Dr. Kélian Dascher-Cousineau

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Education

2022 -	Miller Postdoc in Earth and Planetary Sciences	UC Berkeley
2017 - 2022	Ph.D. in Earth and Planetary Sciences	UC Santa Cruz
2015 - 2017	Master in Earth and Planetary Sciences	McGill University
2012 - 2015	Honors in Planetary Science	McGill University

Research Experience

2022 - Researcher — UC Berkeley
Active tectonics
Reporting to Professor Roland Burgmann: studies on the interplay between slow slip and seismicity.

Summer 2022 Student Researcher — Google
Crisis Response
Reporting to Oleg Zlydenko: method development in forecasting

2017 - 2022 PhD thesis: — UC Santa Cruz
Earthquake Physics
Reporting to Professor Emily Brodsky, Thorne Lay, and Noah Finnegan: studies on the global variations in aftershock productivity, earthquake forecasting, and fault zone geomorphology.

2015 - 2017 Master's thesis: — McGill University
Rock Mechanics
Reporting to Professor James Kirkpatrick: a study of the maturation and wear processes of fault slip surfaces as they evolve with displacement

2014 - 2015 Honor's research project: — McGill University
Fault Zone Architecture
Reporting to Professor Christie Rowe: a detailed survey of the Champlain Thrust fault zone.

Summer 2014 Intern at GEO4 GmbH: — Munich, Germany
Geophysics and Hydrogeology
A geotechnical and geophysical analysis related to environmental regulation and engineering.

Summer 2013 Research project: — McGill University
Seismology
Reporting to Professor Yajing Liu: a geospatial analysis of the West Quebec Seismic Zone.

Awards and Scholarships

2021	Berkeley Miller Fellow	234 000$
2021	Stanford Science Fellow (declined)	273 000$
2021	Caltech OK Earle Prize Fellowship (declined)	70 000$
2019	NASA FINESST	135 000$
2019	Casey Moore Fund	3 500 $
2019	NSERC Postgraduate Scholarship - Doctoral	42 000 $
2018	Jack Henderson Award (Best MSc Thesis of 2017)	270 $
2016	GSA Research Grant	1 800 $
2016	William Henry Howard Scholarship	2 000 $

Publications

2023 Dascher-Cousineau, K., Shchur, O., Brodsky, E.E., & Gunnemann, S. (2023). Using deep-learning for flexible and scalable earthquake forecasting. Geophysical Research Letters

2021 Dascher-Cousineau, K., Finnegan, N. J., & Brodsky, E.E. (2021). The Lifespan of Fault-Crossing Channels. *Science*, 373(6551), 204-207.

2021 Dascher-Cousineau, K., Lay, T., & Brodsky, E. E. (2021). Reply to 'Comment on 'Two Foreshock Sequences Post Gulia and Wiemer (2019)' by Laura Gulia and Stefan Wiemer. *Seismological Research Letters,* 92(5), 3251-3258.

2020 Dascher-Cousineau, K., Lay, T., & Brodsky, E. E. (2020). Two Foreshock Sequences Post Gulia and Wiemer (2019). *Seismological Research Letters*, 91(5), 2843-2850.

2020 Dascher-Cousineau, K., Brodsky, E. E., Lay, T., & Goebel, T. H. (2020). What controls variations in aftershock productivity? *Journal of Geophysical Research: Solid Earth*, 125(2), e2019JB018111.

2019 Liu, C., Lay, T., Brodsky, E. E., Dascher-Cousineau, K., & Xiong, X. (2019). Co-seismic rupture process of the large 2019 Ridgecrest earthquakes from joint inversion of geodetic and seismological observations. *Geophysical Research Letters*, 46(21), 11820-11829.

2018 Dascher-Cousineau, K., Kirkpatrick, J. D., & Cooke, M. L. (2018). Smoothing of Fault Slip Surfaces by Scale-Invariant Wear. *Journal of Geophysical Research: Solid Earth*, 123(9), 7913-7930.

2018 Rowe, C. D., Ross, C., ... Dascher-Cousineau, K. et al., (2018). Geometric complexity of earthquake rupture surfaces preserved in pseudotachylyte networks. *Journal of Geophysical Research: Solid Earth,* 123(9), 7998-8015.

