

Florian Enescu

EDUCATION

- Ph.D. in Mathematics (August 2001), **University of Michigan at Ann Arbor** (thesis advisor: **Professor Melvin Hochster**)
- Master of Science (August 1999), **University of Michigan at Ann Arbor**
- Diploma (B.Sc.) in Mathematics, (June 1996), **University of Bucharest, Romania**

POSITIONS

- (July 2009 – present) Associate Professor, **Georgia State University**
- (August 2004 – June 2009) Assistant Professor, **Georgia State University**
- (August 2001 - August 2004) Scott Assistant Professor, **University of Utah**
- (Fall 2002) Postdoctoral Research Fellow, **Mathematical Sciences Research Institute, Berkeley, California**
- (1996 - 1999) Graduate Student Instructor, **University of Michigan at Ann Arbor**
- (1999 - 2000) Research Assistant, **University of Michigan at Ann Arbor**
- (1995 – present) **Institute of Mathematics of the Romanian Academy, Romania**

RESEARCH INTERESTS

- Commutative Algebra, Algebraic Geometry

GRANTS

- (01/01/2010-12/31/2011) National Security Agency, Young Investigators Grant (P.I.) - **Hilbert-Kunz multiplicities and local cohomology questions in positive characteristic**, \$29,882 (\$14,991 annually-continuation for second year pending on satisfactory performance)
- (09/01/2008-08/31/2010) National Security Agency/University of South Carolina Subcontract (P.I.) - **GSU-USC Commutative Algebra Seminar** , \$15,280 (\$7,640 annually).
- (01/01/2007-12/31/2009) National Security Agency, Young Investigators Grant (P.I.) - **Special chapters in the theory of rings of positive characteristic**, \$29,130 (\$14,565 annually)
- (08/01/2005-07/31/2006, with a no-cost extension until 04/30/2007) NSF Grant CCF-0515010 (P.I.) - **Collaborative research: a new theoretical and algorithmic framework for RTL datapath verification using polynomial algebra over finite rings** \$36,190.
- (2005) Research Initiation Grant, **Georgia State University**, \$8600.
- (1999, 2000) Rackham Travel Grant, **University of Michigan at Ann Arbor**

AWARDS, HONORS

- (2004) Outstanding Instructor Award, **University of Utah**

- (Fall 2002) Postdoctoral Research Fellow, **Mathematical Sciences Research Institute, Berkeley, California**
- (Fall 2000 – Summer 2001) Rackham Predoctoral Fellowship, **University of Michigan at Ann Arbor**
- (1991 - 1996) National Merit Fellowship, **University of Bucharest, Romania**

PAPERS

Algebra:

- Local cohomology and F-stability, accepted for publication in **Journal of Algebra** (special issue dedicated to Paul C. Roberts)
- Frobenius structure of local cohomology, joint work with M. Hochster, accepted for publication in **Algebra and Number Theory**
- Lower bounds for Hilbert-Kunz multiplicities for local rings of fixed dimension, joint work with I. M. Aberbach, **Michigan Math. Journal** (special issue in the honor of M. Hochster), volume 57, 1--16.
- Briançon-Skoda for Noetherian filtrations, **Analele Stiintifice Univ. Ovidius Seria Math**, Florian Enescu, (special issue dedicated to D. Popescu) vol XV 2007, fasc. 1, pages 91--96
- Asymptotic growth of powers of ideals, joint work with C. Ciuperca, Sandra Spiroff, **Illinois Jour. Math** (special issue dedicated to P. Griffith), 51 (2007), no. 1, 29--39 (electronic)
- When does the F-signature exist?, joint work with I. M. Aberbach, **Annales Math. de Toulouse**, 15, 2 (2006) 195--201
- On the upper semi-continuity of the Hilbert-Kunz multiplicity, joint work with K. Shimomoto, **Journal of Algebra**, 285 (2005), no. 1, 222--237
- The structure of F-pure rings, joint work with I.M. Aberbach, **Mathematische Zeitschrift**, 250 (2005) no. 4, 791--806
- An inequality involving tight closure and parameter ideals, joint work with C. Ciuperca, **Bulletin of the London Math. Society**, 36 (2004), no. 3, 351--357
- On rings with small Hilbert-Kunz multiplicity, joint work with M. Blickle, **Proceedings of the Amer. Math. Soc.**, 132 (2004), 2505--2509
- Applications of pseudocanonical covers to tight closure theory, **Journal of Pure and Applied Algebra**, (178) 2003, no. 2, 150--167

