

CURRICULUM VITÆ

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EDUCATION:

B.S. Pennsylvania State University State College, PA August 1973
Ph.D. University of Illinois Urbana, Illinois June 1979
Advisor: Phillip Griffith

EXPERIENCE:

1979–1982	Instructor	University of Kansas
1982–1984	Assistant Professor	University of South Carolina
1984–1991	Associate Professor	University of South Carolina
1988–1989	Visiting Associate Professor	Michigan State University
1991–present	Professor	University of South Carolina
Fall 2007	Visiting Scholar	Purdue University
Fall 2008	Visiting Professor	University of Notre Dame
2014–2015	Visiting Professor	University of Notre Dame

RESEARCH SUPPORT:

1980	University of Kansas	summer grant
1981	National Science Foundation	summer grant
1982–1983	National Science Foundation	summer grant
1984	National Science Foundation (with W. T. Trotter, et. al.)	EPSCoR grant
1986–1987	National Science Foundation	summer grant
1988–1989	National Science Foundation	summer grant
1991–1993	National Science Foundation (with M. Miller)	summer grant
1994–1996	National Science Foundation (with G. McNulty, et al.)	SCREMS grant to purchase computers
1994–1997	National Science Foundation	summer grant
2005–2006	National Security Agency (with M. Miller, S. Spiroff, A. Singh)	conference grant
2008–2010	National Security Agency	summer grant
2009–2010	National Security Agency (with F. Enescu, A. Vraciu, Y. Yao)	conference grant
2010–2012	National Security Agency	summer grant
2012–2018	Simons Foundation	Collaboration Grant
2013	National Science Foundation (with M. Ballard, J. Kass, A. Vraciu)	conference grant

PUBLICATIONS:

- [1] A. Kustin, *Locally power series algebras over normal domains*, J. of Algebra **64** (1980), 20–28.
- [2] A. Kustin, *A classification of locally power series algebras*, J. of Pure and Applied Algebra **17** (1980), 293–303.
- [3] A. Kustin and M. Miller, *Algebra structures on minimal resolutions of Gorenstein rings of embedding codimension four*, Math. Z. **173** (1980), 171–184.
- [4] A. Kustin and M. Miller, *A general resolution for grade four Gorenstein ideals*, Manuscripta Math. **35** (1981), 221–269.
- [5] A. Kustin and M. Miller, *Algebra structures on minimal resolutions of Gorenstein rings*, Commutative algebra: analytic methods, Lecture Notes in Pure and Appl. Math. **68** Marcel Dekker, New York (1982), 45–66.
- [6] A. Kustin and M. Miller, *Structure theory for a class of grade four Gorenstein ideals*, Trans. Amer. Math. Soc. **270** (1982), 287–307.
- [7] J. Brewer and A. Kustin, *Constructing projective algebras*, J. of Algebra **75** (1982), 426–436.
- [8] A. Kustin and M. Miller, *Constructing big Gorenstein ideals from small ones*, J. of Algebra **85** (1983), 303–322.
- [9] A. Kustin and M. Miller, *Multiplicative structure on resolutions of algebras defined by Herzog ideals*, J. of Lond. Math. Soc. **28** (1983), 247–260.
- [10] A. Kustin and M. Miller, *Deformation and linkage of Gorenstein algebras*, Trans. Amer. Math. Soc. **284** (1984), 501–534.
- [11] A. Kustin, *New examples of rigid Gorenstein unique factorization domains*, Comm. in Algebra **12** (1984), 2409–2439.
- [12] J. Griggs, A. Kustin, J. Ross, and J. Stahl, *The lexicographic sum of Cohen-Macaulay and shellable ordered sets*, Graphs and Combinatorics **1** (1985), 145–163.
- [13] A. Kustin and M. Miller, *Tight double linkage of Gorenstein algebras*, J. of Algebra **95** (1985), 384–397.
- [14] A. Kustin and M. Miller, *Classification of the Tor-algebras of codimension four Gorenstein local rings*, Math. Z. **190** (1985), 341–355.
- [15] C. Jacobsson, A. Kustin, and M. Miller, *The Poincaré series of a codimension four Gorenstein ring is rational*, J. of Pure and Applied Algebra **38** (1985), 255–275.
- [16] A. Kustin, *The minimal free resolutions of the Huneke-Ulrich deviation two Gorenstein ideals*, J. of Algebra **100** (1986), 265–304.
- [17] A. Kustin, M. Miller, and B. Ulrich, *Linkage theory for algebras with pure resolutions*, J. of Algebra **102** (1986), 199–228.

