Karianne J. Bergen, Ph.D.

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RESEARCH INTERESTS

PI of the Scientific Machine Learning Research Group at Brown University Data Science Institute.
Broadly trained data scientist with expertise in computational mathematics, signal processing, data mining, and applied machine learning. Research experience in pattern recognition in large sensor data sets with applications in earthquake seismology and threat monitoring, explainable AI for geospatial data, deep learning-based climate downscaling and surrogate models (emulators), and scientific foundation models. Experience teaching and mentoring in data science and applied machine learning at undergraduate through postdoctoral levels.

PROFESSIONAL EXPERIENCE

2021 – **Assistant Professor**, Brown University, Providence, RI
Data Science Institute and Department of Earth, Environmental and Planetary Sciences
Department of Computer Science, by courtesy
Institute at Brown for Environment and Society, faculty affiliate

2020 **Visiting Assistant Professor**, Brown University, Providence, RI

2018-20 **Harvard Data Science Initiative Postdoctoral Fellow**, Harvard University, Cambridge, MA
Department of Computer Science, School of Engineering and Applied Sciences
Department of Earth and Planetary Sciences, Faculty of Arts and Sciences

2009-11 **Assistant Technical Staff (Data Scientist)**, MIT–Lincoln Laboratory, Lexington, MA
Biological and Chemical Defense Systems Group

EDUCATION

2018 **Ph.D. in Computational and Mathematical Engineering,** Stanford University, Stanford, CA
Thesis: Big Data for Small Earthquakes: Detecting Earthquakes over a Seismic Network with Waveform Similarity Search

2015 **M.Sc. in Computational and Mathematical Engineering,** Stanford University, Stanford, CA

2009 **B.Sc. in Applied Mathematics**, Brown University, Providence, RI
Study abroad: University of Edinburgh, UK, Spring 2008

PUBLICATIONS

[$^{++}$trainee (primary advisor), †trainee (co-supervised), *equal contribution]

Preprints / Under review

- **P. Van Katwyk**$^{++}$, B. Fox-Kemper, S. Nowicki, H. Seroussi and **K. J. Bergen**. Emulator-expanded projections reveal structure in Antarctic sea level uncertainty. [under review]

- **P. Van Katwyk**[++], B. Fox-Kemper, S. Nowicki, H. Seroussi, and **K. J. Bergen**. ISEFlow: A Flow-Based Neural Network Emulator for Improved Sea Level Projections and Uncertainty Quantification. [under review, preprint DOI: 10.5194/egusphere-2025-4914]
- **A. Narayanan**[++] and **K. J. Bergen**. Prototype-based Explainable Neural Networks with Channel-specific Reasoning for Geospatial Learning Tasks. [under review, preprint DOI: 10.48550/arXiv.2602.00331]

Journal Publications (Peer Reviewed)

