

# Nicholas Landry

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## Education

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<b>University of Colorado Boulder</b> <i>PhD in Applied Mathematics, GPA: 3.88</i> Advisor: Juan G. Restrepo	<b>Boulder, CO</b> 2017–Present
<b>University of Colorado Boulder</b> <i>MS in Applied Mathematics, GPA: 3.88</i>	<b>Boulder, CO</b> 2017–2020
<b>University of New Hampshire</b> <i>BS in Mechanical Engineering, GPA: 4.0</i> University Honors, Summa Cum Laude	<b>Durham, NH</b> 2010–2014

## Experience

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### Research.....

**Pacific Northwest National Laboratory** **Richland, WA**  
*PhD Intern in the Data Sciences and Analytics Group in the National Security Directorate Summer 2021*

- Implemented a contagion module in the PNNL-developed HyperNetX library
- Drastically improved the efficiency of the HyperNetX hypergraph data structure

**University of Colorado Boulder** **Boulder, CO**  
*Research Assistant* 2018–Present

- Mentored by Juan G. Restrepo
- Modeling contagion processes on hypergraphs and examining the effect of heterogeneity, community, and assortativity on the resulting dynamics
- Modeling complex epidemic processes on networks
- Examining the effect that representing inherently multiplex data with uniplex networks has on epidemic dynamics
- Modeling reservoir computers with OECTs as activation units

**University of New Hampshire** **Durham, NH**  
*Research Assistant* 2013–2015

- Mentored by Prof. Marko Knezevic
- Awarded UNH Summer Undergraduate Research Fellowship (SURF) grant to conduct research
- Developed a metal microstructure data compaction method using FFT methods to make metal-forming simulations more computationally efficient; applied this framework to metals with cubic and hexagonal symmetries

### Industry.....

**Turbocam International** **Barrington, NH**  
*Manufacturing Engineer* 2014–2017

- Led interdepartmental, large-scale projects
- Developed software applications for machine status tracking
- Implementing process and quality automation through developed software applications
- Helped improve manufacturing processes and created 5-axis mill programs

## Funding

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- NSF Award 2121905, “HNDS-I: Developing a software library for the analysis and visualization of spreading processes on social hypergraphs”, \$80,193 2021-2022  
Co-writer with Juan G. Restrepo (PI; University of Colorado Boulder)

## Publications

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- **Nicholas W. Landry**, jimi adams, *On limitations of uniplex networks for modeling multiplex diffusion*, In Preparation, 2021
- **Nicholas W. Landry**, Juan G. Restrepo, *Hypergraph community structure and the emergence of polarization*, In Preparation, 2021
- **Nicholas W. Landry**, Juan G. Restrepo, *Hypergraph dynamics: assortativity and the expansion eigenvalue*, Preprint, 2021. arXiv:2109.01099, Under Review
- **Nicholas W. Landry**, *The effect of time-dependent infectiousness on epidemic dynamics*, Preprint, 2021. arXiv:2106.10384, Under Review
- **Nicholas W. Landry**, Juan G. Restrepo, *The effect of heterogeneity on hypergraph contagion models*, Chaos, 2020. DOI: 10.1063/5.0020034
- **Nicholas W. Landry**, Marko Knezevic, *Delineation of First-Order Elastic Property Closures for Hexagonal Metals Using Fast Fourier Transforms*, Materials, 2015. DOI: 10.3390/ma8095303
- Marko Knezevic, **Nicholas W. Landry**, *Procedures for reducing large datasets of crystal orientations using generalized spherical harmonics*, Mechanics of Materials, 2015. DOI: 10.1016/j.mechmat.2015.04.014
- Marko Knezevic, Daniel J. Savage, **Nicholas W. Landry**, *Towards Computationally Tractable Simulations of Metal Forming Processes With Evolving Microstructures*, Proceedings of the ASME International Manufacturing Science and Engineering Conference, 2014. DOI: 10.1115/MSEC2014-3984

## Presented Work

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<sup>†</sup> denotes presentations held online due to the COVID-19 pandemic

### Invited Talks.....

- *The effect of contact structure on hypergraph contagion models*<sup>†</sup> May 2021  
Dynamics on Networks with Higher Order Interactions Minisymposium, SIAM Dynamical Systems Conference
- *The effect of heterogeneity on hypergraph contagion models*<sup>†</sup> October 2020  
Fundamentos y Enseñanza de la Física y los Sistemas Dinámicos, Universidad de Antioquia
- *The effect of heterogeneity on hypergraph contagion models*<sup>†</sup> September 2020  
CU Boulder Applied Mathematics Dynamics Seminar
- *Hypergraph Contagion* February 2020  
Colorado Chapter of Society of Young Network Scientists

### Contributed Talks.....

- *On limitations of uniplex networks for modeling multiplex diffusion*<sup>†</sup> July 2021  
Networks 2021
- *Hypergraph community structure and the emergence of polarization*<sup>†</sup> June 2021  
TopoNets 2021: Networks 2021 Satellite
- *The effect of time-dependent infectiousness on epidemic dynamics*<sup>†</sup> March 2021  
Front Range Applied Mathematics Student Conference

