G. Michael Lavigne

CONTACT

mlavigne93@gmail.com (985)-502-3371

APPOINTMENTS

Instrctor of Mathematics
North Carolina School of Science and Mathematics *2022 - present*

Primary duties include teaching 3 courses per semester and 2 January term courses. Lead organizer and instructor of Summer Research and Innovation Program in Mathematics. Piloted two new courses: Linear Algebra w/ Applications and Mathematical Biology. Coordinate large multi-section courses and overseeing all research-related programs, events, and recruiting.

Visiting Assistant Professor and **SCMB Assistant Director** *2020 - 2022*
School of Mathematics, Georgia Institute of Technology
Southeast Center for Mathematics and Biology (SCMB)

School of Math duties included teaching two large-section service courses per semester and managing a team of 6 TAs. Developed and piloted MATH 4755 Mathematical Biology, which won a school-wide award.

Developed and piloted SCMB's educational outreach events and served as lead organizer for convening research events. Other duties included assessment and reporting of Center performance and creation of trainee Development Plan.

EDUCATION

North Carolina State University, Raleigh, NC

Ph.D. in Applied Mathematics, May 2020

M.S. in Applied Mathematics, December 2017

Tulane University, New Orleans, LA

B.S. in Mathematics, May 2015; *Suma Cum Laude*

B.A. in Spanish, May 2015

TEACHING EXPERIENCE

NCSSM	**SRIP Mathematics**	Summer	23, 24, 25
	Linear Algebra	MA4320	23, 24, 25
	Mathematical Modeling	MA4200	23
	Mathematical Biology	J-term	23, 24
	Research in Mathematics	MA4510	23, 24, 26
	Multivariable Calculus	MA4060	22, 24, 25
	Calculus II	MA4044	23, 24, 25
	Calculus I	MA4042	22, 24
Georgia Tech	**Multivariable Calculus**	MATH 2551	21, 22
	Mathematical Biology†	MATH 4755	21
	Integral Calculus	MATH 1552	21, 21

† awarded Student Recognition of Teaching Excellence Award. One of only 2 awarded in CoS.

NCSU	**Calculus III**	MA 242	18, 19
	Calculus II	MA 241	19, 20
	Calculus I	MA 141	19, 17

Educational Programs & Outreach Events

Summer Research and Innovation Program, June 2023, 2024, 2025
Intensive research experience in mathematics. Led 12 high school students in preparing and submitting solutions to MAA challenge problems. Continued support for students to present results at various fora during academic year.

FGCSI Workshop, June 2022
Workshop for aspiring first generation college students. Students used analogue and digital experiments to discover the laws of exponential growth in bio-systems.

STEAM Workshop, April 2022
Workshop for metro Atlanta high school students. Students used analogue and digital experiments to discover the laws of exponential growth in bio-systems.

SCMB Annual Symposium, Winters 2021 and 2022
Served as lead organizer for SCMB's flagship annual event, focused on how math-bio researchers can find success in their collaborations and careers. Recruited speakers, panelists, and served as moderator.

SCMB Summer Modeling Accelerator, Summers 2021 and 2022
Served twice as principal developer, organizer, and instructor for pilot summer program for undergraduates to study the mathematical modeling of complex bio-systems.

Mathematical Interests

- ❑ Mathematical Biology and Infectious Disease Modeling
- ❑ Modeling with Ordinary and Partial Differential Equations
- ❑ Agent-based Modeling and Cellular Automata
- ❑ Inverse Problems, Parameter Estimation, and Machine Learning
- ❑ Subtractive Games and Games on Graphs
- ❑ Fourier Analysis and Spectral Methods

Publications

"'Ring Vaccination' and 'Contact Tracing' as strategies of the innate immune response to viral infection," Lavigne et al., *Proc. of the Royal Society B,* 2021.

"Learning partial differential equations for biological transport models from noisy spatiotemporal data," Lagergren and Nardini et al., *Proceedings of the Royal Society A,* 2020.

Conference Talks and Activities

Nourishing intuition: Matrix operations through Oats and Eggs, Teaching Contemporary Mathematics, oral presentation; Durham, NC. (Feb. 2025)

Bio-systems Reveal Mathematical Gems with Netlogo, Teaching Contemporary Mathematics, oral presentation; Durham, NC. (Feb. 2024)

Growth by chance: re-discoving population laws from probability games, Teaching Contemporary Mathematics, oral presentation; Durham, NC. (Feb. 2023)

What we have learned by living with another discipline, Panel Moderator, SCMB 4th Annual Symposium. (Dec. 2021)

Mathematical Biology: past, present, and future, seminar talk, GT Undergraduate Math Seminar. (Nov. 2021)

What can we learn from embedding in each other's spaces?, Panel Moderator, SCMB 3rd Annual Symposium. (Dec. 2020)

Quantifying Uncertainty in a Stochastic Cellular Automata Model via Equation Learning‡, SMB Annual Meeting, poster presentation; Montreal, QC. (July 2019)

Non-mechanistic Learning of PDEs from Spatial Biological Data, BAMM!, oral presentation; Richmond, VA. (May 2019)

Non-mechanistic Learning of PDEs from Spatial Biological Data, SAMSI PMED/ MUMS Joint Meeting, oral presentation; Raleigh, NC. (May 2018)

Spatial Modeling of in-vivo viral infection with Interferon Response, BAMM!, poster presentation; Richmond, VA. (May 2018)

Spatial Modeling of in-vivo viral infection with Interferon Response, SIAM Southeast Atlantic Section, oral presentation; Chapel Hill, NC. (Feb. 2018)

DARPA INTERCEPT Review Meeting, San Fransisco, SF (Oct. 2017)

Impact of IFN Response of Spatial Dynamics of Viral Infection, SIAM Conference on Applications of Dynamical Systems, oral presentation; Snowbird, UT. (May 2017)

Turing Patterns in Biological Morphogenisis, SynTheSys Lunch Talks, oral presentation, NC State University. (Jan. 2017)

Honors and Awards

Spring 2021	Student Recognition of Excellence in Teaching Award
Fall '20 and '21	CIOS Teaching Honor Roll
Summer 2019	Poster Award, SMB Annual Meeting
2016–2018	RTG Fellowship
2015–2016	Provost Fellowship
May 2015	Terry C. Lawson Prize *(Math Dept. honors)*
May 2015	Hispano-american Studies Prize *(Spanish Dept. honors)*

Coursework and Skills

- ❑ Functional Analysis
- ❑ Matrix Theory
- ❑ Dynamical Systems
- ❑ Control Theory
- ❑ Partial Differential Equations
- ❑ Mathematical Modeling
- ❑ Numerical Analysis
- ❑ Numerical Methods for PDEs
- ❑ Complex Analysis
- ❑ Neural Network Architectures

Programming:	MATLAB, Julia, Python, LaTeX.
Learning Platforms:	Canvas, Mathmatize, MyLab, WebAssign.
Languages:	English, Spanish (C1)