

SEPTEMBER 2023

CURRICULUM VITÆ
LARS WINTHER CHRISTENSEN

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DEGREES AND EDUCATION

- 1999 Ph.D., University of Copenhagen, Denmark
- 1996 M.Sc., University of Copenhagen, Denmark
- 1995 B.Sc. (Mathematics and Physics), University of Copenhagen, Denmark
- 1995 Captain (Army Reserve), Royal Danish Defense College
- 1990 Lieutenant (Army), Danish Army Special Training School

EMPLOYMENT

- 9/2019– President's Excellence in Research Professor
- 9/2016– Professor, Texas Tech University, U.S.A.
- 9/2011–8/2016 Associate Professor, Texas Tech University, U.S.A.
- 9/2007–8/2011 Assistant Professor, Texas Tech University, U.S.A.
- 9/2004–8/2007 Visiting¹ Professor, University of Nebraska-Lincoln, U.S.A.
- 6/2001–5/2004 Product Manager, Cryptomathic, Denmark and France
- 11/1999–5/2001 Software Designer and Release Manager, Nokia Networks, Denmark
- 10/1996–10/1999 Ph.D.-student, University of Copenhagen, Denmark
- 7/1996–6/1997 Assistant Professor, Royal Danish Military Academy
- 1/1995–6/1996 Lecturer, Royal Danish Military Academy
- 4/1990–9/1996 Officer, Royal Danish Army (reconnaissance and military intelligence)

VISITS (one month or longer)

- 5/2016–6/2016 Osaka Prefecture University, Japan (Professor)
- 2/2015–6/2015 Centre de Recerca Matemàtica, Barcelona, Spain (Research Visitor)
- 4/2013–6/2013 Northeastern University, Boston MA, U.S.A. (Visiting Scholar)
- 1/2013–3/2013 Mathematical Sciences Research Institute, Berkeley CA, U.S.A. (Visitor)
- 7/2008 Nanjing University, P.R. China (Professor)
- 2/2004–6/2004 University of Copenhagen, Denmark (Associate Professor)
- 8/1998–11/1998 Purdue University, West Lafayette IN, U.S.A. (Visiting Scholar)

¹Partly supported by grants from the Danish Natural Science Research Council and the Carlsberg Foundation

EDITORSHIPS

- Associate editor, *Communications in Algebra* (2023–)
- Volume editor [with N. Horwitz, I. Peeva, S. Sather-Wagstaff, and J. Striuli], *Selected Proceedings from Two Special Sessions on Commutative Algebra Sponsored by AMS*, *J. Commut. Algebra* **1** (2009), no. 3, special issue, 263 pp.

HONORS

- *Apple Polishing Award*, Texas Tech University Forum Chapter of Mortar Board, 2021
- *Outstanding Researcher*, Texas Tech University, 2019
- *Professing Excellence*, Texas Tech University on-campus students, 2019
- *College of Arts & Sciences Excellence in Research Award*, Texas Tech University, 2016
- *President's Excellence in Teaching Award*, Texas Tech University, 2012
- *Graduate Professor of the Year for the 2009–2010 School Year*, Texas Tech University Chapter of the Society for Industrial and Applied Mathematics
- *Mathematical Association of America Professor of the Year 2009*, Texas Tech University Student Chapter of the Mathematical Association of America

RESEARCH SUPPORT

- *Homological and homotopical algebra of commutative rings*, 2022–2027, PI, Simons Foundation, award no. 962956 (Collaboration Grant for Mathematicians); \$42,000
- *Homological studies of local rings*, 2016–2022, PI, Simons Foundation, award no. 428308 (Collaboration Grant for Mathematicians); \$35,000
- *Derived category methods in commutative algebra*, 2015–2018, co-PI (Danish PI), Carlsberg Foundation, award no. 154-0559; \$30,000
- *Studies of free resolutions towards classification of algebras and representation theory of local rings*, 2014–2016, PI, National Security Agency, award no. H98230-14-0140; \$31,289
- *Cohomology of rings and algebras*, 2013–2014, PI, Simons Foundation, award no. 281886 (Collaboration Grant for Mathematicians); \$7,000
- *Homological and Homotopical Algebra in Module Categories*, 2011–2013, PI, National Security Agency, award no. H98230-11-0214; \$26,595
- *Problems in Commutative Ring Theory and Homological Algebra*, 2005–2007, PI, Carlsberg Foundation, awards no. 04-0260/20 and 2005-1-716; \$100,000
- *Studies in Commutative Ring Theory and Homological Algebra*, 2004–2005, Postdoctoral Fellowship, Danish Natural Science Research Council, award no. 21-04-0176; \$79,500
- *Framework grant "Algebra"*, 1999–2001, co-PI, Danish Natural Science Research Council; \$147,000

OTHER SUPPORT for conferences and curriculum development

- *Stable Cohomology: Foundations and Applications*, 2018, co-PI, National Science Foundation, award no. DMS-1804126; \$35,000
- *Reading and Writing Mathematics*, 2018, PI, CH Foundation; \$43,511

- *Workshop: Structures on Free Resolutions*, 2017, co-PI, National Science Foundation, award no. DMS-1743011; \$16,500

SOUTHWEST LOCAL ALGEBRA MEETING

- 2023, National Science Foundation, DMS-2302496 (co-PI), \$16,000
- 2022, National Security Agency, H98230-22-1-0005 (co-PI), \$17,100
- 2020, National Science Foundation, DMS-1954625 (co-PI), \$12,500
- 2019, National Security Agency, H98230-18-1-0287 (co-PI), \$16,544
- 2018, National Science Foundation, DMS-1803445 (co-PI), \$10,000
- 2017, National Science Foundation, DMS-1700755 (co-PI), \$15,130
- 2016, National Security Agency, H98230-15-0257 (co-PI), \$14,925
- 2015, National Science Foundation, DMS-1502192 (co-PI), \$15,799
- 2014, National Security Agency, H98230-14-1-0105 (co-PI), \$14,860
- 2013, National Science Foundation, DMS-1303428 (co-PI), \$15,692
- 2012, National Security Agency, H98230-11-1-0231 (PI), \$12,100
- 2012, Oak Ridge Associated Universities (PI), \$3,000
- 2011, National Science Foundation, DMS-1068795 (co-PI), \$9,070

MEMBERSHIP OF PROFESSIONAL ORGANIZATIONS

- American Mathematical Society (since 2004)
- Danish Mathematical Society (since 1996)
- Mathematical Association of America (since 2014)

PROFESSIONAL DEVELOPMENT

- Online instructor training (eight weeks), Texas Tech University, U.S.A.; Fall 2020
- Teaching mentoring program (one semester, mentor: J. Lewis), University of Nebraska-Lincoln, U.S.A.; Fall 2005
- Workshop on communication of science research to general audiences (four days), University of Roskilde, Denmark; May 1998

PH.D. STUDENTS and their dissertation publications

2020 – 2023 Alexis Hardesty

- L.W. Christensen, O. Gotchey, and A. Hardesty, *Sampling algebra structures on minimal free resolutions of length 3*, arXiv:2303.13687 [math.AC], 20 pp.
- L. Ferraro and A. Hardesty, *The Tor algebra of trimmings of Gorenstein ideals* Acta Math. Vietnam., to appear.

