

JONAS HARTWIG

CURRICULUM VITAE

LAST UPDATED: DEC 9, 2017

CONTACT INFORMATION

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Iowa State University
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ACADEMIC DEGREES AND EDUCATION

- 2003 – 2008 **Ph.D. in Mathematics**, Chalmers University of Technology
Thesis title: *Generalized Weyl Algebras and Elliptic Quantum Groups*
Advisor: Lyudmila Turowska, Co-advisor: Hjalmar Rosengren
- 1999 – 2003 **M.Sc. in Mathematics**, Lund University
Thesis title: *Generalized Derivations on Algebras and Highest Weight Representations of the Virasoro Algebra*
Advisors: Sergei Silvestrov and Arne Meurman

EMPLOYMENT

- 2015 – Assistant Professor, Department of Mathematics, Iowa State University
- 2012 – 2015 Visiting Assistant Professor, Department of Mathematics, UC Riverside
- 2011 – 2012 Visiting Scholar, Department of Mathematics, Stanford University (Host: Daniel Bump)
- 2010 – 2011 Postdoc, KdV Institute for Mathematics, University of Amsterdam (Host: Jasper Stokman)
- 2009 – 2010 Postdoc, Institute for Mathematics and Statistics, University of São Paulo
(Host: Vyacheslav Futorny)
- 2008 – 2009 Postdoc, KdV Institute for Mathematics, University of Amsterdam (Host: Jasper Stokman)
- 2003 – 2008 PhD position, Mathematical Sciences, Chalmers University of Technology
- 2000 – 2003 Teaching Assistant, Centre for Mathematical Sciences, Lund University

AWARDS AND GRANTS

- 2010 Postdoctoral research grant from the Swedish Research Council (Swedish equivalent of the U.S. National Science Foundation)
- 2009 Postdoctoral research grant from the Foundation for Research Support of the State of São Paulo (FAPESP)
- 2006 Travel grant from the Wilhelm and Martina Lundgren's Science Fund
- 2000 Award from the Nils-Erik Fremberg's Memorial Fund, for successful studies in mathematics

PUBLICATIONS IN PEER-REVIEWED JOURNALS

- (1) J. T. Hartwig, *The q -difference Noether problem for complex reflection groups and quantum OGZ algebras*, Communications in Algebra **45** Issue 3 (2017), arXiv:1512.09234 [math.QA].
- (2) J. T. Hartwig, D. Rosso, *Cylindrical Dyck paths and the Mazorchuk-Turowska equation*, Journal of Algebraic Combinatorics **44** Issue 1 (2016) 223–247, arXiv:1507.04414 [math.RA].
- (3) J. T. Hartwig, V. Serganova, *Twisted generalized Weyl algebras and primitive quotients of enveloping algebras*, Algebras and Representation Theory **19** Issue 2 (2016) 277–313, arXiv:1504.05361 [math.RT].
- (4) V. Futorny, J. T. Hartwig, E. Wilson, *Quantum affine modules with infinite-dimensional weight spaces*, Proceedings of the AMS, **143** (2015) 5159–5171, arXiv:1405.5273 [math.QA].
- (5) K. R. Goodearl, J. T. Hartwig, *The isomorphism problem for multiparameter quantized Weyl algebras*, São Paulo Journal of Mathematical Sciences **9** Issue 1 (2015), 53–61, arXiv:1405.4333 [math.RA].

