

Department of Mathematics
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Employment

- University of North Georgia–Gainesville, Oakwood, GA, USA
 - Assistant Professor, August 2016 – Present
- University of Arizona, Tucson, AZ, USA
 - Postdoctoral Research Associate, August 2015 – August 2016
- University of Arizona, Tucson, AZ, USA
 - Visiting Assistant Professor, September 2014 – August 2015
- Lancaster University, Lancaster, UK
 - Senior Research Associate, September 2013 – August 2014
- University of Wisconsin-Stout, Menomonie, WI, USA
 - Lecturer of Mathematics, August 2012 – May 2013

Education

- University of Georgia, Athens, GA, USA
 - Ph.D. in Mathematics, May 2012
 - Thesis title: *Cohomology and Geometry for Frobenius Kernels of Algebraic Groups*
 - Advisor: Daniel K. Nakano
- New Mexico State University, Las Cruces, NM, USA
 - M.S. in Mathematics, May 2008
- Vietnam National University, Ho Chi Minh City, Vietnam
 - B.S. in Mathematics and Informatics, July 2004
 - Thesis title: *Some Results on the Second Cohomology Group*
 - Advisor: Dong V. Nguyen

Teaching Experience

- Assistant Professor, University of North Georgia–Gainesville
 - Math 0997: Learning Support for Math 1001 (Fall 2017)
 - Math 0999: Learning Support for Math 1111 (Spring 2018)
 - Math 1001: Quantitative Skills and Reasoning (Fall 2016, Fall 2017, Fall 2018)
 - Math 1111: College Algebra (Fall 2017, Spring, Summer & Fall 2018, Fall 2019, Spring & Fall 2020)

- Math 1113: PreCalculus (Fall 2016, Spring 2017, Summer 2018)
- Math 1450: Calculus I (Spring & Fall 2018)
- Math 2400 (*now changed to Math 1401*): Elementary Statistics (Spring 2017)
- Math 2040: Brief Calculus (Spring 2019, Spring 2020)
- Math 2460: Calculus II (Fall 2016, Summer & Fall 2019)
- Math 2470: Calculus III (Spring 2019, Fall 2020)
- Math 2510: Intro to Discrete Mathematics (Summer 2017, Fall 2019, Spring 2020)
- Math 3000: Differential Equations (Spring 2018)
- Math 3600 (*now changed to Math 4600*): Intro to Abstract Algebra I (Fall 2017 & 2018 & 2020)
- Math 3650: Intro to Linear Algebra (Spring & Summer 2019)

Online UNG courses:

- Math 2400: Elementary Statistics (Summer 2020)
- Math 2040: Brief Calculus (Summer 2020)
- Postdoctoral Research Associate, University of Arizona
 - Math 445: Cryptography (Spring 2016)
 - Math 129: Calculus II (Fall 2015)
 - Math 410: Matrix Analysis (Summer 2015)
- Visiting Assistant Professor, University of Arizona
 - Math 129: Calculus II (Spring 2015)
 - Math 116: Calculus Concepts for Business (Fall 2014)
- Lecturer, University of Wisconsin-Stout
 - Math 120: Intro to College Algebra (Spring 2013)
 - Math 153: Calculus I (Spring 2013)
 - Math 120: Intro to College Algebra (Fall 2012)
 - Math 153: Calculus I (Fall 2012)
- Graduate Student Instructor, University of Georgia
 - Math 2200: Calculus I (Spring 2012)
 - Math 2200: Calculus I (Fall 2011)
 - Math 2200: Calculus I (Spring 2010)
 - Math 1113: Precalculus (Fall 2009)
- Graduate Student Instructor, New Mexico State University
 - Math 121G: College Algebra (Spring 2008)
 - Math 121G: College Algebra (Fall 2007)

Course/curriculum Development

1. Math 4610: *Modern Algebra*. Irfan Bagci and I proposed this course in Fall 2019. It has been approved and will be offered in Spring 2021. This course is the next step of Abstract Algebra I (Math 4600), complementing to Abstract Algebra II (Math 4620).
2. Math 4900B: Independent Study (Summer 2018): This is a new course titled *Advanced Proof Techniques*. It is designed to provide students with necessary skills for 2018 Putnam competition (<https://www.maa.org/math-competitions/putnam-competition>) and for graduate level courses.
3. Redesign curriculum components of College Algebra (joint with the Gateways to Completion committee). A pilot implementation of the new design was applied in Math 1111 sections (of committee members) in Fall 2019 and Spring 2020.

