

Ekaterina Landgren

Contact Information

Cooperative Institute for Research in Environmental Sciences
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Research interests

Complex social systems — opinion dynamics, socio-environmental systems, polarization
Mathematics of climate — conceptual climate models, exoplanetary atmosphere dynamics

Education

Cornell University 2022

Ph.D., Applied Mathematics

“Models of Varying Complexity from Voter Networks to Extrasolar Planets”

Advisor: Steven H. Strogatz

Cornell University 2020

M.S., Applied Mathematics

Brown University 2017

B.S., Applied Mathematics, A.B., Philosophy

Cum Laude, Phi Beta Kappa, Sigma Xi

“Modeling Evacuation Dynamics in a Crowded Room”

Advisor: Bjorn Sandstede

Professional Experience

University of Colorado, Boulder 2023–present

Cooperative Institute for Research in Environmental Sciences
Postdoctoral Visiting Fellow

Awards and Fellowships

Best Oral Presentation by an Early-Career Researcher, Honorable Mention 2024

Awarded at International School and Conference on Network Science.

SIAM Science Policy Fellowship 2024

Awarded annually to 5 early-career mathematicians to gain in-depth knowledge of science policy.

Collaborate@ICERM 2024

Awarded to a team of 5 mathematicians to spend a week collaborating on the project

“Modeling and Analysis of Candidate Momentum in U.S. Primary Elections.”

Zonta International Amelia Earhart Fellowship 2021

Awarded annually to up to 35 women around the globe pursuing a PhD in space sciences.

SIAM Student Chapter Certificate of Recognition 2021

Awarded for outstanding service and contributions to the SIAM student chapter.

Undergraduate Research and Teaching Award 2015, 2016

Awarded to Brown students collaborating with faculty on research projects.

Mathematical Contest in Modeling, Honorable Mention	2016
In an undergraduate team, created, analyzed, and wrote a report on a model of fluid dynamics.	
Brown Mathematical Contest for Modeling, Outstanding Winner	2015
In an undergraduate team, created, analyzed, and wrote a report on a model of Hantavirus spread.	

Travel awards

AWM Travel Grant	2024
Postdoctoral Association of Colorado Travel Award	2024
yrCSS Scholarship for Events on Complex Systems	2024
SIAM Early Career Travel Award	2024
CIRES Early Career Travel Award	2024
SIAM Student Travel Award	2019

Peer-Reviewed Publications

Alphabetical author order indicated by ♦

1. A Shallow-water Model Exploration of Atmospheric Circulation on Sub-Neptunes: Effects of Radiative Forcing and Rotation Period
Ekaterina Landgren, Alice Nadeau, Nikole Lewis, Tiffany Kataria, Peter Hitchcock
Planetary Science Journal, 4(6), 106. (2023). DOI: [10.3847/PSJ/acd551](https://doi.org/10.3847/PSJ/acd551)
2. SWAMPE: A Shallow-Water Atmospheric Model in Python for Exoplanets.
Ekaterina Landgren, Alice Nadeau
Journal of Open Source Software 7 (80), 4872 (2022). DOI: [10.21105/joss.04872](https://doi.org/10.21105/joss.04872)
3. Comparison of Two Analytic Energy Balance Models Shows Stable Partial Ice Cover Possible for Any Obliquity
Ekaterina Landgren, Alice Nadeau
Planetary Science Journal 3.79 (2022). DOI: [10.3847/PSJ/ac603d](https://doi.org/10.3847/PSJ/ac603d)
4. How a minority can win: Unrepresentative outcomes in a simple model of voter turnout
Ekaterina Landgren, Jonas L. Juul, Steven H. Strogatz
Physical Review E 104.5 (2021): 054307. DOI: [10.1103/PhysRevE.104.054307](https://doi.org/10.1103/PhysRevE.104.054307)
5. Fractal Behavior of the Fibonomial Triangle Modulo Prime p , Where the Rank of Apparition of p is $p + 1$.
♦ Michael DeBellevue, **Ekaterina Kryuchkova (Landgren)**
Fibonacci Quarterly 56 (2018): 113-120.

Presentations

Invited presentations

1. *Modeling misperception of public support for climate policy* April 2024
National Ecological Observatory Network (NEON) Science Seminar
2. *Modeling misperception of public support for climate policy* March 2024
University of Vermont Complex Systems Center, Burlington, VT

3. *Modeling misperception of public support for climate policy* February 2024
University of Colorado, Boulder. Dynamical Systems Seminar
4. *Modeling misperception of public support for climate policy* February 2024
University of Minnesota. Mathematics of Climate Seminar
5. *Modeling misperception of public support for climate policy* December 2023
University of Colorado, Boulder. Mathematical Biology Seminar
6. *A Shallow Water Model of Atmospheric Circulation on Sub-Neptunes* November 2023
Max Planck Institute for Astronomy. Exocoffee
7. *Misperception of public support for climate policy: A Networks Perspective* October 2023
University of Cambridge Centre for Climate Repair, Cambridge, UK
8. *Beyond Echo Chambers: Misperception of Public Support for Climate Policy* September 2023
Brown University LCDS Seminar, Providence, RI
9. *Modeling Misperception of Public Support for Climate Policy* May 2023
SIAM Conference on Applied Dynamical Systems, Portland, OR
10. *A Shallow-Water Model Exploration of Atmospheric Circulation on Sub-Neptunes* April 2023
Southwest Research Institute, Boulder, CO
11. *How Can Minority Win?* February 2023
University of Colorado Boulder, Seminar, Clauset Larremore lab group
12. *Introduction to Research* February 2022
Cornell Chapter of Association for Women in Mathematics, Ithaca, NY
13. *Effects of Network Structure on Undemocratic Outcomes* August 2021
Clarkson University Graduate Student Seminar
14. *Effects of Network Structure on Undemocratic Outcomes* May 2021
SIAM Conference on Applied Dynamical Systems
15. *Noisy El Niño: A Case Study of Conceptual Climate Models* March 2021
Mt. Holyoke College, Math and Statistics Tea
16. *When Can Minority Win? A Simple Model of Voter Turnout* February 2021
Women in Network Science Seminar, University of Washington
17. *Snowball Planets: Effects of Obliquity, Albedo, and Heat Transport on Ice Cover* October 2020
Jet Propulsion Laboratory, Exoplanet Journal Club