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- (6) V. Futorny, J. T. Hartwig, E. Wilson, *Irreducible completely pointed modules of quantum groups of type A*, Journal of Algebra **432** (2015), 252–279, arXiv:1404.0305 [math.RT].
- (7) V. Futorny, J. T. Hartwig, *Solution to a q -difference Noether problem and the quantum Gelfand-Kirillov conjecture for \mathfrak{gl}_N* , Mathematische Zeitschrift, **276**, Issue 1–2 (2013) 1–37, arXiv:1111.6044 [math.RA].
- (8) J. T. Hartwig, J. V. Stokman, *Extended trigonometric Cherednik algebras and nonstationary Schrödinger equations with delta-potentials*, J. Math. Phys. **54** no. 2 (2013) 021702, arXiv:1104.5489 [math.RT].
- (9) V. Futorny, J. T. Hartwig, *Multiparameter twisted Weyl algebras*, Journal of Algebra, **357** (2012), 69–93, arXiv:1103.5500 [math.QA].
- (10) V. Futorny, J. T. Hartwig, *On the consistency of twisted generalized Weyl algebras*, Proceedings of the American Mathematical Society, **140** (2012), 3349–3363, arXiv:1103.4374 [math.RA].
- (11) J. T. Hartwig and J. Öinert, *Simplicity and maximal commutative subalgebras of twisted generalized Weyl algebras*, Journal of Algebra, **373** (2013) 312–339, arXiv:1009.4892 [math.RA].
- (12) J. T. Hartwig, *Twisted generalized Weyl algebras, polynomial Cartan matrices and Serre-type relations*, Communications in Algebra, **38** Issue 12 (2010), 4375–4389, arXiv:0908.2054 [math.RA].
- (13) J. T. Hartwig, *The elliptic $GL(n)$ dynamical quantum group as an \mathfrak{h} -Hopf algebroid*, Int. J. Math. Math. Sci. 2009, Art. ID 545892, arXiv:0803.3815 [math.QA].
- (14) J. T. Hartwig, *Pseudo-unitarizable weight modules over generalized Weyl algebras*, Journal of Pure and Applied Algebra, **215** Issue 10 (2011), 2352–2377, arXiv:0803.0687 [math.RA].
- (15) J. T. Hartwig, *Hopf Structures on Ambiskew Polynomial Rings*, Journal of Pure and Applied Algebra, **212** Issue 4 (2008), 863–883, arXiv:math/0510375 [math.RA].
- (16) J. T. Hartwig, *Locally Finite Simple Weight Modules over Twisted Generalized Weyl Algebras*, Journal of Algebra, **303** Issue 1 (2006), 42–76, arXiv:math/0502352 [math.RT].
- (17) J. T. Hartwig, D. Larsson, S. D. Silvestrov, *Deformations of Lie algebras using σ -derivations*, Journal of Algebra, **295** Issue 2 (2006), 314–361, arXiv:math/0408064 [math.QA].

PREPRINTS

- (1) J. T. Hartwig, *Principal Galois orders and Gelfand-Zeitlin modules*, arXiv:1710.04186 [math.RT].
- (2) J. T. Hartwig, *Unitarizability of weight modules over noncommutative Kleinian fiber products*, arXiv:1702.08168 [math.RT].
- (3) J. T. Hartwig, *Noncommutative singularities and lattice models*, arXiv:1612.08125 [math.RT].
- (4) V. Futorny, J. T. Hartwig, *De Concini-Kac filtration and Gelfand-Tsetlin characters for quantum \mathfrak{gl}_N* , arXiv:1203.4793 [math.RT].

THESES

- (1) *Generalized Weyl algebras and elliptic quantum groups*, Ph.D. thesis, Chalmers University of Technology and University of Gothenburg, 2008.
- (2) *Modules and Hopf structures for (twisted) generalized Weyl algebras*, Ph.Lic. thesis, Chalmers University of Technology and University of Gothenburg, 2005.
- (3) *Generalized Derivations on Algebras and Highest Weight Representations of the Virasoro Algebra*, M.Sc. thesis, Lund University, 2002.

CONFERENCE TALKS

- Apr 2017 *Categories of modules over noncommutative Kleinian fiber products*, special AMS session, Pullman WA.
Apr 2017 *Noncommutative Kleinian fiber products and vertex models*, special AMS session, Bloomington IN
Oct 2016 *Twisted generalized Weyl superalgebras*,
Special Session on Nonassociative Algebra, AMS Sectional, Denver CO
Sep 2016 *Weight modules over noncommutative Kleinian fiber products*,
Special Session on Noncommutative Ring Theory, AMS Sectional, Brunswick ME
Sep 2014 *Irreducible completely pointed modules over quantum groups of type A*,
Special Session on Lie Algebras and Representation Theory, AMS Sectional, Eau Claire WI
Jul 2012 *Primitive quotients of enveloping algebras, Weyl subalgebras and Dynkin diagrams with loops*,
XXII Brazilian Algebra Meeting, Salvador, Brazil

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Jul 2012 *Galois orders and quantized enveloping algebras*, Lie and Jordan algebras V, Belem, Brazil
Sep 2009 *Twisted generalized Weyl algebras and Serre-type relations*, Repts. Lie theory and Physics, Maresias, Brazil
Jul 2008 *Pseudo-Unitarizable Weight Modules over Generalized Weyl Algebras*, NoMaP, Brussels
Oct 2007 *Elliptic $GL(n)$ quantum group*, Algebra, Geometry, and Mathematical Physics (AGMF), Gothenburg
Jun 2007 *Elliptic $GL(n)$ quantum group*, Integrable Systems and Quantum Symmetries, Prague
Jun 2006 *Quantum groups*, Scandinavian mini-conference in algebra and geometry, Stockholm
Jun 2005 *Generalized Weyl algebras*, Scandinavian mini-conference in algebra and geometry, Oslo
Dec 2005 *Hopf structures on ambiskew polynomial rings*, Algebraic Versus Analytic Representations, Kiev
Jun 2005 *Generalized Weyl algebras and quantum groups*, Selected Topics of Modern Math. Physics, St.Petersburg

