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Education

Ph.D. Mathematics, University of California, Los Angeles, 1997.
Advisors: Professors Richard Elman and Craig Huneke.
M.A., Mathematics, University of California, Los Angeles, 1993.
B.A., Mathematics, University of Chicago, Chicago, IL, 1991.

Employment

Assistant Professor, University of New Mexico, 2012–present.
Lecturer III, University of New Mexico, 2008–2012.
Visiting Assistant Professor, University of California, Riverside, 2005–2008.
Assistant Professor, University of Arkansas, 2005 (resigned).
Visiting Assistant Professor, University of Arkansas, 2000–2005.
Assistant Professor, Virginia Commonwealth University, 1998–2000.
Visiting Assistant Professor, Purdue University, 1997.
Fellow, Teaching Assistant and Research Assistant, UCLA, 1991–1997.
Mathematics Junior Tutor, University of Chicago, 1988–1991.

Interests

Commutative Algebra: Closure Operations, Tight Closure, Local Cohomology.

Publications

- (13) *When is a Nakayama closure semiprime?*, submitted.
- (12) *Progress in Commutative Algebra 2: Closures, Finiteness and Factorization*, edited with Sean Sather-Wagstaff, Christopher Francisco, Lee Klingler, DeGruyter, Berlin, (2012).
- (11) *Progress in Commutative Algebra 1: Combinatorics and Homology*, edited with Sean Sather-Wagstaff, Christopher Francisco, Lee Klingler, DeGruyter, Berlin, (2012).
- (10) *m-full and basically full ideals in rings of characteristic p*, to appear in Rocky Mountain J. Math.
- (9) *A formula for the *-core of an ideal*, with Louiza Fouli and Adela Vraciu, Proc. A.M.S. 139 (2011), 4235-4245.
- (8) *A look at the prime and semiprime operations of one-dimensional domains*, Houston J. Math, 38, (2012), 1-15.
- (7) *The cl-core of an ideal* with Louiza Fouli, Math Proc. Camb. Phil. Soc., 149 (2010), 247-262.
- (6) *When is tight closure determined by the test ideal?* with Adela Vraciu, J. of Comm. Alg., 1 (2009), 591-602.
- (5) *Structure on the set of closure operations of a commutative ring*, J. of Alg., (321) (2009), 2737–2753.

**Publications
Continued**

- (4) *Local Cohomology Modules with Infinite Dimensional Socles*, with T. Marley, Proc. Amer. Math. Soc., (132) (2004), 3485–3490.
- (3) *Cofiniteness and associated primes of local cohomology modules*, with T. Marley, J. of Alg., (256) (2002), no. 1, 180–193.
- (2) *Test Ideals in Quotients of F -finite regular local rings*, Trans. A.M.S., (350) (1998), 4041–4051.
- (1) *Test Ideals in Gorenstein isolated singularities and F -finite reduced rings*, Thesis, University of California, Los Angeles, 1997.

**Work
In
Progress**

- Relating the $*$ -core to geometry*, with L. Fouli and L. Miller.
- Semiprime operations on a nodal curve.*
- When is a subideal of a parameter ideal also a parameter ideal?*, with L. Fouli.
- Applications of test ideals to classifying graphs*, with L. Fouli.
- $*$ -reduction numbers and the $*$ -core*, with L. Fouli and A. Vraciu.
- A new characterization of $*$ -basically full*, with Adela Vraciu.
- Investigations of cofiniteness of local cohomology modules*, with Tom Marley.
- Submodules and homomorphic images of cofinite modules.*

**Honors
and
Funding**

- Senior Personnel for NSF funded: Attracting, Motivating and Preparing Mathematics students in the Southwest by building an energetic community of students and educators (2012-2015).
- William P. and Heather W. Weber award for excellence in teaching, July 2011.
- AWM Travel Grant, to participate in Ring Theory Days in Rome and Local Rings and Varieties in Trieste, May-June 2010.
- NSA Conference Grant, "Recent Developments in Tight Closure", April 14-16, 2005.
- Arkansas Department of Education Grant, Summer 2004-Spring 2005.
- UCLA Dissertation Year Fellowship, Fall 1996–Spring 1997.
- Visiting Scholar, Purdue University, Fall 1995–Spring 1997.
- Visiting Scholar, University of Michigan, Spring 1995.
- UCLA Office of the President Affirmative Action Fellowship, 1991–95.

