

Sarah Jaye C. Oliva

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EDUCATION

Tulane University, Louisiana, USA

PhD in Earth and Environmental Sciences (Jan 2017-Jun 2020)

University of Rochester, New York, USA

PhD student in Geosciences (Sep 2015-Dec 2016) *Moved to Tulane with adviser

Abdus Salam International Centre for Theoretical Physics, Trieste, Italy

Earth System Physics, Pre-PhD Postgraduate Diploma (Sep 2014-Aug 2015)

Ateneo de Manila University, Quezon City, Philippines

BS Materials Science and Engineering, 2014

BS Physics, *Cum Laude*, 2013

Ateneo Freshman Merit Scholar (2009-2014), full tuition & fees scholarship

EMPLOYMENT

Postdoctoral Research Fellow

University of British Columbia, BC, Canada (Jul 2020-present)

FELLOWSHIPS AND AWARDS

2019 George W. Schneider Special Awardee, New Orleans Geological Society

2018 Vokes Fellowship recipient, Dept of Earth and Env Sci, Tulane University

2017 Graduate Student Research Grant awardee, Geological Society of America

2016 GeoPRISMS Student Prize, AGU Poster, Honorable Mention

2013 BPI-DOST Science Awardee (nationwide search in the Philippines)

PEER-REVIEWED PUBLICATIONS

Muirhead, J. D., Fischer, T., Laizer, A., **Oliva, S. J.**, Judd, E., Lee, H., Kazimoto, E., Ebinger, C. J., Sano, Y., Takahata, N., Tiberi, C., van Wijk, J., Dufek, J., Foley, S., Currie, C., Reiss, M. (2020). Displacement of cratonic mantle and lithospheric channeling concentrates deep carbon during continental rifting. *Nature*, 582, 67-72. doi:10.1038/s41586-020-2328-3

Ebinger, C. J., **Oliva, S. J.**, Pham, T. Q., Peterson, K., Chindandali, P., Illsley-Kemp, F., Drooff, C., Shillington, D.J., Accardo, N.J., Gallacher, R.J. & Gaherty, J. (2019). Kinematics of Active Deformation in the Malawi Rift and Rungwe Volcanic Province, Africa. *Geochemistry, Geophysics, Geosystems*, 20(8), 3928-3951. doi:10.1029/2019GC008354

Oliva, S. J., Ebinger, C. J., Wauthier, C., Muirhead, J. D., Roecker, S. W., Rivalta, E., & Heimann, S. (2019). Insights into fault-magma interactions in an early-stage continental rift from source mechanisms and correlated volcano-tectonic earthquakes. *Geophysical Research Letters*, 46(4), 2065-2074. doi: 10.1029/2018GL080866

Lavayssière, A., Drooff, C., Ebinger, C., Gallacher, R., Illsley-Kemp, F., **Oliva, S. J.**, & Keir, D. (2019). Depth extent and kinematics of faulting in the southern Tanganyika Rift, Africa. *Tectonics*, 38(3), 842-862. doi: 10.1029/2018TC005379

Gaherty, J. B., Zheng, W., Shillington, D. J., Pritchard, M. E., Henderson, S. T., Chindandali, P. R. N., Mdala, H., Shuler, A., Lindsey, N., **Oliva, S.J.** & Nooner, S. (2019). Faulting processes during early-stage rifting: seismic and geodetic analysis of the 2009–2010 Northern Malawi earthquake sequence. *Geophysical Journal International*, 217(3), 1767-1782. doi: 10.1093/gji/ggz119

Weinstein, A., **Oliva, S. J.**, Ebinger, C. J., Roecker, S., Tiberi, C., Aman, M., Lambert, C., Witkin, E., Albaric, J., Gautier, S. & Peyrat, S. (2017). Fault-magma interactions during early continental rifting: Seismicity of the Magadi-Natron-Manyara basins, Africa. *Geochemistry, Geophysics, Geosystems*, 18(10), 3662-3686. doi: 10.1002/2017GC007027

Guerrero, R. A., & **Oliva, S. J. C.** (2014). Optical wavelength tuning via actuation of a fluidic grating. *Optical Engineering*, 53(2), 025104. doi: 10.1117/1.OE.53.2.025104

Guerrero, R. A., **Oliva, S. J. C.**, & Indias, J. M. M. (2012). Fluidic actuation of an elastomeric grating. *Applied optics*, 51(24), 5812-5817. doi: 10.1364/AO.51.005812

UPCOMING PUBLICATIONS

Zheng, W., **Oliva, S. J.**, Ebinger, C. J., Pritchard, M. E. Aseismic deformation during the 2014 Mw 5.2 Karonga earthquake, Malawi from InSAR and earthquake source mechanisms. *Geophysical Research Letters*, in review.

