Camilla Cattania

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Department of Geophysics, Stanford University
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Education

2015 PhD in Geophysics
GFZ German Research Center for Geosciences/University of Potsdam, Potsdam, Germany
Thesis: *Improvement of seismicity models based on Coulomb stress interactions and rate-state dependent friction.*

2011 B.A. - M.Sci. Natural Sciences – Experimental and Theoretical Physics
University of Cambridge, Cambridge, UK (Grade: First Class)

Professional experience

Current Postdoctoral Scholar, Stanford University (CA), USA
2016-17 Postdoctoral Fellow, Stanford University (CA), USA and GFZ Potsdam, Germany
2015 Guest Investigator**,** Woods Hole Oceanographic Institution, Woods Hole (MA), USA
2015 Guest Scientist, GFZ Potsdam, Germany

Publications

2018 **Cattania**, C. and P. Segall, *Crack models of repeating earthquakes predict observed moment-recurrence scaling*, J. Geophys. Res. Solid Earth, 123. https://doi.org/10.1029/2018JB016056

Cattania, C., M. Werner, W. Marzocchi, S. Hainzl, M. Gerstenberger, Rhoades, M. Liukis, D., A. Christophersen, A. Helmstetter, A. Jimenez, S. Steacy and T. Jordan, *The forecasting skill of Coulomb-based seismicity forecasting models during the 2010-2012 Canterbury, New Zealand, earthquake sequence,* Seism. Res. Lett., 89 (4): 1238-1250

2017 Pollitz, F. and C. **Cattania**, *Connecting crustal seismicity and earthquake-driven stress evolution in Southern California*, J. Geophys. Res. Solid Earth, 122, 6473–6490, doi:10.1002/2017JB014200

Cattania, C., E. Rivalta, S. Hainzl, L. Passarelli, and Y. Aochi*, A slow rupture episode during the 2000 Miyakejima dike intrusion*, J. Geophys. Res. Solid Earth, 122. doi:10.1002/2016JB013722

2016 **Cattania**, C., J. McGuire, and J. A. Collins, *Dynamic Triggering in the East Pacific Rise*, Geophys. Res. Lett., 43, doi:10.1002/2016GL070857

Cattania, C. and F. Khalid, *A parallel code to calculate seismicity evolution induced by time dependent, heterogeneous Coulomb stress changes,* Computers & Geosciences, 94, 48–55. doi: 10.1016/j.cageo.2016.06.007

2015 **Cattania**, C., S. Hainzl, L. Wang, F. Roth, and B. Enescu, *Aftershock triggering by postseismic stresses: a study based on Coulomb-Rate-and-State models*, J. Geophys. Res. Solid Earth, 120, 2388–2407. doi: 10.1002/2014JB011500

2014 **Cattania**, C., S. Hainzl, L. Wang, F. Roth, and B. Enescu, *Propagation of Coulomb stress uncertainties in physics-based aftershock models*, J. Geophys. Res. Solid Earth, 119, 7846-7864. doi:10.1002/2014JB011183

2013 Hainzl, S., Y. Ben-Zion, C. **Cattania**, and J. Wassermann, *Testing atmospheric and tidal earthquake triggering at Mt. Hochstaufen, Germany*, J. Geophys. Res. Solid Earth, 118, 5442-5452. doi:10.1002/jgrb.50387

In preparation:

Cattania, C. and P. Segall, *Scale dependent slip patterns on 2-D rate-state faults explained by crack models*, in preparation for submission to J. Geophys. Res. Solid Earth

S. Mancini, M. Segou, M. J. Werner, and C. **Cattania**, *Sequence Forecasts for the 2016-2017 Amatrice Visso Norcia Earthquake cascade*, in preparation for submission to J. Geophys. Res. Solid Earth

Awards and Fellowships

2016 Friedrich-Robert-Helmert-Preis for excellent PhD thesis (GFZ Potsdam)
2013 AGU Outstanding Student Paper Award in seismology, AGU Fall Meeting
2009 AGU Outstanding Student Paper Award in seismology, AGU Fall Meeting

Funded Projects

2018 NEHRP award, *Investigating the seismic signature of earthquake nucleation with dynamic simulations of microearthquakes*, $87,774 (I was involved as Co-PI. Principal Investigator: P. Segall)

2018 SCEC award, *Simulation of earthquake cycles on faults with heterogeneous strength and rate-state friction*, $23,000 (I was involved as Co-PI. Principal Investigator: P. Segall)

2017 SCEC award, *Investigating seismic cycles with thermal pressurization using physical models and numerical simulations*. $28,000 (I was involved as Co-PI. Principal Investigator: P. Segall)

2016 DAAD fellowship, *"Studying the precursory phase of large earthquakes with physical and statistical methods"*. ~$105,000 (I was Principal Investigator). Acceptance rate ~10%.