**Conferences
Organized**

- Trends in Commutative Algebra, AMS Sectional Meeting at University of New Mexico, April 17 - 18, 2010.
- Homological Aspects of Module Theory, AMS Sectional Meeting at Florida Atlantic University, October 30 - November 1, 2009.
- Homological aspects in Commutative Algebra, AMS Sectional Meeting at Bard College, October 8-9, 2005.
- Spring Lecture Series, Recent Developments in Tight Closure, University of Arkansas, April 14-16, 2005.

Invited Talks

P-bounded closure operations and semiprime operations on the nodal curve, Singularities in Commutative Algebra and Algebraic Geometry at the 2012 Spring Central Section Meeting of the AMS, Lawrence, KS.

What are your odds at winning the Hat Game?, Sonia Kovalevsky Day, New Mexico State University, October 28, 2011.

Closure operations, cl-reductions and the cl-core, Colloquium, University of New Mexico, October 18, 2011.

When is a closure operation both a Nakayama Closure and a semiprime operation?, Southwest Local Algebra Meeting, New Mexico State University, March 6, 2011.

Deep m-full ideals, Colloquium, New Mexico State University, February 17, 2011.

When is a closure operation both a Nakayama Closure and a semiprime operation?, New Mexico State University, February 16, 2011.

Prime and Semiprime operations over one-dimensional domains, Commutative Ring Theory Days 2010, Roma, May 20, 2010.

Some surprising facts about rings with test ideal \mathfrak{m} , NMSU Algebra Seminar, February 24, 2010.

Operations on m-primary ideals in rings of characteristic p, Commutative Algebra: Module and Ideal Theory at the 2009 Fall Central Section Meeting of AMS, Waco, TX.

*The *-core of an ideal*, Combinatorial and Homological Aspects of Commutative Algebra at the 2009 Fall Eastern Section Meeting of AMS, University Park, PA.

Prime and Semiprime Operations in One-dimensional rings, GSU-USC Commutative Algebra Seminar, April 4-5, 2009.

Algebraic Structures and the Hat Game, California Lutheran University, Colloquium, May 15, 2008.

When is the tight closure determined by the test ideal?, University of Texas, Austin, Algebra Seminar, March 27, 2008.

Structure on the set of closure operations of a commutative ring, AMS-MAA Joint Meetings, Special Session "Recent Developments in Commutative Algebra", San Diego, January, 2008.

Can you win the Hat Game?, Colloquium, Cal State Dominguez Hills, March 20, 2006.

Test Ideals in 1-dimensional domains, Colloquium, Cal State San Bernardino, February 22, 2006.

Associated Primes of Local Cohomology Modules, Colloquium, University of Northern Iowa, February 16, 2006.

The Hat Game, Colloquium, Oxford College of Emory, February 25, 2005.

A Glimpse into Cofiniteness and Local Cohomology, Colloquium, University of Arkansas, Fayetteville, February 22, 2005.

Finiteness properties or lack thereof in Local Cohomology modules, Colloquium, Southern Illinois University, Edwardsville, January 13, 2005.

**Invited Talks
Continued**

Submodules and Quotients of I-cofinite modules, AMS Sectional Meeting, Special Session in Local and Homological Algebra, Nashville, Tennessee, October 17, 2004.

Purely p, Colloquium, University of Nebraska, Lincoln, September 20, 2001.

Test Ideals in One Dimensional Domains, Colloquium, University of Arkansas, October 5, 2000.

Test Ideals, F-Purity and Singularities, Colloquium, US Naval Academy, Annapolis, MD, November 19, 1999.

Test Ideals, F-Purity and Singularities, Conference on Local Cohomology, Guanajuato, Mexico, December 3, 1999.

Classification of two-dimensional Singularities using tight closure methods, AMS-MAA Joint Meeting, Special Session in Commutative Algebra, Baltimore, Maryland, January 1998.

Test Ideals in Noetherian Domains, Colloquium, Virginia Commonwealth University, May 1, 1997.

Minimally elliptic singularities and tight closure, AMS Conference, Special Session in Commutative Algebra, Lawrenceville, New Jersey, October 1996.

Test Ideals in Quotients of F-finite regular local rings, AMS Conference, Special Session for Graduates in Commutative Algebra, Seattle, Washington, August 1996.

