox – A Python version of CHEVIE-GAP for (finite) Coxeter groups; available at <http://www.mathematik.uni-stuttgart.de/~geckmf/>. (See also publication [70].)

Articles:

1. Irreducible Brauer characters of the 3-dimensional special unitary groups in non-defining characteristic. *Comm. Algebra* **18** (1990), 563–584.
2. On the decomposition numbers of the finite unitary groups in non-defining characteristic. *Math. Z.* **207** (1991), 83–89.
3. Generalized Gelfand-Graev characters for Steinberg’s triality groups and their applications. *Comm. Algebra* **19** (1991), 3249–3269.
4. (with G. Hiß) Basic sets of Brauer characters of finite groups of Lie type. *J. reine und angew. Math.* **418** (1991), 173–188.
5. (with K. Lux) The decomposition numbers of the Hecke algebra of type F_4 . *Manuscripta Math.* **70** (1991), 285–306.
6. On the classification of l -blocks of finite groups of Lie type. *J. Algebra* **151** (1992), 180–191.
7. Brauer trees of Hecke algebras. *Comm. Algebra* **20** (1992), 2937–2973.
8. (with G. Pfeiffer) The unipotent characters of the Chevalley groups $D_4(q)$, q odd. *Manuscripta Math.* **76** (1992), 281–304.
9. Basic sets of Brauer characters of finite groups of Lie type, II. *J. London Math. Soc.* (2) **47** (1993), 255–268.
10. (with G. Pfeiffer) On the irreducible characters of Hecke algebras. *Advances in Math.* **102** (1993), 79–94.
11. A note on Harish–Chandra induction. *Manuscripta Math.* **80** (1993), 393–401.
12. The decomposition numbers of the Hecke algebra of type E_6 . *Math. Comp.* **61** (1993), 889–899.
13. On the character values of Iwahori–Hecke algebras of exceptional type. *Proc. London Math. Soc.* **68** (1994), 51–76.
14. (with G. Hiß and G. Malle) Cuspidal unipotent Brauer characters. *J. Algebra* **168** (1994), 182–220.
15. Basic sets of Brauer characters of finite groups of Lie type, III. *Manuscripta Math.* **85** (1994), 195–216.
16. (with G. Hiß and G. Malle) Towards a classification of the irreducible representations in non-defining characteristic of a finite group of Lie type. *Math. Z.* **221** (1996), 353–386.
17. (with G. Malle) Cuspidal unipotent classes and cuspidal Brauer characters. *J. London Math. Soc.* **53** (1996), 63–78.
18. (with G. Hiß, F. Lübeck, G. Malle and G. Pfeiffer) CHEVIE-A system for computing and processing generic character tables for finite groups of Lie type, Weyl groups and Hecke algebras. *Appl. Algebra Engrg. Comm. Comput.* **7** (1996), 175–210.
19. On the average values of the irreducible characters of finite groups of Lie type on geometric unipotent classes. *Doc. Math. J. DMV* **1** (1996), 293–317 (electronic).

20. (with G. Hiss) Modular representations of finite groups of Lie type in non-defining characteristic. *In: Finite reductive groups* (Luminy, 1994; ed. M. Cabanes), Progress in Math. **141**, pp. 195–249, Birkhäuser, Boston, MA, 1997.
21. (with R. Rouquier) Centers and simple modules for Iwahori-Hecke algebras. *In: Finite reductive groups* (Luminy, 1994; ed. M. Cabanes), Progress in Math. **141**, pp. 251–272, Birkhäuser, Boston, MA, 1997.
22. (with J. Michel) “Good” elements in finite Coxeter groups and representations of Iwahori-Hecke algebras. *Proc. London Math. Soc.* (3) **74** (1997), 275–305.
23. (with S. Lambropoulou) Markov traces and knot invariants related to Hecke algebras of B -type. *J. reine angew. Math.* **482** (1997), 191–213.
24. (with S. Kim) Bases for the Bruhat-Chevalley order on all finite Coxeter groups. *J. Algebra* **197** (1997), 278–310.
25. (with F. Bleher and W. Kimmerle) Automorphisms of integral group rings of finite Coxeter groups and Iwahori-Hecke algebras. *J. Algebra* **197** (1997), 615–655.
26. Trace functions on Iwahori-Hecke algebras. *In: Knot theory* (Warsaw, 1995), pp. 87–109, Banach Center Publ. **42**, Polish Acad. Sci., Warsaw, 1998.
27. Kazhdan-Lusztig cells and decomposition numbers. *Represent. Theory* **2** (1998), 264–277 (electronic).
28. Finite groups of Lie type. *In: Representations of reductive groups*, pp. 63–83, Publ. Newton Inst., Cambridge Univ. Press, Cambridge, 1998.
29. (with R. Dipper, G. Hiss and G. Malle) Representations of Hecke algebras and finite groups of Lie type. *In: Algorithmic algebra and number theory* (Heidelberg, 1997), pp. 331–378, Springer Verlag, Berlin/Heidelberg, 1998.
30. Representations of Hecke algebras at roots of unity. *Séminaire Bourbaki*, 50ème année, 1997-98, Astérisque No. 252 (1998), Exp. 836, 33–55.
31. Finite reductive groups. *In: Proceedings of the Summer School on Representation Theory of Algebras, Finite and Reductive Groups* (Cluj-Napoca, 1997), Babes-Bolyai Univ. Fac. Math. Comput. Sci. Res. Semin., Cluj-Napoca, 1998, pp. 101–126.
32. Character sheaves and generalized Gelfand-Graev characters. *Proc. London Math. Soc.* **78** (1999), 139–166.
33. The character table of the Iwahori-Hecke algebra of the symmetric group : Starkey’s Rule. *C. R. Acad. Sci. Paris Sér I* **329** (1999), 361–366.
34. (with G. Malle) On special pieces in the unipotent variety. *Experimental Math.* **8** (1999), 281–290.
35. (with G. Malle) On the existence of a unipotent support for the irreducible characters of finite groups of Lie type. *Trans. Amer. Math. Soc.* **352** (2000), 429–456.
36. (with S. Kim and G. Pfeiffer) Minimal length elements in twisted conjugacy classes of finite Coxeter groups. *J. Algebra* **229** (2000), 570–600.
37. On the representation theory of Iwahori-Hecke algebras of extended finite Weyl groups. *Represent. Theory* **4** (2000), 370–397 (electronic).