- [18] A. Kustin, *Gorenstein algebras of codimension four and characteristic two*, Comm. in Algebra **15** (1987), 2417–2429.
- [19] L. Avramov, A. Kustin, and M. Miller, *Poincaré series of modules over local rings of small embedding codepth or small linking number*, J. of Algebra **118** (1988), 162–204.
- [20] W. Bruns, A. Kustin, and M. Miller, *The resolution of the generic residual intersection of a complete intersection*, J. of Algebra **128** (1990), 214–239.
- [21] A. Kustin, M. Miller, and B. Ulrich, *Generating a residual intersection*, J. of Algebra **146** (1992), 335–384.
- [22] A. Kustin and B. Ulrich, *If the socle fits*, J. of Algebra **147** (1992), 63–80.
- [23] A. Kustin and B. Ulrich, *A family of complexes associated to an almost alternating map, with applications to residual intersections*, Memoirs Amer. Math. Soc. **95** (1992), 1–94.
- [24] A. Kustin, *Complexes which arise from a matrix and a vector: resolutions of divisors on certain varieties of complexes*, J. of Algebra **158** (1993), 420–491.
- [25] A. Kustin, *Classification of the Tor-algebras of codimension four almost complete intersections*, Trans. Amer. Math. Soc. **339** (1993), 61–85.
- [26] A. Kustin, *The minimal resolution of a codimension four almost complete intersection is a DG-algebra*, J. of Algebra **168** (1994), 371–399.
- [27] A. Kustin and S. Palmer Slattery, *The Poincaré series of every finitely generated module over a codimension four almost complete intersection is a rational function*, J. of Pure and Applied Algebra. **95** (1994), 271–295.
- [28] A. Kustin, *Pfaffian identities, with applications to free resolutions, DG-Algebras, and algebras with straightening law*, Contemporary Math. **159** (1994), 269–292.
- [29] A. Kustin, *The deviation two Gorenstein rings of Huneke and Ulrich*, Commutative Algebra, 14–25 September 1992, ICTP, Trieste, Italy, World Scientific Publishing Co., River Edge, NJ (1994), 140–163.
- [30] A. Kustin, *Huneke-Ulrich almost complete intersections of Cohen-Macaulay type two*, J. of Algebra **174** (1995), 373–429.
- [31] A. Kustin, *Ideals associated to two sequences and a matrix*, Comm. in Algebra **23** (1995), 1047–1084.
- [32] A. Kustin, *The minimal free resolution of the Migliore-Peterson rings in the case that the reflexive sheaf has even rank*, J. of Algebra **207** (1998), 572–615.
- [33] A. Kustin, *Complexes associated to two vectors and a rectangular matrix*, Memoirs of the Amer. Math. Soc. **147** (2000), 1–81.
- [34] A. Kustin, *The cohomology of the Koszul complexes associated to the tensor product of two free modules*, Comm. in Algebra **33** (2005), 467–495.