2010 – 2015 Jessica Ann Faucett

- J.A. Faucett, *Expanding the socle of a codimension 3 complete intersection*, Rocky Mountain J. Math. **46** (2016), 1489–1498.

- 2009–2015 Fatih Köksal
- L.W. Christensen, F. Köksal, and L. Liang, *Gorenstein dimensions of unbounded complexes and change of base (With an appendix by Driss Bennis)*, *Sci. China Math.* **60** (2017), 401–420.
 - L.W. Christensen and F. Köksal, *Injective modules under faithfully flat ring extensions*, *Proc. Amer. Math. Soc.* **144** (2016), 1015–1020.

POSTDOCS and long-term visitors

- 2020–2023 Luigi Ferraro
 2018–2019 Dejun Wu (supported by the Chinese National Science Foundation)
 2016–2018 Peder Thompson
 2013–2014 Li Liang (supported by the Chinese National Science Foundation)
 2009–2010 Hamidreza Rahmati

PUBLICATIONS

An up-to-date list is maintained at www.math.ttu.edu/~lchrste/publications.html

PREPRINTS

- [with S. Estrada, L. Liang, P. Thompson, and J. Wang] *One-sided Gorenstein rings*, arXiv:2308.13669 [math.RA], 28 pp.
- [with O. Gotchey and A. Hardesty] *Sampling algebra structures on free resolutions of length 3*, arXiv:2303.13687 [math.AC], 20 pp.

JOURNAL ARTICLES

45. [with L. Ferraro and P. Thompson] *Rigidity of Ext and Tor via flat-cotorsion theory*, *Proc. Edinb. Math. Soc.*, to appear. Preprint arXiv:2112.00103 [math.AC], 10 pp.
44. [with L. Ferraro] *The Improved New Intersection Theorem revisited*, *Michigan Math. J.*, to appear. Preprint arXiv:2206.05812 [math.AC], 7 pp.
43. [with O. Veliche] *Generic local rings on a spectrum between Golod and Gorenstein*, *Adv. Appl. Math.* **151** (2023), paper no. 102580, 55 pp.
42. [with N. Ding, S. Estrada, J. Hu, H. Li, and P. Thompson] *The singularity category of an exact category applied to characterize Gorenstein schemes*, *Quart. J. Math.* **74** (2023), 1–27.
41. [with S. Estrada and P. Thompson] *Gorenstein weak global dimension is symmetric*, *Math. Nachr.* **294** (2021), 2121–2128.
40. [with S. Estrada and P. Thompson] *The stable category of Gorenstein flat sheaves on a noetherian scheme*, *Proc. Amer. Math. Soc.* **149** (2021), 525–538.
39. [with S. Estrada, L. Liang, P. Thompson, D. Wu, and G. Yang] *A refinement of Gorenstein flat dimension via the flat-cotorsion theory*, *J. Algebra* **567** (2021), 346–370.
38. [with O. Veliche and J. Weyman] *Minors of a skew symmetric matrix: a combinatorial approach*, *Electron. J. Linear Algebra*, **36** (2020), 658–663.
37. [with O. Veliche and J. Weyman] *Linkage classes of grade 3 perfect ideals*, *J. Pure Appl. Algebra* **224** (2020), paper no. 106185, 29 pp.

36. [with O. Veliche and J. Weyman] *Trimming a Gorenstein ideal*, J. Commut. Algebra **11** (2019), 325–339.
35. [with P. Thompson] *Pure-minimal chain complexes*, Rend. Semin. Mat. Univ. Padova **142** (2019), 41–67.
34. [with O. Veliche and J. Weyman] *Free resolutions of Dynkin format and the licci property of grade 3 perfect ideals*, Math. Scand. **125** (2019), 163–178.
33. [with D. Wu] *A Bass equality for Gorenstein injective dimension of modules finite over homomorphisms*, Arch. Math. (Basel) **113** (2019), 450–467.
32. [with S.B. Iyengar and T. Marley] *Rigidity of Ext and Tor with coefficients in residue fields of a commutative noetherian ring*, Proc. Edinb. Math. Soc. **62** (2019), 305–321.
31. [with O. Veliche] *The Golod property of powers of the maximal ideal of a local ring*, Arch. Math. (Basel) **110** (2018), 549–562.
30. [with K. Kato] *Totally acyclic complexes and locally Gorenstein rings*, J. Algebra Appl. **17** (2018), 1850039, 6 pp.
29. [with O. Celikbas, L. Liang, and G. Piepmeyer] *Complete homology over associative rings*, Israel J. Math. **221** (2017), 1–24.
28. [with O. Celikbas, L. Liang, and G. Piepmeyer] *Stable homology over associative rings*, Trans. Amer. Math. Soc. **369** (2017), 8061–8086.
27. [with S.B. Iyengar] *Tests for injectivity of modules over commutative rings*, Collect. Math. **68** (2017), 243–250.
26. [with S. Estrada and A. Iacob] *A Zariski-local notion of F-total acyclicity for complexes of sheaves*, Quaest. Math. **40** (2017), 197–214.
25. [with F. Köksal and L. Liang] *Gorenstein dimensions of unbounded complexes and change of base (With an appendix by Driss Bennis)*, Sci. China Math. **60** (2017), 401–420.
24. [with F. Köksal] *Injective modules under faithfully flat ring extensions*, Proc. Amer. Math. Soc. **144** (2016), 1015–1020.
23. [with J. Burke and R. Takahashi] *Building modules from the singular locus*, Math. Scand. **116** (2015), 23–33.
22. [with D.A. Jorgensen] *Vanishing of Tate homology and depth formulas over local rings*, J. Pure Appl. Algebra **219** (2015), 464–481.
21. [with H. Holm] *The direct limit closure of perfect complexes*, J. Pure Appl. Algebra **219** (2015), 449–463.
20. [with O. Veliche] *Local rings of embedding codepth 3: A classification algorithm*, J. Softw. Algebra Geom. **6** (2014), 1–8.
19. [with O. Veliche] *Local rings of embedding codepth 3. Examples*, Algebr. Represent. Theory **17** (2014), 121–135.
18. [with D.A. Jorgensen] *Tate (co)homology via pinched complexes*, Trans. Amer. Math. Soc. **366** (2014), 667–689.
17. [with H. Holm] *Vanishing of cohomology over Cohen–Macaulay rings*, Manuscripta Math. **139** (2012), 535–544.