- Test ideals and flat base change problems in tight closure theory, joint work with I.M. Aberbach, **Trans. Amer. Math. Soc.**, 355 (2003), no. 2, 619--636
- F-injective rings and F-stable primes, **Proceedings of the Amer. Math. Soc.**, 131 (2003), 3379--3386
- Strong test modules and multiplier ideal, **manuscripta mathematica**, vol. 111, (4) 2003, 487--498
- On the behavior of F-rational rings via flat base change, **Journal of Algebra** (November 2000), 232, no. 2, 543--566
- Infinitesimal module deformations in the Thom-Sebastiani problem, joint work with D. Popescu and G. Pfister, **Arch. Math. (Basel)**, (69) 1997, no. 3, 196--208

Applications of algebra to circuit design:

Simulation Bounds for Equivalence Verification of Polynomial Datapaths using Finite Ring Algebra, Namrata Shekhar, Priyank Kalla, M. Brandon Meredith, Florian Enescu, **IEEE Trans. on VLSI, special section on Design Validation and Verification**, Volume 16, Issue 4, April 2008, 376--387

- Equivalence Verification of Polynomial Datapaths using Ideal Membership Testing, Namrata Shekhar, Priyank Kalla, Florian Enescu, **IEEE Trans. on CAD**, Volume 26, Issue 7, July 2007 1320 - -133

Proceedings (refereed):

- Finding linear building-blocks for RTL synthesis of polynomial datapaths with fixed-size bit-vectors, joint work with Sivaram Gopalakrishnan, Priyank Kalla, M. Brandon Meredith, Florian Enescu **Computer-Aided Design, 2007. ICCAD 2007. IEEE/ACM International Conference** on 4-8 Nov. 2007 Page(s):143 - 148
- Optimization of Arithmetic Datapaths with Finite Word-Length Operands, joint work with Sivaram Gopalakrishnan, Priyank Kalla, Florian Enescu, **Asia/South-Pacific DAC, ASP-DAC (2007)**.
- Simulation Bounds for Equivalence Verification of Arithmetic Datapaths with Finite Word-Length Operands, Namrata Shekhar, Priyank Kalla, M Brandon Meredith, Florian Enescu, **Formal Methods in Computer-Aided Design, FMCAD - 2006**.
- Optimizing Fixed-Size Bit-Vector Arithmetic using Finite Ring Algebra, Sivaram Gopalakrishnan, Priyank Kalla, F. Enescu, **Intl. Workshop on Logic and Synthesis, IWLS, 2006**.

- Equivalence Verification of Arithmetic Datapaths with Multiple Word-Length Operands, Namrata Shekhar, Priyank Kalla, Florian Enescu, **Proceedings of the Design Automation and Test in Europe (DATE) Conf.**, March 2006.
- Equivalence verification of polynomial datapaths with fixed-size bit-vectors using finite ring algebra, Namrata Shekhar, Priyank Kalla, Florian Enescu and Sivaram Gopalakrishnan, **Proceedings of the Intl. Conf. on Computer-Aided Design ICCAD**, Nov. 2005.
- Exploiting vanishing polynomials for equivalence verification of fixed-size arithmetic datapaths, Namrata Shekhar, Priyank Kalla, Florian Enescu and Sivaram Gopalakrishnan. **Proceedings of the Intl. Conf. on Computer Design ICCD**, Oct. 2005.