- [35] A. Kustin, *The resolution of the universal ring for modules of rank zero and projective dimension two*, J. of Algebra **310** (2007), 261–289.
- [36] A. Kustin and J. Weyman, *On the minimal free resolution of the universal ring for resolutions of length two*, J. of Algebra **311** (2007), 435–462.
- [37] A. Kustin and A. Vraciu, *Socle degrees of Frobenius powers*, Illinois J. Math. **51** (2007), 185–208.
- [38] A. Kustin, *An explicit, characteristic-free, equivariant homology equivalence between Koszul complexes*, Comm. in Algebra **36** (2008), 3263–3316.
- [39] A. Kustin and B. Ulrich, *Socle Degrees, Resolutions, and Frobenius Powers*, J. of Algebra **322** (2009), 25–41.
- [40] A. Kustin, C. Polini, and B. Ulrich, *Divisors on Rational Normal Scrolls*, J. of Algebra **322** (2009), 1748–1773.
- [41] A. Kustin, C. Polini, and B. Ulrich, *Rational Normal Scrolls and the Defining Equations of Rees Algebras*, Journal für die reine und angewandte Mathematik **650** (2011), 23–65.
- [42] A. Kustin, H. Rahmati, and A. Vraciu, *The resolution of the bracket powers of the maximal ideal in a diagonal hypersurface ring*, Journal of Algebra, **369** (2012), 256–321.
- [43] D. Cox, A. Kustin, C. Polini, and B. Ulrich, *A study of singularities on rational curves via syzygies*, Memoirs Amer. Math. Soc. **222** (2013), 1–116.
- [44] A. Kustin, C. Polini, and B. Ulrich, *Integral extensions and the a -invariant*, Journal of Pure and Applied Algebra **216** (2012), 2800 – 2806.
- [45] A. Kustin and A. Vraciu, *The Weak Lefschetz Property for monomial complete intersections*, Trans. Amer. Math. Soc. **366** (2014), 4571–4601.
- [46] A. Kustin, C. Polini, and B. Ulrich, *The bi-graded structure of symmetric algebras with applications to Rees rings*, J. Algebra **469** (2017), 188–250.
- [47] A. Kustin, J. Striuli, and A. Vraciu, *Exact pairs of homogeneous zero divisors*, J. Algebra **453** (2016), 221–248.
- [48] S. El Khoury and A. Kustin, *Artinian Gorenstein algebras with linear resolutions*, J. Algebra **420** (2014), 402–474.
- [49] A. Kustin, L. Şega, and A. Vraciu, *Minimal quasi-complete intersection ideals*, Illinois J. Math. **58** (2014), 867–889.
- [50] S. El Khoury and A. Kustin, *The explicit minimal resolution constructed from a Macaulay inverse system*, J. Algebra **440** (2015), 145–186.
- [51] S. El Khoury and A. Kustin, *The structure of Gorenstein-linear resolutions of Artinian algebras*, J. Algebra **453** (2016), 492–560.

- [52] A. Kustin, C. Polini, and B. Ulrich, *Blowups and fibers of morphisms*, Nagoya Math. J. **224** (2016), 168–201.
- [53] A. Kustin, C. Polini, and B. Ulrich, *The Hilbert series of the ring associated to an almost alternating matrix*, Comm. Algebra **44** (2016), 3053–3068.
- [54] A. Kustin, C. Polini, and B. Ulrich, *The equations defining blowup algebras of height three Gorenstein ideals*, Algebra Number Theory **11** (2017), 1489–1525.
- [55] A. Kustin, C. Polini, and B. Ulrich, *A matrix of linear forms which is annihilated by a vector of indeterminates*, J. Algebra **469** (2017), 120–187.
- [56] A. Kustin, C. Polini, and B. Ulrich, *Degree bounds for local cohomology*, Proc. Lond. Math. Soc. **121** (2020), 1251–1267.
- [57] A. Kustin, *Canonical complexes associated to a matrix*, J. Algebra **460** (2016), 60–101.
- [58] A. Kustin, *An alternating matrix and a vector, with application to Aluffi algebras* J. Algebra **472** (2017), 115–145.
- [59] A. Kustin, L. Şega, and A. Vraciu, *Poincaré series of compressed local Artinian rings with odd top socle degree*, J. Algebra **505** (2018), 383–419.
- [60] A. Kustin and A. Vraciu, *Totally reflexive modules over rings that are close to Gorenstein*, J. Algebra **571** (2021), 190–231.
- [61] A. Kustin and L. Şega, *The structure of quasi-complete intersection ideals*, J. Algebra **632** (2023), 286–309.
- [62] A. Kustin, *Resolutions of length four which are Differential Graded Algebras*, J. Commut. Algebra **12** (2020), 509–538.
- [63] A. Kustin, *Use DG-methods to build a matrix factorization*, J. Commut. Algebra **14** (2022), 229–266.
- [64] A. Kustin, *Perfect modules with Betti numbers $(2, 6, 5, 1)$* , J. Algebra **600** (2022), 71–124.
- [65] A. Kustin, Rebecca R.G., and A. Vraciu, *The resolution of (x^N, y^N, z^N, w^N)* , J. Algebra **590** (2022), 338–393.
- [66] A. Kustin, Rebecca R.G., and A. Vraciu, *The syzygies of the ideal $(x_1^N, x_2^N, x_3^N, x_4^N)$ in the hypersurface ring defined by $x_1^n + x_2^n + x_3^n + x_4^n$* , J. Algebra **615** (2023), 205–242.
- [67] S. Khoury and A. Kustin, *Quadratically presented Gorenstein ideals*, J. Algebra **622** (2023), 258–290.
- [68] A. Kustin, *The weak Lefschetz property for Standard graded, Artinian Gorenstein algebras of embedding dimension four and socle degree three*. Submitted for publication.