**Graduate
Advising**

Ph.D. Advisor of Bryan White. Working with him on commutative algebra and homological algebra. University of New Mexico, Fall 2010 – present.

Masters Advisor of Laurie Price. Working with her on closure operations in semigroups. University of New Mexico, Spring 2010 – Fall 2011. M.S. December 2011.

Advisor of John Ash. Working with him on computational methods in commutative algebra. University of New Mexico, Fall 2010 – Summer 2011.

Advisor of Kyoko Arai. Worked with her on commutative algebra, tight closure theory. University of Arkansas, Fall 2002- Spring 2007.

**Math Ed
Experience**

Co-PI on a Department of Education (MSP) Grant, *Middle School Math Mentorship*, Summer 2004-Spring 2005.

- Funded Summer Institute for Increasing the Mathematical Content Knowledge of Middle School Math Teachers in Northwest Arkansas.
- Also funded weekly visits of the PI's to local Middle Schools to work with Math Teachers on Lesson Study.

Taught a Pilot Calculus Sequence directed toward retention at the University of Arkansas, 2003-2004.

Developed a Calculus Quiz Show for the Business Calculus Course, Summer 2002.

**Teaching
Experience**

University of New Mexico

Fall 2012 Modern Algebra (322), Abstract Algebra (520)
Spring 2012 Linear Algebra (321), Modern Algebra II (421)
Fall 2011 Linear Algebra (321), Discrete Structures (327)
Spring 2011 Theory of Numbers (319), Modern Algebra II (421)
Fall 2010 Combinatorics (317), Modern Algebra I (322/422)
Spring 2010 Elements of Calculus (180), Advanced Calculus (402/502)
Fall 2009 Discrete Structures (327), Advanced Calculus (401/501)
Spring 2009 Abstract Algebra (521), Complex Analysis (562)
Fall 2008 First Year Calculus (162), Abstract Algebra (520)

University of California, Riverside

Spring 2008 First Year Calculus (9B), Set Theory
Winter 2008 First Year Calculus (9C), Linear Algebra II
Fall 2007 First Year Calculus (9B), Optimization (120)
Spring 2007 Geometry (133)
Winter 2007 First Year Calculus (9C), Multivariable Calculus (10A) and Linear Algebra II
Fall 2006 First Year Calculus (9A) and Linear Algebra I
Spring 2006 First Year Calculus (9B and 9C)
Winter 2006 Differential Equations
Fall 2005 First Year Calculus (9A)

University of Arkansas

Spring 2005 Linear Algebra and Math Structures II
Fall 2004 Calculus I and Intro to Abstract Algebra
Summer 2004 Institute for Middle Level Math Teachers
Spring 2004 Calculus II (Geared toward retention)
Fall 2003 Calculus I (Geared toward retention)
Spring 2003 Combinatorics, Algebra I
Fall 2002 Discrete Mathematics, Intro to Abstract Algebra II
Summer 2002 Survey of Calculus
Spring 2002 Calculus II, Combinatorics
Fall 2001 Calculus II, Intro to Abstract Algebra I
Summer 2001 Survey of Calculus, Finite Dimensional Vector Spaces
Spring 2001 Calculus II, Algebra I
Fall 2000 Intro to Abstract Algebra II, Algebra II

Virginia Commonwealth University

Spring 2000 Calculus with Analytic Geometry I, Mathematical Structures
Fall 1999 Calculus with Analytic Geometry I, Intro to Abstract Algebra
Spring 1999 Abstract Algebra II
Fall 1998 Abstract Algebra I, Linear Algebra
Spring 1998 Intro to Contemporary Math, Linear Algebra

Purdue University

Fall 1997 Introductory Analysis II

Outreach

UNM-PNM Mathematics Competition Co-organizer, Fall 2008-present.

Summer course instructor for Algebraic Structures and closure operations (July 2012 and Summer 2014) on NSF-funded MCTP Grant: Attracting, Motivating and Preparing Mathematics students in the Southwest by building an energetic community of students and educators.

Mentor for internationally recognized High School Science Fair project: Completing Graphs by Katherine Cordwell (1st place, Central New Mexico Regional Science Fair, 1st place New Mexico Science Fair 2012, 2nd Place AMS Award and 2nd Place in Mathematics at ISEF 2012.)

