

# Ekaterina Landgren

## Postdoctoral Visiting Fellow

Cooperative Institute for Research in Environmental Sciences  
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## EDUCATION

### Cornell University, Ithaca, NY

Ph.D. in Applied Mathematics December 2022  
Dissertation: Models of Varying Complexity from Voter Networks to Extrasolar Planets

M.Sc. in Applied Mathematics May 2020  
Advisor: Steven Strogatz

### Brown University, Providence, RI

Sc.B. in Applied Mathematics, A.B. in Philosophy May 2017  
Cum Laude, Phi Beta Kappa, Sigma Xi  
Honors thesis: Modeling Evacuation Dynamics in a Crowded Room  
Advisor: Bjorn Sandstede

## RESEARCH INTERESTS

Dynamical systems and their applications, mathematical models of social phenomena, conceptual climate models, intermediate complexity climate models, planetary atmosphere dynamics.

## PUBLICATIONS

Landgren, E., Nadeau, A., Lewis, N., Kataria, T., and Hitchcock, P. A Shallow-water Model Exploration of Atmospheric Circulation on Sub-Neptunes: Effects of Radiative Forcing and Rotation Period. *The Planetary Science Journal*, 4(6), 106. (2023)

Landgren, E. and Nadeau, A. SWAMPE: A Shallow-Water Atmospheric Model in Python for Exoplanets. *Journal of Open Source Software* 7 (80), 4872 (2022)

Landgren, E. and Nadeau, A. Comparison of Two Analytic Energy Balance Models Shows Stable Partial Ice Cover Possible for Any Obliquity. *Planetary Science Journal* 3.79 (2022)

Landgren, E., Juul, J.L., and Strogatz, S.H. How a minority can win: Unrepresentative outcomes in a simple model of voter turnout. *Physical Review E* 104.5 (2021): 054307.

\*DeBellevue and Kryuchkova (Landgren). Fractal Behavior of the Fibonomial Triangle Modulo Prime  $p$ , Where the Rank of Apparition of  $p$  is  $p + 1$ . *Fibonacci Quarterly* 56 (2018): 113-120.  
*Alphabetical order indicated by \**.

## PRESENTATIONS

### Invited presentations

“Modeling Misperception of Public Support for Climate Policy: A Networks Perspective” October 2023  
University of Cambridge Centre for Climate Repair

“Beyond Echo Chambers: Misperception of Public Support for Climate Policy” September 2023  
Brown University LCDS Seminar

“Modeling Misperception of Public Support for Climate Policy” May 2023  
SIAM Conference on Applied Dynamical Systems

“A Shallow-Water Model Exploration of Atmospheric Circulation on Sub-Neptunes” April 2023  
Southwest Research Institute

“Introduction to Research” Cornell Chapter of Association for Women in Mathematics	February 2022
“Effects of Network Structure on Undemocratic Outcomes.” Clarkson University Graduate Student Seminar	August 2021
“When Can Minority Win? A Simple Model of Voter Turnout.” SIAM Conference on Applied Dynamical Systems	May 2021
Women in Network Science Seminar, University of Washington	February 2021
“Noisy El Niño: A Case Study of Conceptual Climate Models” Math and Statistics Tea, Mt. Holyoke College	March 2021
“Snowball Planets: Effects of Obliquity, Albedo, and Heat Transport on Ice Cover” Jet Propulsion Laboratory Exoplanet Journal Club	October 2020

### Contributed presentations

“Introducing SWAMP-E: Shallow Water Atmosphere Model in Python for Exoplanets” Emerging Researchers in Exoplanet Science Conference	May 2021
“How Can Minority Win?” Contagion on Complex Social Systems Workshop	August 2022

### Poster presentations

“Exploring the Interaction of Rotation Rate and Stellar Irradiation on Synchronously Rotating Sub-Neptunes” American Geophysical Union Fall Meeting	December 2022
“Introducing SWAMP-E: a Shallow-Water Atmospheric Model in Python for Exoplanets” American Geophysical Union Fall Meeting	December 2021
Emerging Researchers in Exoplanet Science Conference	May 2021

