

Eric Beaucé | Curriculum Vitae

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Academic Positions

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

Education

- **Massachusetts Institute of Technology** **Cambridge, USA**
Ph.D., Geophysics 2021
- **Massachusetts Institute of Technology** **Cambridge, USA**
Master of Science, Geophysics 2018
- **Ecole Normale Supérieure de Lyon** **Lyon, France**
Master of Science, Physics 2016
- **Ecole Normale Supérieure de Lyon** **Lyon, France**
Bachelor of Science, Physics 2014

Teaching Experience

- **Sonic and Visual Representation of Data** **Columbia University**
Graduate and undergraduate course (teaching assistant) 2023
Introduction to data sonification and visualization in Python.
- **Introduction to Statistical Seismology** **Columbia University**
Graduate course (guest lecturer) 2022
- **Introduction to Machine Learning in Earthquake Seismology** **University of Colorado**
Graduate course (guest lecturer, remote) 2021

- **Essentials of Geophysics** **Massachusetts Institute of Technology**
Graduate course (teaching assistant) 2019
 Introduction to seismology, gravity, planetology, magnetism, and geodynamics.
- **Remote Sensing** **Massachusetts Institute of Technology**
Undergraduate course (teaching assistant) 2018
 Introduction to wave physics, Maxwell's equations, and their application to radar methods.

Field Experience

- **Axial Seamount** **Pacific Coast, USA**
OBS deployment at the Axial Seamount aboard the Marcus Langseth September 2022
 Deployment of 15 three-component ocean bottom seismometers (OBS) near the Axial seamount, Pacific ocean off the coast of Oregon and Washington. The goal is to capture the next eruption in great details.
- **San Jacinto Fault** **California, USA**
Preliminary passive seismic experiment (FaultProbe project) July 2018
 Deployment of 400 one-component geophones in two arrays on either sides of the San Jacinto Fault. The project aimed to monitor temporal changes of the P-wave velocity on the fault.
- **Roseau Valley** **Saint Lucia**
Groundwater flow imaging January 2018
 Self-potential (SP), resistance and gravity survey to map groundwater flow and identify relevant locations for fresh water wells.
- **New England** **New England, USA**
Diverse subsurface exploration geophysical methods 2016 - 2020
 Educational field trips with the SEG Student Chapter of MIT. Training to active source seismic acquisition (2x24 geophones and one sledge hammer), gravity measurements, SP/resistance and magnetometry.

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):
 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.

- BPMF (https://github.com/ebeauce/Seismic_BPMF): 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.

Outreach Activity

Collaboration with Seismic Sound Lab.....

- o June 2023: Introduction to seismology with sonified seismic data to CGEP's Energy Journalism Fellows.
- o October 2022: Seismic Sound Lab (<https://seismicsoundlab.github.io/>) demonstration at Lamont-Doherty Earth Observatory's Open House.

Invited Seminars

- o Los Alamos National Laboratory, Frontiers in Geoscience (2023).

Peer-reviewed Articles

2023.....

- o **Eric Beaucé**, Piero Poli, Benjamin Holtzman, Felix Waldhauser 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>.

2022.....

- o **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>.
- o **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>.
- o 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>.

Submitted Articles

- **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. *Under review at Seismological Research Letters: Electronic Seismologist*.
- Jens-Erik Lundstern, **Eric Beaucé** and Orlando J. Teran. The importance of nodal plane orientation diversity for earthquake focal mechanism stress inversions. *Under review at Geological Society of London*.

Articles in Preparation

- **Eric Beaucé** and Felix Waldhauser. Monitoring the Dynamics of the Axial Seamount with a Seismic Network Covariance Matrix Analysis over a Decade.
- **Eric Beaucé**. Statistical Model of Earthquake Occurrence for Local-Scale Seismicity Based on Fractal Clustering.