16. [with D.A. Jorgensen, H. Rahmati, J. Striuli, and R. Wiegand] *Brauer–Thrall for totally reflexive modules*, J. Algebra **350** (2012), 340–373.
15. [with H. Holm] *Algebras that satisfy Auslander’s condition on vanishing of cohomology*, Math. Z. **265** (2010), 21–40.
14. [with S. Sather-Wagstaff] *Transfer of Gorenstein dimensions along ring homomorphisms*, J. Pure Appl. Algebra **214** (2010), 982–989.
13. [with J. Striuli and O. Veliche] *Growth in the minimal injective resolution of a local ring*, J. Lond. Math. Soc. **81** (2010), 24–44.
12. [with S. Sather-Wagstaff] *Descent via Koszul extensions*, J. Algebra **322** (2009), 3026–3046.
11. [with H. Holm] *Ascent properties of Auslander categories*, Canad. J. Math. **61** (2009), 76–108.
10. [with S. Sather-Wagstaff] *A Cohen–Macaulay algebra has only finitely many semidualizing modules*, Math. Proc. Cambridge Philos. Soc. **145** (2008), 601–603.
9. [with G. Piepmeyer, J. Striuli, and R. Takahashi] *Finite Gorenstein representation type implies simple singularity*, Adv. Math. **218** (2008), 1012–1026.
8. [with O. Veliche] *A test complex for Gorensteinness*, Proc. Amer. Math. Soc. **136** (2008), 479–487.
7. [with O. Veliche] *Acyclicity over local rings with radical cube zero*, Illinois J. Math. **54** (2007), 1439–1454.
6. [with S. Iyengar] *Gorenstein dimension of modules over homomorphisms*, J. Pure Appl. Algebra **208** (2007), 177–188.
5. [with A. Frankild and H. Holm] *On Gorenstein projective, injective and flat dimensions —A functorial description with applications*, J. Algebra **302** (2006), 231–279.
4. *Sequences for complexes II*, Math. Scand. **91** (2002), 161–174.
3. [with H.-B. Foxby and A. Frankild] *Restricted homological dimensions and Cohen–Macaulayness*, J. Algebra **251** (2002), 479–502.
2. *Sequences for complexes*, Math. Scand. **89** (2001), 161–181.
1. *Semi-dualizing complexes and their Auslander categories*, Trans. Amer. Math. Soc. **353** (2001), 1839–1883.

BOOK AND BOOK CHAPTERS

- [with S. Estrada and P. Thompson] *Five theorems on Gorenstein global dimensions*. In: A. Leroy and S.K. Jain (eds), “Algebra and Coding Theory”, 67–78, Contemp. Math. vol. 785. Amer. Math. Soc., Providence RI, 2023.
- [with O. Veliche and J. Weyman] *Three takes on almost complete intersection ideals of grade 3*. In: I. Peeva (ed), “Commutative Algebra: Expository Papers Dedicated to David Eisenbud on the Occasion of his 75th Birthday”, 219–281. Springer Nature, Cham, 2022.
- [with S.B. Iyengar] *Dimension of finite free complexes over commutative noetherian rings*. In: N. Baeth, T. Freitas, G. Leuschke, and V.H.J. Pérez (eds), “Commutative Algebra: 150 years with Roger and Sylvia Wiegand,” 11–17, Contemp. Math. vol. 773. Amer. Math. Soc., Providence RI, 2021.

- [with S. Estrada and P. Thompson] *Homotopy categories of totally acyclic complexes with application to the flat-cotorsion theory*. In: A.K. Srivastava, A. Leroy, I. Herzog, and P.A. Guil Asensio (eds), "Categorical, Homological and Combinatorial Methods in Algebra," 99–118, Contemp. Math., vol. 751. Amer. Math. Soc., Providence RI, 2020.
- *Tate homology beyond Gorenstein rings*. In: D. Herbera, W. Pitsch, and S. Zarzuela (eds), "Extended Abstracts Spring 2015," 47–51. Trends in Mathematics, vol. 5. Birkhäuser, Cham, 2016.
- [with H.-B. Foxby and H. Holm] *Beyond totally reflexive modules and back*. In: M. Fontana, S.E. Kabbaj, B. Olberding, and I. Swanson (eds), "Commutative Algebra – Noetherian and non-Noetherian Perspectives," 101–143. Springer-Verlag, New York NY, 2011.
- *Gorenstein Dimensions*, Lecture Notes in Math. vol. 1747. Springer-Verlag, Berlin, 2000, xiii + 204 pp.

SOFTWARE

- [with L. Ferraro, F. Gandini, F. Moore, and O. Veliche] *ResLengthThree*, MACAULAY2 package (2020); current version: 1.0.
- [with O. Veliche] *TorAlgebra*, MACAULAY2 package (2014); current version: 2.1 (2020). (Version 1.0 documented in [20].)

