

# François. X. Passelègue

-SNF- *Ambizione Fellow*

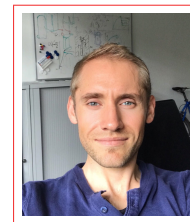
☎ +41 216 933 964

✉ [passelegue@gmail.com](mailto:passelegue@gmail.com)

🌐 <https://fxpasselegue.weebly.com/>

Born in 1986

French citizen



## Positions

- 2017– **Ambizione Fellow**, *École Polytechnique Fédérale de Lausanne*, LEMR Team, Switzerland.  
"Effect of fluids on the stability and healing processes of fault during fluid-injection"
- 2015–2017 **Postdoctoral Research Scientist**, *The University of Manchester*, Manchester, UK, "Brittle-ductile transition of crustal rocks".  
working with Prof. Giulio Di Toro and Dr. Julian Mecklenburgh
- 2014–2015 **Teaching and Research associate**, *École Normale Supérieure*, Paris, France.  
192 hours of teaching

## Education

- 2011-2014 **Ph.D. in Geophysics**, *École normale supérieure*, Paris, France, "Experimental study of the seismic rupture", defended with highest honors.  
under the supervision of Pr. Raül Madariaga and Dr. Alexandre Schubnel
- 2010-2011 **Master VTESS**, *Université de Franche-Comté*, with honors, Rank 1.
- 2009-2010 **Master in Geosciences**, *Université de Franche-Comté*, with honors, Rank 1.
- 2007-2009 **Bachelor in Geosciences**, *Université de Franche-Comté*, with honors.

## Internships

- Summer 2017 **1-month Internship**, *Istituto Nazionale di Geophysica e Vulcanologia*, Roma, Italy.  
working with Dr. Elena Spagnuolo and Dr. Marco Scuderi
- Fall 2016 **2-weeks Internship**, *University College of London*, London, UK.  
working with Dr. Nicolas Brantut and Dr. Thomas Mitchell
- Fall 2014 **1-month Internship**, *Istituto Nazionale di Geophysica e Vulcanologia*, Roma, Italy.  
working with Pr. Giulio Di Toro
- Winter 2014 **1-month Internship**, *National Research Institute for Earth Science and Disaster Resilience*, Tsukuba, Japan.  
working with Pr. Eiichi Fukuyama
- Spring 2010 **3-month Internship**, *Brown University*, Providence, USA.  
working with Pr. David Goldsby

## Field experience

- 2018 **Apennines, Italy**, 2 weeks, Deformation of the lithosphere, Structural Geology, Coseismic damage and fluid flow in carbonates.  
With Dr. Michele Fondriest and Pr. Giulio Di Toro

- 2012 **Adamello, Alps, Italy, 1 week**, Deformation of the lithosphere, Structural Geology, Relation between seismic and aseismic fault.  
With Pr. Giulio Di Toro
- 2009-2010 **Mercantour, Alps, 4 weeks**, Deformation of the lithosphere, Structural Geology, Localisation of the deformation at the brittle-ductile transition.  
With Dr. Henri Leclère
- 2009-2010 **Outer hebrides, 4 weeks**, Deformation of the lithosphere, Structural Geology, Segmentation of the outer hebrides thrust.  
With Pr. Olivier Fabbri
- 2006-2010 **France, 20 weeks**, Deformation of the lithosphere, Structural Geology, Mapping and cross section through different domains in France during by education.  
With Pr. Olivier Fabbri, Dr. P. Rolin and Dr. P. Goncalves

## Teaching

- 2014–2015 **Geophysics and solid mechanics**, *École normale supérieure*, 192 hours/year (L3, M1), Solid mechanics, Rock physics, Thermodynamic, Structural geology, Seismology.
- 2011–2014 **Geosciences and Informatic**, *Université Diderot, Paris VII and IPGP*, Rock mechanics (M1), Rock physics (L3), Structural geology (L3), Informatics and Programming (L1 and L2), Field geology (L3), Orogenesis (L3).
- 2009–2011 **Geosciences**, 40 hours/year, Deformation of the lithosphere, Structural Geology.

