

# Eric Beaucé

## Curriculum Vitae

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## Academic Positions

02/2022 - present	<b>Postdoctoral Brinson Fellow</b>	Lamont-Doherty Earth Observatory, Columbia University
09/2021 - 01/2022	<b>Postdoctoral Researcher</b>	Massachusetts Institute of Technology
2016 - 2021	<b>Research/Teaching assistant</b>	Massachusetts Institute of Technology
Ph.D. Thesis: Analyzing the Collective Behavior of Earthquakes to Understand Fault Mechanisms Better. Available at <a href="https://tinyurl.com/EBPhDThesisManuscript">https://tinyurl.com/EBPhDThesisManuscript</a> .		
Supervised by Robert van der Hilst and Michel Campillo.		

## Education

2021	<b>Ph.D., Geophysics</b>	Massachusetts Institute of Technology
2016	<b>Master of Science, Physics</b>	École Normale Supérieure de Lyon
2014	<b>Bachelor of Science, Physics</b>	École Normale Supérieure de Lyon

## Teaching Experience

2023	<b>Sonic and Visual Representation of Data</b>	Columbia University
Role: Teaching assistant. Level: Graduate.		
Summary: Introduction to data sonification and visualization in Python.		
2022	<b>Introduction to Statistical Seismology</b>	Columbia University
Role: Guest lecturer. Level: Graduate.		
2021	<b>Introduction to Machine Learning in Earthquake Seismology</b>	University of Colorado
Role: Guest lecturer (remote). Level: Undergraduate.		
2019	<b>Essentials of Geophysics</b>	Massachusetts Institute of Technology
Role: Teaching assistant. Level: Graduate.		
Summary: Introduction to seismology, gravity, planetology, magnetism, and geodynamics.		
2018	<b>Physical Principles of Remote Sensing</b>	Massachusetts Institute of Technology
Role: Teaching assistant. Level: Undergraduate.		
Summary: Introduction to wave physics, Maxwell's equations, and their application to radar methods.		

## Field Experience

2022, 2023	<b>OBS deployment at the Axial Seamount</b>	Pacific Coast, USA
07/2018	<b>Preliminary passive seismic experiment (FaultProbe project)</b>	San Jacinto, California, USA
01/2018	<b>Groundwater flow imaging</b>	Roseau Valley, Saint Lucia
2016 - 2020	<b>Diverse subsurface exploration geophysical methods</b>	New England, USA

## Outreach Activity

### Seismic Sound Lab

Link to website: <https://seismicsoundlab.github.io/>. The Seismic Sound Lab introduces audiences of all backgrounds and ages to the physics of earthquakes and wave propagation using sonified data as a means of communication. The Seismic Sound Lab brings a major contribution to Lamont-Doherty Earth Observatory's annual Open House event and also regularly showcases its work to campus visitors.

## Conference and Seminar Organization

2025	AGU : Primary organizer of <i>"Collective Behaviors in Seismology: Models and Observations for Complexity in Seismicity, Crustal Mechanics, and Faulting"</i> .
2023 - 2025	Organizer of weekly divisional seminars at Lamont.
2025	SSA : Co-organizer of workshop <i>"Building a High-Resolution Earthquake Catalog from Raw Waveforms: A Step-by-Step Guide"</i> .
2025	Lamont Symposium on Earth Hazards : Moderator of <i>"Challenges in Forecasting Earth Hazards"</i> .
2024	AGU : Co-organizer of <i>"On the Seismicity of "Stable" Continental Regions: The April 2024 New Jersey Earthquake and Beyond"</i> .
2023	SSA : Primary organizer of <i>"Deciphering Earthquake Clustering for the Better Understanding of Crustal Deformation Mechanisms"</i> .
2022	AGU : Co-organizer of <i>"Microseismicity and Fault Slip: Observations, Modeling, and Experiments"</i> .