TALKS AT CONFERENCES AND WORKSHOPS

LECTURE SERIES AND PLENARY TALKS

- *Differential Graded Algebra Structures on Free resolutions. Free Resolutions of Length 3. Generic Artinian Quotients of the Trivariate Polynomial Algebra* (3 online lectures), Workshop on Differential Graded Algebra Techniques in Commutative Algebra, Institute for Studies in Theoretical Physics and Mathematics, Tehran, Iran; Jan. 2022
- *Multiplicative structures. Linkage. Almost complete intersections* (3 lectures), Structure of Length 3 Resolutions Workshop, University of California, San Diego CA; Aug. 2019
- *Pure minimality in the category of complexes*, International Conference on Algebra and Related Topics, Rabat, Morocco; July 2018
- *From Tate (co)homology over group algebras to stable (co)homology over associative rings* (main lecturer, 6 lectures), Mini-workshop on Homological Algebra, Osaka Prefecture University, Japan; June 2016
- *Gorenstein homological algebra* (main lecturer, 8 lectures), Summer School on Homological Algebra, Nanjing University, P.R. China; July 2008

LONGER TALKS, MORE THAN 30 MINUTES

- *The Improved New Intersection Theorem revisited*, Homological Commutative Algebra and Related Topics, Georgia Southern University, Savannah GA, U.S.A.; June 2022
- *Minimal resolutions and rigidity of Ext and Tor with coefficients in residue fields*, 18th (Virtual) Seminar on Commutative Algebra and Related Topics, Institute for Studies in Theoretical Physics and Mathematics, Tehran, Iran; Jan. 2022

- *Singularity categories of sheaves*, Homological Commutative Algebra, Special Session at AMS Meeting #1161, virtual meeting (formerly at Chattanooga TN, U.S.A.); Oct. 2020
- *Complete resolutions*, Stable Cohomology: Foundations and Applications, Snowbird UT, U.S.A.; May 2018
- *Two-way traffic on the co-basechange highway*, International Conference on Homological Algebra, Lexington KY, U.S.A.; July 2015
- *Tate homology far beyond group algebras*, 7th China–Japan–Korea International Conference on Ring Theory, Hangzhou, P.R. China; July 2015
- *Stable homology*, International Conference on Representations of Algebras and Related Topics, Woods Hole MA, U.S.A.; May 2015
- *Tate homology beyond Gorenstein rings*, Homological bonds between Commutative Algebra and Representation Theory, University of Barcelona, Spain; Feb. 2015
- *Homology of tensor product complexes*, Directions in Commutative Algebra: Past, Present and Future (dedicated to the memory of H.-B. Foxby), Special Session at AMS Meeting #1102, Eau Claire WI, U.S.A.; Sep. 2014
- *Co-basechange of injective modules—the other direction*, International Conference on Representations of Algebras and Related Topics, Woods Hole MA, U.S.A.; May 2014
- *Representation theory of totally reflexive modules*, Commutative Algebra and its Interactions with Algebraic Geometry, Representation Theory, and Physics, Centro de Investigación en Matemáticas, Guanajuato, Mexico; May 2012
- *Brauer-Thrall for totally reflexive modules*, International Conference on Representations of Algebras and Related Topics, Woods Hole MA, U.S.A.; April 2011
- *Algebras that satisfy Auslander’s condition on vanishing of cohomology*, International Conference on Representations of Algebras and Related Topics, Woods Hole MA, U.S.A.; April 2010
- *Vanishing of Tate homology and depth formulas over local rings*, Relative Homological Algebra, Special Session at AMS Meeting #1057, Lexington KY, U.S.A.; March 2010
- *Simple hypersurface singularities via totally reflexive modules*, Fifth International Fez Conference on Commutative Algebra and Applications, Fez, Morocco; June 2008
- *Finite Gorenstein representation type implies simple singularity*, International Conference on Representations of Algebras and Related Topics, Woods Hole MA, U.S.A.; April 2008
- *Forced isomorphisms and two conjectures of Auslander*, KUMUNU VII, Lawrence KS, U.S.A.; Nov. 2006
- *Natural transformations detect finiteness of homological dimensions*, Conference on Triangulated Categories, Leeds, U.K.; Aug. 2006
- *Measuring Gorenstein dimensions*, Workshop on Homological Methods in Commutative Algebra, Institute for Studies in Theoretical Physics and Mathematics, Tehran, Iran; May 2002

SHORTER TALKS, 20–30 MINUTES

- *Regular rings*, Commutative Algebra, Special Session at AMS Meeting #1189, Omaha NE, U.S.A.; Oct. 2023
- *Revisiting the Improved New Intersection Theorem*, Homological Methods in Commutative Algebra, Special Session at AMS Meeting #1186, Cincinnati OH, U.S.A.; April 2023

- *Vanishing of Ext and Tor with coefficients in residue fields*, Homological Methods in Commutative Algebra, Special Session at AMS Meeting #1176, online meeting (formerly Medford MA, U.S.A.); March 2022
- *Gorenstein global dimensions*, Commutative Algebra, Special Session at AMS Meeting #1165, online meeting (formerly Providence RI, U.S.A.); March 2021
- *Dimension and codimension of homologically finite complexes*, DG Methods in Commutative Algebra and Representation Theory, online conference in lieu of Special Session at AMS Meeting #1158; May 2020
- *Gorenstein flat-cotorsion theory*, Homological Methods in Algebra, Special Session at AMS Meeting #1152, Gainesville FL, U.S.A.; Nov. 2019
- *5-generated perfect ideals of grade 3*, Commutative Algebra: in Celebration of the 150th birthday of Roger and Sylvia Wiegand, Special Session at AMS Meeting #1150, Madison WI, U.S.A.; Sep. 2019
- *Total acyclicity and flat-cotorsion theory*, Commutative Algebra and its Environs, Special Session at AMS Meeting #1147, Honolulu HI, U.S.A.; March 2019
- *Liaison and the classification of local rings of low codepth*, Homological Aspects of Commutative Algebra and Representation Theory, Special Session at AMS Meeting #1144, San Francisco CA, U.S.A.; Oct. 2018
- *Linkage classes of grade 3 perfect ideals*, Homological Commutative Algebra, Special Session at AMS Meeting #1139, Boston MA, U.S.A.; April 2018
- *Pure-minimal chain complexes*, Categorical, Homological and Combinatorial Methods in Algebra (Celebrating the 80th Birthday of S.K. Jain), Special Session at AMS Meeting #1136, Columbus OH, U.S.A.; March 2018
- *The licci property of grade 3 perfect ideals*, Commutative Algebra: Interactions with Algebraic Geometry and Algebraic Topology, Special Session at AMS Meeting #1133, Orlando FL, U.S.A.; Sep. 2017
- *The Golod property of powers of the maximal ideal*, Homological Methods in Commutative Algebra, Special Session at AMS Meeting #1131, Denton TX, U.S.A.; Sep. 2017
- *Homological dimensions of modules over a commutative noetherian ring; what's new?*, Commutative Algebra, Special Session at AMS Meeting #1129, New York City NY, U.S.A.; May 2017
- *Rigidity of Ext and Tor with coefficients in residue fields of a commutative noetherian ring*, Homological Methods in Commutative Algebra, Special Session at AMS Meeting #1124, Raleigh NC, U.S.A.; Nov. 2016
- *Tests for injectivity of modules over commutative rings*, Commutative Ring Theory, Special Session at AMS Meeting #1120, Fargo ND, U.S.A.; April 2016
- *Somewhere between Gorenstein and Golod*, Commutative Algebra, Special Session at AMS Meeting #1117, Athens GA, U.S.A.; March 2016
- *Stable homology*, Aspects of Resolutions and Syzygies in Commutative Algebra, Special Session at AMS Meeting #1115, New Brunswick NJ, U.S.A.; Nov. 2015
- *Intersections and sums of Gorenstein ideals*, Commutative Artinian Algebras and their Deformations, Special Session at the 2015 Joint International Meeting with the Amer. Math. Soc., the Eur. Math. Soc., and the Soc. Portuguesa de Mat., Porto, Portugal; June 2015