## Supervision of Ph.D students

- 2019–2023 **Federica Paglialunga**, *École Polytechnique Fédérale de Lausanne*, "Dynamic and energy budget of laboratory earthquakes", Experimental rock mechanics.  
Co-advison with Pr. Marie Violay
- 2017–2021 **Corentin Noel**, *École Polytechnique Fédérale de Lausanne*, "Mechanic of faulting during pore pressure oscillations", Experimental rock mechanics.  
Main advisor : Pr. Marie Violay
- 2016–2020 **Mateo Accosta**, *École Polytechnique Fédérale de Lausanne*, "Influence of fluids in the weakening of faulting", Experimental rock mechanics.  
Main advisor : Pr. Marie Violay
- 2016–2019 **Jérôme Aubry**, *École normale supérieure*, "Mechanical coupling at the brittle ductile transition of crustal rocks", Experimental rock mechanics.  
Main advisor : Pr. Alexandre Schubnel
- 2016–2019 **Samson Marty**, *École normale supérieure*, "Acoustic signature of the seismic cycle", Experimental rock mechanics.  
Main advisor : Pr. Alexandre Schubnel

## Funding awards

- 2017 **Ambizione Fellow, grant PZENP2/173613**, *Stability and healing processes of fault during fluid-injection : from the lab to the field*, 386 000 CHF.

## Technical Strength

French Native  
English Fluent

Technical Skills **Experimental Apparatus, Microstructural analysis, Software**, High pressure and temperature, oil and gas confining medium, Rotary shear apparatus, Hopkinson bar, high frequency monitoring system, optical fiber sensors, x-ray diffraction, SEM, EDS, EBSD, TEM, Matlab, Labview, R, ArcMap, Fortran, Julia, Latex.

## Scientific communications and services

Conferences **as first author**, *AGU and EGU*, more than 10 talks and more than 10 posters.  
(last 5 years)

Invited Seminars **Stanford University (2013), ETH (2014), NIED (2014), Gordon conference (2014), Harvard University (2014), Geoazur (2015), University of Manchester (2015) ...**  
(last 5 years) **Universita di Padova (November 2018), GFZ Potsdam (beginning 2019).**

Comittees **Co-convener of sessions at EGU and AGU.**

Reviewer **JGR, GRL, Pageoph, Tectonophysics, Nature scientific reports, Geology, Nature Geosciences.**

## Publications

Under review **On the Nature of Fault Slip : From the Field to the Laboratory**  
**Passelègue, F. X.**, Almakari, M., Dublanchet, P., Barras, F., Violay, M.  
Submitted

**A flow law for pseudotachylytes in the continental crust**  
**Passelègue, F. X.**, Tielke, J., Mecklenburgh, D., J., Di Toro., G.  
Submitted to Geology

**Anatomy of dynamic slip in laboratory earthquakes at crustal conditions**  
Harbord, C. W. A., Nielsen, S.B., De Paola, N., Faulkner, D., **Passelègue, F. X.**  
Submitted to Geophysical Research Letters