1. **P. Van Katwyk**[++], B. Fox-Kemper, H. Hewitt, and **K. J. Bergen**. Rewiring climate modeling with machine learning emulators. *Communications Earth & Environment*. DOI: 10.1038/s43247-026-03238-z.
2. **P. Van Katwyk**[++] and **K. J. Bergen** (2025). HybridFlow: Quantification of Aleatoric and Epistemic Uncertainty with a Single Hybrid Model. *Transactions on Machine Learning Research (TMLR).* DOI: 10.48550/arXiv.2510.005054.
3. **M. L. Rocha**[†], A. Lynch, and **K. J. Bergen** (2025). Enhancing Sea Ice Concentration Resolution in a Northern Sea Route Strait using a Generative Adversarial Network. *JGR: Machine Learning and Computation*. DOI: 10.1029/2024JH000281
4. **P. Van Katwyk**[++], B. Fox-Kemper, H. Seroussi, S. Nowicki, and **K. J. Bergen** (2023). A variational LSTM emulator of sea level contribution from the Antarctic ice sheet. *Journal of Advances in Earth Systems Modeling,* 15(12). DOI: 10.1029/2023MS003899
5. H. Wang, […], **P. Van Katwyk**[++]**, K. Bergen**, et al. (2023). Scientific discovery in the age of artificial intelligence. *Nature*. DOI: 10.1038/s41586-023-06221-2
6. S. J. Arrowsmith, J. MacCarthy, D. Trugman, **K. J. Bergen**, D. Lumley & B. Magnani (2022). Big Data Seismology. *Reviews of Geophysics*, 60(2). DOI: 10.1029/2021RG000769.
7. **K. J. Bergen**, P. A. Johnson, M. V. de Hoop & G. C. Beroza (2019). Machine learning for data-driven discovery in solid Earth geoscience. *Science*, 363(6433). DOI: 10.1126/science.aau0323. Reprinted (in Chinese) in *Translated World Seismology*, 1, 1-21, 2020.
8. C. E. Yoon, **K. J. Bergen**, K. Rong, H. Elezabi, W. L. Ellsworth, G. C. Beroza, P. Bailis & P. Levis (2019). Unsupervised large-scale search for similar earthquake signals. *Bulletin of the Seismological Society of America,* 109(4): 1451-1468. DOI: 10.1785/0120190006.
9. **K. J. Bergen** & G. C. Beroza (2018). Detecting Earthquakes over a Seismic Network using Single-Station Similarity Measures. *Geophysical Journal International*, 213(3), 1984-1998. DOI: 10.1093/gji/ggy100. Winner: Geophysical Journal International 2018 Student Author Award.
10. **K. J. Bergen** & G. C. Beroza (2018). Earthquake fingerprints: Extracting waveform features for similarity-based earthquake detection. *Pure and Applied Geophysics* 176(3). DOI: 10.1007/s00024-018-1995-6
11. C. E. Yoon, O. O'Reilly, **K. J. Bergen**, & G. C. Beroza (2015). Earthquake Detection Through Computationally Efficient Similarity Search. *Science Advances* 1(11). DOI: 10.1126/sciadv.1501057. Reprinted (in Chinese) in *Translated World Seismology*, 6, 496-516, 2017.

Conference Proceedings (Peer Reviewed)

10. **A. Narayanan**[++] and **K. J. Bergen** (2024). Prototype-based Methods in Explainable AI and Emerging Opportunities in the Geosciences. *International Conference on Machine Learning (ICML) Workshop on AI for Science: Scaling in AI for Scientific Discovery.* DOI: https://arxiv.org/abs/2410.19856
11. **H. Sit**[++], B. Keith, and **K. J. Bergen** (2024). Improving Explainability of Softmax Classifiers Using a Prototype-Based Joint Embedding Method. *International Joint Conference on Artificial Intelligence (IJCAI) Workshop on Explainable Artificial Intelligence.* DOI: https://arxiv.org/abs/2407.02271
12. K. Rong, C. E. Yoon, **K. J. Bergen**, H. Elezabi, P. Bailis, P. Levis & G. C. Beroza (2018). Locality-Sensitive Hashing for Earthquake Detection: A Case Study of Scaling Data-Driven Science. *Proceedings of the Conference on Very Large Data Bases (VLDB),* 11(11): 1674–1687. DOI: 10.14778/3236187.3236214
13. **K. Bergen**, C. Yoon, & G. Beroza (2016). Scalable Similarity Search: A New Approach for Large-Scale

Earthquake Detection. Proceedings of the International Conference on Similarity Search and Applications (SISAP), *Lecture Notes in Computer Science*, Vol. 9939. DOI: 10.1007/978-3-319-46759-7_23