- *Injective modules and flat ring extensions*, Rings, Modules, Categories and Applications, Special Session at the First Joint Meeting of the Real Soc. Mat. Española, Unione Mat. Italiana, Soc. Catalana de Mat., Soc. Italiana per la Mat. Applicata e Industriale, and Soc. Española de Mat. Aplicada, Bilbao; Spain; July 2014
- *Local rings of embedding codepth 3*, Commutative Algebra and its Environs, Special Session at AMS Meeting #1090, Ames IA, U.S.A.; April 2013
- *Limits of finite free complexes*, Topics in Commutative Algebra, Special Session at AMS Meeting #1085, Tucson AZ, U.S.A.; Oct. 2012
- *Local rings of trivial \mathcal{G} -type*, Topics in Commutative Algebra, Special Session at AMS Meeting #1081, Lawrence KS, U.S.A.; March 2012
- *Building modules over a local ring from its singular locus*, Commutative Algebra, Special Session at AMS Meeting #1075, Salt Lake City UT, U.S.A.; Oct. 2011
- *A depth formula for Tate Tor-independent modules over Gorenstein rings*, Local Commutative Algebra, Special Session at AMS Meeting #1074, Lincoln NE, U.S.A.; Oct. 2011
- *Tate (co)homology via pinched complexes*, Homological Methods in Commutative Algebra, Special Session at AMS Meeting #1068, Statesboro GA, U.S.A.; March 2011
- *Vanishing of cohomology over Cohen–Macaulay algebras*, Trends in Commutative Algebra, Special Session at AMS Meeting #1059, Albuquerque NM, U.S.A.; April 2010
- *A Cohen–Macaulay algebra has only finitely many semi-dualizing modules*, Commutative Algebra and Applications to Algebraic Geometry, Special Session at AMS Meeting #1052, University Park PA, U.S.A.; Oct. 2009
- *Descent via Koszul extensions*, Free Resolutions, Special Session at AMS Meeting #1030, Chicago IL, U.S.A.; Oct. 2007
- *Finite Gorenstein representation type implies simple singularity*, Commutative Algebra and its Interaction with Algebraic Geometry, Banff International Research Station, Banff AB, Canada; June 2007
- *Descent via Koszul extensions*, Advances in Algebra and Geometry, Mathematical Sciences Research Institute, Berkeley CA, U.S.A.; April 2007
- *Acyclicity of complexes detects Gorensteinness of rings*, Commutative Algebra, Special Session at AMS Meeting #1019, Salt Lake City UT, U.S.A.; Oct. 2006
- *Acyclicity over local rings with $\mathfrak{m}^3 = 0$* , Summer School on Monomial Resolutions and Hilbert Functions, Cornell University, Ithaca NY, U.S.A.; May 2006
- *Short rings with long complexes*, Resolutions and Hilbert Functions, Special Session at AMS Meeting #1018, San Francisco CA, U.S.A.; April 2006
- *When are evaluation homomorphisms invertible?*, Homological Aspects of Commutative Algebra, Special Session at AMS Meeting #1009, Annandale-on-Hudson NY, U.S.A.; Oct. 2005
- *Stable cohomology*, Minnowbrook Workshop on Commutative Algebra, Syracuse University Conference Center, Minnowbrook NY, U.S.A.; Aug. 2005
- *New formulas of the Auslander–Buchsbaum type*, Nebraska Commutative Algebra Conference: WiegandFest, Lincoln NE, U.S.A.; May 2005
- *Gorenstein dimension of modules finite over homomorphisms*, Homological Algebra and Its Applications, Special Session at AMS Meeting #1006, Lubbock TX, U.S.A.; April 2005

- *Adjoint functors and Gorenstein dimensions*, Homological Algebra of Commutative Rings, Special Session at the Sixth International Joint Meeting of the Amer. Math. Soc. and the Soc. Mat. Mexicana, Houston TX, U.S.A.; May 2004
- *Semi-dualizing complexes*, Conference on Commutative Algebra and Algebraic Geometry, Messina, Italy; June 1999

COLLOQUIA

- University of Nebraska, Lincoln, U.S.A.; Sep. 2018
- University of South Carolina, Columbia, U.S.A.; March 2018
- Texas Tech University, Lubbock, U.S.A.; Sep. 2015
- University of Texas, Arlington, U.S.A.; Nov. 2014
- Miami University, Oxford OH, U.S.A.; April 2013
- University of Missouri, Columbia, U.S.A.; Nov. 2012
- Texas Tech University, Lubbock, U.S.A.; Oct. 2010
- New Mexico State University, Las Cruces, U.S.A.; Jan. 2010
- NYC College of Technology, Brooklyn NY, U.S.A.; Oct. 2009
- Nanjing University, P.R. China; July 2008
- University of Missouri, Columbia, U.S.A.; March 2008
- North Dakota State University, Fargo, U.S.A.; Nov. 2007
- Osaka Prefecture University, Japan; May 2007
- Okayama University, Japan; May 2007
- Shinshu University, Matsumoto, Japan; May 2007
- Shizuoka University, Japan; May 2007
- University of Missouri, Kansas City MO, U.S.A.; March 2007
- Kent State University, Kent OH, U.S.A.; Feb. 2007
- Cal Poly State University, San Luis Obispo CA, U.S.A.; Jan. 2007
- Texas Tech University, Lubbock, U.S.A.; Feb. 2006
- University of Kentucky, Lexington, U.S.A.; Nov. 2005
- University of Nebraska, Lincoln, U.S.A.; Nov. 2005
- University of Copenhagen, Denmark; Feb. 2004