Sonia Kovalevksy Day, Job Panel, New Mexico State University, October 28, 2011.

Middle School Math Mentorship Program, Summer 2004-Spring 2005.

Ready Razorback Final, University of Arkansas Recruiting Activity, October 2, 2004.

Honors Convocation, University of Arkansas, September 13, 2004.

College Highlights for High School Students, Department Representative, Fall 2002.

Proctor and Grader, ACTM Mathematics Competition, March 2002.

Judge, NW Arkansas Science Fair, Math. Div., March 2001/2002/2005.

Service

Referee for Communications in Algebra, Houston Journal of Mathematics, International Electronic Journal of Algebra, Journal of Algebra, Journal of Korean Mathematical Society, Proceedings of the Indian Academy of Sciences and Rocky Mountain Journal of Mathematics.

Colloquium Committee, UNM, Fall 2012-present.

Hiring Committee for MCTP Postdoctoral Assistant, UNM, Spring 2012.

Undergraduate Committee, U of A, Fall 2003-Spring 2005.

Advisor, Pi Mu Epsilon, U of A, Fall 2002-Spring 2005.

Founding Member/Advisor, AWSM, U of A, Spring 2002-Spring 2005.

Thesis Committee Member for Michael Reed, *Symbolic blow-ups and generation in degree four*, University of Arkansas, Ph.D. May 2004.

Thesis Committee Member for Jennifer Mann, *On a Certain Family of Determinantal-Like Ideals*, University of Arkansas, Ph.D. August 2002.

Credentials Committee, Co-Chair, VCU, Fall 1999–Spring 2000.

Credentials Committee, VCU, Spring 1998–Spring 2000.

President, Friends of Women in Mathematics, UCLA, Fall 1994–Winter 1995.

Graduate Student Affairs Committee, UCLA, Fall 1993–Spring 1994.

Math and Physical Sciences Council, UCLA, Fall 1992–Fall 1993.

- Seminar Talks** *The $*$ -core of an ideal*, Geometry Seminar, University of New Mexico, September 12, 2012.
- m-full ideals*, Geometry Seminar, University of New Mexico, May 2, 2012.
- Finiteness properties of local cohomology continued*, Geometry Seminar, University of New Mexico, November 7, 2011.
- Finiteness properties of local cohomology*, Geometry Seminar, University of New Mexico, October 31, 2011.
- Using Characteristic p methods to determine singularities*, Geometry Seminar, University of New Mexico, December 10, 2008.
- Openness of Amplitude*, Algebraic Geometry Working Seminar, UC Riverside, March 8, 2007.
- Annihilators of Local Cohomology in Characteristic 0, Continued*, Algebraic Geometry Seminar, UC Riverside, February 20, 2007.
- Annihilators of Local Cohomology in Characteristic 0*, Algebraic Geometry Seminar, UC Riverside, February 13, 2007.
- $*$ -full ideals and Rational Singularities*, Commutative Algebra Seminar, UC Riverside, November 17, 2006.
- Annihilators of Local Cohomology Modules*, Algebraic Geometry Seminar, UC Riverside, November 14, 2006.
- $*$ -full ideals*, Commutative Algebra Seminar, UC Riverside, November 3, 2006.
- Connectedness of the punctured spectrum and cofiniteness*, Algebraic Geometry Seminar, UC Riverside, June 1, 2006.
- Connections between Local Cohomology and Geometry*, Algebraic Geometry Seminar, UC Riverside, May 25, 2006.
- Classifying Singularities via Tight Closure, Part II*, Algebraic Geometry Seminar, UC Riverside, March 7, 2006.
- Classifying Singularities via Tight Closure*, Algebraic Geometry Seminar, UC Riverside, February 2, 2006.
- Graded Local Cohomology Modules with infinitely many Associated Primes*, Commutative Algebra Seminar, UC Riverside, January 13, 2006.
- Computing Top Local Cohomology Modules using Graded Techniques*, Commutative Algebra Seminar, UC Riverside, December 9, 2005.
- Non cofinite Local Cohomology Modules*, Commutative Algebra Seminar, UC Riverside, December 2, 2005.
- When do the set of I cofinite R -modules form an abelian subcategory?*, Commutative Algebra Seminar, UC Riverside, November 18, 2005.
- The Calculus Quiz Show*, Graduate Seminar, University of Arkansas, October 24, 2003.