Oliva, S. J., Ebinger, C. J., Rivalta, E., Wauthier, C., Williams, C., & Currie, C. State-of-stress and stress rotations:

quantifying the role of surface topography and subsurface density contrasts in magmatic rift zones (Eastern Rift, Africa). *Earth and Planetary Science Letters*, in preparation.

CONFERENCE
TALKS

- Oliva, S. J., Ebinger, C. J., Rivalta, E., Wauthier, C., Williams, C., Currie, C., (2019, Dec). State-of-stress and stress rotations: quantifying the role of surface topography and subsurface density contrasts in magmatic rift zones (Eastern Rift, Africa). In *AGU Fall Meeting Abstracts*.
- Oliva, S. J., Ebinger, C. J., Wauthier, C., Muirhead, J. D., Roecker, S. W., Rivalta, E., Heimann, S., Fischer, T., Dufek, J. (2018, Sep). Insights into magma storage and fault-magma interactions in an early-stage continental rift from active deformation and kinematic modeling studies. In *Cities on Volcanoes 10*.
- Oliva, S. J. C., Ebinger, C., Rivalta, E., & Williams, C. A. (2017, December). State-of-stress in magmatic rift zones: Predicting the role of surface and subsurface topography. In *AGU Fall Meeting Abstracts*.
- Oliva, S. J., Ebinger, C., Shillington, D., Albaric, J., Deschamps, A., Keir, D., & Drooff, C. (2017, April). Comparison of magmatic and amagmatic rift zone kinematics using full moment tensor inversions of regional earthquakes. In *EGU General Assembly Conference Abstracts* (Vol. 19, p. 941).
- Oliva, S. J. C. and Guerrero, R. A. (2014, May). Variable diffraction and optical wavelength tuning using a fluidic grating. In *8th International OSA Network of Students Conference in North America*.
- Oliva, S. J. C. and Guerrero, R. A. (2012, Oct). Optical wavelength tuning with a fluidic grating. In *30th National Physics Congress, Philippines*.

CONFERENCE
POSTERS

- Oliva, S. J. C., Ebinger, C., Rivalta, E., Wauthier, C., & Williams Jr, C. A. (2018, December). Quantifying state-of-stress and surface deformation in magmatic rift zones: Eastern Rift, Africa. In *AGU Fall Meeting Abstracts*.
- Oliva, S. J. C., Ruiz, M. C., Bean, C. J., Lokmer, I., Bell, A. F., Ebinger, C., Hernandez, S., La Femina, P.C & Ruiz, G. (2018, December). Full moment tensors of caldera earthquakes during the 2018 eruption of Sierra Negra, Galápagos. In *AGU Fall Meeting Abstracts*.
- Oliva, S. J. C., Ebinger, C. J., Keir, D., Shillington, D. J., & Chindandali, P. R. (2016, December). Deciphering the role of fluids in early stage rifting from full moment tensor inversion of East African earthquakes. In *AGU Fall Meeting Abstracts*.
- Oliva, S. J. C., Guidarelli, M., Ebinger, C. J., Roecker, S. W., & Tiberi, C. (2015, December). Surface Wave Analysis of Regional Earthquakes in the Eastern Rift System (Africa). In *AGU Fall Meeting Abstracts*.
- Indias, J. M., Oliva, S. J., & Guerrero, R. (2011). Fluidic actuation of a binary optical element. *Proceedings of the Samahang Pisika ng Pilipinas, SPP2011-PB*.

WORKSHOP
TALKS AND
COLLOQUIA

- "Insights into fault-magma interactions in an early-stage continental rift (Eastern Rift, Africa)," *invited talk* in **Rifts and Rifted Margins**: Session 1, Tectonic and magmatic contributions to rift seismicity (online) (Jun 15, 2020)
- "Deformation at all Timescales Overview," Student-Postdoc Symposium, **GeoPRISMS Synthesis and Integration: Theoretical and Experimental Institute**, Hotel Menger, San Antonio, TX, USA (Feb 25, 2019)
- "Insights into magma storage and fault-magma interactions in an early-stage continental rift from active deformation and kinematic modeling studies," *seminar talk* at **Abdus Salam International Centre for Theoretical Physics**, Trieste, Italy (Sep 13, 2019)
- "Comparison of magmatic and amagmatic rift zone kinematics using full moment tensor inversions of regional earthquakes," *seminar talk* at **GFZ Centre for Geosciences**, Potsdam, Germany (May 11, 2017)
- "Time-domain Moment Tensor Inversion," *methods talk* at **Seismology Student Workshop**, Lamont-Doherty Earth Observatory, Columbia University, NY, USA (March 13-14, 2017)
- "Comparison of magmatic and amagmatic rift zone kinematics using full moment tensor inversions of regional earthquakes," *research talk* at **Seismology Student Workshop**, Lamont-Doherty Earth Observatory, Columbia University, NY, USA (March 13-14, 2017)

