

CURRICULUM VITAE*

THORSTEN HOLM

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Date and place of birth: 28 March 1965 in Offenbach/M., Germany
Nationality: German

EDUCATION AND EMPLOYMENT

06/2009: Offer for a W2-professorship, Christian-Albrechts-Universität zu Kiel, declined
05/2009: Awarded the title of professor (Außerplanmäßiger Professor), Leibniz Universität Hannover

SINCE 10/2007: Lecturer (permanent), Leibniz University Hannover, Institute for Algebra, Number Theory and Discrete Mathematics (on parental leave 12/08-01/09)

09/2006: Guest professor, Université Montpellier 2

03/2004-12/2007: Lecturer (permanent), University of Leeds, Department of Pure Mathematics (on leave 02/2006 - 12/2007)

10/2002-09/2007: Lecturer (Oberassistent C2, non-permanent), University Magdeburg, Institute for Algebra and Geometry (on leave 03/2004 - 02/2006)

01/2002: Habilitation in Mathematics at the University of Magdeburg. Degree awarded: Privatdozent Dr.rer.nat.habil. Habilitation Thesis: *Blocks of Tame Representation Type: Derived Equivalences and Hochschild Cohomology*.

04/1997-09/2002: Assistant position (Wissenschaftlicher Assistent C1) at the University of Magdeburg, Institute for Algebra and Geometry

04/1996-03/1997: Visiting researcher at the University of Oxford (holding a research grant from the Deutsche Forschungsgemeinschaft (DFG))

02/1996-03/1996: Research position at the University of Cambridge

05/1994-01/1996: Assistant position (Wissenschaftlicher Mitarbeiter) at the University of Magdeburg, Institute for Algebra and Geometry

04/1992-04/1994: University of Essen, Institute for Experimental Mathematics.

PhD student in the Graduiertenkolleg 'Theoretical and Experimental Methods in Pure Mathematics'

Degree awarded: Dr.rer.nat. (July 1994). Doctoral dissertation: *Hochschild-Kohomologie von Blöcken mit zyklischer Defektgruppe* (supervisor: Prof. G.O. Michler)

Employment as teaching assistant at the University of Essen

*Date: December 2019

10/1985-03/1992: University of Frankfurt

Studies in mathematics and computer science

Degree awarded: Diploma in Mathematics (October 1991). Diploma thesis: *Über einen Zusammenhang zwischen der geometrischen Invariante Σ^1 und Darstellungen von Gruppen* (supervisor: Prof. R. Bieri)

1988-1992: Employment as teaching assistant at the University of Frankfurt

CURRENT RESEARCH INTERESTS

Representation theory of finite groups and finite dimensional algebras; Algebraic combinatorics; Cluster categories and cluster tilted algebras; Homological algebra; Derived categories and derived equivalences; Invariants of algebras, especially invariants of derived module categories; Hochschild cohomology.

LIST OF PUBLICATIONS

BOOKS

- [1] K. Erdmann, T. Holm, *Algebras and Representation Theory*. Springer Undergraduate Mathematics Series (2018).
- [2] *Triangulated Categories* (eds. T. Holm, P. Jørgensen, R. Rouquier), London Mathematical Society Lecture Notes Series 375, Cambridge University Press, 2010.

SNAPSHOT (FOR A GENERAL AUDIENCE)

- [1] T. Holm, *Friezes and tilings*. Appeared in *Snapshots of modern mathematics from Oberwolfach* (2015); part of the IMAGINARY open mathematics platform

