

# CURRICULUM VITAE\*

THORSTEN HOLM

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

## EDUCATION AND EMPLOYMENT

09/2006: Guest professor, Université Montpellier 2  
SINCE 03/2004: Lecturer (permanent), University of Leeds, Department of Pure Mathematics (on leave 02/2006 - 01/2007)  
SINCE 10/2002: Lecturer (Oberassistent C2, non-permanent), University of 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

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\*Date: May 2007

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  $\Sigma^1$  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; Degrees of Brauer characters of finite groups; Representation type of algebras; Homological algebra; Derived categories and derived equivalences; Invariants of algebras, especially invariants of derived module categories; Representation dimension; Explicit derived equivalence classifications; Hochschild cohomology, especially ring structure and Lie superalgebra structure; Algebraic combinatorics; Cluster categories and cluster complexes.

## LIST OF PUBLICATIONS

- [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  $k[X]/(f)$* . Beitrage 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-Universitat 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. Schroer, *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, to appear. (math.RT/0511610)
- [33] K. Erdmann, T. Holm, *Maximal  $n$ -orthogonal modules for selfinjective algebras*. Preprint (March 2006). (math.RT/0603672)

- [34] T. Holm, P. Jørgensen, *Cluster categories and selfinjective algebras: type A*. Preprint (October 2006). (math.RT/0610728)
- [35] T. Holm, P. Jørgensen, *Cluster categories and selfinjective algebras: type D*. Preprint (December 2006). (math.RT/0612451)
- [36] T. Holm, P. Jørgensen, *Stable Calabi-Yau dimension of finite type selfinjective algebras*. Preprint (March 2007). (math.RT/0703488)
- [37] T. Holm, A. Zimmermann, *Generalized Reynolds ideals and derived equivalences for algebras of dihedral and semidihedral type*. Preprint (April 2007), 11 pages.
- [38] J. Feldvoss, T. Holm, *The graded Lie superalgebra structure on the Hochschild cohomology of truncated polynomial algebras*. Preliminary version (23 pages).
- [39] T. Holm, P. Jørgensen, *Cluster categories and selfinjective algebras: type E*. In preparation.
- [40] T. Holm, A. Skowroński, *Derived equivalence classification of symmetric algebras of polynomial growth*. In preparation.
- [41] T. Holm, A. Zimmermann, *Generalized Reynolds ideals of deformed preprojective algebras of generalized Dynkin type*. In preparation.

## GRANTS, FELLOWSHIPS AND AWARDS

- 01/2007-12/2008: DAAD-PROCOPE Grant (approx. £14000). 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 (£3,500)
- 09/2004: LMS Scheme 4 Grant awarded (£210)
- 04/1996-03/1997: Research grant (*Forschungsstipendium*, approx. £30000), awarded by the Deutsche Forschungsgemeinschaft (DFG). Project: *Hochschild cohomology and modular representation theory*
- 07/1996: Travel grant awarded by the DFG (£1000)
- 06/1995: Prize of the University of Essen for outstanding doctoral dissertations
- 04/1992-04/1994: Doctoral grant, Deutsche Forschungsgemeinschaft (DFG)

## RESEARCH STAYS

- 15.-20.04.2007: University of Newcastle
- September 2006: Université Montpellier
- February 2006: Universität Hannover, Mathematisches Institut
- 04.-15.04.2005 and 04.-22.07.2005: Universität Hannover, Mathematisches Institut
- 07.-11.06.2004 and 18.-24.09.2004: University of Oxford, Mathematical Institute
- 01.-10.10.2002: Nicholas Copernicus University Toruń

04.-15.02.2002 and 26.06.-01.07.2002: University of Oxford, Mathematical Institute  
 10.-24.03.2002: Université de Lausanne (IMA)  
 31.08.-07.09.2000: Budapest, Technical University  
 01.04.1996-31.03.1997: University of Oxford, Mathematical Institute  
 01.02.96-31.03.1996: University of Cambridge, DPMMS