## AWARDS AND FELLOWSHIPS

Zonta International Amelia Earhart Fellowship Awarded annually to up to 35 women around the globe pursuing a PhD in space sciences.	2021
SIAM Student Chapter Certificate of Recognition Awarded for outstanding service and contributions to the SIAM student chapter.	2021
SIAM Student Travel Award	2019
Undergraduate Research and Teaching Award Awarded to Brown students collaborating with Brown faculty on research projects.	2015, 2016
2016 Mathematical Contest in Modeling, <i>Honorable Mention</i> In an undergraduate team created, analyzed, and wrote a report on a model of fluid dynamics.	2016
Brown Mathematical Contest for Modeling, <i>Outstanding Winner</i> In an undergraduate team created, analyzed, and wrote a report on a model of Hanta virus spread.	2015

## UNDERGRADUATE RESEARCH MENTORSHIP

“Energy Balance Model for HAT-P-2b” Thomas Mitchell. Mentored jointly with Nikole Lewis	Summer 2022, Fall 2022
“Wind farm layout optimization” Anna Asch. Mentored jointly with Shriya Nagpal and Alice Nadeau	Spring 2021
“Mathematics and Climate” Anna Asch. Directed Reading Program	Fall 2020
“Applying the Budyko Model to Martian Obliquity” Anushka Narayanan. Mentored jointly with Alice Nadeau	Summer 2020, Fall 2020

## TEACHING EXPERIENCE

MIT ESP (Educational Studies Program), *Instructor* Online, Summer 2020  
M14095: Mathematical Models and How to Build One,  
Designed and taught a six-session class in mathematical modeling for high school students.

### Cornell University

*Teaching Assistant*  
MATH 4210: Nonlinear Dynamics and Chaos Spring 2020  
MATH 3610: Mathematical Modeling Fall 2019  
MATH 2930: Differential Equations for Engineers Spring 2019

### Brown University

*Teaching Assistant*  
APMA 1650: Statistical Inference I Fall 2015, Spring 2017

## INDUSTRIAL EXPERIENCE

IMA Math-to-Industry Bootcamp III Minneapolis, MN, Summer 2018  
Six-week coding and research program at Institute for Mathematics and its Applications  
Hewlett-Packard Customer Operations, *Summer Intern* Moscow, Russia, Summer 2014

## SERVICE AND LEADERSHIP

### SIAM Minisymposium Organizer

Dynamics of Influence and Representation in Social Systems May 2021  
SIAM Conference on Applications of Dynamical Systems  
Joint with Alice Schwarze and Leonie Neuhauser

### Cornell University

Expanding Your Horizons Conference, *Logistics Chair* AY 2021  
Organize a campus-wide STEM outreach event for 500 middle-school girls.  
Center for Applied Mathematics First-Year Mentoring Program, *Mentor* AY 2019, 2021  
Mentor a first-year PhD student  
SIAM Graduate Student Chapter, *President* 2018-2021  
Organized SIAM-sponsored events for student chapter members.  
Center for Applied Math Anti-Racism Reading Group, *Co-organizer* AY 2020  
Moderated a biweekly graduate student discussion focusing on anti-racism and DEI topics.  
ZigZag Mentorship Program, *Mentor* AY 2017, AY 2019  
Mentored undergraduate students on course selection and career development.  
Expanding Your Horizons Conference, *Math Workshop Volunteer* 2018, 2019  
Led a mathematics workshop for middle school girls.

### Brown University

Applied Mathematics Department Undergraduate Group, *President* AY 2015, AY 2016  
Organized events for undergraduates interested in applied mathematics.  
Technology House, *President* AY 2016  
Led a sixty-person, communal living group for students interested in STEM topics.  
New Scientist Program, *Mentor* AY 2015  
Mentored and advised a first generation college student.

## PROFESSIONAL MEMBERSHIPS

Society for Industrial and Applied Mathematics, *Member*  
American Mathematical Society, *Member*  
Mathematics of Climate Research Network, *Member*

## LANGUAGES

- Fluent: Russian, English
- Advanced: Spanish, German
- Intermediate: Korean
- Beginner: Swedish

## SKILLS

Programming languages: Python, HTML  
Software: MATLAB, Mathematica, Maple