TRAVEL AWARDS

- Tulane Graduate Studies Student Association Travel award, 2017, 2018, 2019
- Tulane School of Science and Engineering Dean's Travel Award, Fall 2019
- Early Career Scientist's Travel Support award, European Geosciences Union General Assembly 2017
- Student Travel Grant award, American Geophysical Union Fall Meeting 2015

SERVICE TO THE
PROFESSION

Session Convener and Chair, V11B/12A/13D: Magmatism, Tectonics, and Faulting in Rifts, Arcs, Ridges, Calderas, and Volcanic Fields: Understanding Processes, Timescales, and Their Interactions, **American Geophysical Union Fall Meeting**, San Francisco, CA, USA (Dec 2019)

Breakout Leader, **GeoPRISMS Pre-AGU Mini-workshop** "Strategies for Synthesis, Integration, and Future Opportunities," San Francisco, CA, USA (Dec 2019)

Session Chair, V31C: The 2018 Eruptions of Kilauea Volcano, Hawaii, and Fernandina and Sierra Negra Volcanoes, Galápagos I, **American Geophysical Union Fall Meeting**, Washington, DC, USA (Dec 2018)

Breakout Scribe/Presenter, **GeoPRISMS Synthesis and Integration: Theoretical and Experimental Institute**, Hotel Menger, San Antonio, TX, USA (Feb 25-Mar 1, 2019)

Breakout Moderator in Student-Postdoc Symposium, **GeoPRISMS Rift Initiation and Evolution: Theoretical and Experimental Institute**, Hotel Albuquerque, Albuquerque, NM, USA (Feb 6-10, 2017)

OTHER
WORKSHOPS

SAGE/GAGE Workshop: Earth in 4D: Bridging the Timescales in Dynamic Earth Processes, Hilton Portland Downtown, Portland, OR, USA (Oct 9-11, 2019)

Advanced Workshop on Earthquake Fault Mechanics: Theory, Simulation & Observations, International Centre for Theoretical Physics, Trieste, Italy (Sep 2-14, 2019),

Cooperative Institute in Dynamic Earth Research (CIDER) Summer program, University of California – Berkeley, Berkeley, CA, USA (Jun 16-Jul 12, 2019)

CIG-LLNL Computational Seismology Workshop, Livermore Open Valley Campus, Livermore, CA, USA (Sep 18-22, 2017)

CIG Crustal Deformation Workshop, Colorado School of Mines, Golden, CO, USA (June 26-30, 2017)

Advanced School in Physics of Volcanoes, International Centre for Theoretical Physics, Trieste, Italy (Oct 17-21, 2016)

CIG All Hands Meeting: Interdisciplinary Directions in Computational Geophysics, Computational Infrastructure for Geodynamics, UC Davis, CA, USA (Jun 17-24, 2016)

Seismology Student Workshop, Lamont-Doherty Earth Observatory, Columbia University, NY, USA (March 17-18, 2016)

FIELDWORK
EXPERIENCE

Nov 2019: Sierra Negra volcano, Galápagos, Ecuador

- Led demobilization trip, arranged all travel logistics, conducted all local communications in Spanish, and successfully brought seismic gear back to the US as part of a two-person team

Jul 2018 and Mar 2019: Sierra Negra volcano, Galápagos, Ecuador

- Arranged travel logistics, coordinated onsite with local partners, and performed service runs (maintenance and data download) of seismic stations with another collaborating team

May-Jun 2018: Tanzania and Kenya

- Deployed a seismometer and helped make CO₂ gas measurements around the rift and at the Oldoinyo Lengai summit as field assistant

Apr-May 2018: Sierra Negra volcano, Galápagos, Ecuador

- Assisted in travel logistics, documentation for temporary export/import of instruments, and fieldwork for the rapid response seismic deployment of four seismometers around the volcano

Mar 2016: Oklahoma, USA

- Assisted in seismic deployment of Cornell team
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RESEARCH VISITS
AND
INTERNSHIPS

Research Visit with Dr. Claire Currie, **University of Alberta**, Edmonton, Canada (May 2019)