Research Interests

- Representation Theory
- Algebraic Geometry
- Mathematics Education

Publications

1. *Redesigning College Algebra: A Vision for the Future*, accepted for publication in Gardner Institute (joint with Bikash Das, Thomas Hartfield, Clayton Kitchings, Marnie Phipps, and Alejandro Sarria)
2. *Low degree cohomology of Frobenius Kernels*, (2019). In: Feldvoss J., Grimley L., Lewis D., Pavelescu A., Pillen C. (eds) *Advances in Algebra. SRAC 2017. Springer Proceedings in Mathematics & Statistics*, vol 277, 255–259. Springer, Cham.
3. *Rational singularities of G -saturation*, *Journal of Commutative Algebra* **10** (2018), 375–391.
4. *Cohomology of SL_2 and related structures*, *Communications in Algebra* **46** (2018), 979–1000 (joint with K. Lux and Y. Zhang)
5. *On nilpotent commuting varieties and cohomology of Frobenius kernels*, *J. Algebra* **425** (2015), 65–84.
6. *On varieties of commuting nilpotent matrices*, *Linear Algebra and its Applications* **452** (2014), 237–262 (joint with K. Šivic).
7. *Commuting varieties of r -tuples over Lie algebras*, *J. Pure Appl. Algebra* **218** (2014), 1400–1417.
8. *Cohomology for Frobenius kernels of SL_2* , *J. Algebra* **396** (2013), 39–60.
9. *First cohomology for finite groups of Lie type: simple modules with small dominant weights*, *Trans. Amer. Math. Soc.* **365** (2013), 1025–1050 (joint with the UGA VI-GRE Algebra Group).

10. *Cohomology and Geometry for Frobenius Kernels of Algebraic Groups*, PhD thesis, University of Georgia, 2012.
11. *Second cohomology for finite groups of Lie type*, J. Algebra **360** (2012), 21–52 (joint with the UGA VIGRE Algebra Group).
12. *Cohomology for infinitesimal unipotent algebraic and quantum groups*, Transform. Groups. **17** (2012), 393–416 (joint with D. Nakano and C. Drupieski).

Recent submission to peer-review journals

1. *Module Varieties of Quotients of Polynomial Algebras*, submitted. This is joint work with Jerry Magana, an undergraduate student of UNG–Gainesville.
2. *Normality and Rational Singularities of G -saturation*, submitted.

In preparation (preprints available upon request)

1. *Geometry of the second Frobenius kernels*, joint with P. Levy.
2. *Commuting varieties and cohomological complexity theory*, joint with P. Levy and K. Šivic.

Software Development

In collaboration with Jon F. Carlson, I wrote a package of computer programs on Representation Theory, for computing the radical and socle layers of a given finite-dimensional module, and for classifying the simple submodules in each layer. This package was already implemented in MAGMA. I wrote a function which calculates the basic algebra for the first Frobenius kernel of the unipotent subgroup of Type A , and then computes the cohomology ring of that basic algebra. In my dissertation, I also created a program in MAGMA to compute character multiplicities in the cohomology module for the r -th Frobenius kernel of the Borel subgroup of SL_2 .

