

STACY LAROCHELLE

Division of Geological and Planetary Sciences, California Institute of Technology
1200 E. California Blvd., MS 252-21, So. Mudd Building, Pasadena, CA 91125
Email: stacy.larochelle@caltech.edu | Phone: (626) 395-6932

EDUCATION

Ph.D. in Geophysics, California Institute of Technology	Expected June 2022
Thesis: <i>Solid Earth Deformation and Fault Slip Induced by Water</i>	
M.S. in Geophysics, California Institute of Technology	2018
B.Eng. in Civil Engineering, McGill University	2016
International Baccalaureate and Diploma of College Studies in Pure & Applied Sciences, Champlain College Saint-Lambert	2012

RESEARCH POSITIONS

Visiting research assistant, Institut Géo. National and École normale supérieure Paris	2019
Collaborators: Kristel Chanard, Luce Fleitout and Jérôme Fortin	
Visiting research assistant, Géoazur, Université Côte d'Azur	2019
Collaborators: Jean-Paul Ampuero and Frédéric Cappa	
Graduate research assistant, California Institute of Technology	2016-22
Thesis Advisors: Jean-Philippe Avouac and Nadia Lapusta	
Undergrad. research assistant in earth and planetary Sciences, McGill University	2015
Advisor: Yajing Liu	
Summer undergrad. research assistant in environmental geomechanics, McGill University	2015
Advisor: Patrick Selvadurai	
Summer undergrad. research assistant in structural engineering, McGill University	2014
Advisor: Denis Mitchell	

AWARDS & FELLOWSHIPS

Seismological Society of America (SSA) Student Presentation Award	2021
Embassy of France in the United States Chateaubriand Fellowship	2020
Caltech GPS Division Best Teaching Assistant Award	2019
American Geophysical Union (AGU) Outstanding Student Presentation Award	2018
NSERC Postgraduate Scholarship - Doctoral	2018-21
Seismological Laboratory Gutenberg Fellowship	2017
McGill British Association Medal	2016
McGill Gordon Hunt Engineering Scholarship	2015-16
McGill Summer Undergraduate Research in Engineering Poster Award	2015
NSERC Undergraduate Student Research Award (x2)	2014-15
McGill Dean's Honor List	2012-16
Hydro-Québec McGill Admission Scholarship	2012-15

PUBLICATIONS

Submitted:

Larochelle, S., Chanard, K., Fleitout, L., Fortin, J., Gualandi, A., Longuevergne, L., Rebischung, P., Violette, S., and Avouac, J.-P., Understanding the geodetic signature of large aquifer systems: Example of the Ozark Plateaus in Central United States, submitted to *Journal of Geophysical Research: Solid Earth*. (Preprint: <https://doi.org/10.1002/essoar.10507870.1>)

Michel, S., Jolivet, R., Lengliné, O., Gualandi, A., **Larochelle, S.**, and Gardonio, B., Searching for slow slip events along the San Andreas Fault near Parkfield using Independent Component Analysis, in revision for *Journal of Geophysical Research: Solid Earth*.

Published:

Larochelle, S., Lapusta, N., Ampuero, J.-P., and Cappa, F. (2021). Constraining fault friction and stability with fluid-injection field experiments. *Geophysical Research Letters*, 48, e2020GL091188. <https://doi.org/10.1029/2020GL091188>.

Larochelle, S., Gualandi, A., Chanard, K., and Avouac, J.-P. (2018), Identification and extraction of seasonal geodetic signals due to surface load variations, *Journal of Geophysical Research: Solid Earth*, 123, <https://doi.org/10.1029/2018JB016607>.

Non-peer reviewed:

Larochelle, S., Liu, Y., and Kao, H., (2016), Poroelastic modeling of hydraulic fracturing induced earthquake stress field, Geological Survey of Canada, Open File 8028, 27 p., <https://doi.org/10.4095/297811>.

