

LEAH E. LEJEUNE

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RESEARCH INTERESTS

Mathematical biology; ordinary differential equations; mathematical modeling; dynamical systems; infectious diseases; evolutionary dynamics; difference equations

EDUCATION

- May 2023 **Ph.D. Applied Mathematics**, University of Louisiana at Lafayette
-Thesis: *Dynamics of a two-strain cholera model with an environmental component*
-Advisor: Dr. Cameron Browne
-GPA: 3.95
- Dec. 2019 **M.S. Applied Mathematics**, University of Louisiana at Lafayette
-Major professor: Dr. Cameron Browne
-GPA: 4.0
- May 2015 **B.S. Mathematical Science**, Franciscan University of Steubenville
-Senior Thesis: *Fundamental Theorem of Finite Abelian Groups*
-GPA: 3.9

RESEARCH EXPERIENCE

- June 2023–present **Postdoctoral Associate**, Virginia Tech
Developing and analyzing coupled behavior–disease models of COVID-19 to increase reliability of predictive models for future disease outbreaks and better inform policy construction.
- Jan. 2022–May 2022 **Research Assistant**, University of Louisiana at Lafayette
May 2019–May 2020 Analyzing dynamics of a two–strain cholera model with environmental component using both deterministic and stochastic methods.
- June 2021–May 2022 **Independent research project**, University of Louisiana at Lafayette
Extending results of traditional Beverton–Holt and Ricker difference equations population models, expanded to incorporate evolutionary dynamics.
- May 2022 **CBMS Conference: Interface of Mathematical Biology and Linear Algebra**, University of Central Florida, Orlando, FL
Worked with a conference subgroup of professors and graduate and undergraduate students to research and present results on issues with using the basic reproduction number to determine optimal control strategies.
- Summer 2013 **REU Intern**, Michigan State University Lyman Briggs College
Collaboratively researched behavior of roots of Fibonacci-type functions.

TEACHING & TUTORING EXPERIENCE

- Instructor of Record (Teaching Assistant)**, University of Louisiana at Lafayette
- Fall 2021 - Pre-Calculus Trigonometry and Function Theory: 2 sections, in-person instruction
- Spring 2021 - Pre-Calculus Algebra: 2 sections, hybrid instruction & in-person instruction
- Fall 2020 - Pre-Calculus Algebra: 2 sections, hybrid instruction
- Spring 2019 - Pre-Calculus Algebra: 2 sections, in-person instruction
- Fall 2018 - Applied College Algebra: 2 sections: in-person instruction

Fall 2017-Spring 2018 **Teaching Assistant**, University of Louisiana at Lafayette
Tutored undergraduates in College Algebra, Trigonometry, Pre-calculus, Calculus I, II, & III, Differential Equations; graded for professors in Calculus II and III.

AWARDS & HONORS

Aug. 2022 **Dissertation Completion Fellowship**, University of Louisiana at Lafayette
Support for outstanding PhD candidates in final year of writing and defending a Thesis.

May 2022 **Poster presentation finalist**, CBMS Conference: Interface of Mathematical Biology and Linear Algebra, University of Central Florida, Orlando, FL

FUNDING & GRANTS

Jan. 2023 **\$1300 Graduate Student Travel Grant**, Joint Mathematics Meetings, Boston, MA

Nov. 2022 **\$500 Student Travel Award**, 5th Annual Meeting of the SIAM Texas-Louisiana Section, Houston, TX

July 2022 **\$650 Student Travel Award**, SIAM LS22 Conference, Pittsburgh, PA

July 2022 **\$400 travel award**, University of Louisiana at Lafayette Graduate Student Organization

May 2022 **\$600 travel award**, CBMS Conference: Interface of Mathematical Biology and Linear Algebra, University of Central Florida, Orlando, FL

Feb. 2020 **\$100 travel award**, Math For All Conference, Tulane University, New Orleans, LA

PAPERS

1. LeJeune, L. & Browne, C. Effect of cross-immunity in a multi-strain cholera model. *Under revision.*

NON-PEER REVIEWED PUBLICATIONS

1. LeJeune, Leah. "Cross Immunity in a Multi-strain Cholera Model." *SIAM News Blog*, Society for Industrial and Applied Mathematics, 18 Nov. 2022, https://sinews.siam.org/Details-Page/cross-immunity-in-a-multi-strain-cholera-model?fbclid=IwAR2iMnAPZFGmakIn_EfNU3lsABMQg8tk--j044BNdZ-98pglCNBaPeOPaU. Research.

