

Angelica Babei

McMaster University
Hamilton Hall, Room 417
1280 Main Street West
Hamilton, ON, Canada, L8S 4K1

Phone: (603) 266-7124
Email: babeiangelica@gmail.com
Website: angelicababei.com
Last updated: Oct 13, 2022

EDUCATION

Dartmouth College , Hanover, NH	
Ph.D. in Mathematics (Advisor: Thomas R. Shemanske)	2019
Thesis: <i>On the Arithmetic of Tiled Orders</i>	
A.M. in Mathematics	2015
Colgate University , Hamilton, NY	
B.A. in Mathematics and German	2014

EMPLOYMENT

McMaster University , Hamilton, ON	
Postdoctoral Fellow (Mentor: Cameron Franc)	Fall 2021 - present
Dartmouth College , Hanover, NH	
Postdoctoral Researcher (Mentor: John Voight)	Spring 2021 - Summer 2021
Université de Montréal CRM , Montréal, QC	
Postdoctoral Fellow, thematic semester “Cohomology in Arithmetic”	Fall 2020 - Spring 2021
Vanderbilt University , Nashville, TN	
Postdoctoral Scholar (Mentor: Larry Rolen)	Fall 2019 - Summer 2020

RESEARCH INTERESTS

A blend of algebraic number theory, combinatorial and computational methods. More specifically, classical and Hilbert modular forms, modular forms for noncongruence subgroups, Atkin and Swinnerton-Dyer type congruences, quaternionic orders and orders in central simple algebras, and Bruhat-Tits buildings.

PUBLICATIONS

- Families of ϕ -congruence subgroups of the modular group* (with Andrew Fiori and Cameron Franc). Submitted for publication. ([PDF](#))
- Generalized Ramanujan-Sato series arising from modular forms* (with Lea Beneish, Manami Roy, Holly Swisher, Bella Tobin, and Fang-Ting Tu). Submitted for publication. ([PDF](#))
- Computing zeta functions of table algebra orders using the Bushnell-Reiner integral approach* (with Allen Herman). Submitted for publication. ([PDF](#))
- Type numbers of orders in central simple algebras*. Preprint ([PDF](#))
- The Riemann Hypothesis for period polynomials of Hilbert modular forms* (with Larry Rolen and Ian Wagner). *Journal of Number Theory*, 218 (2021), 44–61. ([PDF](#))
- Metacommutation of primes in Eichler orders* (with Sara Chari). *Acta Arithmetica*, 197:1 (2021), 77–92. ([PDF](#))

7. *Computing normalizers of tiled orders in $M_n(k)$* , Proceedings of the Thirteenth Algorithmic Number Theory Symposium, edited by Renate Scheidler and Jonathan Sorenson, Open Book Series 2, Mathematical Sciences Publishers, Berkeley, 2019, 55-68. ([PDF](#))

COMPUTATIONAL PROJECTS

1. Implementing a new environment for Hilbert modular forms in Magma ([github repository](#))
2. Contributor to the [LMFDB](#)

TALKS

- *A family of ϕ -congruence subgroups* June 2022
Workshop on Cohomology, Geometry and Explicit Number Theory, COGENT
- *A family of ϕ -congruence subgroups* June 2022
Algebra and Number Theory Seminar, University of Calgary
- *Solomon zeta functions of table algebras* November 2021
Number Theory Seminar, Oregon State University
- *Solomon zeta functions of table algebras* September 2021
Algebra and Algebraic Geometry Seminar, McMaster University
- *Genus 2 curves with real multiplication and graded rings of Hilbert modular forms* September 2021
Simons Collaboration on Arithmetic Geometry, Number Theory, and Computation
- *Period polynomials, their zeros, and Eichler cohomology* April 2021
Algebra and Number Theory Seminar, Louisiana State University
- *Period polynomials, their zeros, and Eichler cohomology* February 2021
Algebra and Representation Theory Seminar, University of Oklahoma
- *On the partition function modulo 3* January 2021
Joint Mathematics Meetings 2021, AMS Special Session on Quadratic Forms and Theta Functions
- *Zeros of period polynomials for Hilbert modular forms* December 2020
CMS 2020 Winter Meeting, special session on *Computations with Arithmetic Groups*.
- *Counting ideals in Eichler orders: a combinatorial approach* March 2020
Bates College, ME.
- *Metacommutation in quaternion orders and actions on the Bruhat-Tits tree* January 2020
Joint Mathematics Meetings 2020, Denver, CO.
- *Metacommutation in Eichler orders* September 2019
PANTS 2019, University of North Carolina at Charlotte, Charlotte, NC.
- *Hilbert modular forms in Magma* August 2019
Number Theory Seminar, Vanderbilt University, Nashville, TN.
- *Type numbers of orders in central simple algebras* January 2019
Joint Mathematics Meetings 2019, Baltimore, MD.
- *Type numbers of orders in central simple algebras* November 2018
Five College Number Theory Seminar, Amherst College, Amherst, MA.
- *Class and type numbers of orders in central simple algebras* October 2018
Québec-Maine Number Theory Conference, Université Laval, Québec.
- *Computing normalizers of tiled orders in $M_n(\mathbb{Q}_p)$* July 2018
Algorithmic Number Theory Symposium XIII, University of Wisconsin, Madison, WI.