ARTICLES

- [1] T. Holm, Hochschild-Kohomologie von Blöcken mit zyklischer Defektgruppe. Vorlesungen aus dem Fachbereich Mathematik der Universität GH Essen. Heft 22 (1994).
- [2] T. Holm, *The even Hochschild cohomology ring of a block with cyclic defect group*. J. Algebra 178 (1995), 317-341.
- [3] T. Holm, *The Hochschild cohomology ring of a modular group algebra: the commutative case*. Comm. Algebra 24 (1996), 1957-1969.
- [4] T. Holm, *Hochschild cohomology of the integral group ring of a cyclic group and related algebras*. Arch. Math. 67 (1996), 360-366.
- [5] T. Holm, *Derived equivalences and Hochschild cohomology for blocks with quaternion defect groups*. In: Darstellungstheoretage Jena 1996, Sitzungsber. Math.-Naturwiss. Kl., 7, Akad. Gemein. Wiss. Erfurt, Erfurt, 1996, 75-86.
- [6] T. Holm, *Derived equivalent tame blocks*. J. Algebra 194 (1997), 178-200.
- [7] T. Holm, *Hochschild cohomology of Brauer tree algebras*. Comm. Algebra 26 (1998), 3625-3646.
- [8] T. Holm, *Derived categories, derived equivalences and representation theory*. In: M. Linckelmann (ed.), Proceedings of the summer school on representation theory of algebras, finite and reductive groups, Cluj-Napoca, Romania, September 15-25, 1997. Cluj-Napoca: "Babes Bolyai" University, Faculty of Mathematics and Computer Science, 33-66 (1998).

- [9] T. Holm, W. Willems, *Der Euklidische Algorithmus - warum nicht in der Schule?* Mathematische Unterrichtspraxis, Heft 4 (1999), 34-41.
- [10] T. Holm, *Derived equivalence classification of algebras of dihedral, semidihedral and quaternion type.* J. Algebra 211 (1999), 159-205.
- [11] K. Erdmann, T. Holm, *Twisted bimodules and Hochschild cohomology for selfinjective algebras of class A_n .* Forum Math. 11 (1999), no. 2, 177-201.
- [12] T. Holm, *Hochschild cohomology rings of algebras $k[X]/(f)$.* Beiträge Algebra Geom. 41 (2000), 291-301.
- [13] T. Holm, *Blocks of Tame Representation Type and Related Algebras: Derived Equivalences and Hochschild Cohomology.* Habilitationsschrift, Otto-von-Guericke-Universität Magdeburg (2001), 1-137.
- [14] K. Erdmann, T. Holm, N. Snashall, *Twisted bimodules and Hochschild cohomology for selfinjective algebras of class A_n , II.* Algebr. Represent. Theory 5 (2002), 457-482.
- [15] J. Bialkowski, T. Holm, A. Skowroński, *Derived equivalences for tame weakly symmetric algebras having only periodic modules.* J. Algebra 269 (2003), 652-668.
- [16] J. Bialkowski, T. Holm, A. Skowroński, *On nonstandard tame selfinjective algebras having only periodic modules.* Colloq. Math. 97 (2003), 33-47.
- [17] T. Holm, *Representation dimension of some tame blocks of finite groups.* Algebra Colloq. 10 (2003), 275-284.
- [18] T. Holm, *Hochschild cohomology of tame blocks.* J. Algebra 271 (2004), 798-826.
- [19] R. Bocian, T. Holm, A. Skowroński *The representation dimension of domestic weakly symmetric algebras.* Cent. Eur. J. Math. 2 (2004), 67-75.
- [20] R. Bocian, T. Holm, A. Skowroński, *Derived equivalence classification of weakly symmetric algebras of Euclidean type.* J. Pure Appl. Algebra 191 (2004), 43-74.
- [21] K. Erdmann, T. Holm, O. Iyama, J. Schröer, *Radical embeddings and representation dimension.* Adv. Math. 185 (2004), 159-177.
- [22] T. Holm, *The representation dimension of Schur algebras: the tame case.* Quart. J. Math. 55 (2004), 477-490.
- [23] T. Holm, *Cartan determinants for gentle algebras.* Arch. Math. 85 (2005), 233-239.
- [24] T. Holm, W. Hu, *On the representation dimension for rank 2 group algebras and related algebras.* J. Algebra 301, no.2 (2006), 791-802.
- [25] T. Holm, A. Skowroński, *Derived equivalence classification of symmetric algebras of domestic type.* J. Math. Soc. Japan 58, no.4 (2006), 1133-1149.
- [26] R. Bocian, T. Holm, A. Skowroński, *Derived equivalence classification of selfinjective one-parametric algebras.* J. Pure Appl. Algebra 207 no.3 (2006), 491-536.
- [27] T. Holm, W. Willems, *A local conjecture on Brauer character degrees of finite groups.* Trans. Amer. Math. Soc. 359 no.2 (2007), 591-603.
- [28] C. Bessenrodt, T. Holm, *q -Cartan matrices and combinatorial invariants of derived categories for skewed-gentle algebras.* Pacific J. Math. 229 No.1 (2007), 25-48.
- [29] R. Bocian, T. Holm, A. Skowroński, *Derived equivalence classification of nonstandard selfinjective algebras of domestic type.* Comm. Algebra 35 (2007), no.2, 515-526.
- [30] C. Bessenrodt, T. Holm, A. Zimmermann, *Generalized Reynolds ideals for non-symmetric algebras.* J. Algebra 312 (2007), no.2, 985-994.