## GRADUATE STUDENTS

Graham Murphy (10/2004 - present)

Wei Hu (10/2004 - present); joint supervision with Changchang Xi, Beijing Normal University; funded by AsiaLink project of the EU ‘Algebras and Representations in Europe’

External examiner for PhD theses:

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, University of Magdeburg, 2000 - 2004

Member of several hiring committees, University of Magdeburg, 1998-2003

Organizer Departmental Seminar, University of Magdeburg, 2002-2004

Organizer Algebra Seminar, University of Leeds, since 10/2004

Reviewer for Mathematical Reviews, since 1997

Referee for mathematical journals, including *Inventiones mathematicae*; *Transactions of the AMS*, *Proceedings of the LMS*; *Journal of the Mathematical Society of Japan*; *Archiv der Mathematik*; *Journal of Algebra*; *Communications in Algebra*; *Designs, Codes and Cryptography*; *Journal of Algebra and Its Applications*; *Acta Mathematica Sinica*

## ORGANIZATION OF CONFERENCES

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

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

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

Organizer of conference *Darstellungstheorie-Tage 2001*, Magdeburg, 2.-3.11.2001 (joint with C. Bessenrodt)

## TEACHING EXPERIENCE

## (1) LECTURE COURSES (University of Leeds)

MATH0111/0131 Elementary Differential Calculus (semester 1, 2005/06)

MATH3071 Groups and Symmetry (semester 1, 2005/06)

MATH2032 Rings, Polynomials and Fields (semester 2, 2004/05)

MATH3071 Groups and Symmetry (semester 1, 2004/05)

MATH2032 Rings, Polynomials and Fields (semester 2, 2003/04)

## (2) LECTURE COURSES (University of Magdeburg)

Linear Algebra I (winter 2007/08, planned)

Representation Theory (summer 2007)

Lie Algebras (winter 2006/07)

Geometry for Computer Graphics (summer 2006)

Mathematical Foundations of Computer Science (summer 2006)

Coding Theory (winter 2003/04)

Mathematical Foundations of Computer Science (summer 2003)

Introduction to Algebra and Number Theory (winter 2002/03)

Cryptography and Elliptic Curves (summer 2002)

Cryptography (winter 2001/02)

Computer algebra (winter 1999/2000), including Practical Classes

Algebraic Number Theory (winter 1998/99)

Number Theory (summer 1998)

Algebra II (summer 1997)

## (3) SEMINARS (University of Magdeburg)

Lie algebras, root systems and applications (summer 2007)

Cluster Algebras and Cluster Complexes (with C. Bey, winter 2006/07)

Total Positivity of Matrices and Cluster Theory (with C. Bey, summer 2006)

Applied Algebra (summer 2003)

Lie Algebras (with C. Bessenrodt, summer 2000)

Introduction to the Computer Algebra System MAPLE (winter 1999/2000)

Hecke Algebras and Schur Algebras of Symmetric Groups (with C. Bessenrodt, winter 1998/99)

## (4) PROBLEMS CLASSES GIVEN AS TEACHING ASSISTANT

University of Magdeburg (1994-1996 and 1997-2001):

Mathematics II for Economics

Mathematics I & II for Computer Scientists

Mathematics I for Engineers

Algebra I & II

Reflection Groups

Finite Fields I & II

Mathematics for Computer Algebra

University of Essen (1992-1994):

Linear Algebra for Computer Scientists

Linear Algebra I

University of Frankfurt (1988-1991):

Linear Algebra I & II

Algebra I & II

Discrete Mathematics

Homological Algebra

(4) OTHER

First-year tutorials, University of Leeds (groups of six students)

Working seminars for PhD students, University of Leeds

Numerous seminars on advanced topics for undergraduates, University of Magdeburg

## LIST OF TALKS

*Cluster-Kategorien und selbstinjektive Algebren.* Universität Osnabrück, 25.01.2007

