The mission of the Department of Mathematics and Applied Mathematics is to foster excellence in mathematical research and to offer a strong undergraduate and graduate education that will prepare our students for stimulating and rewarding employment, career, and life-long learning opportunities. In addition, we strive to help all VCU students achieve a level of quantitative literacy and analytical skills enabling them to deal effectively with the quantitative issues that they will encounter throughout their lives.

Math Advising takes place on the 4th Floor of Harris Hall in Rooms 4117!
Our Advisor will help you with Overrides, Holds, Graduation Applications and any other questions you may have regarding your Major or Minor in Math!

Math Advising

The Dept. of Mathematics & Applied Mathematics has a departmental tea every Friday afternoon from 2-3 pm in the Math Mall Commons Area on the 4th Floor of Harris Hall. Come and join us for Coffee, Tea, Cookies, and Board Games!
ALL are Welcome!

Departmental Tea

The Math Help Center is located in Harris Hall 2nd Floor Room 2126!

Help Center

1015 Floyd Avenue
PO Box 842014
Richmond, VA 23284
Phone: 804-828-1301
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Welcome!

A warm welcome to our new faculty and staff who arrived at VCU this fall in the Department of Mathematics & Applied Mathematics!

Neal Bushaw
Assistant Professor

Dr. Neal Bushaw received his Ph.D. in Mathematics from the University of Memphis in 2012. Before coming to VCU, he was a Visiting Assistant Professor at Arizona State University and a research postdoc at Instituto Nacional de Matemática Pura e Aplicada (IMPA) in Rio de Janeiro.

Jamey Lovin
Instructor

Jamey Lovin started her career as an aeronautics analyst after receiving her M.A.S. from Embry-Riddle Aeronautical University. She is dedicated to helping educators inspire students’ passion for mathematics.

Benjamin Marlin
Instructor

Dr. Ben Marlin received his Ph.D. from New Mexico State University in Industrial Engineering. Prior to teaching at VCU, Ben served as an Analyst for the United States Army conducting research on topics like modeling manpower requirements for the Afghan National Police Force.

Oleksandr Misiats
Assistant Professor

Dr. Oleksandr received his Ph.D. from Penn State University in 2012. Dr. Misiats’ research interests are in the area of Analysis, Partial Differential Equations, Stochastic Analysis and Calculus of Variations with application to Materials Science Problems and Engineering.

Mitchell Phillips
Instructor

Mitch Phillips is a proud alumnus with a Bachelor’s and Master’s degree in Mathematical Sciences from VCU. He studied pure mathematics with a concentration in Graph Theory and Combinatorics. He now instructs precalculus and calculus courses.

Ali Kavruk
Visiting Assistant Professor

Ali Kavruk earned his Ph.D. in mathematics from the University of Houston. Ali’s research focuses on the theory operator algebras with applications to the quantum information theory and quantum entanglement as well as graph C*-algebras and logic.

Robin Lawson
Academic Advisor

Robin brings to us a strong background in Psychology, Counseling, and Human Development, along with a decade of academic advising experience from Radford and Virginia Tech. We are very happy to have her join us.
**Projects**

Sean Cox, Brent Cody, and Monroe Eskew continued work on the project “Open problems in the foundations of mathematics”, funded by the VCU Presidential Research Quest Fund. Some highlights of funded activities: In Spring 2017, we co-taught a special topics graduate course, titled “Filters, ultrafilters, and applications” where the students learned applications of logic to graph theory, combinatorics, and nonstandard analysis.

We hosted a workshop in May, titled Ideal Fest. There were five participants from outside VCU, including one from Japan. We worked on a variety of unsolved problems, making progress on several. Brent Cody and Hiroshi Sakai (the participant from Japan) have already submitted a manuscript based on work done at Ideal Fest.

Sean Cox and Monroe Eskew collaboratively solved several published open problems of Foreman, including one from the 1980s, and have submitted a manuscript of their work.

Cody, Cox, and Eskew have each also submitted solo papers based on work funded by the project.

**Grant for Student Success**

Dr. Rebecca Segal has been selected for funding as a mini-grant through our “WATCH US” grant from the NSF INCLUDES program. The grant has funding to help put students on equal foundation and provide them with tools to success, by delivering a series of programming tutorial courses to incoming graduate students by current graduate students. The grant will support networking lunches for the new graduate students as well.