- [69] S. El Khoury and A. Kustin, *Artinian Gorenstein algebras of embedding dimension four and socle degree three over an arbitrary field*. Submitted for publication.
<https://arxiv.org/abs/2402.13354>

STUDENTS:

Colin Day	M.A.	December, 1989
Susan Palmer Slattery	Ph.D.	August, 1990
Franz Soares	M.A.	Summer, 1995
Chris Portwood	M.A.	August, 2006
Carrie Finch	Ph.D. (co-advisor)	December, 2006
Brett Barwick	Ph.D.	August, 2012
Jaree Hudson	Ph.D.	August, 2018
Thomas Schnibben	Ph.D.	August, 2018
Hannah Kimbrel	M.A.	August, 2019
Keller VandeBogert	Ph.D.	August, 2021

MEETINGS AND CONFERENCES ORGANIZED:

Organized (with F. Curtis) Special Session on Commutative Algebra, AMS meeting, Orono, Maine, August, 1991.

Organized (with M. Miller) Special Session on Homological aspects of commutative ring theory, AMS meeting, Kent State University, November, 1995.

Organized (with S. Spiroff, M. Miller, and A. Singh) Commutative Algebra Conference honoring the contributions of Phillip Griffith, September 16-18, 2005.

Organized (with A. Vraciu) Georgia State University– University of South Carolina Commutative Algebra Seminar, Columbia, S.C., November, 2006.

Organized (with F. Enescu and A. Vraciu) Special Session on Commutative Algebra and Algebraic Geometry, AMS meeting, Davidson College, March, 2007.

Organized (with A. Vraciu) Georgia State University– University of South Carolina Commutative Algebra Seminar, Columbia, S.C., April, 2007.

Organized (with A. Vraciu) Georgia State University– University of South Carolina Commutative Algebra Seminar, Columbia, S.C., November, 2007.

Organized (with A. Vraciu) Georgia State University– University of South Carolina Commutative Algebra Seminar, Columbia, S.C., January, 2008.

Organized (with A. Vraciu) Georgia State University– University of South Carolina Commutative Algebra Seminar, Columbia, S.C., November, 2008.

Organized (with A. Vraciu) Georgia State University– University of South Carolina Commutative Algebra Seminar, Columbia, S.C., April, 2009.

Organized (with A. Vraciu) Commutative Algebra Meetings in the Southeast, Columbia, S.C., September, 2009.

Organized (with S. Sather-Wagstaff and J. Vassilev) Special Session on Homological Aspects of Module Theory, AMS meeting, Florida Atlantic University, October-November, 2009.

Organized (with A. Vraciu) Commutative Algebra Meetings in the Southeast, Columbia, S.C., March, 2011.

Organized (with M. Ballard, J. Kass, and A. Vraciu) Commutative Algebra and Algebraic Geometry in the Southeast, Columbia, S.C., November, 2013.

Organized (with J. Carleson) Special Session on Commutative Algebra, AMS meeting, University of Georgia, March, 2016.