*Cluster categories and selfinjective algebras.* Workshop on Representation Theory, Universität Hannover, 16.12.2006

*Bilinear forms, Hochschild homology and invariants of derived module categories.* CIRM Marseille-Luminy, Conference 'Homologie et déformations en algèbre, géométrie et représentations', 28.9.2006

*Maximal orthogonal modules for selfinjective algebras and cluster complexes.* Université Montpellier 2, Séminaire AGATA, 14.9.2006

*Maximal orthogonal modules, cluster complexes and Catalan numbers.* Universität Hannover, Algebra and Algebraic Combinatorics Seminar, 19.7.2006

*Maximal  $n$ -orthogonal modules for selfinjective algebras.* Universität Köln, Algebra Research Seminar, 18.7.2006

*Maximal  $n$ -orthogonal modules for selfinjective algebras.* Universität Bielefeld, Representation Theory Seminar, 16.6.2006

*Cartan matrices and graded derived invariants for gentle quivers.* 7th NWDR Workshop on Representation Theory, Hannover, 17.2.2006

*Generalized Reynolds ideals and derived equivalence classifications.* Universität Hannover, Algebra and Algebraic Combinatorics Seminar, 6.2.2006

*Weighted locally gentle quivers and Cartan matrices.* Conference on Representation Theory and Related Topics, International Center for Theoretical Physics (ICTP), Trieste, Italy, 23.1.-28.1.2006

*Counting paths in graphs with relations and invariants of algebras.* Otto-von-Guericke-Universität Magdeburg, Seminar on Discrete Mathematics and Geometry, 27.6.2005

*On the representation dimension of rank 2 group algebras and related algebras.* Joint International Meeting AMS-DMV-ÖMG, Mainz, 16.-19.6.2005 (Special Session Representations and Cohomology of Groups and Algebras)

*Representation dimension of algebras.* Workshop Algebras and Representation Theory, Warwick, 29.5.2005

*Cartan determinants of gentle algebras.* Universität Paderborn, Representation Theory Seminar, 14.4.2005

*Algebras, representations and explicit invariants.* University of Glasgow, Algebra Seminar, 9.3.2005

*Algebras, representations and explicit invariants.* University of Manchester, Algebra Seminar, 22.2.2005

*On Cartan determinants for gentle algebras.* Bielefeld, Representation Theory Seminar, 7.1.2005

*On Cartan determinants for gentle algebras.* Universität Hannover, Algebra and Algebraic Combinatorics Seminar, 15.12.2004

*Algebras, Representations and Homology.* University of Kent, Canterbury, Mathematics Seminar, 29.11.2004

*Homological Algebra in Representation Theory, or: how complicated is an algebra?.* Bristol, Pure Mathematics Seminar, 19.10.2004

*Derived equivalences for selfinjective tame algebras.* Paderborn, Representation Theory Seminar, 22.7.2004

*Representation dimension of tame Schur algebras.* Workshop Representation theory of finite groups and finite dimensional algebras, Hannover, 16.7.2004

*Conjectures on Brauer character degrees of finite groups.* Oxford, Representation Theory Seminar, 10.6.2004

*Representation dimension of group algebras and related algebras.* Second Sino-German Workshop on Representation theory and the theory of finite groups, Goslar, 10.2.2004

*Algebras, Representations and Homological Algebra.* University of Leeds, 18.9.2003

*Derived equivalences for weakly symmetric algebras of Euclidean and tubular types.* Conference Frobenius Algebras and Related Topics, Toruń, 15.9.2003

*Algebras, representations and homological algebra.* Algebra Seminar, Universität Hannover, 17.7.2003

*Derived invariants of algebras.* Workshop Algebraic Groups, Hecke Algebras and Abstract Representation Theory, Bielefeld, 27.06.2003