Technical Reports

14. D. Reiter, V. Napoli, S. Arrowsmith*, **K. Bergen***, G. Beroza*, C. DeGroot-Hedlin*, M. Hedlin*, K. Koper*, A. Mueen*, N. Nakata*, K. Pankow*, Z. Peng*, S. Ravela*, W. Rodi*, B. Stump*, J. Williams* & S.-H. Yoo* (2021). Machine Intelligence for Nuclear Explosion Monitoring: A Strategic Plan to Guide Research and Development Through 2025. *White Paper*, prepared for the Air Force Research Laboratory.
15. F. El-Masri*, **K. Bergen***, O. Addai*, P. Liu*, S. Chowdhury*, X. Huang*, M. Wolff, & K. Lopiano (2014). Analysis of Self-Reported Health Outcomes from Web Based Media Sources. CRSC Technical Report TR14-11, *Twentieth Mathematical and Statistical Modeling Workshop for Graduate Students*, P. Gremaud, I.C.F. Ipsen, & R. Smith.

Other Publications

16. S. J. Arrowsmith, D. T. Trugman, **K. Bergen**, and B. Magnani (2022). The Big Data Revolution Unlocks New Opportunities for Seismology. *Eos*, 103. DOI: 10.1029/2022EO225016. Published on 9 June 2022.
17. **K. J. Bergen***, T. Chen* & Z. Li* (2019). Preface to SRL Special Focus Section on Machine Learning in Seismology. *Seismological Research Letters* 90(2A): 466-480. DOI: 10.1785/0220190018.
18. J. J. Braun, **K. Bergen**, & T. J. Dasey (2011). Inner Rehearsal Modeling for Cognitive Robotics. *Proceedings of SPIE*, Vol. 8064, 80640A. DOI: 10.1117/12.888000
19. J. J. Braun, A. Hess, Y. Glina, E. C. Wack, **K. Bergen**, T. J. Dasey, R. M. Mays, & J. Strawbridge (2010). Information fusion of standoff and other information for biodefense decision support. *Proceedings of SPIE*, Vol. 7665, 76650C. DOI: 10.1117/12.852817
20. J. J. Braun, A. Hess, Y. Glina, E. C. Wack, **K. Bergen**, T. J. Dasey, R. M. Mays, & J. Strawbridge (2010). Approaches to information fusion with spatiotemporal aspects for standoff and other biodefense information sources. *Proceedings of SPIE*, Vol. 7710, 771003. DOI: 10.1117/12.852862

Trainee Publications

- H. Seroussi, […], **P. Van Katwyk**$^{++}$, et al. (2023). Insights on the vulnerability of Antarctic glaciers from the ISMIP6 ice sheet model ensemble and associated uncertainty. *The Cryosphere*, 17, 5197–5217. DOI: 10.5194/tc-17-5197-2023.

Code Repositories

- Ice Sheet Emulator (ISE) for ISMIP6 Emulation of Sea Level Rise (released 2023). `https://brown-sciml.github.io/ise/ise.html`. DOI: 10.5281/zenodo.10416634.
- FAST: End-to-end earthquake detection pipeline via efficient time series similarity search (released 2019). `https://github.com/stanford-futuredata/FAST`

PRESENTATIONS (since 2021, selected) [$^{\#}$virtual]

Invited Talks (Colloquia, Conferences & Workshops)

Society of Industrial and Applied Mathematics (SIAM) Conference on the Mathematics of Data Science (MDS), Salt Lake City, UT. *Transferability and Internal Representations in Scientific Foundation Models for Climate Downscaling.* [upcoming Nov 2026]

Society of Industrial and Applied Mathematics (SIAM) Conference on Mathematical and Computational Issues in the Geosciences, Baton Rouge, LA (2025). *From Emulation to Explanation: Compressing Climate Models and Geospatial Data with Machine Learning.*

Statewide California Earthquake Center (SCEC) Annual Meeting Palm Springs, CA (2025). *Toward Trustworthy AI for Earth Science: Lessons from Climate Modeling and a Vision for Earthquake Science.*

Northern California Earthquake Hazards Workshop, US Geological Survey, Menlo Park, CA (2025[#]). *Beyond the Buzzwords: What Every Earth Scientist Should Know Before Using AI.*