- [31] R. Kessar, T. Holm, M. Linckelmann, *Blocks with quaternion defect group over a 2-adic ring: the case \tilde{A}_4* . Glasgow Math. J. 49 (2007), 29-43.
- [32] C. Bessenrodt, T. Holm, *Weighted locally gentle quivers and Cartan matrices*. J. Pure Appl. Algebra 212 (2008), 204-221.
- [33] K. Erdmann, T. Holm, *Maximal n -orthogonal modules for selfinjective algebras*. Proc. Amer. Math. Soc. 136, no. 9 (2008), 3069-3078.
- [34] T. Holm, A. Zimmermann, *Generalized Reynolds ideals and derived equivalences for algebras of dihedral and semidihedral type*. J. Algebra 320, no. 9 (2008), 3425-3437.
- [35] T. Holm, P. Jørgensen, *On the relation between cluster and classical tilting*. J. Pure Appl. Algebra 214 (2010), 1523-1533.
- [36] T. Holm, P. Jørgensen, *Triangulated categories: definitions, properties and examples*. In: Triangulated Categories (eds. T. Holm, P. Jørgensen, R. Rouquier), London Mathematical Society Lecture Notes Series (No. 375), Cambridge University Press (2010), 1-51.
- [37] T. Holm, A. Skowroński, *Derived equivalence classification of symmetric algebras of polynomial growth*. Glasgow Math. J. 53 (2011), 277-291.
- [38] T. Holm, *Classification of torsion pairs in cluster categories of Dynkin type*. Oberwolfach Reports 8 (2011), 555-558.
- [39] T. Holm, P. Jørgensen, M. Rubey, *Ptolemy diagrams and torsion pairs in the cluster category of Dynkin type A_n* . J. Algebraic Combin. 34 (2011), 507-523.
- [40] T. Holm, A. Zimmermann, *Deformed preprojective algebras of type L : Külshammer ideals and derived equivalences*. J. Algebra 346 (2011), 116-146.
- [41] T. Holm, P. Jørgensen, *On a cluster category of infinite Dynkin type, and the relation to triangulations of the infinity-gon*. Math. Z. 270 (2012), 277-295.
- [42] J. Bastian, T. Holm, S. Ladkani, *Derived equivalence classification of cluster-tilted algebras of Dynkin type E* . Algebr. Represent. Theory 16 (2013), 527-551.
- [43] T. Holm, P. Jørgensen, *Realising higher cluster categories of Dynkin type as stable module categories*. Quart. J. Math. 64 (2013), 409-435.
- [44] T. Holm, P. Jørgensen, D. Yang, *Sparseness of t -structures and negative Calabi-Yau dimension in triangulated categories*. Bull. Lond. Math. Soc. 45 (2013), 120-130.
- [45] T. Holm, P. Jørgensen, M. Rubey, *Ptolemy diagrams and torsion pairs in the cluster categories of Dynkin type D* . Adv. in Appl. Math. 51 (2013), 583-605.
- [46] T. Holm, P. Jørgensen, *SL_2 tilings and triangulations of the strip*. J. Combin. Theory Ser. A 120 (2013), 1817-1834.
- [47] C. Bessenrodt, T. Holm, P. Jørgensen, *Generalized frieze pattern determinants and higher angulations of polygons*. J. Combin. Theory Ser. A 123 (2014), 30-42.
- [48] T. Holm, P. Jørgensen, M. Rubey, *Torsion pairs in cluster tubes*. J. Algebraic Combin. 39 (2014), 587-605.
- [49] J. Bastian, T. Holm, S. Ladkani, *Towards derived equivalence classification of the cluster-tilted algebras of Dynkin type D* . J. Algebra 410 (2014), 277-332.
- [50] T. Holm, P. Jørgensen, *Cluster tilting vs. weak cluster tilting in Dynkin type A infinity*. Forum Math. 27 (2015), 1117-1137.
- [51] T. Holm, P. Jørgensen, *Generalized friezes and a modified Caldero-Chapoton map depending on a rigid object*. Nagoya Math. J. 218 (2015), 101-124.
- [52] T. Holm, P. Jørgensen, *Generalized friezes and a modified Caldero-Chapoton map depending on a rigid object, II*. Bull. Sci. Math. 140 (2016), 112-131.