- 2019 **Effect of fluid viscosity on fault reactivation and induced earthquakes**  
Cornelio\*, C., [Passelègue, F. X.](#), Spagnuolo, E., Di Toro, G., Violay, M.  
Journal of Geophysical Research
- Precursory moment release scales with earthquake magnitude**  
Acosta\*, M., [Passelègue, F. X.](#), Schubnel, A., Madariaga, R., Violay, M.  
Geophysical Research Letters
- Fault reactivation during fluid pressure oscillations : transition from stable to unstable slip**  
Noel\*, C., [Passelègue, F. X.](#), Giogetti, C., Violay, M.  
Journal of Geophysical Research
- Effect of water and rock composition on re-strengthening of cohesive faults during the deceleration phase of seismic slip pulses**  
Violay, M., [Passelègue, F. X.](#), Spagnuolo, E., Di Toro, G., Cornelio, C.  
Earth and Planetary Science Letters
- From Fault Creep to Slow and Fast Earthquakes in Carbonates**  
[Passelègue, F. X.](#), Aubry, J., Nicolas, A., Fondriest, M., Deldicque, D., Schubnel, A., Di Toro, G.  
Geology
- On the origin of high-frequency radiation in experimental earthquakes**  
Marty\*, S., [Passelègue, F. X.](#), Aubry J., Schubnel A., Bhat, H. S., Madariaga R.  
Geophysical Research Letters
- 2018 **Fault reactivation by fluid injection : Controls from stress state and injection rate**  
[Passelègue, F. X.](#), Brantut, N., Mitchell, T. M.  
Geophysical Research Letters
- Frictional Heating Processes and Energy Budget during Laboratory Earthquakes**  
Aubry\*, J., [Passelègue, F. X.](#), Deldicque, D., Girault, F., Marty, S., Lahfid, A., Bhat, H. S., Escartin, J., Schubnel, A.  
Geophysical Research Letters
- Dynamic weakening during earthquakes controlled by fluid thermodynamics**  
Acosta\*, M., [Passelègue, F. X.](#), Schubnel, A., Violay, M.  
Nature Communications
- Development and Recovery of Stress-Induced Elastic Anisotropy During Cyclic Loading Experiment on Westerly Granite**  
[Passelègue, F. X.](#), Pimienta, L., Faulkner, D., Schubnel, A., Fortin, J., Guéguen, Y.  
Geophysical Research Letters
- Frictional instabilities and carbonation of basalts triggered by injection of pressurized H<sub>2</sub>O- and CO<sub>2</sub>-rich fluids**  
Giacomel, P., Spagnuolo, E., Nazzari, M., Marzoli, A., [Passelègue, F. X.](#), Youbi, N., Di Toro, G.  
Geophysical Research Letters
- 2017 **Influence of fault strength on precursory processes during laboratory earthquakes**  
[Passelègue, F. X.](#), Latour, S., Schubnel, A., Nielsen, S., Bhat, H. S., Madariaga, R.  
AGU Monograph

- 2016 **Frictional evolution, acoustic emissions activity, and off-fault damage in simulated faults sheared at seismic slip rates**  
Passelègue, F. X., Spagnuolo, E., Violay, M., Nielsen, S., Di Toro, G., Schubnel, A.  
Journal of Geophysical Research
- Dynamic weakening and amorphization in serpentinite during laboratory earthquakes**  
Brantut, N., Passelègue, F. X., Deldicque, D., Rouzaud, J. N., Schubnel, A.  
Geology
- Dynamic rupture processes inferred from laboratory microearthquakes**  
Passelègue, F. X., Schubnel, A., Nielsen, S., Bhat, H. S., Deldicque, D., Madariaga, R.  
Journal of Geophysical Research
- 2014 **Radon emanation from brittle fracturing in granites under upper crustal conditions**  
Nicolas, A., Girault, F., Schubnel, A., Pili, É., Passelègue, F. X., Fortin, J., Deldicque, D.  
Geophysical Research Letters
- The influence of ambient fault temperature on flash-heating phenomena**  
Passelègue, F. X., Goldsby, D. L., Fabbri, O.  
Geophysical Research Letters
- 2013 **Fluid overpressure along an Oligocene out-of-sequence thrust in the Shimanto Belt, SW Japan**  
Passelègue, F. X., Fabbri, O., Dubois, M., Ventalon, S.  
Journal of Asian Earth Sciences
- From sub-Rayleigh to supershear ruptures during stick-slip experiments on crustal rocks**  
Passelègue, F. X., Schubnel, A., Nielsen, S., Bhat, H. S., Madariaga, R.  
Science

\* Denotes Supervised or co-supervised student's paper