INVITED PRESENTATIONS

AGU Fall Meeting, New Orleans, LA, USA	2021
SSA Annual Meeting, Online	2021
Saudi Water Forum, Riyadh, Saudi Arabia [<i>cancelled due to COVID-19</i>]	2021
11th Knowles Lectures and Solid Mechanics Symposium, Pasadena, CA	2020
AGU Fall Meeting, San Francisco, CA, USA	2019
Café des Géosciences, École normale supérieure, Paris, France	2019

TEACHING EXPERIENCE

Student for:

Caltech E110: Principles of University Teaching and Learning in STEM Winter 2021

Teaching Assistant for:

Caltech ME/Ge/Ae 102a/160: Continuum Mechanics Fall 2020

Caltech ME/Ge/Ae 266: Dynamic Fracture & Frictional Faulting Spring 2020

Caltech Ge 162: Introduction to Seismology Winter 2019

Caltech Ge 118: Introduction to Data Analysis Fall 2018

Caltech Ge 1: Introduction to Earth Sciences Spring 2018

McGill CIVE 210: Surveying Summer 2016

McGill FACC 300: Engineering Economy Winter 2015-16 & Fall 2016

SYNERGISTIC ACTIVITIES

Student representative of the AGU Geodesy Section Executive Committee	2021
SeismoLab Seminars Organizing Committee	2018-19
NSF Workshop on Modeling Earthquake Source Processes Organizing Committee	2018
Reviewer for: <i>Earth and Planetary Sciences Letters, Journal of Geophysical Research: Solid Earth, Pure and Applied Geophysics, Remote Sensing and Tectonics.</i>	2018-

COMMUNITY INVOLVEMENT

Caltech Y tutoring	2021
GPS FUTURE Ignited mentoring program	2020
Caltech HerStories Organizing Committee [<i>cancelled due to COVID-19</i>]	2019-20
GPS Local Student Committee	2019-20
WinGs (Women in GPS) Treasurer	2018-20
Caltech Graduate Student Council Board of Directors	2017-19
Caltech Graduate Student Council Social Committee	2016-19

CONFERENCE PRESENTATIONS

- Larochelle, S.**, Chanard, K., Fleitout, L., Fortin, J., Longuevergne, L., Argus, D. and Avouac, J.-P. (2021, *invited*), Extracting and separating different sources of hydrology-induced deformation in geodetic datasets, Oral presentation prepared for AGU Fall Meeting, New Orleans, LA & Online, 13-17 Dec.
- Argus, D., Martens, H. R., Wiese, D. N., Borsa, A. A., Knappe, E., **Larochelle, S.**, Avouac, J.-P., Chanard, K., Anderson, M., Peidou, A., White, M. W. and Landerer, F. (2021), Loss of water in the ground in the southwest U.S. during drought in 2020 and 2021, Presentation prepared for AGU Fall Meeting, New Orleans, LA & Online, 13-17 Dec.
- Larochelle, S.**, Lapusta, N., Ampuero, J.-P., and Cappa, F. (2021, *invited*), Constraining the Stability of a Rate-and-State Fault Subjected to Fluid Injection, Oral presentation presented at SSA Annual Meeting, Online, 19-23 Apr.
- Larochelle, S.** and Avouac, J.-P. (2021, *invited*), Monitoring of Continental Water Storage from GNSS and GRACE Observations, Oral presentation at Saudi Water Forum, Riyadh, Saudi Arabia, 7-9 Feb. [*Cancelled due to COVID-19*]
- Larochelle, S.**, Chanard, K., Fleitout, L., Gualandi, A., Fortin, J., Rebischung, P., Violette, S., and Avouac, J.-P. (2020), Understanding the geodetic signature of large aquifer systems: Example of the Ozark Plateaus in Central United States, Abstract G015-05. Oral presentation presented at AGU Fall Meeting, Online, 1-17 Dec.
- Larochelle, S.**, Lapusta, N., Ampuero, J.-P., and Cappa, F. (2020), What can fluid-injection field experiments tell us about fault stability?, Abstract T002-0005. Poster presentation presented at AGU Fall Meeting, Online, 1-17 Dec.