2016 Mundy, E. M., Dascher-Cousineau, K., Gleeson, T., Rowe, C. D., & Allen, D. M. (2016). Complexity of hydrogeologic regime around an ancient low-angle thrust fault revealed by multidisciplinary field study. *Geofluids*.

Presentations

2022-2023	Dascher-Cousineau, K., Brodsky, E.E., Shchur, O., & Günnemann, S. (2022). Is the sizing and timing of earthquakes separable? American Geophysical Union (AGU) Fall Meeting Abstracts (*talk*) Seismological Society of America (*talk*)
2022	Dascher-Cousineau, K., (2022) Earthquake forecasting in a data-rich era. Berkeley Seismo Lab Seminar Series (*invited talk*)
2022	Dascher-Cousineau, K., Shchur, O., Brodsky, E.E., & Günnemann, S. (2022). Flexible and Scalable Earthquake Forecasting. Southern California Earthquake Center (SCEC) meeting (*plenary talk*).
2022	Dascher-Cousineau, K., Shchur, O., Brodsky, E.E., & Günnemann, S. (2022). Neural network based earthquake forecasts: under the hood. Collaboratory for the Study of Earthquake Predictability (CSEP) workshop (*invited talk*)
2021	Dascher-Cousineau, K., Finnegan, N. J., & Brodsky, E.E. (2021). The Lifespan of Fault-Crossing Channels, Sino-USA Earthquake Hazards Seminar *(invited talk)*
2021	Dascher-Cousineau, K., Shchur, O., & Brodsky, E.E. (2021). Flexible and Scalable Earthquake Forecasting. Southern California Earthquake Center (SCEC) meeting (*poster*). Cargèse School: Earthquakes (*talk*), American Geophysical Union (AGU) Fall Meeting Abstracts (*talk*),
2020	Dascher-Cousineau, K., Finnegan, N. J., & Brodsky, E.E. (2020). Competition between fault advection and fluvial aggradation determines channel geometry along strike-slip faults. American Geophysical Union (AGU) Fall Meeting Abstracts (*poster*)
2020	Dascher-Cousineau, K., Lay, T. & Brodsky, E. E., (2020). Two Foreshock Sequences Post Gulia and Wiemer (2019). Southern California Earthquake Center (SCEC) meeting (*poster*)
2019	Dascher-Cousineau, K, Brodsky, E. E., Finnegan, N., Duvall, A. (2019). Large scale detection of fault damage. American Geophysical Union (AGU) Fall Meeting Abstracts (*talk*). Southern California Earthquake Center (SCEC) meeting (*poster*)
2018	Dascher-Cousineau, K., Brodsky, E. E., & Lay, T. (2018). Why do strike-slip earthquakes produce fewer aftershocks? American Geophysical Union (AGU) Fall Meeting Abstracts (*talk*). Southern California Earthquake Center (SCEC) meeting (*poster*)
2016-2017	Dascher-Cousineau, K., Kirkpatrick, J. D., & Cooke, M. L.. Evolution of fault slip surfaces with displacement. GAC-MAC (*talk*) Gordon Research Conference: Rock Deformation (*poster*), Canadian Tectonics Group (*poster*), McGill Earth and Planetary Science (EPS) Symposium (*poster*).

Teaching Experience

2023	Lead on Data Science Discovery Project: undergraduate data science research team.
2022	GEODES computing onramp: weekend intensive course
2016-2022	Undergraduate research mentor: Mitchell May studying fault roughness, Alex Watson studying automated crack detection using machine learning, Joseph Cherayil studying b-value variations across locked and creeping faults.
2015-2022	Dynamic earth, GIS, hydrogeology, structural geology, mineralogy, and field school teaching assistant
2012-2015	Math, physics, and geology tutor

Practical Skills

Programming	Python, MatLab, GIS, basic HTML, Java, C, and C++
Fieldwork	Seismic surveying; boring for water and soil sampling; total station, GPS and lidar surveying; geological mapping; wilderness first aid (CPR/AED(A+))
Instrumentation	White light profilometry, XRD, SEM, AFM, and optical microscopy
Foundations	ODE's, PDE's, vector calculus, advanced linear algebra, numerical analysis, statistics, regression, complex analysis signal processing, dynamic systems, mechanics, and machine learning