Contributed presentations

- *Modeling misperception of public support for climate policy* June 2024
International School and Conference on Network Science, Québec City, Canada
- *Modeling misperception of public support for climate policy* June 2024
SIAM Conference on Mathematics of Planet Earth, Portland, OR
- *Modeling misperception of public support for climate policy* April 2024
Network Inequality Seminar. Complexity Science Hub, Vienna
- *Modeling misperception of public support for climate policy* January 2024
Dynamics Days 2024. University of California, Davis
- *Climate policy is more popular than most people think* October 2023
Social and Environmental Futures Workshop, University of Colorado, Boulder

- *How can minority win?* August 2022
Contagion on Complex Social Systems Workshop, University of Colorado, Boulder
- *Introducing SWAMP-E: Shallow Water Atmosphere Model in Python for Exoplanets* May 2021
Emerging Researchers in Exoplanet Science Conference

Poster presentations

- *Climate policy is more popular than you think!* March 2024
STEM Poster Day at the Colorado State Capitol
Project Bridge, University of Colorado Anschutz
- *Exploring the Interaction of Rotation Rate and Stellar Irradiation on Synchronously Rotating Sub-Neptunes* December 2022
American Geophysical Union Fall Meeting, Chicago, IL
- *Introducing SWAMP-E: Shallow-Water Atmospheric Model in Python for Exoplanets* December 2021
American Geophysical Union Fall Meeting
- *Introducing SWAMP-E: Shallow-Water Atmospheric Model in Python for Exoplanets* May 2021
Emerging Researchers in Exoplanet Science Conference

Student Mentorship

Ashley Dancer 2023

Ph.D. Student in the Environmental Studies at University of Colorado, Boulder

Mentored jointly with Matt Burgess.

Project title: "Agent-Based Model of Fertility"

Thomas Mitchell 2022

Undergraduate Student in Astronomy at Cornell University

Mentored jointly with Nikole Lewis.

Project title: "Energy Balance Model for HAT-P-2b"

Anna Asch 2021

Undergraduate Student in Mathematics at Cornell University

Mentored jointly with Shriya Nagpal and Alice Nadeau.

Project title: "Wind farm layout optimization"

Anna Asch 2020

Undergraduate Student in Mathematics at Cornell University

Directed Reading Program

Project title: "Mathematics and Climate"

Anushka Naranyan 2020

Undergraduate Student in Mathematics at Cornell University

Mentored jointly with Alice Nadeau.

Project title: "Applying the Budyko Model to Martian Obliquity"

Teaching Experience

MIT Educational Studies Program

Instructor

M14095: Mathematical Models and How to Build One, *Online* Summer 2020

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

Industry experience

IMA Math-to-Industry Bootcamp III Summer 2018

Six-week coding and research program. Minneapolis, MN

Hewlett-Packard Customer Operations Summer 2014

Summer intern. Moscow, Russia

Service and Leadership

Conference Session Organizer

○ *AMS Special Session on Complex Social Systems at JMM* January 2024

Co-organizer

○ *Dynamics of Influence and Representation in Social Systems at SIAM DS21* May 2021

Co-organizer

University of Colorado Boulder

○ *Postdoctoral Mentoring Program* 2024

Mentor

○ *Women in Network Science Society* 2023–present

Communications team: write a monthly newsletter, organize conference meet-ups.

○ *Mathematics of Climate Research Network Mentoring Program* 2024

Mentor

○ *Kent Denver School Gender Advancements in STEM Career Panel* January 2023

Panelist

Cornell University

○ *Expanding Your Horizons Conference* 2021

Logistics chair, organized a campus-wide STEM outreach event for 500 middle-school girls.

○ *Write a Researcher* 2021

Corresponded with a high school student about mathematics research.

- *Center for Applied Mathematics First-Year Mentoring Program* 2019, 2021
Mentored a first-year PhD student.
- *SIAM Graduate Student Chapter* 2018–2021
President. Organized SIAM-sponsored events for student chapter members.
- *Center for Applied Math Anti-Racism Reading Group* 2020
Co-organizer. Moderated a biweekly graduate student discussion focusing on anti-racism and DEI topics.
- *ZigZag Mentorship Program* 2017, 2019
Mentored undergraduate students on course selection and career development.

Brown University

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

Reviewer for

Journal of Open Source Software, npj Complexity, Scientific Reports, Physica D: Nonlinear Phenomena, Europhysics Letters

Other Professional Activities

Workshops attended

- *Social and Environmental Futures Workshop*, Boulder, CO October 2023
- *Mathematics Research Communities: Complex Social Systems*, Buffalo, NY June 2023
- *Contagion on Complex Social Systems*, Boulder, CO August 2022
- *Science Communication Workshop*, Ithaca, NY October 2021

Membership in professional organizations

- Society for Industrial and Applied Mathematics
- American Mathematical Society
- Network Science Society
- Mathematics of Climate Research Network
- Women in Network Science Society

Media features

- SIAM DS23 presentation featured in SIAM News Blog ([link](#)) May 2023
- Featured in “2024 SIAM Science Policy Fellows” in SIAM news ([link](#)) March 2024