

## JEAN-ARTHUR OLIVE

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### Appointments

- 2018– CNRS Research Scientist, Ecole Normale Supérieure, Paris, France.
- 2018– Adjunct Associate Research Scientist, Lamont-Doherty Earth Observatory.
- 2018–2021 Adjunct Scientist, Woods Hole Oceanographic Institution.
- 2015–2017 Postdoctoral Research Scientist, Lamont-Doherty Earth Observatory / Columbia University.

### Research interests

Lithosphere geodynamics. Thermo-mechanical modeling of plate boundary evolution. Seafloor spreading. Feedbacks between deformation and surface processes. Brittle deformation across scales.

### Education

- 2015 **Ph.D., Marine Geophysics**, Massachusetts Institute of Technology / Woods Hole Oceanographic Institution Joint Program in Oceanography, Cambridge MA, USA.  
*Dissertation title:* Mechanical and Geological Controls on the Long-Term Evolution of Normal Faults. *Thesis advisor:* Dr. Mark Behn.
- 2009 **M.S., Geophysics**, Institut de Physique du Globe de Paris / Ecole Normale Supérieure, Paris, France.
- 2007 **B.S., Earth and Planetary Science**, Ecole Normale Supérieure, Paris, France.

### Selected publications (17 out of 37, complete list available [here](#))

\* denotes student advisee

- Brune, S., Kolawole, F., **Olive, J.-A.**, Stamps, S., Buck, W.R., Furman, T., and Shillington, D., Geodynamics of rift initiation and evolution, *Nat. Rev. Earth Environ.*, 2023.
- Olive, J.-A.**, Malatesta, L.C., Behn, M.D., and Buck, W.R., Sensitivity of rift tectonics to global variability in the efficiency of river erosion, *PNAS*, v. 119, 2022.
- \*Fan, Q., **Olive, J.-A.**, and Cannat, M., Thermo-mechanical state of ultraslow-spreading ridges with a transient magma supply, *J. Geophys. Res.*, 126, 2021.
- \*De Sagazan, C., and **Olive, J.-A.**, Fault spacing enhanced by sedimentation at the Andaman sea spreading center, *Geology*, 49, 2021.
- Olive, J.-A.**, and Dublanchet, P., Controls on the magmatic fraction of extension at mid-ocean ridges, *Earth Planet. Sci. Lett.*, v. 549, 2020.
- Parnell-Turner, R., Sim, S. J., and **Olive, J.-A.**, Time-dependent crustal accretion on the Southeast Indian Ridge revealed by Malaysia Airlines MH370 search, *Geophys. Res. Lett.*, v. 47, 2020.
- Jolivet, R., Simons, M., Duputel, Z., **Olive, J.-A.**, Bhat, H. S., and Bletery, Q., Interseismic loading of subduction megathrust drives long term uplift in northern Chile, *Geophys. Res. Lett.*, v. 47, 2020.
- Howell, S., **Olive, J.-A.**, Ito, G., Behn, M., Seafloor expression of oceanic detachment faulting reflects gradients in mid-ocean ridge magma supply, *Earth Planet. Sci. Lett.*, v. 516, 2019.
- Olive, J.-A.**, and Crone, T. J., Smoke without fire: How long can thermal cracking sustain hydrothermal circulation in the absence of magmatic heat?, *J. Geophys. Res.*, v. 123, 2018.
- Barreyre, T., **Olive, J.-A.**, Crone, T. J., and Sohn, R., Depth-dependent permeability and heat extraction at basalt-hosted hydrothermal systems across mid-ocean ridge spreading rates, *Geochem. Geophys. Geosyst.*, v. 19, 2018.
- Olive, J.-A.**, and Escartín, J., Dependence of seismic coupling on normal fault style along the Northern Mid-Atlantic Ridge, *Geochem. Geophys. Geosyst.*, v. 17, 2016.
- Olive, J.-A.**, Behn, M. D., Mittelstaedt, E., Ito, G., and Klein, B. Z., The role of elasticity in simulating long-term tectonic extension, *Geophys. J. Int.*, v. 205, 2, 2016a.