AI Seminar, Baskin School of Engineering, University of California, Santa Cruz, CA (2024). *From Polar Ice to Rising Seas: Advancing Climate Science with Machine Learning.*

Exploring System Dynamics in the Natural World with AI, University of Oslo, Norway (2024). *From Polar Ice to Rising Seas: Advancing Climate Science with Machine Learning.*

University Research Series, Naval Undersea Warfare Center, Newport, RI (2024). *Pioneering AI-Human Partnerships to Advance Science and Technology: SciAI in Earth and Climate Science.*

Modeling Talk Series, Alphabet/Google (2024[#]). *Machine learning in Geosciences: Earthquakes, Ice, and XAI.*

National Academies Committee on Solid Earth Geophysics Fall 2023 Meeting (2023[#]). Artificial Intelligence and Machine Learning in Geophysics: Are We Beyond the Black Box? *Machine Learning for data-driven discovery in geosciences: progress and opportunities.*

School of Earth and Space Exploration, Arizona State University, Tempe, AZ (2023[#]). *Machine Learning for data-driven discovery in geosciences: progress and challenges ahead.*

Computability in Europe (CiE), Computational Science Session, Batumi, Georgia (2023[#]). *Earthquake monitoring: Big data, deep learning and explainable AI.*

Women in Data Science Conference: Data Science in Crises Management, American University of Beirut, Lebanon (2023[#]). *Earthquakes, Big Data and Explainable AI.*

Ground-Based Nuclear Explosion Monitoring Seminar, Sandia National Laboratory, Albuquerque, NM (2023[#]). *Explainable AI in Seismology: An interpretable convolutional neural network for earthquake detection.*

NSF AI Institute for Data-Driven Discovery in Physics Seminar, Carnegie Mellon University, Pittsburgh, PA (2022[#]). *Earthquake monitoring, Deep Learning and Explainable AI.*

Earthquake Science Seminar, US Geological Survey, Menlo Park, CA (2022[#]). *Big data for small earthquakes: Data mining, deep learning and explainable AI.*

International Symposium: Frontier of Understanding Earth's Interior and Dynamics, Tohoku University, Sendai, Japan (2022[#]). *Big Data Analysis in Geoscience.*

Symposium on Artificial Intelligence and Earthquake Engineering, Earthquake Engineering Research Institute (EERI) San Diego Chapter, CA (2022[#]). *Explainable AI in Seismology: An interpretable convolutional neural network for earthquake detection.*

Njord Center Seminar, University of Oslo, Norway (2022[#]). *Big data for small earthquakes: Data mining, deep learning and explainable AI.*

Geoscience Seminar, University of Montana, Missoula, MT (2022[#)]. *Big data for small earthquakes: Data mining, deep learning and explainable AI.*

Scientific Computing and Numerics Seminar, Cornell University, Ithaca, NY (2021[#]). *Big data for small earthquakes: Data mining, deep learning and explainable AI.*

Department of Earth, Atmospheric and Planetary Sciences, MIT, Cambridge, MA (2021). *Big data for small earthquakes: Data mining, deep learning and explainable AI.*

Brazilian Seismology Symposium, International Congress of the Brazilian Geophysical Society, Rio de Janeiro, Brazil (2021[#]). *Explainable AI for Seismology: An interpretable convolutional neural network for earthquake detection.*

Department of Geology and Geophysics, University of Utah, Salt Lake City, UT (2021[#]). *Big data for small earthquakes: Data mining, deep learning and explainable AI.*

Geological Society of Washington, DC (2021[#]). *Advancing solid Earth geoscience with machine learning.*

Invited Panelist

Dynamic Data Driven Applications Systems (DDDAS) Workshop, MIT, Cambridge, MA (2022[#]). *Seismic and Nuclear Explosion Monitoring Panel.*

Conference on Neural Information Processing Systems (NeurIPS) (2021[#]). Workshop Panel, *AI for Science: Mind the Gaps*.