*Algebras, representations and homological algebra.* Colloquium, Philipps-Universität Marburg, 25.4.2003

*Hochschild cohomology of tame blocks of group algebras.* Workshop on Hochschild cohomology and applications, Leicester, 2.4.2003

*The representation dimension and how to determine it.* University of Leicester, Pure Maths Seminar, 28.3.2003

*Derived equivalences and invariants of algebras.* University of Birmingham, Algebra Colloquium, 27.3.2003

- Representation dimension and the finitistic dimension conjecture for special biserial algebras.* Symposium 'Twenty Years of Tilting Theory', Chiemsee, 18.11.2002
- Auslander's representation dimension.* Darstellungstheorie-Tage 2002, Kassel, 9.11.2002
- Derived equivalence of algebras.* Nicholas Copernicus University Toruń, Algebra Seminar, 8.10.2002
- Auslander's representation dimension and radical embeddings.* Nicholas Copernicus University Toruń, Representation Theory Seminar, 3.10.2002
- Representation dimension of algebras.* Beijing Normal University, Representation Theory Seminar, 20.9.2002
- Blocks of groups with dihedral, semidihedral or quaternion Sylow 2-subgroups.* Workshop 'Representation Theory and Finite Simple Groups', Beijing, 19.9.2002
- Auslander's representation dimension.* London Math. Soc. Research Symposium 'Representations of finite groups and related algebras', University of Durham, 4.7.2002
- Group algebras of tame representation type.* Representation Theory Seminar, Bielefeld, 24.5.2002
- Blocks of group algebras: an introduction to tame representation type.* Université de Lausanne (IMA), 13.3. und 20.3.2002
- Tame Blocks and Related Algebras.* Representation Theory Seminar, University of Oxford, 14.2.2002
- Hochschild cohomology of tame blocks.* Oberwolfach Conference 'Darstellungstheorie endlicher Gruppen', 29.3.2001
- Hochschild cohomology of group algebras and blocks.* Seminar, Renyi Institute, Budapest, 4.9.2000
- Twisted bimodules and Hochschild cohomology.* International Conference on the Representation Theory of Algebras ICRTA 9.5, Bielefeld, 4.9.1998
- Algebras of dihedral, semidihedral and quaternion type - Derived equivalences and tameness.* Third Chemnitz-Prague-Torun Algebra Symposium, Torun, 30.5.1997
- Algebras of dihedral, semidihedral and quaternion type - Derived equivalences and tameness.* Bielefeld-Chemnitz-Seminar, University of Bielefeld, 18.4.1997
- Derived Equivalences and Hochschild Cohomology.* Leicester University, Pure Maths Seminar, 27.11.1996
- Homological Properties of Tame Blocks.* Conference 'Representation Theory of Finite Groups', Bad Honnef, 30.8.1996
- Homological Properties of Tame Blocks.* AMS Summer Research Institute 'Cohomology, Representations and Actions of Finite Groups', Seattle, 15.7.1996
- Homological Properties of Blocks of Group Algebras.* Oxford, Algebra Seminar, 4.6.1996
- Deriviert äquivalente zahme Blöcke.* Darstellungstheoretage 1996, Jena, 17.5.1996
- Cohomological Properties of Blocks of Finite Groups.* University of Cambridge, Algebra Seminar, 6.3.1996
- Nilpotente Blöcke und ihre Hochschild-Kohomologieringe.* DMV annual meeting, Ulm, September 1995

*Hochschild Cohomology in Modular Representation Theory.* Bielefeld-Chemnitz-Seminar, Bielefeld, 20.12.1994

*Hochschild Cohomology of Blocks with Cyclic Defect Groups.* Workshop 'Derived Equivalences', Pappenheim, September 1994

*Hochschild-Kohomologie von Blöcken mit zyklischer Defektgruppe.* Annual Meeting Deutsche Mathematiker Vereinigung (DMV), Duisburg, September 1994

THORSTEN HOLM

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