- [53] C. Bessenrodt, T. Holm, P. Jørgensen, *All SL_2 -tilings come from infinite triangulations*. Adv. Math. 315 (2017), 194-245.
- [54] M. Cuntz, T. Holm, *Frieze patterns over integers and other subsets of the complex numbers*. J. Comb. Algebra 3 (2019), 153-188.
- [55] S. Gratz, T. Holm, P. Jørgensen, *Cluster tilting subcategories and torsion pairs in Igusa-Todorov cluster categories of Dynkin type A_∞* , Math. Z. 292 (2019), 33-56.
- [56] T. Holm, P. Jørgensen, *A p -angulated generalisation of Conway and Coxeter's theorem on frieze patterns*. Int. Math. Res. Not. IMRN, to appear.
- [57] M. Cuntz, T. Holm, P. Jørgensen, *Frieze patterns with coefficients*. Preprint (2019), arXiv:1909.02332.

GRANTS, FELLOWSHIPS AND AWARDS

11/2016: Best teaching award, Fakultät Mathematik und Physik, Leibniz Universität Hannover.

2012-2015: DFG grant within the Priority Program SPP 1388 'Darstellungstheorie'; PhD position for 3 years, plus funds for travel and guests. Title of project: *Cluster categories and torsion theory*.

2009-2012: DFG grant within the Priority Program SPP 1388 'Darstellungstheorie'; PhD position for 3 years, plus funds for travel and guests. Title of project: *Cluster categories, cluster-tilted algebras and derived equivalences*.

05/2007: Travel grant awarded by the DFG

01/2007-12/2008: DAAD-PROCOPE Grant. Exchange with Université de Picardie, Amiens (France). Coordinator on the German side.

02/2006: Research in Pairs (RiP) stay awarded, Mathematisches Forschungsinstitut Oberwolfach (with K. Erdmann, 12.-25.3.2006)

07/2005: LMS Scheme 1 Conference Grant awarded (Workshop on Triangulated Categories, Leeds, 13-19 August 2006)

09/2004: LMS Scheme 4 Grant awarded (collaboration with K. Erdmann, Oxford)

04/1996-03/1997: Research grant (*Forschungsstipendium*, awarded by the Deutsche Forschungsgemeinschaft (DFG)). Project: *Hochschild cohomology and modular representation theory*

07/1996: Travel grant awarded by the DFG

06/1995: Prize of the University of Essen for outstanding doctoral dissertations

04/1992-04/1994: Doctoral grant, Deutsche Forschungsgemeinschaft (DFG)

DOCTORAL STUDENTS

Sira Gratz (Leibniz Universität Hannover, 10/2011 - 05/2015)

Thesis: *From finite to infinite: cluster algebras as colimits, and mutating torsion pairs in discrete cluster categories*.