Seismological Society of America Annual Meeting (2021[#]). Plenary Panel, *Machine Learning in Seismology: Where are we now and where are we going?*

Invited Talks (Collaboration Meetings)

LunaSCOPE Collaboration Meeting, Brown University (August, 2024). *Building Trustworthy AI for EEPS.*

SciAI Center Collaboration Meeting, Cornell University (June 2024). *Emulators for Science and the Science of Emulators,* and *Building Trustworthy AI for Earth and Climate Science: Data, Domain Expertise and Interpretability.*

MINEM Technical Interchange Meeting, Air Force Research Laboratory (Feb 2021[#]). *What is the right way to use black box models in scientific or decision-support applications?*

Contributed Presentations

Gordon Research Conference: Machine Learning for Actionable Climate Science, Bryant University, Smithfield, RI (2025). *Advancing Climate Science with Neural Network-Based Emulators and Spatiotemporal Explainable AI.* [Poster]

Applied Math in Statistics and Data Science Education Workshop, Institute for Computation and Experimental Research in Mathematics (ICERM), Providence, RI (2025). *Data Detectives: Introducing Data Science Through Curiosity and Critical Thinking.* [Lightning Talk]

University Talks – Brown University

Climate & Environmental Lunch Bunch, DEEPS. *What should scientists know about Generative AI?* (2025); *Building Trustworthy AI for EEPS* (2024).

Geophysics Lunch Bunch, DEEPS. *Machine learning for data-driven discovery in the geosciences: progress and opportunities* (2023); *Big data for small earthquakes: data mining, deep learning and explainable AI* (2021); *Machine learning for data-driven discovery in solid Earth geoscience* (2020).

Applied Math Colloquium, APMA. *Big data for small earthquakes: Scalable earthquake detection with locality-sensitive hashing and deep learning* (2021[#]).

Applied Math Lightning Talks, APMA. *SciML Group Ongoing Projects* (2024).

TEACHING EXPERIENCE

[format: [#]virtual, [&]hybrid]

Brown University – Instructor

- Data Detectives: How to Think Like a Data Scientist (DATA 0150, First Year Seminar)
  - Fall 2026 *planned offering in AY 2026–27*
  - Fall 2024 total enrollment: 16 students (first year undergrads)
- Tackling Climate Change with Machine Learning (EEPS 1720 / DATA 1720)
  - Spring 2026 total enrollment: 8 students (6 undergrad, 2 graduate)
  - Spring 2024 total enrollment: 9 students (5 undergrad, 4 graduate)
  - Spring 2023 total enrollment: 17 students (15 undergrad, 2 graduate, 3 auditors)
- Machine Learning for the Earth and Environment (EEPS 1340 / EEPS 1960D / DATA 1340)
  - Spring 2027 *planned offering in AY 2026–27*

Spring 2025 total enrollment: 25 students (18 undergrad, 7 graduate)
Fall 2023 total enrollment: 27 students (20 undergrad, 7 graduate)
Spring 2022 total enrollment: 24 students (14 undergrad, 10 graduate)
Spring 2021[#] total enrollment: 22 students (12 undergrad, 10 graduate, 1 auditor)

- Probability, Statistics and Machine Learning (DATA 1010)

  Fall 2021[&] total enrollment 48 students (1 undergrad, 47 graduate)

Stanford University

Instructor of Record

- Introduction to Machine Learning (CME 250)

  Winter 2015, Spring 2015, Fall 2015, Winter 2016 (total enrollment: 301 students).