- Olive, J.-A.**, Behn, M. D., Ito, G., Buck, W. R., Escartín, J., and Howell, S., Sensitivity of seafloor bathymetry to climate-driven fluctuations in mid-ocean ridge magma supply, *Science*, v. 350, 2015.
- Olive, J.-A.**, Behn, M. D., and Malatesta, L. C., Modes of extensional faulting controlled by surface processes, *Geophys. Res. Lett.*, v. 41, 19, 2014b.
- Olive, J.-A.**, and Behn, M. D., Rapid rotation of normal faults due to flexural stresses: an explanation for the global distribution of normal fault dips, *J. Geophys. Res.*, v. 119, 3722-3739, 2014.
- Olive, J.-A.**, Pearce, F., Rondenay, S., and Behn, M. D., Pronounced zonation of seismic anisotropy in the Western Hellenic subduction zone and its geodynamic significance, *Earth Planet. Sci. Lett.*, v. 391, 2014a.
- Olive, J.-A.**, Behn, M. D. and Tucholke, B. E., The structure of oceanic core complexes controlled by the depth-distribution of magma emplacement, *Nature Geoscience*, v. 3, 491-495, 2010.

### **Other selected publications**

- **Olive, J.-A.**, Mid-ocean ridges: Geodynamics written in the seafloor, in *Dynamics of Plate Tectonics and Mantle Convection*, edited by J. Duarte, Elsevier, 2023.
- Escartín, J., and **Olive, J.-A.**, Mid-ocean ridges and their geomorphological features, in *Treatise on Geomorphology (2nd edition)*, v. 9, 2022.

### **Service**

Committee member: *Comité National de la Recherche Scientifique*: Section 18 (2021–2026); Early Career Representative for AGU's Tectonophysics Section (2021–2023); AGU Bowie Medal Committee (2020–); InterRidge France Committee (2021–); IMOVE-InterRidge Working group on seafloor observatories (2018–2021).

Software development and distribution: *SiStER (Simple Stokes solver with Exotic Rheologies)*, a 2-D code for long-term tectonic modeling (<https://github.com/jaolive/SiStER>)

### **Awards and Funding Awards (as lead PI)**

- 2023 ANR "Tremplin" Grant: *Geological signatures of megathrust activity*.
- 2019 Emergence(s) Ville de Paris: *Development and effect of inelastic deformation in the subduction earthquake cycle*.
- 2016 NSF Grant EAR-1650166: *Collaborative Research: Quantifying the sensitivity of rifting processes to erosion and sedimentation*.
- 2015 NSF Grant OCE-1536943: *Collaborative Research: Modeling hydrothermal recharge and outflow in oceanic crust analogs with sharp permeability gradients*.
- 2014 Lamont-Doherty Earth Observatory Postdoctoral Fellowship.

### **Educational activities**

Teaching (within ENS' Geoscience Department):

- 2023– *Lithosphere Dynamics* (Advanced undergraduate level)
- 2020– *Applied Geoscientific Modeling* (Masters level)
- 2020– *Introduction to Analogue Geodynamic modeling* (short course, Masters level)
- 2020– *Continuum Mechanics* (Advanced Undergraduate level)
- 2019–2021 *Earth History and Dynamics* (Advanced Undergraduate level)

Advising: *Postdocs*: B. Oryan (2022–); *PhDs*: A. Demont (2021–), L. Petit (2019–2023), Q. Fan (visiting from Peking University, 2018–2019); *Masters*: H. Lestrelin (2021), C. de Sagazan (2018–2019); *Undergraduates*: C. Sfez (2021), E. Caujolle (2021), K. Moutard (2021).

### **Recent Invited Talks**

- 2022 Constitutive laws for the brittle lithosphere: Insights from structural geology and experimental rock mechanics (*Ada Lovelace Workshop on Modelling Mantle and Lithosphere Dynamics, Hévíz, Hungary*).
- 2019 Non-recoverable deformation around partially-locked megathrusts (*SZ4D Megathrust modeling workshop, Eugene OR*).