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, Potsdam,
           Germany/University of 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., 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 review:

Cattania, C. and P. Segall, *Crack models of repeating earthquakes predict observed moment-recurrence scaling*, in review at J. Geophys. Res. Solid Earth

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   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   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   Graduate Course: Geophysics Earthquake Seismology, Deformation, and Stress
2018   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