SELECTED SEMINAR TALKS AND COLLOQUIA

Nov 2017 *Galois orders and Gelfand-Zeitlin modules* (Invited seminar talk), University of South Alabama
Oct 2017 *Galois orders and Gelfand-Zeitlin modules* (Invited seminar talk), University of Iowa
May 2017 *The q -Difference Noether Problem for Complex Reflection Groups and Quantum OGZ Algebras* (Invited seminar talk), University of Wisconsin Milwaukee
May 2016 *Noncommutative Singularities and Vertex Models* (Invited seminar talk), Denver University
Nov 2015 *The quantum Gelfand-Kirillov conjecture for gl_n* (Combinatorics/Algebra seminar), ISU
Oct 2015 *The Mazurchuk-Turowska equation* (Combinatorics/Algebra seminar), ISU
Oct 2015 *Weyl algebra combinatorics* (Combinatorics/Algebra seminar), ISU
May 2015 *The boson-fermion correspondence* (Operator Algebra seminar), UC Riverside
Apr 2015 *Harish-Chandra induction* (Lie Theory seminar), UC Riverside
Apr 2015 *The 10,000 page proof* (Undergraduate seminar), UC Riverside
Feb 2015 *Graded algebras attached to quivers* (Lie Theory seminar), UC Riverside
Nov 2014 *Quantum affine modules for non-twisted affine Kac-Moody algebras* (Lie Theory seminar), UC Riverside
May 2013 *Category \mathcal{O} I*. (Lie Theory seminar), UC Riverside
Mar 2013 *Category \mathcal{O} II*. (Lie Theory seminar), UC Riverside
Jun 2012 *Weyl subalgebras and Cartan matrices* (invited), São Paulo, Brazil
Apr 2012 *Galois orders and quantized enveloping algebras* (invited), UC Santa Barbara
Apr 2012 *R-matrices* (RTUQA seminar), Stanford University
Feb 2011 *Dynamical Yang-Baxter equation (and applications)* (seminar), Stanford University
Jan 2011 *Quantum double of Hopf algebroids* (seminar), Stanford University
Jun 2010 *Double affine Hecke algebras and quantum integrable systems* (seminar), Copenhagen University
Feb 2010 *Cartan matrices associated to twisted generalized Weyl algebras* (invited), IMPA, Brazil
Nov 2009 *Hopf algebroids and elliptic quantum groups* (seminar), IME-USP, Brazil
Oct 2009 *Twisted generalized Weyl algebras and Serre-type relations* (seminar), IME-USP, Brazil
May 2009 *Twisted generalized Weyl algebras associated to Cartan matrices and Serre-type relations* (invited), Lund
Nov 2008 *Generalized Weyl algebras* (colloquium), University of Amsterdam
Mar 2006 *Ambiskew polynomial rings with Hopf structure* (invited), Uppsala University
Mar 2005 *Weight modules over twisted generalized Weyl algebras* (invited), Uppsala University

PROFESSIONAL SERVICE

- Reviewed 22 research articles for 13 different journals including Proceedings of the AMS, Journal of Algebra, Communications in Algebra, Journal of Pure and Applied Algebra, Representation Theory, SIGMA, Algebras and Representation Theory, and Journal of Mathematical Physics.
- Organized a Mini-Symposium in Representation Theory during the International Linear Algebra Society meeting 2017.
- Organizing a local weekly seminar, the Representation Theory Seminar.

TEACHING

- Temporary graduate advisor for three graduate students at ISU.
- Developed two new graduate level classes to be given the upcoming academic year 2017/2018: Commutative Algebra, and Lie Algebras and their Representations.

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- 2015 – (Iowa State University) Taught MATH 265 (Calc 3) twice, MATH 207 (Linear Algebra), 301 (Undergraduate Abstract Algebra 1) twice, 504 (Graduate Abstract Algebra 1), 505 (Graduate Abstract Algebra 2), 619X (Commutative Algebra)
- 2012 – 2015 (UC Riverside) Taught Single and Multivariable Calculus, Discrete Mathematics, Differential Equations, Optimization, Linear Algebra.
- 2009 (University of Amsterdam) TA and co-lecturer on Differentiable Manifolds.
- 2003 – 2008 (Chalmers University of Technology) Taught Euclidean Geometry. Lecturer on Discrete Mathematics. TA on Calculus, Linear Algebra, Fourier Analysis, Discrete Mathematics, MATLAB, Geometry, and Abstract Algebra. Constructed and graded assignments.
- 2000 – 2003 (Lund University) TA on Linear Algebra and Calculus.