  Summer 2016[#] (Stanford Foundations in Data Science Affiliates Program)
  Developed syllabus and recorded lectures in studio for online version of CME 250 offered by the Stanford Center for Professional Development (SCPD)

Grader/Teaching Assistant

- Introduction to Probability and Statistics for Engineers (CME 106), Summer 2012

Workshop Instructor

- Introduction to Machine Learning

  Fundamentals of Data Science Workshop (Jan 2018), Pontificia Universidad Católica, Santiago, Chile
  ICME Summer Short Courses (Aug 2014, Aug 2015), Stanford University

- Applied Linear Algebra

  ICME Math Refresher Course Series (Sept 2013), Stanford University

Guest Lectures

Climate Modeling I (EEPS 1400, Nov 2025), Brown University
Data, Ethics, and Society (DATA 0080, Sept 2024), Brown University
Machine Learning across the Earth and Planetary Sciences (EPS 268, Oct 2019), Harvard University
Time Series and Prediction (STAT 131, Nov 2018), Harvard University
Know Your Planet: Big Earth (EARTH 1B, Jan 2017, Jan 2018), Stanford University

Pedagogical Training

TEAM Enhanced Advising and Mentoring, Brown University (AY 24–25)
Sheridan Junior Faculty Teaching Fellows Program, Brown University (AY 22–23)
Data Science Course Design Institute, Brown University (2020)

TRAINEES

Postdoctoral Research Fellows

Hilarie Sit, Provost's STEM Postdoctoral Program, July 2023–July 2025

Ph.D. Student Research

Anushka Narayanan (EEPS), Sept 2023–present
Awards: NSF Graduate Research Fellowship Honorable Mention (2023)
Topic: Intrinsically interpretable neural network architectures for spatiotemporal data; Geoscientific foundation models

Peter Van Katwyk (EEPS), Sept 2021– May 2026
Awards: NSF Graduate Research Fellowship in Geosciences – Artificial Intelligence (2022)
Internship: NASA Ames Research Center, Mountain View CA (Summer 2024)
Post-PhD: Applied Scientist position at Microsoft, Redmond, WA
Dissertation: *Probabilistic Machine Learning Emulation of Ice Sheet Contributions to Sea Level Rise*

Graduate Advising

Graduate Student Committees

Anson Cheung (EEPS)	Ph.D. Dissertation Defense Committee	Spring 2023
Sarah Esenther (EEPS)	Ph.D. Advisory Committee	Fall 2022–Spring 2026
Eads Fouche (EEPS)	Ph.D. Advisory Committee	Fall 2025–present
Carol Hundal (EEPS)	Ph.D. Preliminary Examination Committee	Spring 2022
Matt Jones (EEPS)	Ph.D. Advisory Committee	2022–2023
Nandita Kumari (EEPS),	LunaSCOPE Postdoc Mentoring Committee	2024–2025
Ethan Kyzivat (EEPS)	Ph.D. Advisory Committee	2020–2023
Aidan LaBella (CS),	Ph.D. Research Comp Committee	2024–present
Janie Levin (EEPS)	Ph.D. Preliminary Examination Committee	Spring 2024
Maria Luisa Rocha (EEPS)	Preliminary Exam Research Project	2023–2024
Caleb Ukaonu (EEPS)	Ph.D. Advisory Committee	2023–present
Andy Ye (EEPS)	Ph.D. Preliminary Examination Committee	2026–present

Undergraduate Advising

Senior Honors Thesis Advisor

Anna Lapre (Applied Math-Computer Science), CSCI 1970 Independent Study, AY 24–25.
Title: Optimizing Carbon Capture via Metal Organic Frameworks using Machine Learning. Available at the *Brown Digital Repository*, DOI: 10.26300/rhg4-sj26.
Awards: Jerome L. Stein Memorial Award for Undergraduate Excellence, Division of Applied Math; Academic Achievement Award, Data Science Institute.

Senior Honors Thesis Reader

Ayushman Choudhury (Applied Math-Computer Science), AY 24–25.

