

# DR. LAUREN LAZARUS MELFI

Assistant Professor, Applied Mathematics  
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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*

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## 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).

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### **AWARDS AND FELLOWSHIPS:**

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

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### **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”	
<i>(disrupted by COVID-19 pandemic)</i>	

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. <i>(disrupted by COVID-19 pandemic)</i>	

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:***

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 "System Delay as a Feature, Not a Bug"	October 16, 2020 (virtual)
Rose-Hulman Institute of Technology Mathematics REU Colloquium "Modeling Oscillations with Delayed Feedback"	July 16, 2020 (virtual)
University of Hartford Mathematics Undergraduate Colloquium "System Delay as a Feature, Not a Bug."	September 14, 2018
Claremont Center for the Mathematical Sciences Colloquium "Delay in the System: Oscillations caused by non-trivial response time."	November 30, 2016

***Contributed Conference Talks:***

Dynamics Days US 2023 Poster: "Exploring Chaos in the Delayed Oscillator with Cubic Nonlinearity"	January 9, 2023 (virtual)
Joint Mathematics Meetings "Exploring Chaos in the Delayed Oscillator with Cubic Nonlinearity"	January 6, 2023 Boston, MA
SIAM Conference on Applications of Dynamical Systems "Model Reconstruction for Coupled Oscillator Networks from Temporal Data" with M. Panaggio, M.-V. Ciocanel, G. McLaughlin, C. Topaz, and B. Xu	May 24, 2021 (virtual)
Joint Mathematics Meetings "Comparison and machine classification of limit cycles from ODE and delayed oscillator models"	January 17, 2020 Denver, CO
SIAM Conference on Applications of Dynamical Systems "Comparison and connection between delay oscillators and ODE oscillators."	May 19, 2019 Snowbird, UT
Joint Mathematics Meetings "Frequency effects of various cubic resonances on a delayed oscillator."	January 16, 2019 Baltimore, MD
SIAM Conference on Applications of Dynamical Systems "Internally delayed oscillator in coupling."	May 24, 2017 Snowbird, UT
Joint Mathematics Meetings "Periodic forcing of a first-order delay limit cycle oscillator." with M. Davidow and R. H. Rand.	January 5, 2017 Atlanta, GA
IUTAM Symposium, Analytical Methods in Nonlinear Dynamics "Dynamics of a delay limit cycle oscillator." with M. Davidow and R. H. Rand.	July 8, 2015 Frankfurt, Germany

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.	

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## TEACHING EXPERIENCE:

<b>Wentworth Institute of Technology</b>	2020 – present
Integrated Engineering Calculus I; Differential Equations; Differential Equations & Systems Modeling; Linear Algebra & Matrix Theory; Partial Differential Equations; Multivariable Calculus; Finite Mathematics	

<b>Trinity College</b>	2017 - 2020
Intro to Mathematical Modeling; Differential Equations; Linear Algebra; Calculus II; Mathematical Pearls; Calculus III; Statistical Data Analysis	

<b>Harvey Mudd College</b>	2016 - 2017
Intro to Differential Equations; Intermediate Differential Equations; Intro to Linear Algebra; Differential Equations and Linear Algebra II; Multivariable Calculus	

<b>Cornell University</b>	2016
Calculus I; [also see Predoctoral Teaching Experience below]	

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## STUDENT RESEARCH MENTORING:

Benjamin Liske, Trinity College '20	Summer 2019
Daniel Melesse, Trinity College '20	Summer 2019
Kalsang Sherpa, Trinity College '20	Summer 2018
<i>Outstanding Poster, MAA Student Poster Session, Joint Mathematics Meetings 2019</i>	

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## SERVICE TO PROFESSION:

Organizing Committee Member: Dynamics Days 2020, Hartford, CT	January 2020
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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	Dec 2022
AWM/MfA Essay Contest – Round 1	Feb 2021, Feb 2022
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

**Past Membership:**

American Mathematical Society (AMS) – 2016-2019

**SERVICE TO INSTITUTE / SCHOOL:**

Member, Applied Mathematics Curriculum Committee	2021-present
Member, Computer Science Search Committee, School of Computing & Data Science	2022-23
Co-Chair, First-Year Exploratory Program Task Force	2022-23
Co-Chair, Data Science Search Committee, School of Computing & Data Science	2021-22
Member, Women’s Leadership Initiative Advisory Committee (ad hoc)	2021

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**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  
Calculus I Sp 2014, Sp 2015

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

*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

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## **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