

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 Active tectonics	UC Berkeley
Reporting to Professor Roland Burgmann: studies on the interplay between slow slip and seismicity.		
Summer 2022	Student Researcher Crisis Response	Google
Reporting to Oleg Zlydenko: method development in forecasting		
2017 - 2022	PhD thesis: Earthquake Physics	UC Santa Cruz
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: Rock Mechanics	McGill University
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: Fault Zone Architecture	McGill University
Reporting to Professor Christie Rowe: a detailed survey of the Champlain Thrust fault zone.		
Summer 2014	Intern at GEO4 GmbH: Geophysics and Hydrogeology	Munich, Germany
A geotechnical and geophysical analysis related to environmental regulation and engineering.		
Summer 2013	Research project: Seismology	McGill University
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

2022	Dascher-Cousineau, K., Shchur, O., Brodsky, E.E., & Gunnemann, S. (under review). Using deep-learning for flexible and scalable earthquake forecasting.
2021	Dascher-Cousineau, K., Finnegan, N. J., & Brodsky, E.E. (2021). The Lifespan of Fault-Crossing Channels. <i>Science</i> , 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. <i>Seismological Research Letters</i> , 92(5), 3251-3258.
2020	Dascher-Cousineau, K., Lay, T., & Brodsky, E. E. (2020). Two Foreshock Sequences Post Gulia and Wiemer (2019). <i>Seismological Research Letters</i> , 91(5), 2843-2850.
2020	Dascher-Cousineau, K., Brodsky, E. E., Lay, T., & Goebel, T. H. (2020). What controls variations in aftershock productivity? <i>Journal of Geophysical Research: Solid Earth</i> , 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. <i>Geophysical Research Letters</i> , 46(21), 11820-11829.
2018	Dascher-Cousineau, K., Kirkpatrick, J. D., & Cooke, M. L. (2018). Smoothing of Fault Slip Surfaces by Scale-Invariant Wear. <i>Journal of Geophysical Research: Solid Earth</i> , 123(9), 7913-7930.
2018	Rowe, C. D., Ross, C., ... Dascher-Cousineau, K. et al., (2018). Geometric complexity of earthquake rupture surfaces preserved in pseudotachylite networks. <i>Journal of Geophysical Research: Solid Earth</i> , 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. <i>Geofluids</i> .

Presentations

- 2022 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*)
- 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

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

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