- *Type numbers of orders in central simple algebras* May 2018
Number Theory Seminar, Dartmouth College, NH.
- *Tiled orders and the building for $SL_n(\mathbb{Q}_p)$* September 2017
Maine-Québec Number Theory Conference, University of Maine, ME.

TEACHING EXPERIENCE

- Instructor*, McMaster University
- Math 1MM3 - Applied Calculus Winter 2022
 - Math 1K03 - Advanced Functions Fall 2021
- Instructor*, Vanderbilt University
- Math 2420 - Methods of Ordinary Differential Equations Spring 2020
 - Math 1300 - Accelerated Single Variable Calculus I (2 sections) Fall 2019
- Instructor*, Dartmouth College
- Math 22 - Linear Algebra with Applications Fall 2018
 - Math 8 - Calculus of Functions of One and Several Variables Fall 2017
 - Math 1 - Calculus with Algebra Fall 2016
- Ethics Seminar Facilitator*, Dartmouth College
- Topics: Professionalism, Mentoring, Authorship and Peer Review, Data Collection Fall 2018

PROFESSIONAL ACTIVITIES

- **Hilbert Modular Forms Infrastructure Week** July 2021
Organized a 1-week workshop bringing together researchers affiliated with the Simons Collaboration on Arithmetic Geometry, Number Theory, and Computation.
- **Vanderbilt University Online Course Design Institute** June - July 2020
Participated in a 2-week workshop to prepare for planning and teaching an online course. Topics include building sample learning modules, online teaching tools and issues of access, and planning strategies to provide a thriving online learning experience.
- **Vanderbilt Center for Teaching - The Open Classroom** September 2019
Participated in discussion sessions on *Teaching Creativity* and *Active Learning*
- **Dartmouth Algebra and Number Theory Seminar - Organizer** 2015 - 2019
- **Dartmouth Mathematics Women's Tea - Organizer** Fall 2018
- **Dartmouth Center for the Advancement of Learning** August 2018
Participated in a workshop on *Creating an Inclusive Learning Environment*
- **Sage Days 95 : Women in Sage** July 2018
- **Dartmouth Ethics Facilitator Training** Spring 2018
- **Sage Days 87 : p-adics in Sage and the LMFDB** July 2017
Computed Galois splitting models for the LMFDB.
- **2016 NES MAA Vermont Workshop** October 2016
Teaching Calculus Now - Current Trends and Best Practices
- **Dartmouth College Mathematics Teaching Seminar** Summer 2016
Participated in an 8-week course focused on the discussion and implementation of pedagogical materials and philosophies. Topics included planning lessons and courses, student assessments and collaborative learning assignments.

OUTREACH

- **Nashville Math Club** - Workshop Co-leader 2019 - 2020
Knot Theory (September 2019)
Set Theory and the Inclusion-Exclusion Principle (February 2020)
- **Nebraska Conference for Undergraduate Women in Mathematics** - Panelist January 2019
- **Dartmouth Sonia Kovalevesky Day** - Panelist May 2019
- **Dartmouth Sonia Kovalevesky Day** - Workshop Co-leader 2015 - 2018
Cryptography: The Mathematics of Secrets (April 2018)
The Number Games: Survival of the Brainiacs (May 2017)
Complex Networks (April 2016)
Ramsey's Three Friends and Three Strangers (May 2015)
- **Johns Hopkins University : Center for Talented Youth** - Workshop Co-leader 2016 - 2017
The Number Games: Survival of the Brainiacs (May 2017)
Complex Networks (April 2016)
- **Exploring Mathematics Camp at Dartmouth** - Workshop Co-leader August 2016
Developed two week-long workshops for middle and high school students.
Probability and Knot Theory

OTHER SKILLS

- Programming skills: Magma, SageMath, Python, MATLAB, Git
- Language skills: native Romanian, fluent English, proficient German, Russian