JUNLE JIANG

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RESEARCH INTERESTS

I am interested in the dynamic processes of the Earth and strive to understand their underlying mechanisms, predictability, and societal impacts, with the ultimate goals to improve the assessment and migitation of geo-hazards and safe, sustainable exploration of geo-energy. My current research is focused on microseismicity, large earthquakes, and crustal deformation due to tectonic and human activities over timescales from seconds to centuries, through integrating laboratory-based physical models and geophysical observations, in particular from Global Navigation Satellite System (GNSS) and Interferometric Synthetic Aperture Radar (InSAR).

EDUCATION

Peking University, Beijing, China	Physics	*B.Sc.*, 2009
Caltech, Pasadena, CA, USA	Geophysics	*M.Sc.*, 2011
Caltech, Pasadena, CA, USA	Computational Science and Engineering	*Ph.D. Minor*, 2014
Caltech, Pasadena, CA, USA	Geophysics	*Ph.D.*, 2016

APPOINTMENTS

Assistant Professor, School of Geosciences, University of Oklahoma	2020/08–present
Postdoctoral Associate, Cornell University	2018/06–2020/07
Green Postdoctoral Scholar, Scripps Institution of Oceanography, UC San Diego	2016/02–2018/05
Research and Teaching Assistant, Seismological Laboratory, Caltech	2009/09–2015/12

PHD DISSERTATION

Jiang, J. (2016), Probabilistic Imaging and Dynamic Modeling of Earthquake Source Processes, California Institute of Technology. doi:10.7907/Z9639MQC. (Advisors: M. Simons & N. Lapusta)

PUBLICATIONS IN REVIEW/PREPARATION

1. Materna, K., A. Barbour, **J. Jiang**, and M. Eneva, A Decade of Crustal Deformation and Aseismic Slip at the North Brawley Geothermal Field, under review.
2. **Jiang., J.**, B. Erickson, M. Barall, R. Ando, S. Barbot, C. Cattania, L. Dal Zilio, B. Duan, V. Lambert, N. Lapusta, D. Liu, M. Li, D. Liu, Y. Liu, S. Ozawa, C. Pranger, Y. van Dinther, Developing Code Verification Benchmarks for Three-Dimensional Numerical Simulations of Sequences of Earthquakes and Aseismic Slip (SEAS), in preparation.

REFEREED PUBLICATIONS (1ST–4TH AUTHOR)

1. **Jiang, J.**, Y. Bock, and E. Klein (2021), Coevolving early afterslip and aftershock signatures of a San Andreas fault rupture, *Science Advances*, 7. doi:10.1126/sciadv.abc1606.
2. **Jiang, J.**, & Lohman, R. B. (2020). Coherence-guided InSAR deformation analysis in the presence of ongoing land surface changes in the Imperial Valley, California. *Remote Sens. Environ.*, 112160. doi:10.1016/j.rse.2020.112160.
3. Erickson, B.*, **J. Jiang***, M. Barall, N. Lapusta, E. M. Dunham, R. Harris, L. Abrahams, K. Allison, J.-P. Ampuero, S. Barbot, C. Cattania, A. Elbanna, Y. Fialko, B. Idini, J. Kozdon, V. Lambert, Y. Liu, Y. Luo, X. Ma, P. Segall, P. Shi, and M. Wei, The Community Code Verification Exercise for Simulating Sequences of

Earthquakes and Aseismic Slip (SEAS), *Seismo. Res. Lett.* (*equal contributions). doi:10/ggj42s.

