

JEAN-ARTHUR OLIVE

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Current position

2015–present. Postdoctoral Research Scientist, Lamont-Doherty Earth Observatory / Columbia University.

Research interests

Geodynamics of the lithosphere. Seismology. Thermo-mechanical modeling of fault evolution at tectonic plate boundaries. Feedbacks between deformation and fluid Earth processes.

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.

Publications

- Weiss, J. R., Ito, G., Brooks, B. A., **Olive, J.-A.**, Moore, G. F., and J. H. Foster, Formation of the frontal thrust zone of accretionary wedges by top-down propagation of the protothrusts, *in revision*.
- Escartín, J., Mével, C., Petersen, S., Bonnemains, D., Cannat, M., Andreani, M., and ODEMAR Science Party, including **Olive, J.-A.**, Tectonic structure, evolution, and the nature of oceanic core complexes and their detachment fault zones (13°20'N and 13°30'N, Mid-Atlantic Ridge), *in revision*.
- Olive, J.-A.**, and J. Escartín, Dependence of seismic coupling on normal fault style along the Northern Mid-Atlantic Ridge, *Geochem. Geophys. Geosyst.*, v. 17, 2016.
- Escartín, J., F. Leclerc, **J.-A. Olive**, C. Mevel, and ODEMAR Science Party, First direct observation of coseismic slip and seafloor rupture along a submarine normal fault and implications for fault slip history, *Earth Planet. Sci. Lett.*, v. 450, 2016.
- Olive, J.-A.**, Behn, M. D., Ito, G., Buck, W. R., Escartín, J., and S. Howell, Response to comment on "Sensitivity of seafloor bathymetry to climate-driven fluctuations in mid-ocean ridge magma supply" (by Tolstoy), *Science*, v. 353, 6296, 2016c.
- Olive, J.-A.**, Behn, M. D., Ito, G., Buck, W. R., Escartín, J., and S. Howell, Response to comment on "Sensitivity of seafloor bathymetry to climate-driven fluctuations in mid-ocean ridge magma supply" (by Huybers et al.), *Science*, v. 352, 6292, 2016b.
- Howell, S., G. Ito, M. D. Behn, F. Martinez, **J.-A. Olive**, and J. Escartín, Magmatic and tectonic extension at the Chile Ridge: Evidence for mantle controls on ridge segmentation, *Geochem. Geophys. Geosyst.*, v. 17, 2016.
- Olive, J.-A.**, M. D. Behn, E. Mittelstaedt, G. Ito, and B. Z. Klein, The role of elasticity in simulating long-term tectonic extension, *Geophys. J. Int.*, v. 205, 2, 2016a.
- Olive, J.-A.**, M. D. Behn, G. Ito, W. R. Buck, J. Escartín, and S. Howell, Sensitivity of seafloor bathymetry to climate-driven fluctuations in mid-ocean ridge magma supply, *Science*, v. 350, 2015.

- Zhou, Z., J. Lin, M. D. Behn, and **J.-A. Olive**, Mechanism for normal faulting in the subducting plate at the Mariana Trench, *Geophys. Res. Lett.*, v. 42, 2015.
- Olive, J.-A.**, M. D. Behn, and L. C. Malatesta, Modes of extensional faulting controlled by surface processes, *Geophys. Res. Lett.*, v. 41, 19, 2014b.
- Olive, J.-A.**, and M. D. Behn, 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.**, F. Pearce, S. Rondenay, and M. D. Behn, Pronounced zonation of seismic anisotropy in the Western Hellenic subduction zone and its geodynamic significance, *Earth Planet. Sci. Lett.*, v. 391, 2014a.
- Mittelstaedt, E., J. Escartín, N. Gracias, **J.-A. Olive**, T. Barreyre, A. Davaille, M. Cannat, and R. Garcia, Quantifying diffuse and discrete venting at the Tour Eiffel vent site, Lucky Strike hydrothermal field, *Geochem. Geophys. Geosyst.*, v. 13, 4, Q04008, 2012.
- Fontaine, F. J., **J.-A. Olive**, M. Cannat, J. Escartín, and T. Perol, Hydrothermally-induced melt lens cooling and segmentation along the axis of fast- and intermediate-spreading centers, *Geophys. Res. Lett.*, v. 38, L14307, 2011.
- Olive, J.-A.**, M. D. Behn, and B. E. Tucholke, The structure of oceanic core complexes controlled by the depth-distribution of magma emplacement, *Nature Geoscience*, v. 3, 491-495, 2010.

Community Service

- Seminar / session convener: *Weekly LDEO MGG-SGT Seminar (2015-2016)*; *OS and EP sessions at AGU (since 2015)*; *GeoPRISMS RIE TEI early-career symposium (2017)*.
- Software development and distribution: *SiStER (Simple Stokes solver with Exotic Rheologies)*, a 2-D code for long-term tectonic modeling; *eiSPLIT*, a package for shear-wave splitting analysis.

Honors and Awards

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| 2014 | Lamont-Doherty Earth Observatory Postdoctoral Fellowship |
| 2014 | CSDMS Student Modeler Award |
| 2014 | AGU Outstanding Student Paper Award (Tectonophysics Section) |
| 2012 | MIT-EAPS Department Award for Excellence in Teaching |
| 2011 | AGU Outstanding Student Paper Award (Earth's Deep Interior Section) |
| 2011 | GeoPRISMS Student Prize, Honorable Mention |
| 2010 | MIT-EAPS Department Award for Excellence in Teaching |

Funding Awards

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| 2016 | NSF Grant EAR-1650166 (\$205,750): <i>Collaborative Research: Quantifying the sensitivity of rifting processes to erosion and sedimentation</i> . PIs: J.-A. Olive (Lead), W. R. Buck, and M. D. Behn. |
| 2015 | NSF Grant OCE-1536943 (\$68,110): <i>Collaborative Research: Modeling hydrothermal recharge and outflow in oceanic crust analogs with sharp permeability gradients</i> . PIs: J.-A. Olive (Lead), E. Mittelstaedt, T. Barreyre, and R. Sohn. |

Teaching Experience

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| 2016 | Instructor , <i>Introduction to numerical modeling of lithospheric deformation in MATLAB</i> , GSA Annual Meeting Short Course (Daylong workshop on geodynamic modeling). |
| 2013 | Lecturer , <i>Mathematics Refresher for Incoming Graduate Students</i> , MIT / WHOI Joint Program (Four lectures on vector calculus and partial differential equations). |
| 2012 | Teaching Assistant , <i>Introduction to Geology (12.001)</i> , MIT (In charge of review sessions, labs, designing and grading tests). |
| 2010 | Teaching Assistant , <i>Application of Continuum Mechanics to Earth, Atmospheric and Planetary Sciences (12.005)</i> , MIT (In charge of review sessions and 2 lectures). |

Recent Invited Talks

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| 2017 | The role of surface processes in stabilizing half-graben structures (<i>GeoPRISMS RIE TEI</i>). |
| 2016 | Shaping the seafloor: from seconds to millions of years (<i>Geophysics Department Seminar, Stanford University</i>). |