2014 Computing time at the FutureSOC-Lab of the Hasso Plattner Institute, Potsdam, *Massively Parallel Simulation of Seismic Events following Earthquakes*. ~300 CPU hours (I was involved as Co-PI. Principal Investigator: F. Khalid)

Invited Talks

2018 CalTech, Seismolab seminar, *Crack models to explain seismic cycles at different scales: small repeating earthquakes and vertical strike slip faults* (upcoming, December 2018)

2018 University of Michigan, *Physical Models of Seismic Sequences Across Multiple Scales: Aftershocks and Small Repeating Earthquakes*

2018 ETH Zurich, *Crack models to explain seismic cycles at different scales: small repeating earthquakes and vertical strike slip faults*

2017 CSEP Workshop: Informing Earthquake Debates with CSEP Results, Palm Springs, CA, USA, *Evaluation of physical, statistical and hybrid models during the 2010-2012 Canterbury earthquake sequence*

2015 Yale University, CT, USA, Geophysics department seminar, *Interplay of slow slip and seismicity during the Tohoku aftershock sequence and the Miyakejima dike intrusion*

2015 International summer school on Earthquake Science, Lake Yamanakako, Japan, *A slow rupture episode during the 2000 Miyakejima dike intrusion*

2014 Training School Earthquakes: nucleation, triggering, and relationships with aseismic processes, Cargèse, France, *Aftershock triggering by postseismic stresses: a study based on Coulomb-Rate-and-State models*

2014 CSEP/USGS/GEM Workshop: Next Steps for Testing Operational Earthquake Forecasts and Seismic Hazard Models, Palm Springs, CA, USA, *Overview of Coulomb-Based Models in the Retrospective Canterbury Experiment*, Panel discussion on the Retrospective Canterbury Experiment

Teaching and Outreach

2018 Introductory Geophysics (undergraduate, I taught 1 lecture), Earthquake Seismology (graduate, 1 lecture)
Geophysics Earthquake Seismology, Deformation, and Stress (graduate, entire course)
Mentoring of PhD student Simone Mancini (University of Bristol, UK)
2017 Participation in TV documentary on seismicity in the Eastern Alps (TV channel: ARTE)
2013 Supervision of a summer intern (Vic-Fabienne Schumann)

Professional Service

- Reviewer for *Journal of Geophysical Research; Tectonophysics, Pure and Applied Geophysics; Geophysical Research Letters; Earth, Planets and Space; Nature Scientific Reports.*
2017 Field work: site survey and testing of seismic stations for the European project AlpArray
2016 Judge for the AGU Outstanding Student Paper award
2013 Organization committee member of the GeoSim seminars series, Potsdam, Germany
2013 Co-author of the article *Modellierung als Werkzeug:Erdbebeninteraktion verstehen und Seismizität vorhersagen (Modeling as a tool: understanding earthquake interaction and forecasting seismicity)*, *System Erde. GFZ-Journal (2013) 3-1* (report on GFZ activities aimed at the general public)

Computational Skills

Operating Systems: proficient knowledge of Linux, standard knowledge of Windows
Programming Languages and scientific software: proficient knowledge of bash scripting, C, Matlab; working knowledge of Fortran, C++, Python, GMT; basic knowledge of Java, ML, Paraview, Gnuplot
Parallel programming: familiarity with OpenMP, basic knowledge of MPI
Others: working knowledge of standard profiling and version control tools (gprof, git, valgrind)

Github repository containing the main code developed during my PhD: https://github.com/camcat/crs

Language Skills

Italian (native), English (fluent), German (good working knowledge), French (basic)

Professional Memberships

American Geophysical Union
Seismological Society of America
European Geosciences Union