4. Tymofyeyeva, E., Fialko, Y., **Jiang, J.**, Xu, X., Sandwell, D., Bilham, R., et al (2019). Slow slip event on the southern San Andreas fault triggered by the 2017 Mw8.2 Chiapas (Mexico) earthquake. *J. Geophys. Res. Solid Earth*, 124. doi:10.1029/2018JB016765. Media Coverage: EOS Research Spotlight.
5. Xu, X., L. Ward, **J. Jiang**, B. Smith-Konter, E. Tymofyeyeva, E. Lindsey, A. G. Sylvester, and D. T. Sandwell (2018), Surface creep rate of the Southern San Andreas Fault modulated by stress perturbations from nearby large events, *Geophys. Res. Lett., 45*, 10259–10268, doi:10.1029/2018GL080137.
6. Fan, W., D. Bassett, **J. Jiang**, P. M. Shearer, and C. Ji (2017), Rupture evolution of the 2006 Java tsunami earthquake and the possible role of splay faults, *Tectonophysics*, *721*, 143–150, doi:10.1016/j.tecto.2017.10.003.
7. Michel, S., J.-P. Avouac, N. Lapusta, and **J. Jiang** (2017), Pulse-like partial ruptures and high-frequency radiation at creeping-locked transition during megathrust earthquakes, *Geophys. Res. Lett.*, *44*, 8345–8351, doi:10.1002/2017GL074725.
8. **Jiang, J.** and N. Lapusta (2017), Connecting depth limits of interseismic locking, microseismicity, and large earthquakes in models of long-term fault slip, *J. Geophys. Res. Solid Earth, 122*, 6491–6523, doi:10.1002/2017JB014030.
9. Yue, H., M. Simons, Z. Duputel, **J. Jiang**, E. Fielding, C. Liang, S. Owen, A. Moore, B. Riel, J. P. Ampuero and S.V. Samsonov (2016), Depth varying rupture properties during the 2015 Mw 7.8 Gorkha (Nepal) earthquake, *Tectonophysics, 714–715*, 44-54, doi:10.1016/j.tecto.2016.07.005.
10. **Jiang, J.**, and M. Simons (2016), Probabilistic imaging of tsunamigenic seafloor deformation during the 2011 Tohoku-oki Earthquake, *J. Geophys. Res. Solid Earth*, *121*, 9050–9076, doi:10.1002/2016JB013760. Media Coverage: EOS Research Spotlight.
11. **Jiang, J.**, and Y. Fialko (2016), Reconciling seismicity and geodetic locking depths on the Anza section of the San Jacinto fault, *Geophys. Res. Lett.*, *43*, 10663–10671, doi:10.1002/2016GL071113.
12. Bletery, Q., A. Sladen, **J. Jiang**, and M. Simons (2016), A Bayesian source model for the 2004 great Sumatra-Andaman earthquake, *J. Geophys. Res. Solid Earth*, *121*, 5116–5135, doi:10.1002/2016JB012911.
13. **Jiang, J.**, and N. Lapusta (2016), Deeper penetration of large earthquakes on seismically quiescent faults, *Science*, *352*(6291), 1293–1297, doi:10.1126/science.aaf1496. Media Coverage: New Yorker, Phys.org.
14. Duputel, Z., **J. Jiang**, R. Jolivet, M. Simons, L. Rivera, J.-P. Ampuero, B. Riel, S. E. Owen, A. W. Moore, S. V. Samsonov, F. O. Culaciati, and S. E. Minson (2015), The Iquique earthquake sequence of April 2014: Bayesian modeling accounting for prediction uncertainty, *Geophys. Res. Lett.*, *42*, 7949–7957, doi:10.1002/2015GL065402.