Janine Bastian (Leibniz Universität Hannover, 10/2008 - 12/2011)

Thesis: *Derived equivalences for cluster-tilted algebras of types \tilde{A}_n and D_n* .

Graham Murphy (University of Leeds, 10/2004 - 05/2008)

Thesis: *Cluster combinatorics and derived equivalences for m -cluster tilted algebras.*

External examiner for PhD theses:

Hermund A. Torkildsen, NTNU Trondheim (Norway), December 2010

Guodong Zhou, Université de Picardie, Amiens (France), June 2007

Matthew Grime, University of Bristol (England), January 2006

Peter Collings, University of Oxford (England), November 2004

Salah Al-Nofayee, University of Bristol (England), September 2004

ADMINISTRATION AND PROFESSIONAL SERVICE

Member of Faculty Board for Teaching, Leibniz Universität Hannover, since 2009

Member of University Committee for PostDoc grants (*Wege in die Forschung*), Leibniz Universität Hannover, 2011-2015

Member of Faculty Board, University of Magdeburg, 2000 - 2004

Member of several hiring committees, University of Magdeburg, 1998-2003, and Leibniz Universität Hannover, since 2007

Reviewer for grant proposals: Deutsche Forschungsgemeinschaft (DFG), Israel Science Foundation, Österreichische Akademie der Wissenschaften (ÖAW), L'agence national de la recherche (ANR), Alexander von Humboldt-Stiftung

Referee for book manuscripts for various publishers

Reviewer for Mathematical Reviews, 1997 - 2011

Referee for mathematical journals, including *Acta Mathematica Sinica*; *Advances in Mathematics*; *Algebra and Number Theory*; *Algebras and Representation Theory*; *Archiv der Mathematik*; *Bulletin of the London Mathematical Society*; *Canadian Journal of Mathematics*; *Colloquium Mathematicum*; *Communications in Algebra*; *Designs, Codes and Cryptography*; *Discrete Mathematics*; *Inventiones mathematicae*; *Journal für die Reine und Angewandte Mathematik (Crelle)*; *Journal of Algebra*; *Journal of Algebra and Its Applications*; *Journal of Algebraic Combinatorics*; *Journal of Combinatorial Theory Series A*; *Journal of Pure and Applied Algebra*; *Journal of the Mathematical Society of Japan*; *Journal of the London Mathematical Society*; *Mathematische Nachrichten*; *Mathematische Zeitschrift*; *Nagoya Mathematical Journal*; *Proceedings of the American Mathematical Society*; *Proceedings of the Edinburgh Mathematical Society*; *Proceedings of the London Mathematical Society*; *Quarterly Journal of Mathematics*; *Selecta Mathematica*; *Séminaire Lotharingien de Combinatoire*; *Transactions of the American Mathematical Society*

ORGANIZATION OF CONFERENCES

Mini-Workshop *Friezes*, Mathematisches Forschungsinstitut Oberwolfach, 1.-7. November 2015

CIRM-meeting *Hochschild cohomology, structure and applications*, Luminy, 7-11 June 2010 (joint with L. Avramov, C. Cibils, M.J. Redondo)

Norddeutsches Gruppentheoriekolloquium, Magdeburg, 9 - 10 November 2007 (joint with W. Willems)

Workshop on Triangulated Categories, Leeds, 13 - 19 August 2006 (joint with P. Jørgensen, R. Rouquier) - A Satellite of the ICM 2006

ARTIN meeting (Algebra and representation theory in the north), Leeds, 10.-11.12.2004 (joint with J. Schröer)

Darstellungstheorie-Tage 2001, Magdeburg, 2. - 3.11.2001 (joint with C. Bessenrodt)

THORSTEN HOLM

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