PRESENTATIONS

Sept. 2023 *Cross-immunity and transmission influences in a multistrain host-pathogen cholera model*
Virginia Tech MathBio Seminar, Blacksburg, VA

July 2023 *Cross-immunity and transmission influences in a multistrain host-pathogen cholera model*
Society for Mathematical Biology Annual Meeting - 2023, Columbus, OH

Feb. 2023 *Modeling infectious diseases using differential equations and stochastic processes: an application to cholera serotype cycling*
UL Lafayette AMS Graduate Student Chapter, Lafayette, LA

Jan. 2023 *Effect of cross-immunity in a multi-strain cholera model*
Joint Mathematics Meetings, Boston, MA

Dec. 2022 *Effect of cross-immunity in a multi-strain cholera model*

University of Pittsburgh AWM Seminar, remote presentation.

- Nov. 2022 *Effect of cross-immunity in a multi-strain cholera model*
5th Annual Meeting of the SIAM Texas-Louisiana Section, Houston, TX
- Oct. 2022 *Effect of cross-immunity in a multi-strain cholera model*
International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems, Lafayette, LA
- July 2022 *Effect of cross-immunity in a multi-strain cholera model*
SIAM Conference on the Life Sciences, Pittsburgh, PA
Presenter and session chair.
- May 2022 *Dynamics of a two-strain cholera model with environmental component*, poster presentation, CBMS Conference: Interface of Mathematical Biology and Linear Algebra, University of Central Florida, Orlando, FL
- Feb. 2022 *Effect of cross-immunity in a multi-strain cholera model*
Society for Mathematical Biology Math-Epidemiology/Math-Immunology Subgroups Mid-Year Mini Virtual Conference, Lehigh University
- Oct. 2021 *Dynamics of a two-strain cholera model with environmental component*
Applied Math Seminar, University of Louisiana at Lafayette
- Mar. 2020 *Dynamics of a two-strain cholera model with environmental component*,
Math For All in New Orleans, Tulane University
- Aug. 2013 *Some Fibonacci-type Polynomials and their Properties*,
MAA MathFest, Hartford, Connecticut

PROFESSIONAL AFFILIATION

- Apr. 2023 - present **Society for Mathematical Biology**
Member; presented and volunteered at conference
- Feb. 2021-present **Models of Infectious Disease Agent Study network**
Member; presented a 3-minute lightning talk and sat on a panel for the MIDAS Trainee Network Committee Quarterly Meeting in January 2023.
- Mar. 2022-present **Society for Industrial and Applied Mathematics**,
Member; presented at conferences and chaired a conference session in 2022.
- 2021-present **American Mathematical Society**, UL Lafayette Student Chapter
President: Running meetings to maintain and develop chapter; jointly organizing weekly activities to support graduate students and seminars to facilitate interdepartmental community; spearheaded efforts to restart the chapter in 2021.
- 2019-2020 Treasurer: Progressed in creating a university account to receive chapter funds.
- 2017-present Member: Attended talks and various university chapter events.
- 2018-2023 **Association for Women in Mathematics**, UL Lafayette Student Chapter
Member: Attended regional conference in April 2019; participated in various university chapter events.

SERVICE TO PROFESSION

- June 2023 **Referee for journal**: Journal of Biological Dynamics, 2023, 1 publication
- Feb. 2023 **Referee for journal**: Journal of Biological Systems, 2023, 1 publication
- Jan. 2023 **Poster reviewer**, Joint Mathematics Meetings, Boston, MA

Reviewed 6 undergraduate posters between two poster sessions. Heard student presentations, asked questions, and provided feedback electronically.

MENTORING

Spring 2023 Joint research project with undergraduate student in extension of dissertation work

COMMUNITY OUTREACH

March 2022 **The Big Event**, University of Louisiana at Lafayette
Planted trees and mulched gardens with other graduate students in participation with a campus-wide community service outreach event.

May 2020 **United Way of Acadiana Food Distribution**, Lafayette, LA
Distributed meals to families in need during COVID-19 pandemic with local outreach organization.

March 2019 **Family Adventure Day**, Lafayette, LA
Volunteered with Healing House, a local organization for supporting grieving children. Directed a cookie-decorating booth part of a scavenger hunt event for families in the community.

Spring 2019 **Homeless Outreach**, Lafayette, LA
Served dinners and socialized with homeless community in downtown Lafayette.

Nov. 2019, Nov. 2018 **Science Day**, University of Louisiana at Lafayette
Showcased mathematics department to local high school seniors by engaging students in various creative mathematical games and experiments.

RELEVANT SKILLS

MATLAB, Mathematica, Maple, Python, LaTeX, MS Office

REFERENCES

Cameron J. Browne (PhD Advisor): cameron.browne@louisiana.edu

Bruce A. Wade (Department Head): bruce.wade@louisiana.edu

Justin C. Lynd (Professor/Mentor): justin.lynd@louisiana.edu

Ping W. Ng (Graduate Coordinator): ping.ng@louisiana.edu

James Kimball (Teaching Supervisor): jkimball@louisiana.edu