ADDITIONAL PUBLICATIONS

15. Gombert, B., Z. Duputel, R. Jolivet, M. Simons, **J. Jiang**, C. Liang, E. J. Fielding, and L. Rivera (2018), Strain budget of the Ecuador–Colombia subduction zone: A stochastic view, *Earth Planet. Sci. Lett.*, *498*, 288–299, doi:10.1016/j.epsl.2018.06.046.
16. Bletery, Q., A. Sladen, B. Delouis, M. Vallée, J.-M. Nocquet, L. Rolland, and **J. Jiang** (2014), A detailed source model for the M_w 9.0 Tohoku-Oki earthquake reconciling geodesy, seismology, and tsunami records, *J. Geophys. Res. Solid Earth*, *119*, 7636–7653, doi:10.1002/2014JB011261.
17. Minson, S. E., M. Simons, J. L. Beck, F. Ortega, **J. Jiang**, S. E. Owen, A. W. Moore, A. Inbal, and A. Sladen (2014), Bayesian inversion for finite fault earthquake source models - II: the 2011 great Tohoku-oki, Japan earthquake, *Geophys. J. Int.*, *198*(2), 922–940. doi:10.1093/gji/ggu170.
18. Wei, S., R. Graves, D. V. Helmberger, J.-P. Avouac, and **J. Jiang** (2012), Sources of shaking and flooding during the Tohoku-Oki earthquake: A mixture of rupture styles, *Earth Planet. Sci. Lett.*, *333-334*(C), 91–100, doi:10.1016/j.epsl.2012.04.006.
19. Simons, M., S. E. Minson, A. Sladen, F. Ortega, **J. Jiang**, S. E. Owen, L. Meng, J. P. Ampuero, S. Wei, R. Chu, D. V. Helmberger, H. Kanamori, E. Hetland, A. W. Moore, and F. H. Webb (2011), The 2011

magnitude 9.0 Tohoku-oki earthquake: Mosaicking the megathrust from seconds to centuries, *Science*, *332*(6036), 1421–1425, doi:10.1126/science.1206731.

INVITED TALK

2020/03 School of Geosciences, University of Oklahoma

2019/09 Andes Seminar, Department of Earth and Atmospheric Sciences, Cornell University

2019/03 Department of Earth, Atmospheric and Planetary Sciences, Massachusetts Institute of Technology

2018/03 Department of Geology and Geophysics, Woods Hole Oceanographic Institution

2017/03 Department of Earth, Planetary, and Space Sciences, University of California Los Angeles

2016/03 Institute of Geophysics and Planetary Physics, Scripps Institution of Oceanography, University of California, San Diego

SELECTED CONFERENCE PRESENTATIONS

- Jiang., J., Bock, Y., and E. Klein, Dynamics of early afterslip-aftershock coevolution following the 2004 Parkfield earthquake, SSA Annual Meeting, Apr. 2021 (Oral Presentation).
- Jiang, J., and Lohman, R. B., Characterizing tectonic and anthropogenic ground deformation history in the Imperial Valley, California, using Sentinel-1 InSAR time series, AGU Fall Meeting, San Francisco, CA, Dec. 2019 (Oral Presentation).
- Jiang, J. (2019), Perspectives from the SCEC Sequences of Earthquakes and Aseismic Slip (SEAS) Project, SCEC workshop on "How Physics-Based Earthquake Simulators Might Help Improve Earthquake Forecasts," June 18, 2019 (Invited Oral Presentation).
- Jiang, J., and Lohman, R. B., Time-dependent deformation and seismicity in the Imperial Valley, California. SCEC Annual Meeting, Sept. 2019 (Poster Presentation).
- Jiang, J. (2019), Perspectives from the SCEC Sequences of Earthquakes and Aseismic Slip (SEAS) Project, SCEC workshop on "How Physics-Based Earthquake Simulators Might Help Improve Earthquake Forecasts," June 18, 2019 (Invited Oral Presentation).
- Jiang., J., Bock, Y., and E. Klein, Imaging slip evolution on the San Andreas fault due to the 2004 Parkfield earthquake, AGU Fall Meeting, Washington D.C., Dec. 2018 (Oral Presentation).
- Jiang, J., and Erickson, B. A. Advancing Simulations of Sequences of Earthquakes and Aseismic Slip (SEAS). SCEC Annual Meeting, Sept. 2018 (Invited Oral Presentation).
- Jiang, J. and Y. Fialko, Mechanisms of unsteady shallow creep on major crustal faults, AGU Fall Meeting, New Orleans, LA, Dec. 2017 (Oral Presentation).
- Jiang, J., and M. Simons, Multiscale probabilistic imaging of tsunamigenic seafloor deformation during the 2011 Tohoku-oki earthquake, SSA Fall Meeting, Denver, CO, Apr. 2017 (Invited Oral Presentation).
- Kirschvink, J. and J. Jiang, Potential Seismic and Tsunami Hazard from the Palau Trench, as viewed from molluscan grazing notches in uplifted coral atolls, GSA Annual Meeting, Oct. 2014 (Oral Presentation).
- Jiang, J., Lapusta, N. and H. Noda, Re-evaluating the seismogenic potential of creeping fault regions: implications from models with rate-and-state friction and enhanced coseismic weakening, AGU Fall Meeting, San Francisco, CA, USA, Dec. 2013 (Invited Oral Presentation).