- Michel, S., Jolivet, R., Lengliné, O., Gualandi, A., **Larochelle, S.**, and Gardonio, B. (2020), Twelve years of seismic and aseismic slip along the San Andreas Fault near Parkfield, Abstract T005-05. Oral presentation presented at AGU Fall Meeting, Online, 1-17 Dec.
- Larochelle, S.**, Lapusta, N., Ampuero, J.-P., and Cappa, F. (2020), Slip response to fluid depressurization constrains fault friction, contribution # 10608. Poster presented at SCEC Annual Meeting, Palm Springs, USA, 9-12 Sep.
- Larochelle, S.**, Lapusta, N., Ampuero, J.-P., and Cappa, F. (2019), Numerical Modeling of Fluid-Induced Slip on Rate-and-State Faults Motivated by a Field Experiment, Abstract T31E-0337. Poster presented at AGU Fall Meeting, San Francisco, USA, 9-13 Dec.
- Larochelle, S.**, Chanard, K., Gualandi, A., and Avouac, J.-P. (2019), Regional fluctuations in hydrological mass inferred from GNSS and GRACE observations, Abstract G53A-03. Oral presentation presented at AGU Fall Meeting, San Francisco, USA, 9-13 Dec.
- Larochelle, S.**, Gualandi, A., Chanard, K., and Avouac, J.-P. (2019, *invited*), Spatiotemporal characterization of seasonal crustal deformation due to hydrological processes, Abstract U12C-18. eLightning presentation presented at AGU Fall Meeting, San Francisco, USA, 9-13 Dec.
- Larochelle, S.**, Lapusta, N., Ampuero, J.-P., and Cappa, F. (2019), Numerical modeling of fluid-induced slip on a rate-and-state fault motivated by a field experiment. Oral presentation presented at GeoProc2019, Utrecht, Netherlands, 7-9 July.
- Larochelle, S.**, Gualandi, A., Chanard, K., and Avouac, J.-P. (2018), Identification and extraction of seasonal geodetic signals due to surface load variations, Abstract G43C-0724. Poster presented at AGU Fall Meeting, Washington D.C., USA, 10-14 Dec.
- Larochelle, S.**, Lapusta, N., Ampuero, J.-P., and Cappa, F. (2018), Numerical modeling of a fluid-induced aseismic-seismic slip sequence on a rate-and-state fault, contribution #8311. Poster presented at SCEC Annual Meeting, Palm Springs, USA, 9-12 Sep.
- Larochelle, S.**, Lapusta, N., Ampuero, J.-P., and Cappa, F. (2018), Numerical modeling of a fluid-induced aseismic-seismic slip sequence on a rate-and-state fault. Poster presented at NSF Workshop on Modeling Earthquake Source Processes, Pasadena, USA, 8-10 Oct.
- Larochelle, S.**, Chanard, K., Gualandi, A., and Avouac, J.-P. (2017), Seasonal geodetic strain in the Himalaya: Extraction, modeling & correlation with seismicity, Abstract G31A-0893. Poster presented at AGU Fall Meeting, New Orleans, Louisiana, USA, 11-15 Dec.
- Larochelle, S.**, Lapusta, N., and Ampuero J.-P. (2017), Numerical modeling of fluid-induced seismic and aseismic fault slip. Poster presented at Cargèse Earthquakes School, Cargèse, Corsica, France, 2-6 Oct.
- Liu, Y., Harrington, R., Deng, K. and **Larochelle, S.** (2015), Modeling aseismic and seismic slip induced by fluid injection on pre-existing faults governed by rate-and-state friction, Abstract T52B-08. Oral presentation presented at 2015 AGU Fall Meeting, San Francisco, California, USA, 14-18 Dec.
- Larochelle, S.**, Selvadurai, A.P.S., and Cao, C. (2015), Fluid flow through a fracture in a Cobourg limestone sample. Poster presented at 2015 McGill SURE Poster Presentation, Montreal, QC, Canada, 13 Aug.

Larochelle, S., Pietkowicz, R., and Mitchell, D. (2014), Simulated earthquake testing of concrete frame structures. Poster presented at 2014 McGill SURE Poster Presentation, Montreal, QC, Canada, 14 Aug.