SEMINARS²

- Aarhus University, Denmark; Nov. 2022 (homological algebra)
- University of Murcia, Spain; Oct. 2021 (algebra)
- University of Murcia, Spain; Dec. 2019 (algebra)
- Norwegian University of Science and Technology, Trondheim, Norway; Nov. 2019 (algebra)
- Northeastern University, Boston MA, U.S.A.; June 2019 (commutative algebra)
- University of Murcia, Spain; Feb. 2019 (algebra)
- University of Copenhagen, Denmark; Dec. 2018 (algebra and topology)

² Seminars at home institution not included

- University of Utah, Salt Lake City, U.S.A.; Nov. 2018 (commutative algebra)
- University of Nebraska, Lincoln; Sep. 2018 (commutative algebra)
- University of Copenhagen, Denmark; June 2018 (algebra and topology)
- University of Kansas, Lawrence, U.S.A.; Nov. 2016 (commutative algebra)
- Osaka Prefecture University, Japan; June 2016 (algebra)
- University of Connecticut, Storrs, U.S.A.; April 2016 (commutative algebra)
- University of Utah, Salt Lake City, U.S.A.; March 2016 (commutative algebra)
- University of Texas, Arlington, U.S.A.; Feb. 2016 (algebra)
- Nanjing University, P.R. China; June 2015 (algebra)
- Nanjing Normal University, P.R. China; June 2015 (algebra)
- University of Kentucky, Lexington, U.S.A.; April 2015 (commutative algebra)
- University of Copenhagen, Denmark; April 2015 (algebra and topology)
- University of Sheffield, U.K.; March 2015 (commutative algebra and algebraic geometry)
- University of Murcia, Spain; March 2015 (algebra)
- University of Copenhagen, Denmark; Dec. 2014 (algebra and topology)
- CUNY Graduate Center, New York City, U.S.A.; Oct. 2014 (comm. alg. and alg. geometry)
- University of Wisconsin, Madison, U.S.A.; Oct. 2014 (algebra)
- University of Missouri, Columbia, U.S.A.; Nov. 2013 (algebra)
- CUNY Graduate Center, New York City, U.S.A.; May 2013 (comm. alg. and alg. geometry)
- Oklahoma State University, Stillwater, U.S.A.; April 2013 (commutative algebra)
- University of California, Berkeley, U.S.A.; March 2013 (comm. alg. and alg. geometry)
- University of Arizona, Tucson, U.S.A.; Feb. 2013 (algebra)
- University of Copenhagen, Denmark; Jan. 2013 (algebra and topology)
- Autonomous University of Barcelona, Spain; Dec. 2012 (homological algebra)
- University of Nebraska, Lincoln, U.S.A.; Oct. 2012 (commutative algebra)
- University of Copenhagen, Denmark; Jan. 2012 (algebra and topology)
- University of Barcelona, Spain; May 2011 (algebraic geometry)
- CUNY Graduate Center, New York City, U.S.A.; March 2011 (comm. alg. and alg. geometry)
- University of California, Riverside, U.S.A.; Feb. 2011 (algebra)
- University of Copenhagen, Denmark; Dec. 2010 (algebra and topology)
- CUNY Graduate Center, New York City, U.S.A.; Oct. 2010 (comm. alg. and alg. geometry)
- New Mexico State University, Las Cruces, U.S.A.; Jan. 2010 (algebra)
- University of Kansas, Lawrence, U.S.A.; Nov. 2009 (commutative algebra)
- CUNY Graduate Center, New York City, U.S.A.; Oct. 2009 (comm. alg. and alg. geometry)
- Yale University, New Haven CT, U.S.A.; Oct. 2009 (algebra and Lie groups)
- University of Copenhagen, Denmark; June 2009 (algebra and topology)
- University of Osnabrück, Germany; June 2009 (algebra and topology)
- University of Paderborn, Germany; June 2009 (representation theory)
- University of Texas, Arlington, U.S.A.; April 2009 (algebra)
- University of Nebraska, Lincoln, U.S.A.; April 2009 (commutative algebra)
- CUNY Graduate Center, New York City, U.S.A.; Feb. 2009 (comm. alg. and alg. geometry)

- Texas A&M University, College Station, U.S.A.; Feb. 2009 (algebraic geometry)
- University of Colorado, Denver, U.S.A.; Jan. 2009 (discrete mathematics)
- University of Utah, Salt Lake City, U.S.A.; Jan. 2009 (commutative algebra)
- University of Copenhagen, Denmark; Dec. 2008 (algebra and topology)
- Nanjing Normal University, P.R. China; July 2008 (algebra)
- University of Missouri, Columbia, U.S.A.; March 2008 (algebra)
- University of Nebraska, Lincoln, U.S.A.; Feb. 2008 (commutative algebra)
- University of Copenhagen, Denmark; Dec. 2007 (algebra and topology)
- University of Aarhus, Denmark; July 2007 (algebra)
- Okayama University, Japan; May 2007 (algebra)
- Nagoya University, Japan; May 2007 (representation theory)
- Meiji University, Tokyo, Japan; May 2007 (commutative algebra)
- University of Utah, Salt Lake City, U.S.A.; March 2007 (commutative algebra)
- Texas Tech University, Lubbock, U.S.A.; Feb. 2007 (algebra)
- Cal Poly State University, San Luis Obispo CA, U.S.A.; Jan. 2007 (algebra)
- University of Copenhagen, Denmark; Dec. 2006 (algebra and topology)
- University of Copenhagen, Denmark; Jan. 2006 (algebra)
- University of Utah, Salt Lake City, U.S.A.; Dec. 2005 (commutative algebra)
- Northeastern University, Boston MA, U.S.A.; Nov. 2005 (representation theory)
- University of Copenhagen, Denmark; May 2005 (algebra)
- University of Aarhus, Denmark; May 2005 (algebra)
- University of Utah, Salt Lake City, U.S.A.; March 2005 (commutative algebra)
- Syracuse University, Syracuse NY, U.S.A.; March 2005 (algebra)
- University of Nebraska, Lincoln, U.S.A.; Oct. 2003 (commutative algebra)
- University of Missouri, Columbia, U.S.A.; Sep. 2002 (algebra)
- University of Missouri, Columbia, U.S.A.; Nov. 1998 (algebra)
- Purdue University, West Lafayette IN, U.S.A.; Aug. 1998 (commutative algebra)

