Ekaterina Landgren

Contact Information

Cooperative Institute for Research in Environmental Sciences
University of Colorado at Boulder
Boulder, CO 80309, USA

ekaterina.landgren@colorado.edu
kathlandgren.com

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

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

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. 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.

2. 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

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

4. 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

5. 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 Journa*l, 4(6), 106. (2023). DOI: 10.3847/PSJ/acd551

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 Minnesota. Mathematics of Climate 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. *Introduction to Research* February 2022
    Cornell Chapter of Association for Women in Mathematics, Ithaca, NY
12. *Effects of Network Structure on Undemocratic Outcomes* August 2021
    Clarkson University Graduate Student Seminar
13. *Effects of Network Structure on Undemocratic Outcomes* May 2021
    SIAM Conference on Applied Dynamical Systems
14. *Noisy El Niño: A Case Study of Conceptual Climate Models* March 2021
    Mt. Holyoke College, Math and Statistics Tea
15. *When Can Minority Win? A Simple Model of Voter Turnout* February 2021
    Women in Network Science Seminar, University of Washington
16. *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* 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*
  American Geophysical Union Fall Meeting December 2021

- *Introducing SWAMP-E: Shallow-Water Atmospheric Model in Python for Exoplanets*
  Emerging Researchers in Exoplanet Science Conference May 2021

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

- *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, Scientific Reports, Europhysics Letters, Physica D: Nonlinear Phenomena

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

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