Invited Conference Talks

- AMS Fall Southeastern Sectional Meeting, Univ of Tennessee at Chattanooga, TN, Oct 10–11, 2020: *Module Varieties of Quotients of Polynomial Algebras*
- AMS Fall Eastern Sectional Meeting, Binghamton University, NY, October 12–13, 2019. *Low degree cohomology of Frobenius kernels*
- AMS Spring Southeastern Sectional Meeting, Auburn University, Auburn, AL, Mar 15–17, 2019: *On weakly rational singularities of G -varieties*
- 2019 Joint Mathematics Meetings AMS/MAA, Baltimore, MD, January 16–19, 2019: *Zariski Topology of Group Cohomology Rings*
- Southeastern Lie Theory Workshop X, University of Georgia, Athens, GA, June 10–12, 2018: *On the complexities of Frobenius kernels and Finite Chevalley groups*

- AMS Spring Eastern Sectional Meeting, Northeastern University, MA, Apr 21–22, 2018:
On geometric properties of G -saturation
- AMS Spring Central Sectional Meeting, Ohio State University, OH, Mar 16–18, 2018:
On the complexities of Frobenius kernels and Finite Chevalley groups
- 2017 Southern Regional Algebra Conference, University of South Alabama, Mobile, AL, March 17 -19, 2017: *Rational singularities of G -saturation*
- 2016 AMS Southeastern Sectional Meeting, University of Georgia, GA, March 5-6, 2016:
Cohomology of SL_2 and related structures
- AMS special session on “Geometric and categorical methods in representation theory” at the Joint Mathematics Meetings in Seattle, Washington, Jan 08, 2016:
On nilpotent commuting varieties and cohomology of Frobenius kernels
- 2013 Spring Eastern Sectional Meeting, Boston College, MA April 6-7:
Nilpotent Commuting Varieties
- 2012 Spring AMS Southeastern Section Meeting, University of South Florida, FL March 10-11: *Commuting Varieties and Cohomology of Frobenius Kernels*
- 2011 Fall AMS Central Section Meeting, University of Nebraska-Lincoln, NE October 14-16: *Cohomology for Infinitesimal Unipotent Algebraic and Quantum Groups*
- Sciences Conference at University of Natural Sciences, Ho Chi Minh City, October 2004:
Some Results on the Second Cohomology Group

Seminar/Colloquium Talks and others

- Poster presentation at 2019 UNG Symposium on Innovation, Research and Engagement (SOIRE), Dahlonoga, GA, Nov 15, 2019: *Design Advanced Algebra Courses With Significant Learning Experiences: Using Sagemath To Enhance Project-Based Learning Activities*
- Mathematics Colloquium, University of North Georgia–Gainesville, GA, Feb 25, 2019:
Using SageMath to enhance Project-based learning activities in advanced algebra courses
- UNG Club Talk, Feb 21, 2018: *On the Fermat’s Last Theorem*
- Algebra Seminar, University of South Alabama, Mobile, AL, Oct 27, 2017:
Commuting varieties and cohomological complexity theory
- Mathematics Colloquium, University of North Georgia–Gainesville, GA, Oct 9, 2017:
Commuting varieties and cohomological complexity theory
- 2017 SIAM Mini Symposium, University of North Georgia–Gainesville, GA, Apr 5, 2017:
On the theory of partitions
- Mathematics Colloquium, University of North Georgia–Gainesville, GA, Feb 13, 2017:
Some properties of commuting matrices
- Algebra/Number Theory Seminar, University of Arizona, Tucson, AZ, Nov 17, 2015:
On a connection between Frobenius kernels and finite Chevalley groups

- Algebra/Number Theory Seminar, University of Arizona, Tucson, AZ, Apr 14, 2015:
Cohomology of Weyl modules over SL_2
- Algebra/Number Theory Seminar, University of Arizona, Tucson, AZ, Dec 2, 2014:
Commutative algebra properties of nilpotent commuting varieties
- Algebra/Number Theory Seminar, University of Arizona, Tucson, AZ, Sep 16, 2014:
Cohomology theory of Frobenius kernels
- Pure Maths Seminar, Lancaster University, Lancaster, UK, Feb 26, 2014:
On the cohomology ring of Frobenius kernels
- Algebra Seminar, University of Manchester, Manchester, UK, Feb 11, 2014:
On the cohomology ring of Frobenius kernels
- Mathematics Colloquium, University of South Alabama, March 21, 2013:
Nilpotent Commuting Varieties
- Algebra Seminar, University of Georgia, December 05, 2011:
Nice Properties of Commuting Varieties
- VIGRE Seminar, University of Georgia, Fall 2011:
Barvinok's Algorithm for Counting Integral Points in a Polytope
- Algebra Seminar, University of Georgia, Fall 2011:
Computing Algebraic Structures with MAGMA
- Algebra Seminar, University of Natural Sciences, Ho Chi Minh City, July 24, 2011:
Cohomology for Frobenius Kernels of Algebraic Groups
- Invited Talk in the Teaching Seminar, University of Georgia, Fall 2010:
Teaching Experiences as an International TA
- Mock AMS conference, University of Georgia, Summer 2010:
Cohomology for Infinitesimal Unipotent Algebraic and Quantum Groups
- VIGRE Seminar, University of Georgia, Summer 2009:
Integral Distances in a Circle
- Algebra Seminar, University of Georgia, Spring 2009:
Some Results on the Second Cohomology Group