OTHER RESEARCH ACTIVITIES³

- Research in Pairs (two weeks, with H. Holm),
Centro Internazionale per la Ricerca Matematica, Trento, Italy; April 2019
- Research in Pairs (two weeks, with H. Holm),
Centre International de Rencontres Mathématiques, Luminy, Marseille, France; March 2017
- *Opening Perspectives in Algebra, Representations, and Topology* (workshop),
Centre de Recerca Matemàtica, Barcelona, Spain; May 2015
- *Macaulay2 Workshop and Conference*,
University of Illinois, Urbana–Champaign, U.S.A.; June 2014
- *Representation Theory, Homological Algebra, and Free Resolutions* (workshop),
Mathematical Sciences Research Institute, Berkeley CA, U.S.A.; Feb. 2013

³ Including longer conferences and workshops that are not included under talks given or meetings organized

- *Noncommutative Algebraic Geometry and Representation Theory* (workshop), Mathematical Sciences Research Institute, Berkeley CA, U.S.A.; Jan. 2013
- Research in Teams (one week, with H. Holm), Banff International Research Station, Banff AB, Canada; Nov. 2010
- Research in Pairs (two weeks, with H. Holm), Mathematisches Forschungsinstitut Oberwolfach, Germany; May 2010
- *Triangulated Categories and Singularities* (workshop), University of Paderborn, Germany; May 2009
- Research in Pairs (two weeks, with H.-B. Foxby and H. Holm), Mathematisches Forschungsinstitut Oberwolfach, Germany; Oct.–Nov. 2008
- Research in Teams (one week, with H. Holm), Banff International Research Station, Banff AB, Canada; June 2008
- *Workshop on Syzygies and Hilbert Functions*, Banff International Research Station, Banff AB, Canada; Oct. 2006
- *Summer School on Interactions between Homotopy Theory and Algebra*, University of Chicago, IL, U.S.A.; July–Aug. 2004

CONFERENCES AND WORKSHOPS ORGANIZED

- *Free Resolutions and Representation Theory* [with C. Miller, S. Sam, and J. Weyman], Institute for Computational and Experimental Research in Math., Providence RI, U.S.A.; Aug. 2020
- *Stable Cohomology: Foundations and Applications* [with S.B. Iyengar, M.E. Walker, and S. Witherspoon], Snowbird UT, U.S.A.; May 2018
- *Structures on Free Resolutions* [with P. Thompson], Sixteenth Red Raider Mini-Symposium, Lubbock TX, U.S.A.; Oct. 2017
- *Homological and Combinatorial Commutative Algebra* [with I. Henriques and M. Vas Pinto], Special Session at the 2015 Joint International Meeting with the Amer. Math. Soc., the Eur. Math. Soc., and the Soc. Portuguesa de Mat., Porto, Portugal; June 2015
- *Homological Methods in Algebra* [with H. Rahmati and J. Striuli], Special Session at AMS Meeting #1100, Lubbock TX, U.S.A.; April 2014
- *Commutative Algebra: Module and Ideal Theory* [with L. Fouli and D.A. Jorgensen], Special Session at AMS Meeting #1051, Waco TX, U.S.A.; Oct. 2009
- *Commutative Algebra: Connections with Algebraic Topology and Representation Theory* [with M. Chardin, S. Iyengar, R. Wiegand, and S. Wiegand], a conference on the occasion of Luchezar Avramov's 60th birthday, Lincoln NE, U.S.A.; May 2008
- *Progress in Commutative Algebra* [with S. Sather-Wagstaff and J. Striuli], AMS Special Session at the Joint Mathematics Meetings, San Diego CA, U.S.A.; Jan. 2008
- *Commutative Algebra* [with S. Iyengar and S. Sather-Wagstaff], Special Session at AMS Meeting #1011, Lincoln NE, U.S.A.; Oct. 2005

SOUTHWEST LOCAL ALGEBRA MEETINGS [WITH L. FOULI, D.A. JORGENSEN ET. AL.]

- Norman OK, U.S.A.; March 2024 [with J. Kujawa and J. Montaña]
- Denton TX, U.S.A.; March 2023 [with C. Conley, J. Montaña, and A. Shepler]

- Waco TX, U.S.A.; Feb. 2022 [with D. Herden and M. Sepanski]
- New Orleans LA, U.S.A.; March 2020 [with T. H. Hà]
- El Paso TX, U.S.A.; Feb. 2019 [with A. Duval]
- Fayetteville AR, U.S.A.; Feb. 2018 [with M. Johnson and P. Mateo]
- Albuquerque NM, U.S.A.; March 2017 [with J. Vassilev]
- San Marcos TX, U.S.A.; Feb. 2016 [with S. Morey and P. Shroff]
- Stillwater OK, U.S.A.; Feb. 2015 [with C. Fransisco, J. Mermin, and J. Schweig]
- College Station TX, U.S.A.; March 2014 [with L.F. Matusevich and S. Witherspoon]
- Tucson AZ, U.S.A.; March 2013 [with K. Beck and R.C. Heitmann]
- Lubbock TX, U.S.A.; March 2012 [with R.C. Heitmann]
- Las Cruces NM, U.S.A.; March 2011 [with R.C. Heitmann]
- Arlington TX, U.S.A.; March 2010