FUNDED RESEARCH AND WORKSHOPS

Research Grants

- PI, 2020 SCEC, $27,000, "Distinguishing between Tectonic and Anthropogenic Processes in the Salton Sea Geothermal Field."
- PI, 2017–2021 XSEDE (Extreme Science and Engineering Discovery Environment) Award with an allocation of 120,000 computing units, "Integrated Simulation of Dynamic Earthquakes and Crustal Deformation."
- PI (w/ B. Erickson), 2018/2019/2020 SCEC, $45,000/$50,000/$56,000, "Advancing Simulations of

Sequences of Earthquakes and Aseismic Slip (SEAS)."

- Co-PI (PI: Y. Fialko), 2018 SCEC, $28,000, "Mechanisms of unsteady shallow creep on major crustal faults."
- Co-PI (PI: Y. Fialko), 2017 SCEC, $28,000, "Microseismicity, geodetic coupling, and earthquake variability on heterogeneous faults: A case study of the Anza section of the San Jacinto Fault."
- Co-PI (PI: Y. Fialko), 2016 SCEC, $28,000, "Reconciling seismic and geodetic locking depths on the Anza segment of the San Jacinto Fault."

Workshop Grants

- PI (w/ B. Erickson), 2020 SCEC, $12,000, "Workshop for Advancing Simulations of Sequences of Earthquakes and Aseismic Slip (SEAS) — Free-Surface effects in 2D/3D models."
- PI (w/ B. Erickson), 2019 SCEC, $12,000, "Workshop for Advancing Simulations of Sequences of Earthquakes and Aseismic Slip (SEAS) — Full Dynamics and 3D Effects."
- PI (w/ B. Erickson), 2018 SCEC, $12,000, "Workshop for Advancing Simulations of Sequences of Earthquakes and Aseismic Slip (SEAS) — Exploring Complexity and Resolution."
- PI (w/ R. Harris, B. Erickson), 2017 SCEC, $18,500, "A Joint Workshop: Rupture Dynamics Code Validation and Comparing Simulations of Earthquake Sequences and Aseismic Slip."

HONORS AND AWARDS

Green Postdoctoral Fellowship, IGPP, SIO, UCSD, 2016–2018

Leadership Award, Graduate Student Office, Caltech, 2016

Demetriades-Tsafka-Kokkalis Best Thesis Prize in Seismo-Engineering, Prediction, and Protection, Caltech, 2016

Chinese Government Award for Outstanding Self-Financed Students Abroad, 2015

Outstanding Student Paper Award, Tectonophysics Section, American Geophysical Union, 2015

Honor for Excellent Graduate, Peking University, 2009

Petro China Scholarship, Peking University, 2007

Dean's List Award for Academic Excellence, Hong Kong University of Science and Technology, 2007

Cannon Scholarship, Peking University, 2006

TEACHING EXPERIENCE

Instructor, University of Oklahoma

- GEOL1114 Physical Geology for Scientists and Engineers (2020 Fall; 37 students)
- GPHY5920 Computational Geophysics (2021 Spring; 5 students)
- GPHY3440 Mentored Research Experience (2021 Spring; 1 student)

Guest lecturer, Cornell University

- EAS2550 Satellite-Based Remote Sensing — Rowena Lohman (2019 & 2020 Spring)
- EAS7800 Earthquake Record Reading — Geoffrey Abers (2019 Spring)

