DR. LAUREN LAZARUS MELFI

Assistant Professor, Applied Mathematics
School of Computing & Data Science
Wentworth Institute of Technology

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EDUCATION:

Cornell University 2010 - 2016
Ph.D. in Theoretical and Applied Mechanics – Advisor: R. H. Rand

University of New Hampshire 2006 - 2010
B.S. in Physics with University Honors; B.A. in Classics – Summa Cum Laude

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ACADEMIC POSITIONS:

Wentworth Institute of Technology 2020 – present
Assistant Professor, Applied Mathematics, School of Computing and Data Science

Trinity College 2017 - 2020
Harold L. Dorwart Visiting Assistant Professor, Dept. of Mathematics

Harvey Mudd College 2016 - 2017
Visiting Assistant Professor, Dept. of Mathematics

Cornell University Spring 2016
Teaching Associate, Dept. of Mathematics

PUBLICATIONS:

M. J. Panaggio, M.-V. Ciocanel, **L. Lazarus**, C. M. Topaz, and B. Xu: Model reconstruction from temporal data for coupled oscillator networks. *Chaos* **29**, 103116 (2019).

L. Lazarus, M. Davidow, and R. Rand: Periodically Forced Delay Limit Cycle Oscillator. *International Journal of Non-Linear Mechanics,* **94**, pp. 216-222 (2017).

L. Lazarus, M. Davidow, and R. Rand: Dynamics of an oscillator with delay parametric excitation. *International Journal of Non-Linear Mechanics,* **78**, pp. 66-71 (2016).

L. Lazarus, M. Davidow, and R. Rand: Dynamics of a delay limit cycle oscillator. *Nonlinear Dynamics*, **82**, pp. 481-488 (2015).

L. Lazarus and R. H. Rand: Dynamics of a System of Two Coupled Oscillators Driven by a Third Oscillator. *Journal of Applied Nonlinear Dynamics*, **3** (3), pp. 271-282 (2014).

AWARDS AND FELLOWSHIPS:

Finalist, President's Award for Distinguished Teaching, Wentworth Institute of Technology	2023
Fellow, Center for Teaching and Learning, Trinity College	2018 – 2019
Participant, AMS Mathematics Research Community, Agent-Based Modeling	June 2018
Blue '17 Fellow, MAA Project NExT	2017 – 2018
H. D. Block Teaching Prize, Cornell University	2016
Phi Beta Kappa Honor Society, Beta of New Hampshire	2010

PRESENTATIONS:

Special Session Conference Talks:

SIAM/CAIMS Annual Meeting — July 17, 2020
"Model Reconstruction for Coupled Oscillator Networks from Temporal Data." (virtual)
with M. J. Panaggio, M.-V. Ciocanel, C. Topaz, and B. Xu.

AIMS Conference on Dynamical Systems, Differential Equations and Applications — June 2020
"Comparing and classifying the behaviors of delayed and instantaneous oscillator models"
(disrupted by COVID-19 pandemic)

AIMS Conference on Dynamical Systems, Differential Equations and Applications — June 2020
"Model Reconstruction for Coupled Oscillator Networks from Temporal Data"
with M. J. Panaggio, M.-V. Ciocanel, C. Topaz, and B. Xu. *(disrupted by COVID-19 pandemic)*

Joint Mathematics Meetings — January 17, 2019
"Network reconstruction from temporal data for coupled oscillators." Baltimore, MD
with H. Adams, M.-V. Ciocanel, K. Houston-Edwards, M. J. Panaggio, C. Topaz, and B. Xu.