- *The effect of heterogeneity on hypergraph contagion models*<sup>†</sup> September 2020  
TopoNets 2020: NetSci 2020 Satellite Conference
- *Improvisatory Elements of Teaching* February 2019  
Workshop for the Graduate Teacher Program Boulder, CO
- *So You Think You're Bad at Math* January 2019  
Ignite Talk for the Graduate Teacher Program's Spring Conference Boulder, CO
- *Music Data Mining: Finding Structure in Song* Fall 2018  
Statistics, Optimization, and Machine Learning Seminar, Applied Math Boulder, CO

#### **Posters.....**

- *The effect of time-dependent infectiousness on epidemic dynamics*<sup>†</sup> March 2020  
Northeastern Regional Conference on Complex Systems
- *The effect of heterogeneity on hypergraph contagion models*<sup>†</sup> August 2020  
Dynamics Days Digital 2020
- *The effect of simplex and network degree distribution on simplicial contagion models* January 2020  
Dynamics Days Hartford, CT

#### **Media.....**

- *Contagion on Complex Networks* February 2020  
Radio, Season 3 Episode 13, Probably Novel at University of Colorado Boulder

### **Awards**

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- Chief Student Marshal for UNH Commencement 2014 based on GPA and contributions to the college 2014
- Mechanical Engineering Faculty Choice Award for Poster at UNH Undergraduate Research Conference 2014
- Nominee for the Goldwater Scholarship; 1 of 4 students representing UNH 2012
- Eagle Scout 2008

### **Leadership, Mentoring, and Service**

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**CU Boulder Applied Math Department** **Boulder, CO**  
*Co-Coordinator of the Dynamical Systems seminar* Spring 2021

- Invited speakers and publicized talks along with Juan G. Restrepo and James Meiss

**University of Colorado Boulder** **Boulder, CO**  
*Graduate Peer Mentor* 2020–2021

Met with students over the course of the semester to check in and offer support

**CU Boulder Applied Math Department** **Boulder, CO**  
*Lead Teaching Assistant* 2018–2019

- Led a weekly seminar for 15 first year students
- Facilitated video consultations to student TAs to help develop effective teaching skills
- Informed students about important topics, like obtaining residency, finding a research advisor, summer opportunities, and succeeding as a grad student

**CU Boulder Applied Math Department** **Boulder, CO**  
*Graduate Student Representative* 2018–2019

- Gathered student input through polls and meetings
- Met with the Applied Mathematics graduate committee to voice student concerns
- Collaborated with students and faculty to help create policies agreeable to both parties

**I Have a Dream Foundation of Boulder County** **Lafayette, CO**  
*Tutoring Volunteer* 2018

Tutored underprivileged students in the local school district in math and science

**University of New Hampshire**

*Vice President of UNH Chapter of Pi Mu Epsilon*

**Durham, NH**

2012-2013

**Reviewer**.....

**Journals**

Nature Communication Physics, Nature Communications

**Conferences**

Algorithm Engineering and Experiments (2022)

**Teaching**

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**University of Colorado Boulder**

**Boulder, CO**

*Instructor*

*Summer 2020*

Taught Calculus 1 for Engineers to 20 students five days a week in a remote learning setting; managed a teaching assistant, presented concepts, and developed course material and exams.

**University of Colorado Boulder**

**Boulder, CO**

*Teaching Assistant*

*2017-Present*

- Calculus 1 for Engineers (APPM 1350): Fall 2017
- Calculus 2 for Engineers (APPM 1360): Spring 2018, Summer 2019, Fall 2019
- Calculus 3 for Engineers (APPM 2350): Fall 2018
- Differential Equations and Linear Algebra (APPM 2360): Spring 2019, Fall 2020, Spring 2021
- Matrix Methods (APPM 3310): Spring 2020

**Workshops**

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- *Complex Networks Winter Workshop (CNWW)* *January 2021*  
Participant Online
- *Statistics and Modeling with Novel Data Streams at the SISIMID summer school* *June 2020*  
Participant Online
- *Understanding and Exploring Network Epidemiology in the Time of Coronavirus* *April 2020*  
Participant Online

**Certifications**

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**Certificate in College Teaching**

**Boulder, CO**

*Graduate Teacher Program*

*November 2018*

- Attended 20 hours of teaching-related workshops
- Observed by a faculty member to vouch for my teaching
- Participated in 2 consultations using video footage from my class
- Attended 20 hours of discipline-specific teaching workshops.
- Wrote a teaching portfolio, outlining my teaching experience, skills, and philosophy

**Travel Grants**

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- *Networks 2021 Registration Waiver* 2021  
Awarded a registration waiver for Networks 2021 which is being held virtually
- *SIAM Student Travel Award* 2021  
Awarded a registration waiver for SIAM DS 2021 which is being held virtually
- *CU Boulder Graduate School Student Travel Grant* 2020  
Awarded a travel grant for Dynamics Days 2020

## **Organizations and Affiliations**

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- o Society for Industrial and Applied Mathematics (SIAM)