Certification of completion, Cornell University

- "Teaching & Learning in the Diverse Classroom" Course

Guest lecturer & discussion leader, University of California San Diego

- SIOG237 Space Geodesy — Yuri Fialko & David Sandwell

Graduate teaching assistant, California Institute of Technology

- Ge11d/102 Introduction to Geophysics — Robert Clayton & Mike Gurnis
- Ge161 Plate Tectonics — Joann Stock
- Ge293 Computational Geophysics — Jean-Paul Ampuero, Robert Clayton & Mike Gurnis
- Ae/ME/Ge266 Dynamic Rupture and Frictional Faulting — Nadia Lapusta

STUDENT ADVISING/MENTORING

Patrick Ferchaud (École Polytechnique) (w/ N. Lapusta): BEM modeling, 2011 summer

Xander Zheng (Caltech SURF) (w/ M. Simons): InSAR analysis of LA basin aquifers, 2012 summer

Gillian Quiros (UCSD Regents Scholar): Modeling nonlinear dynamical systems, 2017/09–2018/05

Ganiyat Shodunke (Ph.D. student at OU): Deformation at geothermal fields, 2021/01–present

SYNERGISTIC ACTIVITIES

Co-Leader of SCEC SEAS Working Group (2017–present)

Founding Member of Inclusion, Diversity, and Equity in Earth and Atmospheric Sciences (IDEEAS) Working Group, Cornell University (2019–2020)

Participant in Postdoctoral Leadership Program, Cornell University (2018–2019)

Organizer, Geophysics Seminar at IGPP/SIO/UCSD (2016–2018)

Organizer, Dix Seismological Laboratory Seminar, Caltech (2011–2012)

Board of Directors, Graduate Student Council, California Institute of Technology

- Director at Large (2013–2014); Treasurer (2012–2013); Option Representative for Geophysics (2011–2013); Under-Represented Student Advocate (2011–2013)

Executive Committee, Caltech Chinese Students and Scholars Association

- President (2011–2012); Director for Sports and Outdoor Activities (2010–2011)

Outreach activities, Tectonic Observatory and Seismological Laboratory, Caltech

- Lab tours and scientific presentations to K-12 Students
- On-campus presentations at Huntington Middle School, Blair High School, etc.

FIELD EXPERIENCES

Campaign GPS survey for the San Jacinto fault, Anza, CA, PI: Y. Fialko, Sept. 2016–2018

Rock sample collection and structure mapping of rock islands, Palau, PI: J. Kirschvink, Mar. 2017

Seismic deployment at Anza, PI: F. Vernon, Apr. 2016

Campaign GPS survey across central Taiwan, PI: S.-B. Yu, Academia Sinica, Dec. 2011

Seismic survey, Salton Seismic Imaging Project (SSIP), PI: J. Stock, Caltech, Mar. 2011

PROFESSIONAL SERVICE

Referee for proposals: NSF (ad hoc & panel), DFG (Deutsche Forschungsgemeinschaft; ad hoc), NASA (panel), and USGS (panel).

Referee for journals: *Geophysical Research Letters, Journal of Geophysical Research - Solid Earth, Geophysical Journal International, Earth and Planetary Science Letters, Bulletin of the Seismological Society of America, Earth Planets and Space, Pure and Applied Geophysics, Tectonophysics, Remote Sensing, Geosciences, Energies, Sensors,* etc.

Outstanding Student Paper Award (OSPA) Liaison/Judge at 2017–2019 AGU Annual Meeting.

Member of the Graduate Affairs Committee, Petroleum Geosciences Vision Committee, Computing Committee, and Environmental Geophysics Search Committee at the University of Oklahoma

PROFESSIONAL SOCIETIES

American Geophysical Union (AGU); Seismological Society of America (SSA); American Association for the Advancement of Science (AAAS); Society of Exploration Geophysics (SEG); Geothermal Research Council (GRC).