**Retirement**

Dr. Hassan Sedaghat Retired from VCU June 30, 2017. We wish him well. (picture from his retirement gathering in the Math Dept.)

**Conferences**

Earlier this year Dr. Brent Cody gave talks at the Kurt Gödel Research Center in Vienna, Austria and at the Logic Colloquium 2017, held in Stockholm, Sweden.

Glenn Hurlbert was invited to the University of Malta in June to give a colloquium lecture in the Department of Mathematics and another talk at the 2nd Malta Conference on Graph Theory and Combinatorics. He also spoke on his research at Georgia Tech in April and UNC-Greensboro in February. In addition, he delivered a series of interactive presentations in May on the mathematics of juggling to first through eighth grade students at Richmond Montessori School, as well as a mathematical juggling talk to Richmond city middle school girls as part of Sonya Kovalevsky Day at the Math Science Innovation Center in December.

**Research Grants**

Two VCU Presidential Research Quest grants were awarded to professors in the department.

Craig Larson—Automated Discovery Tools for Large-scale Systematic Mathematical Research

Angela Reynolds & Rebecca Segal—The contribution of macrophages to disease progression, joint project with Shohba Ghosh in the Department of Internal Medicine.

**Instructor Jody Cox** gave birth to Ava Brynn Cox on March 10, 2017. Congratulations to Jody and Sean Cox. (pictured above)

**Instructor Justin Albert’s wife** gave birth to Arthur Michael Albert on August 27, 2017. Congratulations to Dr. Albert and his family. (pictured above)

**Dr. Brent Cody** got married to Anna Maternick on August 27, 2016 and they are expecting their first child on November 5, 2017. Congratulations on both Brent!
For one week in April 2017, a diverse group of mathematicians worked to solve a range of biological problems using mathematical and computation tools. This workshop was one in a series aimed at building new research collaborations, expanding career networks and energizing mathematical biology research.

Working in collaborative teams of 6-7, each along with a senior research mentor, and a co-leader, researchers developed new mathematical models to address questions in a range of application areas. Topics include autism spectrum disorder, ectoparasites and allogrooming, argasid ticks dynamics, super-fast nematocyst firing, combination therapy dynamics, and infectious disease modeling led by Jen-Mei Chang (California State University Long Beach), Nina Fefferman (University of Tennessee, Knoxville), Holly Gaff (Old Dominion University), Laura Miller (University of North Carolina, Chapel Hill), Helen Moore (Bristol Meyer Squibb), and Linda Allen (Texas Tech University), respectively. The workshop hosted a total of 50 participants.

In the post workshop survey, 100% of responders felt that the workshop was worth their time. The workshop provided a positive, supportive, productive work environment with researchers at all career stages. It helped to build new collaborations and expand their professional network.

100% of the participants gained knowledge in a variety of areas: 78% learned new mathematics, 90% learned new biology, and 70% learned new computational skills. 90% of participants expect to continue with the research group beyond the first publication. The workshop allowed participants to get real research done, to learn new tools that can be applied to other projects, and to get re-engaged and excited about research in general.

The workshop was organized by Ami Radunskaya (Pomona College), Rebecca Segal (Virginia Commonwealth University), and Blerta Shtylla (Pomona College). They are working to offer additional workshops in the future. This workshop was possible with funding support from the Society of Mathematical Biology, AWM-ADVANCE grant, Microsoft Research, and Mathematical Biosciences Institute.
The second BAMM! Conference was held in Richmond, Virginia in May 2016. We enjoyed a wide range of dynamic plenary talks throughout the conference.

Gregory Forest from University of North Carolina at Chapel Hill gave the opening plenary talk regarding the use of mathematics to understand the role of mucus in lung disease and how individual difference in mucus composition can determine the best course of treatment. Shandelle Henson from Andrews University gave an overview of her work on using dynamical system techniques to understand the link between rising seawater temperatures and increased incidences of sea bird cannibalism behavior and changes in egg laying patterns. Linda Allen from Texas Tech University discussed her research on disease spread as described by stochastic within-host and between-host models. She uses branching process approximations to study the infection or epidemic dynamics when R0 is greater than unity and to explore how outbreaks can be controlled. The final plenary talk was by Doron Levy from University of Maryland, College Park. He gave a summary of his work modeling the interplay between the immune system and chronic myelogenous leukemia and how vaccines and combination therapy effectiveness can be predicted.