## Invited Conference Talks and Seminars

- Brown University, Geophysics Seminar (to be presented in March 2026).
- 3rd Workshop on Earthquake Physics and Applications of AI to Tectonic Faulting (Italy, September 2025).
- UC Santa Cruz, Institute of Geophysics and Planetary Physics Seminar (USA, May 2025).
- US Geological Survey, Moffett Field, Earthquake Science Center Seminar (USA, May 2025).
- ERC TECTONIC / FEAR Seminars on Earthquake Physics (Online, November 2024).
- Massachusetts Institute of Technology, Geophysics Seminar (USA, November 2023).
- Ecole Normale Supérieure, Laboratoire de Géologie (France, October 2023).
- Los Alamos National Laboratory, Frontiers in Geoscience (USA, June 2023).

## Technical and Personal skills

- **Programming Languages:** C, C++, CUDA, Python, Fortran, Shell, Matlab.
- **Parallel Computing:** OpenMP, CUDA.
- **Machine Learning Libraries:** Pytorch, Tensorflow, Keras, Scikit-learn.
- **Super-computer Job Scheduler:** Slurm, OAR.
- **Open-source Software Developer** (<https://github.com/ebeauce>):
  - Fast Matched Filter ([https://github.com/beridel/fast\\_matched\\_filter](https://github.com/beridel/fast_matched_filter)): Template matching optimized on CPUs and GPUs with Python and Matlab wrappers.
  - BeamPower (<https://github.com/ebeauce/beampower>): Backprojection optimized on CPUs and GPUs with Python wrappers.

- BPF (https://github.com/ebeauce/Seismic\_BPF): Complete earthquake detection and location workflow using Fast Matched Filter and BeamPower.
- ILSI (https://github.com/ebeauce/ILSI): Python package for stress inversion.
- o **Languages:** French (native), English, Spanish.

## Submitted Articles

- o **Eric Beaucé**, Piero Poli, Felix Waldhauser, Benjamin Holtzman and Chris Scholz. Shift and increase in tidal modulation of seismicity in the Ridgecrest fault zone before and after the 2019 M7.1 earthquake. *In review at Bulletin of Seismological Society of America*
- o Rodrigo Flores Allende, Léonard Seydoux, **Eric Beaucé**, Luis Fabian Bonilla, Philippe Gueguen, Claudio Satriano. An Enhanced Deep-Learning Catalog of the Mw 8.1 Maule Aftershock Sequence. *In review at Journal of Geophysical Research: Solid Earth*
- o Folarin Kolawole, Zach Foster-Baril, Leonardo Seeber, Jacob Tielke, Abhishek Prakash, Meritxell Colet, **Eric Beaucé**, Won-Young Kim, Rasheed Ajala, Christine McCarthy, Felix Waldhauser. The 2024 Mw4.8 New Jersey Intraplate Earthquake: Preferential Rupture of an Immature Fault in Frictionally Unstable Basement Rocks. *In review at Journal of Geophysical Research: Solid Earth*
- o Theresa Sawi, **Eric Beaucé**, Benjamin Holtzman, Fabian Walter, Léonard Seydoux. Array-based characterization of glacial seismicity via unsupervised machine-learning. *In review at Journal of Geophysical Research: Machine Learning and Computation*

## Articles in Preparation

- o Won-Young Kim, Felix Waldhauser, **Eric Beaucé** and Folarin Kolawole. The Mw4.8 Tewksbury, New Jersey earthquake of 5 April 2024 likely triggered by transient stresses from rapidly refilled nearby reservoir

## Peer-reviewed Articles

### 2025

- o **Eric Beaucé**. Measuring and modelling the occupation probability to characterize the temporal statistics of seismic sequences. *Geophysical Journal International*. DOI: https://doi.org/10.1093/gji/ggaf433
- o **Eric Beaucé**, Felix Waldhauser, David Schaff, Won-Young Kim, Folarin Kolawole. The 5 April 2024  $M_w$ 4.8 Tewksbury, New Jersey aftershock sequence resolved with machine-learning-enhanced detection methods. *Geophysical Research Letters*. DOI: https://doi.org/10.1029/2024GL113598