Member of the Scientific Committee, International Meeting in Commutative Algebra and its Related Areas, Instituto de Ciências Matemáticas e de Computação - Universidade De São Paulo, Brazil, July, 2017

INVITED TALKS:

Colloquium, Wesleyan University, November, 1977.

Colloquium, University of Maine, May, 1979.

Conference on Analytic methods in Commutative Algebra, George Mason University, August, 1979.

Seminar, Northwestern University, November, 1979.

Special Session on Commutative Algebra, AMS meeting, Philadelphia, April, 1980.

Colloquium, University of Missouri, February, 1981.

Seminar, University of Tennessee, May, 1981.

Seminar, University of North Carolina at Chapel Hill, November, 1981.

Seminar, Northeastern University, November, 1981.

Special Session on Commutative Algebra, AMS meeting, Cincinnati, January, 1982.

Colloquium, University of South Carolina, February, 1982.

Colloquium, Michigan State University, February, 1982.

Seminar, Purdue University, July, 1983.

Seminar, Special Year on Commutative Algebra, University of Illinois at Urbana, July, 1983.

Nordic Summer School on Algebra, Topology, and their interaction, University of Stockholm, August, 1983.

Special Session on Commutative Algebra, AMS meeting, Louisville, January, 1984.

Special semester on Commutative Algebra, AMS meeting, Northwestern University, May, 1984.

Mid-West Commutative Algebra Conference, Purdue University, March, 1986.

Invariant Theory Conference, University of Tennessee, April, 1986.

Piedmont Mathematics Conference, University of North Carolina at Charlotte, March, 1987.

Colloquium, University of North Carolina at Wilmington, April, 1987. Seminar, Michigan State University, June, 1987.

Mini-program on Commutative Algebra, Mathematical Sciences Research Institute, Berkeley, June, 1987.

Colloquium, Michigan State University, April, 1989.

Colloquium, University of South Carolina at Spartanburg, October, 1989.

Conference on free resolutions, Sundance, Utah, May, 1990.

Conference on Commutative Algebra and Algebraic Geometry, Oberwolfach, June, 1992.

Colloquium, Vechta, June, 1992.

Workshop on Commutative Algebra, International Centre for Theoretical Physics, Trieste, Italy, September, 1992.

Special Session on Commutative Algebra, AMS meeting, Northeastern University, October, 1995.

Seminar, Michigan State University, November, 1995.

Special Session on Commutative Algebra, AMS meeting, Lawrenceville NJ, April, 2004.

Special Session on Commutative Algebra, AMS meeting, Nashville, October, 2004.

Seminar, Northeastern University, March, 2005.

Special Session on Commutative Algebra, AMS meeting, Annandale-on-Hudson, NY, October, 2005.

Special Session on Commutative Algebra and Algebraic Geometry, AMS meeting, Miami, FL, April 1-2, 2006.

Special Session on Commutative Algebra and Algebraic Geometry, AMS meeting, Notre Dame, IN, April 8-9, 2006.

Seminar, Purdue University, September, 2006.

Georgia State University-University of South Carolina Commutative Algebra Seminar, Georgia State University, October, 2006.

Georgia State University-University of South Carolina Commutative Algebra Seminar, Georgia State University, March 2007.

Seminar, Purdue University, September, 2007.

Georgia State University-University of South Carolina Commutative Algebra Seminar, Georgia State University, September, 2007.

Special Session on Commutative Algebra, AMS meeting, New Brunswick, New Jersey, October, 2007.

Seminar, Purdue University, November, 2007.

Seminar, University of Notre Dame, November, 2007.

Georgia State University-University of South Carolina Commutative Algebra Seminar, Georgia State University, April, 2008.

Georgia State University-University of South Carolina Commutative Algebra Seminar, Georgia State University, September, 2008.

Seminar, University of Notre Dame, September, 2008.

Seminar, Purdue University, October, 2008.

Georgia State University-University of South Carolina Commutative Algebra Seminar, Georgia State University, February, 2009.

Conference Talk, Second Bluegrass Algebra Conference, University of Kentucky, March, 2009.