Ph.D. THESIS

A study of F-rationality and F-injectivity, University of Michigan at Ann Arbor, August 2001

INVITED TALKS

- (August 2008), Hilbert-Kunz multiplicities, Commutative Algebra and Its Interactions Conference, University of Michigan.
- (April 2008), Local Cohomology and F-stability, Commutative Algebra Seminar, University of Minnesota.
- (March 2008), The Frobenius Structure of Local Cohomology, Algebraic Geometry Seminar, University of Barcelona, Spain.
- (January 2008), On the behavior of F-injectivity under flat base change, GSU-USC Joint Commutative Algebra Seminar, University of South Carolina.
- (November 2007), A question on F-injectivity with implications for F-stability, GSU-USC Joint Commutative Algebra Seminar, University of South Carolina
- (November 2007), A question on F-injectivity with implications for F-stability, GSU-USC Joint Commutative Algebra Seminar, University of South Carolina
- (July 2007), Local cohomology and F-stability, International Conference on Homological and Combinatorial aspects in Commutative Algebra, Busteni, Romania.
- (March 2007), Frobenius depth, GSU-USC Commutative Algebra Seminar, University of South Carolina.
- (March 2007), Hilbert-Kunz multiplicities, Colloquium, North Dakota State University.
- (November 2006), Lower bounds for Hilbert-Kunz multiplicities, Algebra Seminar, University of South Carolina.
- (October 2006), Lower bounds for Hilbert-Kunz multiplicities, AMS Sectional Meeting, Salt Lake City, Utah.
- (May 2006), On almost regular sequences, Homological Conjectures in Commutative Algebra Snowbird, Utah.
- (April 2006), Almost regular sequences, AMS Sectional Meeting, San Francisco State University, San Francisco.
- (March 2006), Local cohomology and Frobenius depth, AMS Sectional Meeting, Florida International University, Miami.

- (February 2006), Positive characteristic techniques in algebra and geometry, Colloquium, Miami University at Ohio
- (October 2005), Local cohomology and F-stable primes, AMS Sectional Meeting, Bard College.
- (October 2005), Local cohomology and F-stable primes, Commutative Algebra Seminar, University of Michigan.
- (August 2005), Local cohomology and the Cohen-Macaulay property, supporting talk (prepared with Sara Faridi), the Minnowbrook workshop on Commutative Algebra.
- (April 2005), Ideals and cones, Algebra Seminar, Emory University.
- (October 2004), The Hilbert-Kunz multiplicity and complete intersections, Algebra Seminar, University of South Carolina.
- (May 2004), The structure of F-pure rings, The Sixth AMS-SSM Joint Meeting, Houston
- (March 2004), Rings with small Hilbert-Kunz multiplicities, University of Missouri
- (March 2004), A new perspective on classical problems in algebra, Colloquium, Kent State University
- (February 2004), A new perspective on classical problems in algebra and geometry, Colloquium, Georgia State University
- (February 2004), Powers of ideals in polynomial rings, Graduate Colloquium, University of Utah
- (March 2003) F-pure rings and the splitting dimension, University of Michigan
- (November 2002) Parameter ideals, multiplicities and tight closure theory, University of California at Riverside
- (October 2002) A few characteristic p concepts in commutative algebra, MSRI, Berkeley, California
- (September 2002) Aspects of the tight closure theory of parameter ideals, MSRI, Berkeley, California
- (March 2002) An incursion into commutative algebra on the path of a simple example, Graduate Student Colloquium, University of Utah
- (January 2002) F-injective rings and F-stable primes, AMS meeting, San Diego, California
- (April 2001) Rings with small Hilbert-Kunz multiplicities, Algebra Weekend, University of Missouri, Columbia
- (March 2001) Test ideals and flat base change problems in tight closure theory, AMS meeting, University of Kansas
- (March 2001) Frobenius structure of local cohomology, University of Utah
- (September 2000) Applications of pseudocanonical covers to tight closure theory, AMS meeting, Toronto
- (March 2000) F-injective rings and F-stable primes, AMS meeting, South Bend, Indiana
- (September 1999) F-rational rings and flat base change, AMS meeting, Salt Lake City