We had about 80 attendees with 40 talks and 20 posters to round out the conference. Topics ranged from disease spread dynamics to models of human physiology to cancer dynamics to neurosciences to ecology. What we had initially envisioned as a local conference has continued to exceeded our expectations with a vibrant group comprised of mathematicians from 20 states and 3 other countries, from undergraduate students on up. Everyone participated in a networking coffee break which allowed great opportunities for career conversations and idea sharing. The poster session took place in VCU’s recently renovated library event space and fostered further conversation and socializing.

The conference was supported by grants from SMB and VCU and was held in cooperation with AWM.
**Undergraduate Activities**

**VCU at Math Modeling Challenge**

Dr. Rebecca Segal took a team of VCU Mathematics students to the 3rd Annual Shenandoah Valley Math Modeling Challenge at VMI in Lexington on September 30 - October 1. David Hood, Samuel Lian, and Sarah Williams had 24 hours to develop a model, write a report and prepare a presentation on the given challenge problem. This year’s problem was to develop an evacuation strategy for a national park. The students represented VCU well and had fun with a new experience.

![David Hood, Samuel Lian, and Sarah Williams at VMI after the Math Modeling Competition.](image)

**Undergraduate News**

Lauren Hux, Demetrus Kelly, Jesse Parrish and Sarah Williams attended the Spring MAA MD-DC-VA Section Meeting held at Frostburg State University on April 28-29, 2017 with Instructor Joe Flenner. (pictured top left)

Hannah DiStasio and Riley Harris attended the 19th annual Nebraska Conference for Undergraduate Women in Mathematics on February 3-5, 2017. (pictured top right)

Kiana Adili, Gwen Dunn, Jesse Parrish, Diana Voronina, Trey West and Sarah Williams attended the Shenandoah Undergraduate Mathematics and Statistics conference held at JMU on October 7, 2017 with Instructor Joe Flenner. Sarah presented a poster based on her work with Dr. Marco Aldi. (pictured bottom left)

Tatenda Ndambakuwa will attend OurCS: Opportunities for Undergraduate Research in Computer Science at Carnegie Mellon University on October 20 – 22, 2017. She will present a poster titled “Retirement planning using the Cost of Living Index.” (pictured bottom right)

**STEAM Fair for Kids**

Instructor Kristina Anthony hosted a STEAM Fair. There were 500 elementary students that attended this big event.

![STEAM Fair for Kids](image)

**Make it Real**

Tatenda Ndambakuwa grew up in Zimbabwe, and vividly remembers the country’s food crisis in 2008 that left her and millions of others facing starvation. Now, Ndambakuwa, a junior double majoring in math and physics at Virginia Commonwealth University, is seeking to prevent future famines in Africa with the power of big data. Ndambakuwa, a student in the College of Humanities and Sciences, is co-founder of a startup that is developing a mobile application to allow African farmers to upload data about their farm’s livestock and crop management, seed and feed access, milk production analysis, cattle pricing and other data points. The app will allow for real-time analyses of Africa’s food production system, allowing policymakers and others to make the system far more efficient.

![Tatenda Ndambakuwa](image)
Last year Women in Math (VCU) hosted Sonya Kovalesky Day on Dec. 3rd 2016. Sonya Kovalevsky Days have been organized and sponsored by AWM and held at colleges and universities throughout the country. Sonya Kovalevsky Days (SK Days) consist of a program of workshops, talks, and problem-solving competitions for female high school and middle school students and their teachers, both women and men.

This year Women in Math (VCU) will host the third annual Sonya Kovalevsky Day, a program of hands-on activities, presentations, and problem-solving for middle-school girls on Saturday, December 2, 2017 from 9 a.m. to 2 p.m.