### 2024

- o Tanner Acquisto, Anne Bécel, Juan Pablo Canales, **Eric Beaucé**. Structural controls on megathrust slip behavior inferred from a 3D, crustal-scale, P-wave velocity model of the Alaska Peninsula subduction zone. *Journal of Geophysical Research: Solid Earth*. DOI: https://doi.org/10.1029/2024JB029632
- o Jens-Erik Lundstern, **Eric Beaucé** and Orlando J. Teran. The Importance of Nodal Plane Orientation Diversity for Earthquake Focal Mechanism Stress Inversions. *Geological Society of London*. DOI: https://doi.org/10.1144/SP546-2023-63.

### 2023

- o **Eric Beaucé**, Piero Poli, Felix Waldhauser, Benjamin Holtzman, and Chris Scholz. Enhanced tidal sensitivity of seismicity before the 2019 M7.1 Ridgecrest, CA earthquake. *Geophysical Research Letters*. DOI: https://doi.org/10.1029/2023GL104375.
- o **Eric Beaucé**, William B. Frank, Léonard Seydoux, Piero Poli, Nathan Groebner, Robert D. van der Hilst and

Michel Campillo. BackProjection and Matched-Filtering (BPMF): An Automated Earthquake Detection and Location Workflow. *Seismological Research Letters: Electronic Seismologist*. DOI: <https://doi.org/10.1785/0220230230>.

## 2022

- **Eric Beaucé**, Robert D. van der Hilst, Michel Campillo. Microseismic Constraints on the Mechanical State of the North Anatolian Fault Thirteen Years after the 1999 M7.4 Izmit Earthquake. *Journal of Geophysical Research: Solid Earth*. DOI: <https://doi.org/10.1029/2022JB024416>.
- **Eric Beaucé**, Robert D. van der Hilst, Michel Campillo. An Iterative Linear Method with Variable Shear Stress Magnitudes for Estimating the Stress Tensor from Earthquake Focal Mechanism Data: Method and Examples. *Bulletin of the Seismological Society of America*. DOI: <https://doi.org/10.1785/0120210319>.
- René Steinmann, Léonard Seydoux, **Eric Beaucé**, Michel Campillo. Hierarchical Exploration of Continuous Seismograms with Unsupervised Learning. *Journal of Geophysical Research: Solid Earth*. DOI: <https://doi.org/10.1029/2021JB022455>.

## 2021

- Hugo Sánchez-Reyes, David Essing, **Eric Beaucé**, Piero Poli. The Imbricated Foreshock and Aftershock Activities of the Balsorano (Italy) Mw 4.4 Normal Fault Earthquake and Implications for Earthquake Initiation. *Seismological Research Letters*. DOI: <https://doi.org/10.1785/0220200253>.

## 2019

- **Eric Beaucé**, William B. Frank, Anne Paul, Michel Campillo and Robert D. van der Hilst. Systematic Detection of Clustered Seismicity beneath the Southwestern Alps. *Journal of Geophysical Research: Solid Earth*. DOI: <http://dx.doi.org/10.1029/2019JB018110>.
- Florent Brenguier, Pierre Boué, Yehuda Ben-Zion, F. Vernon, C.W. Johnson, A. Mordret, O. Coutant, P-E. Share, **Eric Beaucé**, D. Hollis, T. Lecocq. Train Traffic as a Powerful Noise Source for Monitoring Active Faults with Seismic Interferometry. *Geophysical Research Letters*. DOI: <http://dx.doi.org/10.1029/2019GL083438>.

## 2017

- **Eric Beaucé**, William B. Frank and Alexey Romanenko. Fast Matched Filter (FMF): An Efficient Seismic Matched-Filter Search for Both CPU and GPU Architectures. *Seismological Research Letter*. DOI: <https://doi.org/10.1785/0220170181>.