TEACHING EXPERIENCE

- Freshman Honors Seminar, **Imagining Numbers**, Fall 2008, Georgia State University
- Math 1101, **Intro to mathematics modeling**, Fall 2007, Spring 2008 Georgia State University
- Math 4444/6444, **Polynomials**, Spring 2007, Georgia State University

- Math 8220, **Abstract Algebra**, Fall 2006, Georgia State University
- Math 8800, **Introduction to commutative algebra and algebraic geometry**, Summer 2006, Georgia State University
- Math 4442/6442, **Modern Algebra I**, Spring 2006, Fall 2007 Georgia State University
- Math 4441/6441, **Modern Algebra I**, Fall 2005, Spring 2006 Georgia State University
- Math 4450/6450, **Theory of Numbers**, Fall 2005, Georgia State University
- Math 3420/7420, **Applied Combinatorics**, Spring 2005, Georgia State University
- Math 1090, **Discrete Mathematics**, Fall 2004, Spring 2005, Fall 2006, Georgia State University
- Math 1090, **College Algebra**, Spring 2004, University of Utah
- Math 1100, **Business Calculus**, Fall 2001, Fall 2003, University of Utah
- Math 1030, **Precalculus**, Spring 2002, University of Utah
- Math 3220, **Foundations of Analysis II**, Summer 2003, University of Utah
- Math 3100, **Foundations of Geometry**, Fall 2003, University of Utah
- Math 6350, **Commutative Algebra**, Spring 2003, University of Utah
- Math 115, **Calculus I**, Fall 1998 and Spring 1999, University of Michigan
- Math 216, Discussion class: **Ordinary Differential Equations**, Fall 1996, Winter and Fall 1997, Winter 1998, Fall 1999, University of Michigan

Departmental service:

- (2005 – present) Founder and organizer of the program undergraduate **Research Initiations in Mathematics, Mathematics Education and Statistics** (RIMMES, for short)
- (2005-present) Co-founder (with Dr. Phillips) of the Mathematics and Statistics Club at Georgia State University. Co-wrote the constitution, bylaws, and supervised funding applications. Currently, the main faculty advisor coordinating the Board of Advisors and relations of the Club with the College of Arts and Sciences.
- (2005 – present) Founder and organizer of the Undergraduate Mathematics Competition at Georgia State University held every April.
- (2006 – present) Chair of the Outreach Committee
- (2007– present) Co-chair of the Colloquium Subcommittee
- (2006 – present) Member of the Research Committee. The final version for the pure mathematics concentration of our Ph.D. program is based on my draft.
- (2006 – present) Member of the Graduate Committee
- (2008 – present) Member of the Executive Committee
- (2006) Member of the Hiring Committee (ad hoc committee)

- (April 2003, 2004) Co-organizer of the Calculus Challenge (Math contest open to all undergraduate students), University of Utah
- (1997) Preparation of course pack for Math 216 (Ordinary Differential Equations), under the guidance of Professor Ch. Doering, joint work with J. Korman, University of Michigan at Ann Arbor

Independent study courses:

- Independent Research Courses with Anthony Preslicka, Josh Liu, George Whiteaker in relation with RIMMES, Georgia State University
- Independent Research Course with Harrison Stalvey, Summer 2006, Number Theory, Georgia State University
- Independent Study Course with Kazuma Shimomoto, Fall 2003 and Spring 2004, Tight Closure Theory, University of Utah
- Independent Study Course with David Groulx, Fall 2003, Algebra, University of Utah

Mentoring of undergraduate students:

- Judge at the Second Undergraduate Research Conference at Georgia State University, March 2008
- Mentor for George Ryun Whiteaker, Brian Hall, students enrolled in RIMMES, 2006-2007. Presenters at the Undergraduate Research Conference at GSU in April 2007 and at the End-of-the-Year Math and Stat Event at GSU, April 2006
- Mentor for Anthony Preslicka, Josh Liu students enrolled in RIMMES, 2005-2006 at GSU. Presenters at the End-of-the-Year Math and Stat Event at GSU, April 2006
- (Fall 2003) Research Experiences for Undergraduates (REU) mentor for Hyrum Nielsen, University of Utah.
- (April 2003) The Magic of Numbers, two lectures given under the Math Circle program at University of Utah (Math Circle is a program open to high-school students)

Mentoring of graduate students:

- Current masters thesis advisor for Muslim Baig at Georgia State University

- Masters thesis advisor for Sara Malec at Georgia State University. Thesis: Noetherian filtrations and intersection algebras. Defended Summer 2008
- Outside Committee Member for the Ph.D. dissertation of Namrata Shekhar, Department of Electrical Engineering at University of Utah, August 2007 (the work generated several joint papers)
- Masters thesis advisor for M Brandon Meredith at Georgia State University. Thesis: Polynomial functions over finite rings of integers. Defended Summer 2007 (the work generated several joint papers)
- Masters thesis advisor for Christopher Zagrodny at Georgia State University. Thesis: Algebraic concepts in the study of graphs and simplicial complexes. Defended Summer 2006.

MATHEMATICAL COMMUNITY SERVICE

- (2001 – present) Referee for various mathematical journals (Communications in Algebra, Journal of Algebra, Proceedings of the AMS, International Journal of Mathematics and Mathematical Sciences, Mathematics of Computation, Journal of Symbolic Computation)
- (2001 – present) Reviewer for Mathematical Reviews, Zentralblatt
- (2002 – 2004) Co-organizer of the Commutative Algebra Seminar, University of Utah
- (1998 – 2001) Organizer of the Student Commutative Algebra / Algebraic Geometry Seminar, University of Michigan at Ann Arbor

CONFERENCE ORGANIZER

- Co-organizer (together with Sandra Spiroff, March 27-29 2009) of the Special Session “Local and Homological Methods in Commutative Algebra” at the AMS 2009 Spring Central Sectional Meeting to be held at the University of Illinois at Urbana-Champaign
- Co-organizer (together with Yongwei Yao, Oct 20 2006, March 17-18 2007, Sept 16 2007, April 25-27 2008, September 13-14 2009) of the GSU-USC Commutative Algebra Meeting, held at GSU, Atlanta. Two meetings are held in Atlanta every academic year: one regional and one national.
- (March 3-4, 2007) Co-organizer (together with A. Kustin, A. Vraciu) of the Special Session Commutative Algebra and Algebraic Geometry, AMS South-East Section, Davidson College.
- (October 16-17, 2004) Co-organizer (together with A. Vraciu) of the Special Session Local and homological algebra, AMS South-East Section, Nashville, Tennessee
- (June 2004) Co-organizer (together with P.C. Roberts) of the mini-course “Fundamental Problems in Commutative Algebra”, with the participation of graduate students nationwide and

leading experts in the field, at the University of Utah. I have also given five one hour lectures on Local cohomology, local duality and basic notions of tight closure theory at this mini-course.

- (March 13, 2002) American Mathematical Society Meeting, Special Session on Commutative Algebra, Ann Arbor, Michigan (together with A. K. Singh and K. E. Smith)
- (2002 – 2004) Co-organizer of the Commutative Algebra Seminar, University of Utah
- (1998 – 2001) Organizer of the Student Commutative Algebra / Algebraic Geometry Seminar, University of Michigan at Ann Arbor

MEMBERSHIP TO PROFESSIONAL ORGANIZATIONS

- Member of the American Mathematical Society