38. (with L. Iancu and G. Malle) Weights of Markov traces and generic degrees. *Indag. Mathem., N. S.*, **11** (2000), 379–397.
39. On the number of simple modules of Iwahori–Hecke algebras of finite Weyl groups. *Bul. Stiit. Univ. Baia Mare, Ser. B* **16** (2000), 235–246; preprint available at <http://arXiv.org/math.RT/0405555>
40. Kazhdan–Lusztig cells, q -Schur algebras, and James’ conjecture. *J. London Math. Soc.* **63** (2001), 336–352.
41. Modular Harish-Chandra series, Hecke algebras and (generalized) q -Schur algebras. *In: Modular Representation Theory of Finite Groups* (Charlottesville, VA, 1998; eds. M. J. Collins, B. J. Parshall and L. L. Scott), p. 1–66, Walter de Gruyter, Berlin 2001.
42. (with R. Rouquier) Filtrations on projective modules for Iwahori–Hecke algebras. *In: Modular Representation Theory of Finite Groups* (Charlottesville, VA, 1998; eds. M. J. Collins, B. J. Parshall and L. L. Scott), p. 211–221, Walter de Gruyter, Berlin 2001.
43. Constructible characters, leading coefficients and left cells for finite Coxeter groups with unequal parameters, *Represent. Theory* **6** (2002), 1–30 (electronic).
44. (with N. Jacon) Ocneanu traces and Starkey’s rule, *Journal Knot theory and Ramifications*, **12** (2003), 899–904.
45. Character values, Schur indices and character sheaves, *Represent. Theory* **7** (2003), 19–55 (electronic).
46. (with G. Malle) Fourier matrices and Frobenius eigenvalues for finite Coxeter groups. Special issue celebrating the 80th birthday of Robert Steinberg, *J. Algebra* **260** (2003), 162–193.
47. On the induction of Kazhdan–Lusztig cells, *Bull. London Math. Soc.* **35** (2003), 608–614.
48. On the p -defects of character degrees of finite groups of Lie type, *Carpathian J. Math.* **19** (2003), 97–100; preprint available at <http://arXiv.org/math.RT/0405554>
49. On the Schur indices of cuspidal unipotent characters. *In: Finite Groups 2003* (Gainesville, FL, 2003; eds. C. Y. Ho, P. Sin, P. H. Tiep and A. Turull), p. 87–104, Walter de Gruyter, 2004.
50. Computing Kazhdan–Lusztig cells for unequal parameters, *J. Algebra* **281** (2004), 342–365; section ”Computational Algebra”.
51. The Schur indices of the cuspidal unipotent characters of the finite Chevalley groups $E_7(q)$, *Osaka Journal of Math.* **42** (2005), 201–215.
52. Left cells and constructible representations, *Represent. Theory* **9** (2005), 385–416 (electronic); Erratum, *ibid.* **11** (2007), 172–173.
53. (with G. Malle) Reflection groups. *In: Handbook of Algebra*, Vol. 4 (ed. M. Hazewinkel), p. 337–383, Elsevier, 2006.
54. (with L. Iancu) Lusztig’s a -function in type B_n in the asymptotic case. Special issue celebrating the 60th birthday of George Lusztig, *Nagoya J. Math.* **182** (2006), 199–240.