The one-day event will include a short history of its namesake Sonya Kovalevsky, the first female professor in Europe and a pre-emanate mathematician. A plenary talk will be given by a local professional who has dedicated their life to mathematics. The bulk of the day will consist of hands-on sessions that the participants choose according to their interests. Sessions topics may include biomathematics, statistics, animation, engineering, and architecture. This event will provide extracurricular enrichment in STEM for middle school girls, hopefully encouraging them to consider future careers in STEM. Presenters will consist of Richmond area women who work in the STEM field. These women will provide the students with female role models from within our community. Middle school participants will be selected from five Richmond area school divisions.
Over the past year, the department has awarded a number of Master’s and Doctorates:

**Master’s awarded:**
- Doniray Brusafiero
  Adjunct at VCU Mathematics
- Cameron Crenshaw
  PhD at Louisiana State University in Mathematics
- Travis Chezik
  Adjunct at VCU Mathematics
- David Muncy
  Mathnasium
- Benjamin Mackinnon
  Math Teacher Hermitage High School
- Jeremy Meyers
  PhD William and Mary in Computer Science
- Mitchell Phillips
  Instructor VCU

**PhD program in Systems Modeling and Analysis Graduates:**
- Hossein Moradi
  Rekabdarkolaee with advisor Qin Wang and Ed Boone
  Postdoc at VCU
- Dogucan Mazicioglu with advisor Jason Merrick
  Statistics Specialist at Afton Chemical
- Babak Saleck Pay
  with advisor Yongjia Song
  Senior Data Scientist at Precima
- Sepehr Piri with advisor Ed Boone
  Data Modeler at Lexis Nexis Risk Solutions

**Graduate News**

Sarah Minucci, Jamie Shive, Kyle Wendling, and Josh Whitlinger attended the SIAM conference in Pittsburgh. *(photo to the right)*

Josh Whitlinger attended the JMM conference in Atlanta in January 2017 and gave a presentation at the conference entitled “Estimating the Fraction in Fractional Differential Equations using a Bayesian Approach”

Kyle Wendling attended the BAMM! Conference at VCU and presented a poster in May entitled “Noisy Neural Oscillators with Intrinsic and Network Heterogeneity”

Jifang Zhao and Josh Whitlinger attended the SRCOS meeting at Jekyll Island, Georgia in June and both presented posters, Jifang’s entitled “Fused Lasso Based Blocking for Richmond Housing Price Analysis” and Josh entitled “Estimating the Fraction in Fractional Differential Equations using a Bayesian Approach”

Sarah Minucci attended a week-long Summer Graduate Program NIMBioS at UT Knoxville (the topic was Connecting Biological Data with Mathematical Models) in June

Junee TanTorres attended the U of Washington Summer Institute. Attended seminar on Microbiome Analysis in July.

Sarah Minucci, Kyle Wendling, Josh Whittinger, Jamie Shive, Mo Li, Jifang Zhao, Brooke Sanders, and Junee Tan Torres gave talks in the SSOR Seminars about the summer research they did. Overall they went well. Josh wore dress pants and no hat, which seemed to confuse people as to who he was when he presented.

Jamie Shive adopted a small black pug, which she named Maple, like the math software.

Jamie Shive presented a small talk about Graph Theory at the Sonya Covalesges Girls Day at the MathSci Innovation Center in December.

**Graduate Programs**

In the past year, our PhD students in Systems Modeling and Analysis attended many workshops and conferences.

- Babak Saleck Pay
  2017 INFORMS Computing Society Conference
- Ghasemali Salmani Jajaei
  15th INFORMS Computing Society
- Sarah Minucci
  Joint 2017 MBI-NIMBioS-CAMBAM Summer Graduate Program: Connecting Biological Data with Mathematical Models; Mathematical Biology Institute Workshop: Multi-scale Hybrid Modeling; Society for Industrial and Applied Mathematics Annual Meeting
- Jamie Shive
  Society for Industrial and Applied Mathematics Annual Meeting
- Marcella Torres
  Fourth Short Course on Mathematical Sciences in Obesity Research
- Joshua Whittinger
  Joint Mathematics Meetings; NSF/ Harshbarger Student Poster Session
- Kyle Wendling
  Biology and Medicine Through Mathematics
- Antonio Tan-Torres
  9th Summer Institute in Statistics and Modeling in Infectious Diseases
- Brooke Sanders
  INFORMS Annual Meeting