Colloquium Talks:

Monday Night Class, School of Computing & Data Science, Wentworth — October 16, 2023
"Optimizing to Find the Parameters that Govern Nature" (virtual)

Boston University Dynamical Systems Seminar — May 2, 2022
"Model Reconstruction for Coupled Oscillator Networks from Temporal Data"

Talk Math With Your Friends (#TMWYF) Colloquium — April 1, 2021
"Finding Resonance with Delays" — (virtual)

Yale Undergraduate Mathematics Society Seminar — October 16, 2020
"System Delay as a Feature, Not a Bug" — (virtual)

Rose-Hulman Institute of Technology Mathematics REU Colloquium — July 16, 2020
"Modeling Oscillations with Delayed Feedback" — (virtual)

University of Hartford Mathematics Undergraduate Colloquium — September 14, 2018
"System Delay as a Feature, Not a Bug."

Claremont Center for the Mathematical Sciences Colloquium — November 30, 2016
"Delay in the System: Oscillations caused by non-trivial response time."

Contributed Conference Talks:

SIAM Conference on Applications of Dynamical Systems — May 16, 2023
"Exploring Mechanisms of Chaos in Delayed Oscillator Systems with Cubic Nonlinearity" — Portland, OR

Dynamics Days US 2023 — January 9, 2023
Poster: "Exploring Chaos in the Delayed Oscillator with Cubic Nonlinearity" — (virtual)

Joint Mathematics Meetings — January 6, 2023
"Exploring Chaos in the Delayed Oscillator with Cubic Nonlinearity" — Boston, MA

SIAM Conference on Applications of Dynamical Systems — May 24, 2021
"Model Reconstruction for Coupled Oscillator Networks from Temporal Data" — (virtual)
with M. Panaggio, M.-V. Ciocanel, G. McLaughlin, C. Topaz, and B. Xu

Joint Mathematics Meetings — January 17, 2020
"Comparison and machine classification of limit cycles from ODE and delayed oscillator models" — Denver, CO

SIAM Conference on Applications of Dynamical Systems — May 19, 2019
"Comparison and connection between delay oscillators and ODE oscillators." — Snowbird, UT

Joint Mathematics Meetings — January 16, 2019
"Frequency effects of various cubic resonances on a delayed oscillator." — Baltimore, MD

SIAM Conference on Applications of Dynamical Systems — May 24, 2017
"Internally delayed oscillator in coupling." — Snowbird, UT

Joint Mathematics Meetings — January 5, 2017
"Periodic forcing of a first-order delay limit cycle oscillator." — Atlanta, GA
with M. Davidow and R. H. Rand.

IUTAM Symposium, Analytical Methods in Nonlinear Dynamics — July 8, 2015
"Dynamics of a delay limit cycle oscillator." — Frankfurt, Germany
with M. Davidow and R. H. Rand.

ASME International Design & Engineering Technical Conferences — August 20, 2014
"Dynamics of a system of two coupled oscillators driven by a third oscillator." — Buffalo, NY
with R. H. Rand.

American Physical Society March Meeting — March 16, 2010
Poster: "System dynamics of non-diffusively coupled oscillators." — Portland, OR
with J. Tranquillo.

TEACHING EXPERIENCE:

Wentworth Institute of Technology — 2020 – present

Math 1775 Integrated Engineering Calculus I
Math 2025 Multivariable Calculus – *(Course Coordinator, spring 2023)*
Math 2500 Differential Equations
Math 2750 Differential Equations & Systems Modeling
Math 2800 Finite Mathematics
Math 2860 Linear Algebra & Matrix Theory – *(Course Coordinator, fall 2023)*
Math 4900 Partial Differential Equations

Trinity College — 2017 - 2020

Intro to Mathematical Modeling
Linear Algebra
Mathematical Pearls
Statistical Data Analysis
Differential Equations
Calculus II
Calculus III

Harvey Mudd College — 2016 - 2017

Intro to Differential Equations
Intro to Linear Algebra
Multivariable Calculus
Intermediate Differential Equations
Differential Equations and Linear Algebra II

Cornell University — 2016

Calculus I; [also see Predoctoral Teaching Experience below]

STUDENT RESEARCH MENTORING:

Benjamin Liske, Trinity College '20 — Summer 2019

Daniel Melesse, Trinity College '20 — Summer 2019

Kalsang Sherpa, Trinity College '20 — Summer 2018
Outstanding Poster, MAA Student Poster Session, Joint Mathematics Meetings 2019

SERVICE TO PROFESSION:

Organizing Committee Member: Dynamics Days 2020, Hartford, CT — January 2020

Reviewer:
- *Scientific Reports* – Springer Nature
- *College Mathematics Journal* – MAA, Taylor & Francis
- *Nature Communications* – Nature Research
- *International Journal of Systems Science* – Taylor & Francis
- *SN Applied Sciences* – Springer

Contest Judging:
- SCUDEM – SIMIODE Challenge Using Differential Equations Modeling — 2022-2023
- AWM/MfA Essay Contest – Round 1 — 2021-2023
- COMAP Interdisciplinary Contest in Modeling – Triage — Feb/Mar 2021

Membership:
- Mathematical Association of America (MAA)
- Society for Industrial and Applied Mathematics (SIAM)
- Association for Women in Mathematics (AWM)
- Phi Beta Kappa Honor Society
- American Mathematical Society (AMS) – 2016-2019

SERVICE TO INSTITUTE / SCHOOL:

Advisory:
- Faculty Co-Advisor, SIAM Student Chapter — 2022-present
- Panelist, "Literacy, Numeracy, and Smart AI: WIT Faculty Reflections" — January 31, 2023

Committees & Taskforces:
- Senator, Wentworth Faculty Senate — 2022-present
- Member, Applied Mathematics Curriculum Committee — 2021-present
- Member, Differential Equations & Linear Systems Committee (ad hoc) — 2022-23
- Chair, Student Awards Taskforce, School of Computing & Data Science — Summer 2023
- Co-Chair, First-Year Exploratory Program Task Force — 2022-23

Member, Bylaws Committee, School of Computing & Data Science 2022-23
Member, Women's Leadership Initiative Advisory Committee (ad hoc) 2021

Search Committees:
Co-Chair, Computer Science and Data Science Search Committee 2023-24
Member, Computer Science Search Committee 2022-23
Co-Chair, Data Science Search Committee 2021-22

SELECTED OUTREACH:

Panelist / Visitor:
AAUW Tech Savvy Conference at Trinity College, Hartford, CT March 7, 2020
Women in STEM Club at Hall High School, West Hartford, CT April 22, 2019

PREDOCTORAL TEACHING EXPERIENCE:

Cornell University

Instructional Teaching Assistant, Dept. of Mathematics Sp 2014, Sp 2015
Calculus I

Workshop Development Assistant, Engineering Learning Initiatives Sp/Fa 2013, Fa 2014
[Calculus / Multivariable Calculus] for Engineers

Recitation Teaching Assistant, Dept. of Mathematics Fa 2010, Sp/Fa 2011, Sp/Fa 2012, Fa 2015
[Calculus / Multivariable Calculus / Differential Equations / Linear Algebra] for Engineers

Instructor's Assistant, Dept. of Mathematics Sp/Fa 2011, Sp 2012, Sp/Fa 2013, Fa 2014, Fa 2015
[Calculus / Multivariable Calculus / Differential Equations / Linear Algebra] for Engineers

Teaching Assistant, Dept. of Mechanical and Aerospace Engineering Su 2011, Su 2012, Su 2013
System Dynamics, Heat Transfer

University of New Hampshire Sp 2010

Teaching Assistant, Dept. of Physics

PREDOCTORAL RESEARCH EXPERIENCE:

Bucknell University Summer 2009
Research Assistant, NSF REU Program with J. Tranquillo – coupled oscillators

Lehigh University Summer 2008
Research Assistant, NSF REU Program with D. Vavylonis – modeling cell mechanics

University of New Hampshire 2007 - 2009
Research Assistant, with P. Berglund – string theory