Eric Beaucé | Curriculum Vitae

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Academic Positions

Lamont-Doherty Earth Observatory, Columbia University **New York - USA**
Postdoctoral Research Scientist (Brinson Fellow) *2022 - present*

Massachusetts Institute of Technology **Cambridge - USA**
Postdoctoral Researcher *2021 - 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. in 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*

Pre-Ph.D. Research Experience

Institut des Sciences de la Terre **Grenoble - France**
6-month internship supervised by Michel Campillo. *2016*

Development of automated methods for earthquake detection, based on template matching, and application to the Southwestern Alps. Analysis of the catalog in terms of Poissonian vs time clustered seismicity.

Departemento de Geofísica **Santiago - Chile**
3-month internship co-supervised by Benoit Derode and Jaime Campos. *2015*

Source characterization of intermediate-depth earthquakes: estimation of static stress drops and seismic moments from earthquake spectra.

○ **Laboratoire de Géologie, Terre, Planète, Environnement**   **Lyon - France**
2-month internship supervised by Vincent Langlois   *2014*

Development of a discrete element numerical model of a cohesive granular material in C/C++ to simulate landslides. Cohesion was modeled by Euler-Bernoulli beams.

Teaching Experience

○ **Massachusetts Institute of Technology**   **Cambridge - USA**
Robert D. van der Hilst's teaching assistant for Essentials of Geophysics.   *2019*

○ **Massachusetts Institute of Technology**   **Cambridge - USA**
Brent Minchew's teaching assistant for Remote Sensing.   *2018*

Field Experience

○ **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, Pytorch, Fortran, Shell, Matlab.

○ **Parallel Computing:** OpenMP, CUDA.

○ **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.
  - `BeamNetResponse` (`https://github.com/ebeauce/beamnetresponse`):
    Backprojection optimized on CPUs and GPUs with Python wrappers.
  - `BPMF` (`https://github.com/ebeauce/Seismic_BPMF`):
    Earthquake detection and location workflow using `Fast Matched Filter` and `BeamNetResponse`.

- ILSI (https://github.com/ebeauce/ILSI):
  Python package for stress inversion.
- **Languages:** French (native), English, Spanish.

Peer-reviewed Papers

2022 ....

- **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.

2021 ....

- 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.

- Hugo Sanchéz-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.