Conferences and Workshops Attended (but not giving talks)

- Online Course Design and Course Planning webinar, OFD Summer Workshop Course Design, June 18, 2020.
- 2020 Zassenhaus Groups and Friends Conference, Online meetings, May 29-30, June 5 - 6.
- Promotion and Tenure Policies and e-Portfolios webinar, UNG Workshop, March 19, 2020.
- 38th SEARCDE, UNG-Gainesville, Oct 6-7, 2018
- 2018 Grants Academy - UNG, May 7-10, 2018
- Teaching Conversations Workshop, UNG-Gainesville, 2017-2018

- 2017 Research on Teaching and Learning Summit, KSU Center, Kennesaw, GA, Oct 13, 2017
- Workshop: Copyright, Images, and Educational Use Part I, September 6, 2017
- New Faculty Institute Workshops, UNG-Gainesville, 2016-2017
- Math Club Talks, UNG-Gainesville, 2016-2017
- Interdisciplinary Colloquium, “*Quantum Mechanics Calculations of Chemical Reactions of Aluminum and Nickel*” by Alla V. Balueva, UNG–Gainesville, Apr 12, 2017
- 2017 Joint Mathematics Meetings AMS/MAA, Atlanta, GA, January 4-7, 2017
- Research on Teaching and Learning Summit 2016, KSU Center, Kennesaw, GA, Oct 14-15, 2016.
- 38th ARTIN Meeting, University of Aberdeen, 11-13 November, 2013
- Sixty-third BLOC meeting, Mathematical Institute, Oxford, 17-18 October 2013
- New Instructor Workshop, University of Wisconsin-Stout, August 14-16, 2012
- Seattle Summer π -School and Workshop on Cohomology and Support in Representation Theory, August 2012
- Interactions between Commutative Algebra and Representation Theory, Syracuse University, April 2012
- Southeastern Lie Theory Workshop on Algebraic and Finite Groups, Univ of Virginia, June 2011
- 2011 Joint Mathematics Meetings AMS/MAA, New Orleans, LA, January 6-9, 2011
- Southeastern Lie Theory Conference on Homological Methods in Representation Theory, University of Georgia, May 2010
- VIGRE Summer School on Lie and Representation Theory, University of Georgia, May 2010
- Southeastern Lie Theory Workshop on Combinatorial Lie Theory and Applications, North Carolina State University, October 2009

Grants, Honors, and Awards

- 2019 Presidential Innovation Incentive Award with the project “*Design Advanced Algebra Courses With Significant Learning Experiences: Using Sagemath To Enhance Project-Based Learning Activities*” joint with Irfan Bagci
- 2018 Grants Academy: *Algebraic Geometry and applications*, May 7–10, 2018
- EPSRC Grant on the project “*Varieties of modules and representations of Frobenius kernels of reductive groups*” (with Paul Levy), 2013–2014.
- AMS Graduate Student Travel Grant, March 2012
- AMS Graduate Student Travel Grant, October 2011

- University Outstanding Graduate Assistant Award 2010-2011, Department of Mathematics, University of Georgia
- Outstanding Graduate Student Award for 2007-2008, Department of Mathematical Sciences, New Mexico State University