EXPOSITORY LECTURES

- Niagara University, Niagara NY, U.S.A.; March 2022 (*NU Student Mathematics Colloquium*)
- Northeastern University, Boston MA, U.S.A.; Dec. 2021 (online guest lecture)
- Texas Tech University, Lubbock, U.S.A.; May 2019 (*17th Emmy Noether High School Day*)
- Texas Tech University, Lubbock, U.S.A.; March 2019 (*Math Club*)
- Texas Tech University, Lubbock, U.S.A.; May 2018 (*16th Emmy Noether High School Day*)
- Osaka Prefecture University, Japan; May–June 2016 (lecture series for undergraduates)
- Texas Tech University, Lubbock, U.S.A.; May 2016 (*14th Emmy Noether High School Day*)
- Texas State University, San Marcos, U.S.A.; April 2016 (*Math Club*)
- Texas Tech University, Lubbock, U.S.A.; May 2015 (*13th Emmy Noether High School Day*)
- Texas Tech University, Lubbock, U.S.A.; June 2012 (*TTU Summer Math Academy*)
- Montclair State University, Montclair NJ, U.S.A.; Sep. 2011 (*CSAM Seminar series*)
- Texas Tech University, Lubbock, U.S.A.; May 2011 (*9th Emmy Noether High School Day*)
- University of Copenhagen, Denmark; Dec. 2010 (*Social Event with a Scientific Twist*)
- Texas Tech University, Lubbock, U.S.A.; Nov. 2010 (undergraduate colloquium)
- Fairfield University, Fairfield CT, U.S.A.; March 2009 (public lecture)
- University of Nebraska, Lincoln, U.S.A.; Feb. 2008 (joint math. and computer sci. coll.)
- North Dakota State University, Fargo, U.S.A.; Nov. 2007 (undergraduate colloquium)
- Texas Tech University, Lubbock, U.S.A.; Nov. 2007 (MAA undergraduate colloquium)
- University of Missouri, Kansas City MO, U.S.A.; March 2007 (*Expository Talks series*)
- University of Nebraska, Lincoln, U.S.A.; Oct. 2003 (*Landscape Seminar series*)
- Copenhagen College of Engineering, Denmark; May 2003 (undergraduate colloquium)
- Club de la Sécurité des Systèmes d'Information Luxembourgeois, Luxembourg; Oct. 2002
- The Danish Society of Engineers, Copenhagen, Denmark; Feb. 2002
- University of Copenhagen, Denmark; Feb. 2002 (undergraduate colloquium)
- University of Copenhagen, Denmark; Nov. 1995 (undergraduate colloquium)

OTHER PROFESSIONAL SERVICE

- **External examiner** for the universities in Denmark (2002–2014), appointed by the Danish Ministry of Science, Technology, and Innovation
- **External examiner** at the Royal Danish Military Academy and the Danish Army Special Training School (1991–1998)
- **Member** of the American Mathematical Society Committee on Professional Ethics (2021–2024)
Chair (2023–2024)
- **Member** of the Amer. Math. Soc. Sectional Meetings Travel Grants Committee (2021–2023)
- **Member** of Quantitative Reasoning Faculty Working Group under the Charles A. Dana Center, University of Texas at Austin (2015–2016)
- **Panel member** for the National Science Foundation Division of Mathematical Sciences
- **Proposal reviewer** for the National Security Agency Mathematical Sciences Program
- **Referee** of monographs for Springer-Verlag and de Gruyter and of papers for Adv. Math., Amer. J. Math., Forum Math., Int. Math. Res. Not., J. Eur. Math. Soc., J. Lond. Math. Soc., Math. Z., Notices Amer. Math. Soc., Q.J. Math., Trans. Amer. Math. Soc., and other journals
- **Reviewer** for Mathematical Reviews

COMMITTEE WORK⁴ and other service to Texas Tech University

- Tenure and Promotion Committee, College of Arts and Sciences (appointed, 2018–2021)
- Organizing Committee for Emmy Noether High School Mathematics Days (appt., 2014–2019)
- Math Circle co-organizer (2014–2016) and organizer (2016–2018)
- Scheduling Officer, Department of Mathematics and Statistics (appointed, 2016–2018)
- Executive Committee, Department of Mathematics and Statistics (elected, 2015–2017)
- Scholarship Committee, Department of Mathematics and Statistics (appointed, 2010–2017)
- Faculty advisor to Student Chapter of Mathematical Association of America (appt., 2014–2016)
- Undergraduate Committee, Department of Mathematics and Statistics (elected, 2013–2015)
- Graduate Committee, Department of Mathematics and Statistics (elected, 2011–2013)

CURRICULUM DEVELOPMENT

TEXAS TECH UNIVERSITY

- Math 1300 Contemporary Mathematics
- Math 3310 Introduction to Mathematical Reasoning and Proofs
- Math 5317 Introduction to Modern Algebra
- Math 6321 Homological Algebra I: Introduction
- Math 6322 Homological Algebra II: Applications

ROYAL DANISH MILITARY ACADEMY (1995–1997)

- Applied Mathematics, a course of 110 lectures on applications of mathematics to problems in the military, economic, and political sciences

⁴ Standing committees only; service on ad-hoc committees not included

COURSES TAUGHT

TEXAS TECH UNIVERSITY

- Math 1300 Contemporary Mathematics (course coordinator)
- Math 2350 Calculus III
- Math 2360 Linear Algebra
- Math 3310 Introduction to Mathematical Reasoning and Proof
- Math 3350 Higher Mathematics for Engineers and Scientists I
- Math 3360 Foundations of Algebra I
- Math 4360 Foundations of Algebra II
- Math 4000/5399 Phylogenetics (graduate level)
- Math 5316 Applied Linear Algebra (graduate level)
- Math 5317 Introduction to Modern Algebra (graduate level)
- Math 5326 Modern Algebra I (graduate level)
- Math 5327 Modern Algebra II (graduate level)
- Math 5399 Commutative Algebra and Geometry (graduate level)
- Math 5399 Computational Commutative Algebra (graduate level)
- Math 6320 Representation Theory (graduate level)
- Math 6321 Homological Algebra I: Introduction (graduate level)
- Math 6322 Homological Algebra II: Applications (graduate level)

UNIVERSITY OF NEBRASKA-LINCOLN (2004–2007)

- Math 203 Contemporary Mathematics (course coordinator)
- Math 208 Analytical Geometry and Calculus III
- Math 221 Differential Equations
- Math 310 Introduction to Abstract Algebra
- Math 918 Derived Category Methods in Commutative Algebra (graduate level)

UNIVERSITY OF COPENHAGEN (1993–1999 AND 2004)

- Mat 1GA Elementary Analysis and Linear Algebra
- Mat 1GB Multivariable Analysis
- Mat 2AL Abstract Algebra
- Mat 3AG Projective Algebraic Geometry
- Mat 5HA Hyperhomological Algebra (graduate level)

ROYAL DANISH MILITARY ACADEMY (1995–1997)

- Applied Mathematics
- Calculus
- Probability and Statistics