- Performed numerical stress modeling and had discussions on the design and interpretation of the geodynamic models

Research Visit with Dr. Eleonora Rivalta, **GFZ Center for Geosciences**, Potsdam, Germany (May 2017)

- Performed analytical stress modeling, observed gelatin experiments for dike propagation, and had seismology discussions on moment tensor uncertainties and geodynamic modeling; funded through Geological Society of America graduate student research grant

NAIST Project for Interns, **Nara Institute of Science and Technology**, Japan (October 2013)

- Performed interference experiments and fluorescence testing under the supervision of Dr. Hisao Yanagi and Dr. Hiroyuki Katsuki in the Quantum Materials Laboratory

TEACHING
EXPERIENCE

Teaching Assistant, Natural Hazards and their Mitigation, Tulane University (Spring 2019)

- Taught the first three weeks of the lecture, including assignment preparations and grading, while my adviser was at fieldwork

Teaching Assistant, GeoHazards and their Mitigation, University of Rochester (Spring 2016)

- Designed and prepared lab activities to complement the lecture class, facilitated and graded the activities

Teaching Assistant, Geospatial Data Analyses, University of Rochester (Fall 2015)

- Assisted with copying and distributing materials and facilitating class discussions

OUTREACH AND
PUBLIC
PRESENTATIONS

Mentor, **GradMAP Philippines** (mentoring Filipinos through graduate school applications) (Fall 2020)

Scientist penpal, **Letters to a Pre-Scientist** program (AY 2019-2020)

Speaker, public scientific talks (Spanish) on *Monitoring the seismic activity of Sierra Negra volcano* organized by the National Park Service, Isabela, Galápagos, Ecuador (Mar 25, 2019)

Workshop Leader, **STEM in Schools Initiative**, Tulane Center for K-12 STEM (Spring 2019—Spring 2020)

- Prepared a 45-min workshop on *Earthquakes and Structures* and brought it to various middle-school classrooms in the city intermittently throughout the year, including a bilingual English-Spanish version

Workshop Leader, *Earthquakes and Structures* activity, **Boys at Tulane in STEM** (Feb 9, 2019)

Volunteer, Tulane University, **STEM Fest at Superdome** (Oct 20, 2018)

Volunteer, *Earthquakes and Volcanoes* activity, **Girls in STEM at Tulane** (Mar 10, 2018; Nov 3, 2018)

Volunteer, New Orleans Geological Society, **Girls Scouts Believe in Girls event**, (Oct 21, 2017; Sep 28, 2019)

INTERVIEWS AND
FEATURE
ARTICLES

Travis, M. A. "Diamonds aren't forever." *Tulane News*, Tulane University (Jun 4, 2020).

Dunaway, R. "Tulane student hopes research will lead to protection from volcanoes, earthquakes." *New Wave*, Tulane University Press Release (Sep 12, 2017).

Cabato, R. "6 Filipino scientists who are changing the world." *CNN Philippines*, (Jun 28, 2017).

Williams, M. A. "Sarah Oliva: For the Love of Lava." *ICTP Press Release* (Aug 31, 2015).

Sugon, Jr., Q. "Ateneo Physics Student and BPI-DOST Science Awardee Sarah Jaye C. Oliva wins..." Interview with *Ateneo Physics News* (Dec 4, 2013).

AFFILIATIONS

GeoLatinas (blog editor, english-spanish language exchange committee) – since 2019

Tulane GeoLatinas Local Team (founding member, social media manager) – 2019-2020

International Association of Volcanology & Chemistry of the Earth's Interior (IAVCEI) – since 2018

Tulane Earth Science Club – since 2017

Geological Society of America (GSA) – since 2015

Seismological Society of America (SSA) – since 2015

American Geophysical Union (AGU) – since 2015

The Optical Society (OSA) – 2012-2015

MENSA Philippines – since 2010

SKILLS &
INTERESTS

I regularly write Python (ObsPy), MATLAB, GMT, and shell scripts, with adequate experience using and adapting existing Fortran and C++ codes. I have experience in seismological data analyses such as earthquake location (and relocations) from first arrivals, earthquake statistics, dispersion curve analysis for surface wave tomography, velocity structure inversion, focal mechanism determination, and full moment tensor inversion via waveform modeling, as well as finite element modeling (Abaqus, PyLith) for stress analysis. I also have extensive experience on seismic fieldwork and planning, and data archiving. I am passionate about teaching and science communication, especially with regards to STEM outreach. I am interested in tectonophysics, earthquake source physics, and volcanic regions and related hazards.

LANGUAGES

English – Fluent; Filipino – Fluent; Spanish – Conversational