Data Science Fellows (DATA 1150) Mentor

Jacquline Culver (International and Public Affairs, Data Fluency), Fall 2025
Project: Revamping the DATA 0150 “Data Detectives” course project

Benny Smith (Applied Math), Spring 2021
Project: Creating climate science examples with code for *Machine Learning for the Earth and Environment* (EEPS 1340 / DATA 1340)

Nikolai Stambler (History, Data Fluency), Fall 2021
Project: Developing computing and sustainability module for EEPS 1340 / DATA 1340

Rainy Wortelboer (Neuroscience, Data Fluency), Fall 2023
Project: Syllabus development for new First Year Seminar in data science (DATA 0150)

Geordie Young (CS-Economics, Political Science). Fall 2022
Project: Syllabus and reading list development for new course for *Tackling Climate Change with Machine Learning* (EEPS 1720 / DATA 1720)

PROFESSIONAL SERVICE

Advisory Boards

National Earthquake Prediction Evaluation Council, eleven-member standing subcommittee of the Scientific Earthquake Advisory Committee, USGS Earthquake Hazards Program. (2025–)

Editorial

Guest Editor

Seismological Research Letters – Special Focus Section on Machine Learning in Seismology (2019)

Reviewer

Advances in Geophysics; Bulletin of the Seismological Society of America; Computers and Geosciences; Geophysical Research Letters; Geophysical Journal International; International Conference on Learning Representations (ICLR) workshop papers; IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing; IEEE Transactions on Circuits and Systems for Video Technology; Journal of Geophysical Research: Solid Earth; Journal of Petrology; Nature Communications; Science; Science Advances; Scientific Reports

Grant Reviews

Ad Hoc Reviewer

Helmholtz Association, Germany (2025), Department of Energy, USA (2025), Swiss National Science Foundation, Switzerland (2024), Geological Survey Ireland, Ireland (2020).

Panel Reviewer

National Science Foundation, USA (2024).

Workshops and Conferences

Co-ambassador and Faculty Chair

Women in Data Science (WiDS) Providence Regional Conference, Brown University. (2024)
Women in Data Science (WiDS) Providence Datathon Workshop, Brown University. (2023)

Session Chair or Convener

Advances in Machine Learning for Solid Earth Geoscience, AGU Fall Meeting, New Orleans, LA (2025).
New Horizons in Observation: Innovative Data Collection and Analysis, SAGE/GAGE Community Science Workshop, Pittsburgh, PA. (2022)
Workshop on AI for Earth and Space Sciences (AI4ESS), ICLR. (2022) [virtual]

Moderator

Session on Artificial Intelligence in Earthquake Science, Southern California Earthquake Center (SCEC) Annual Meeting. (2020) [virtual]
Panel on Interpretable Machine Learning for Earth and Space Science, AI4ESS Workshop. (2022) [virtual]

Student Presentation Judge and Travel Grant Reviewer

Outstanding Student Paper Award (OSPA), AGU Fall Meeting. (2020–2021)
Seismology Section Student Travel Grant, AGU Fall Meeting. (2020)

Conference Tutorials

Introduction to Machine Learning Workshop and Advanced Machine Learning Workshop, Seismological Society of America (SSA) Annual Meeting, Bellevue, WA. (2022)
Machine Learning for Seismology Workshop, SSA Annual Meeting, Seattle, WA. (2019)
Unsupervised Learning for Geoscience Applications, Machine Learning in Solid Earth Geoscience Conference, Santa Fe, NM. (2019)

Introduction to Machine Learning, SIAM Geosciences Conference, Stanford, CA. (2015)

Mentorship Programs

Geosciences Education and Mentorship Support (GEMS) program, National Association of Geoscience Teachers. *Mentee:* Hayley Woodrich at UIUC (AY22–23)

University Service

Brown University

Commencement Speakers Selection Committee (2026–)
Judge, Hack@Brown Hackathon (2026)
Exploratory (First Year) Advisor and Second Year Advisor (2024–)
Committee on Honorary Degrees (2021–2024)
Faculty Mentor, Women in STEM Networking Events, hosted by Women in Physics, Graduate Students of Color in STEM, and Graduate Women in Science and Engineering. (2022, 2024, 2026)
Panelist, DSI Commencement Forum, Our Data-Driven World: A Brunonian Vision for Data Science. (2023)
Advisory Team for Creation of an Institute for Sustainable Energy at Brown. (2021)