Certificates

- 2020 Security Awareness Training Certificate
- UNG Online Teaching Certification (obtained in summer 2019)
- Certificate for completing Teaching Conversations Workshop, UNG-Gainesville, 2017-2018
- Certificate for completing New Faculty Institute Workshops, UNG-Gainesville, 2016-2017

Professional Service

- **Peer-referee for the research journals:**
 - o *Journal of Algebra*
 - o *Linear Algebra and its Applications*
 - o *Journal of Lie Theory*
 - o *Journal of Pure and Applied Algebra*
- **Reviewer** for AMS Math Reviews (2014–present)
- **AMS Member** from 2016 to 2021
- **SIAM Member** for the year 2019
- **Advising:**
 - o Faculty Advisor for UNG SIAM Student Chapter, Fall 2019
 - o Learning Support Academic Advisor since Fall 2017
 - o Attended Learning Support Advisor Refresher Training session, Feb 19, 2020
 - o NSO/TSO Advising, June 9, July 13, and Aug 9, 2018
 - o NSO/TSO Advising, August 09 and Dec 02, 2017
 - o Attended Learning Support Advisor Training, Feb 14, 2018
- **Committees:**
 - o Hospitality committee member, Math Department, UNG–Gainesville: Assist the department chair in organizing college and department social events.
 - o USG Committee member of Gateways to Completion (G2C) for 2018–2020: Redesign College Algebra course at UNG and improve student outcomes.
 - o Organizing committee member of the 38th SEARCDE, UNG-Gainesville, Oct 6–7, 2018
 - o Committee member of UNG–Math Tournament 2017, 2018 & 2019
 - o Search Committee member for Biology Department, UNG, Fall 2017

- Committee member of Daniel Rossi's comprehensive exam, University of Arizona, 2015
- **University Service: UNG**
 - Local supervisor for Putnam Competition at UNG since 2018. My duty includes recruiting and training students, organizing the Putnam exam at UNG–Gainesville, sorting and mailing students solutions to assigned grading committee.
In the 2019 Putnam Competition, the UNG team (on Gainesville campus) is ranked 202 out of 488. The team was recognized in the CSM–UNG spring 2020 e-newsletter, under the section Students Earn Prestigious Awards.
 - Co-supervising for Meteorology event in 2020 Science Olympiad Tournament, Feb 15, 2020
 - UNG-Open House, April 14, 2018
 - UNG-Open House, Oct 14, 2017
 - Attended a Training session on OneUSG Connect, Mar 19, 2018
 - Marching in the Fall Commencement Ceremony on Gainesville Campus, Dec 15th, 2017
- **Department Service: UNG**
 - Organize training sessions for Putnam Competition in 2019
 - Grader for senior projects in Math Department, UNG, Spring & Fall 2017, and Summer 2020
- **Service as an Event Organizer**
 - Invited Professor Gregory Bard, from the University of Wisconsin–Stout, to give presentations on SageMath in Math Club and Colloquium events, Sep. 23–24, 2019
 - Invited Professor Trung-Hoa Dinh, from Troy University, to give talk in UNG SIAM club, Nov. 14, 2019
 - Organized Training Sessions for the 2019 Putnam Competition. These sessions met every Monday in Fall 2019. Students practiced with sample problems I assigned.
 - Co-organizer (with Dan Nakano and Jon Carlson, UGA) of a special session “*Homological Methods in the Representation Theory of Groups and Algebras*”, 2019 Vietnam-USA Joint Mathematical Meeting, Quy Nhon University, Quy Nhon City, Vietnam
 - Co-organizer of AMS special session “*Group Representations and Cohomology*”, 2017 Joint Mathematics Meetings, Atlanta, GA, January 4, 2017
 - Co-organizer of Southwestern Group Theory Day, University of Arizona, March 21, 2015
 - VIGRE Graduate Student Seminar Co-organizer, University of Georgia, Fall 2011
- **Community Service: UNG**
 - Food Service Assistant for COSAM Picnic, Oct 18, 2019
 - Co-organize (with John Cummings and Kendra Ramey) Tea Time social hours at Mathematics Department (Spring 2019 - present)