55. Kazhdan–Lusztig cells and the Murphy basis, *Proc. London Math. Soc.* **93** (2006), 635–665.
56. Modular principal series representations, *Int. Math. Res. Notices*, vol. 2006, Article ID 41957, pp. 1–20.
57. Relative Kazhdan–Lusztig cells, *Represent. Theory* **10** (2006), 481–524.
58. (with N. Jacon) Canonical basic sets in type B . Special issue in honour of Gordon Douglas James, *J. Algebra* **306** (2006), 104–127.
59. Modular representations of Hecke algebras. *In: Group representation theory* (EPFL, 2005; eds. M. Geck, D. Testerman and J. Thévenaz), pp. 301–353, Presses Polytechniques et Universitaires Romandes, EPFL-Press, Lausanne, 2007.
60. Hecke algebras of finite type are cellular, *Invent. Math.* **169** (2007), 501–517.
61. (with L. Iancu and C. Pallikaros), Specht modules and Kazhdan–Lusztig cells in type B_n ; *J. Pure and Applied Algebra* **212** (2008), 1310–1320.
62. (with D. Hézard), On the unipotent support of character sheaves, *Osaka J. Math.* **45** (2008), 819–831.
63. (with J. Müller), James’ conjecture for Hecke algebras of exceptional type, I. Special issue in honour of Gus Lehrer, *J. Algebra* **321** (2009), 3274–3298.
64. Leading coefficients and cellular bases of Hecke algebras, *Proc. Edinburgh Math. Soc.* **52** (2009), 653–677.
65. (with C. Bonnafé, L. Iancu and T. Lam), On domino insertion and Kazhdan–Lusztig cells in type B_n . *In: Representation theory of algebraic groups and quantum groups* (Nagoya, 2006; eds. A. Gyoja et al.), pp. 33–54, *Progress in Math.* **284**, Birkhäuser, 2010.
66. On Iwahori–Hecke algebras with unequal parameters and Lusztig’s isomorphism theorem. Jacques Tits special issue. *Pure Appl. Math. Q.* **7** (2011), 587–620.
67. Some applications of CHEVIE to the theory of algebraic groups. *Carpath. J. Math.*, **27** (2011), 64–94.
68. On the Kazhdan–Lusztig order on cells and families. *Comment. Math. Helv.* **87** (2012), 905–927.
69. Remarks on modular representations of finite groups of Lie type in non-defining characteristic. *Contemp. Math. Volume 505*, pp. 71–80, Amer. Math. Soc., Providence, RI, 2012.
70. PyCox: Computing with (finite) Coxeter groups and Iwahori–Hecke algebras. Dedicated to the Memory of Prof. H. Pahlings. *LMS J. of Comput. and Math.* **15** (2012), 231–256.
71. (with L. Iancu) Ordering Lusztig’s families in type B_n ; *J. Algebr. Comb.* **38** (2013), 457–489.
72. (with G. Malle) Frobenius–Schur indicators of unipotent characters and the twisted involution module. *Represent. Theory* **17** (2013), 180–198.
73. Kazhdan–Lusztig cells and the Frobenius–Schur indicator. Special section celebrating the 60th birthday of Geoffrey Robinson. *J. Algebra* **398** (2014), 329–342.

74. On the characterization of Galois extensions. *Amer. Math. Monthly* **121** (2014), 637–639.
75. (with C. Bonnafé), Conjugacy classes of involutions and Kazhdan–Lusztig cells. *Represent. Theory* **18** (2014), 155–182.
76. On Kottwitz’ conjecture for twisted involutions. *Journal of Lie Theory* **25** (2015), 395–429.
77. Eigenvalues of real symmetric matrices. *Amer. Math. Monthly* **122** (2015), 482–483.
78. (with A. Halls), On the Kazhdan-Lusztig cells in type E_8 . *Math. Comp.* **84** (2015), 3029–3049.
79. (with C. Bonnafé), Hecke algebras with unequal parameters and Vogan’s left cell invariants. *In: Representations of reductive groups. In Honor of the 60th birthday of David A. Vogan, Jr (eds. M. Nevens and P. Trapa)*, pp. 173–188, *Progress in Math.* **312**, Birkhäuser, 2015.
80. On the ℓ -modular composition factors of the Steinberg representation. *Special Issue in Memory of Professor James Alexander (“Sandy”) Green. J. Algebra* **475** (2017), 370–391.
81. On the construction of semisimple Lie algebras and Chevalley groups. To George Lusztig on his 70th birthday. *Proc. Amer. Math. Soc.* **145** (2017), 3233–3247.
82. Minuscule weights and Chevalley groups. *In: Finite Simple Groups: Thirty Years of the Atlas and Beyond (Celebrating the Atlases and Honoring John Conway, November 2-5, 2015 at Princeton University)*, pp. 159–176, *Contemporary Math.*, vol. 694, Amer. Math. Soc., 2017.

Preprints/In preparation:

- [16a] (with G. Malle), *The character theory of finite groups of Lie type: A guided tour*. Book project (in preparation). Preliminary version of first chapter (72 pages) at [arXiv:1608.01156](https://arxiv.org/abs/1608.01156).
- [17a] (with J. Müller), *Invariant bilinear forms on W -graph representations and linear algebra over integral domains*. Preprint, 41 pages, available at [arXv:1701.02331](https://arxiv.org/abs/1701.02331).
- [17b] *A first guide to the character theory of finite groups of Lie type*. (A pre-version of Chapter 2 of [16a].) Preprint, 35 pages, available at [arXv:1705.05083](https://arxiv.org/abs/1705.05083).

June 2017