Harvard University

Panelist, Tales from the Battlefront: Q&A Among Survivors and Casualties of the Academic Job Search, Office of Postdoctoral Affairs. (2020)

Departmental Service

Brown University

Working Group Leader, SciML + Interdisciplinary ML/AI Community, DSI Working Groups (2026).
Judge, Health Data Fest, School of Public Health / Data Science Institute (2026)
Data Fluency Certificate Advisor, DSI. (AY 23–27)
Director of Postdoctoral Engagement, DSI. (AY 23–26)
Curriculum Committee, DEEPS (computational courses and concentration). (AY 23–26)
Faculty Judge, Brown Computer Science Undergraduate Research Symposium, CS. (2022, 2023)
Ad Hoc Committee on Criteria and Standards for Reappointments, Promotion and Tenure, DEEPS. (2022)
Computing Committee, DEEPS. (AY 22–26)
Postdoctoral Fellow Search Committee, DSI. (2022, 2023)
Lecturer Search Committee, DSI. (2022)

Harvard University

Volunteer, Graduate School Applications Assistance Initiative, SEAS Office of Diversity, Inclusion and Belonging. (2020)
Selection Committee, HDSI Public Interest Data Science Summer Fellowship. (2019)

Stanford University

ICME Industrial Affiliates Program: Xtrapolate Roundtable Moderator (2017–2018), Foundations in Data Science Course Lecturer (2016), Summer Workshop Instructor (2014–2015).
Student Volunteer, Women in Data Science Conference. (2016–2017).
Student Representative, Institute for Computational and Mathematical Engineering (2011–2013).

Science Communication and Outreach

Presenter, Data Science for Science Teachers Bootcamp, NIH Office of Data Science Strategy. (2020) [virtual]
Presenter, Seismological Society of America briefing on Capitol Hill, Washington, DC. (2019)
Classroom speaker (K-12), Skype a Scientist Program. (2018–2026)
George Washington Middle School, Ridgewood, NJ; Sam D. Bundy Elementary School, Farmville, NC; Academy of the Sacred Heart, New Orleans, LA; Turtle River Montessori, Jupiter, FL; McIntosh Middle

School, McIntosh, SD; Garden Spot Middle School, New Holland, PA; Frank Ward Strong School, Durham, NC.

Professional Development and DEI Training

Early and Mid-Career Mentoring Workshop, Chicago, IL. Computing Research Association Widening Participation (CRA-WP). (2023)

Workshop for Early Career Geoscience Faculty [virtual]. On The Cutting-Edge program, National Association of Geoscience Teachers and National Science Foundation. (2021)

Diversity, Inclusion and Belonging Trainings: Allyship and Calling in vs. Calling out, Harvard School of Engineering and Applied Sciences. (2020)

New England Graduate Women in Science and Engineering Retreat: Empowering Individuals to Foster an Inclusive Campus Climate, Tufts University. (2019)

Media Interviews

TWIML Podcast, Machine Learning for Earthquake Seismology with Karianne Bergen. (Jan 20, 2022)

A Promising Forecast for Predictive Science, *EoS.* (Feb 25, 2021)

Algorithms spot millions of California's tiniest quakes in historical data (Apr 18, 2019). *Nature*

Interview with KRON4 News – Bay Area. (Dec 11, 2015)

Media Coverage

Shazam for Seismologists? How a new data mining technique is shaking up earthquake science (May 12, 2019). *Yale Scientific Magazine*

What can machine learning tell us about the solid Earth? (Mar 21, 2019) Featured in *Stanford News*

Stanford Scientists develop "Shazam for Earthquakes" (Dec 4, 2015). Featured in *Stanford News, IEEE Spectrum, Smithsonian Magazine*, NBC News

ACADEMIC PROFILES

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Google Scholar: https://scholar.google.com/citations?user=nQbmcDUAAAAJ&hl=en

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