Special Session on Local and Homological Methods in Commutative Algebra, AMS meeting, Urbana, Illinois, March, 2009.

Colloquium, University of Notre Dame, Notre Dame, IN, October, 2009.

Special Session on Combinatorial and Homological Aspects of Commutative Algebra, AMS meeting, University Park, PA, October, 2009.

Special Session on Trends in Commutative Algebra, AMS meeting, Albuquerque, NM, April, 2010.

Conference Talk, “Commutative Algebra in the Southeast” meeting in Atlanta, GA, September, 2010.

Conference Talk, “Commutative algebra and its interactions with algebraic geometry”, Le Centre International de Rencontres Mathematiques (CIRM), Luminy, France, November, 2010.

Special Session on Homological Methods in Commutative Algebra, AMS meeting, Statesboro, GA, March, 2011: “The generic Hilbert-Burch matrix”.

Conference Talk, “Midwest Commutative Algebra and Geometry Conference”, Purdue University, West Lafayette, IN, May, 2011: “Linearly Presented grade 3 Gorenstein ideals in $k[x, y, z]$ ”.

Special Session on Local Commutative Algebra, AMS meeting, Lincoln, NE, October, 2011: “The bi-graded structure of Symmetric Algebras with applications to Rees rings”.

Seminar, Pennsylvania State University, State College, PA, November, 2011: “The bi-graded structure of Symmetric Algebras with applications to Rees rings”.

Colloquium, Georgia State University, February, 2012: “The bi-graded structure of Symmetric Algebras with applications to Rees rings”.

Special Session on Commutative Algebra, AMS meeting, Oxford, MS, March, 2013: “Rees algebras and singulatities”.

Special Session on Commutative Algebra, Joint International Meeting of the AMS and the Romanian Mathematical Society, Alba Iulia, Romania, June, 2013: “Artinian Gorenstein algebras with linear resolutions”.

Conference Talk, “Commutative algebra and its interactions with algebraic geometry”, Le Centre International de Rencontres Mathematiques (CIRM), Luminy, France, July, 2013: “Artinian Gorenstein algebras with linear resolutions”.

Seminar, New Mexico State University, Las Cruces, NM, August, 2013: “Blowups and fibers of morphisms”.

Special Session on Recent Advances on Commutative Algebra and Its Applications, Louisville, KY, October, 2013: “Quasi-complete intersection ideals and Tate complexes”.

Seminar, University of Notre Dame, September, 2014: “The structure of Gorenstein-linear resolutions of Artinian algebras”.

Seminar, Purdue University, April, 2015: “The cotangent complex, quasi-complete-intersections in the sense of Avramov, and exact zero divisors”.

Seminar, Clemson University, November, 2016: “The equations defining blowup algebras of height three Gorenstein ideals”.

Special Session on Homological Methods in Commutative Algebra, AMS meeting, Raleigh, NC, November, 2016: “The equations defining blowup algebras of height three Gorenstein ideals”.

Special Session on Commutative Algebra, AMS meeting in Charleston, SC, March, 2017: “Degree bounds for local cohomology”.

Minisymposium on Free resolutions governed by geometric and/or combinatorial data, SIAM Conference on Applied Algebraic Geometry, Atlanta, GA, August, 2017: “Resolutions associated to a matrix of linear forms which is annihilated by a vector of indeterminates”.

Mini Symposium on Structures on free resolutions, Texas Tech University, October, 2017: “Use a Macaulay inverse system to detect an embedded deformation”.

Colloquium, Georgia Southern University, April 2018: “Poincaré series of local rings”.

Special Session on Homological Commutative Algebra at the AMS meeting at Northeastern University, Boston, April, 2018: “Compressed local Artinian rings”.

Morgantown Algebra Days 2019, West Virginia University, April, 2019: “Resolutions which are Differential Graded Algebras”.

International conference in honor of Bernd Ulrich, Thematic Program in Commutative Algebra and its Interaction with Algebraic Geometry, Notre Dame, Indiana, June, 2019: “Resolutions which are Differential Graded Algebras”.