Stanford



Greg Beroza

Wayne Loel Professor of Earth Science

Geophysics

Curriculum Vitae available Online

Bio

BIO

My interest is in analyzing seismograms to understand how earthquakes work and to quantify the hazards they pose. My research group studies earthquake source processes for shallow earthquakes, intermediate-depth earthquakes, induced earthquakes, and slow earthquakes. We are working to improve earthquake monitoring in all settings by applying data mining and machine learning techniques to large volumes of continuous seismic waveform data. We also work on methods to anticipate the strength of shaking in earthquakes using the ambient seismic field (seismic waves present in the Earth at all times). We use these ambient field measurements to image shallow structure and also to construct "virtual earthquakes" that can be used to anticipate variations in the strength of shaking in real earthquakes. For the past 12 years I have been Deputy-Director/Co-Director of the Southern California Earthquake Center

ACADEMIC APPOINTMENTS

- Professor, Geophysics

ADMINISTRATIVE APPOINTMENTS

- Freshman Advisor, Stanford University, (1991-2007)
- Undergraduate Advisor,, Geophysics Department, (1995-2001)
- Resident Fellow, Rinconada Undergraduate Residence, Stanford University, (1997-2001)
- Organizing Committee, Stanford Mathematical Geophysics (Summer) School, Stanford University, (1998-2003)
- CGS Subcommittee on Minority Recruitment and Retention, Stanford University, (1999-2001)
- Invited Lecturer, Stanford Mathematical Geophysics (Summer) School, Stanford University, (2000-2000)
- Chair, Geophysics Technology and Teaching Committee, Stanford University, (2000-2002)
- Lecturer, PEER Scholars Course, Stanford, CA, Stanford University, (2003-2003)
- Chair, Geophysics Department Pre-Search Committee, Stanford University, (2003-2004)
- Member, School of Earth Sciences Computer Committee, Stanford University, (2003-2009)
- Chair, Geophysics Strategic Planning Committee, Stanford University, (2003-2003)
- Stanford 1906 Earthquake Centennial Committee, Stanford University, (2004-2006)
- Earth Sciences Council, Stanford University, (2004-2007)
- Associate Chair, Geophysics Department, Stanford University, (2004-2005)
- Chair, Geophysics Department Search Committee, Stanford University, (2004-2005)
- Lecturer: CTSA Extended Professional Development Course on "Stanford and the San Andreas Fault', Stanford University, (2006-2006)

- Chair, Geophysics Fellowship Committee, Stanford University, (2006-2007)
- Geophysics Admissions Committee, Stanford University, (2006-2007)
- Chair, Geophysics Department Faculty Search Committee, Stanford University, (2006-2007)
- Lecturer, PEER Scholars Course, Stanford, CA, Stanford University, (2006-2006)
- Parents weekend lecturer on Stanford and the 1906 Earthquake, Stanford University, (2006-2006)
- Associate Chair, Geophysics Department, Stanford University, (2007-2009)
- Geophysics Department Space Committee, Stanford University, (2008-2010)
- Speaker, Stanford Summer Science Lecture Series, Stanford University, (2008-2008)
- Speaker, Stanford Sierra Camp, Stanford University, (2008-2008)
- Search Committee, Geological and Environmental Sciences, Stanford University, (2008-2009)
- Chair, Geophysics Department, (2008-2013)
- Speaker, Reunion Homecoming Weekend, Stanford University, (2008-2008)
- Geophysics Undergraduate Curriculum Committee, Stanford University, (2009-2010)
- Speaker, Stanford Symposium on Commemorating Loma Prieta: the Future of Bay Area Earthquakes, Stanford University, (2009-2009)
- Speaker, Fresno Stanford Alumni Association, (2010-2010)
- Stanford Parent's Weekend, 1906 Earthquake Walking Tour of the Stanford Campus, Stanford, (2011-2011)
- Member, Stanford Judicial Panel, (2011-2012)
- Organizer, Stanford Symposium on the Tohoku Disaster, Stanford University, (2011-2011)
- Stanford Parent's Weekend, Talk on the Tohoku Earthquake, Stanford University, (2012-2012)
- Planning Committee for SES Campus, Member, (2012-2012)
- Stanford Parent's Weekend, 1906 Earthquake Walking Tour of the Stanford Campus, Stanford University, (2013-2013)

HONORS AND AWARDS

- Undergraduate Thesis Honors, University of California at Santa Cruz (1982)
- Highest Honors in Major, University of California at Santa Cruz (1982)
- Chancellor's Award for Undergraduates, University of California at Santa Cruz (1983)
- ARCS Foundation Scholarship, University of California at Santa Cruz (1983)
- National Science Foundation Fellowship, NSF (1983-1987)
- Presidential Young Investigator Award, NSF (1991)
- Outstanding Undergraduate in Earth Science, University of California at Santa Cruz (1993)
- Fellow, American Geophysical Union (2008)
- Brinson Lecturer, Carnegie Institute of Washington, Department of Terrestrial Magnetism (2008)
- Wayne Loel Professor of Earth Sciences, Stanford University (2009)
- Distinguished Speaker, College of Science, Rochester Institute of Technology (2011)
- Distinguished Lecturer, IRIS/SSA (2012)
- Beno Gutenberg Medal, European Geosciences Union (2014)
- Lawson Lecturer, UC Berkeley (2015)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- AGU Seismology Section President, AGU (2015 - present)

- Grand Challenge Committee on Faulting and Deformation Processes, IRIS (2015 - 2015)
- Guest Editor, The Leading Edge special volume on induced and triggered seismicity (2015 - 2015)
- Invited Speaker, 2nd Global Summit of Research Institutes for Disaster Risk Reduction (Kyoto, Japan) (2015 - 2015)
- Invited Speaker, Civil and Environmental Engineering Department, University of Illinois, Urbana-Chapaign (2015 - 2015)
- Invited Speaker, Madariaga Symposium, Paris, France (2015 - 2015)
- Invited Speaker, Hokudan International Symposium on Active Faulting, Awaji, Japan (2015 - 2015)
- Keynote Lecturer, AGIS Workshop on Induced Seismicity, Davos, Swizterland (2015 - 2015)
- Lawson Lecture, University of California, Berkeley (2015 - 2015)
- Organizing Committee, Workshop "Future of Seismic and Geodetic Facilities in the Earth Sciences" (2015 - 2015)
- invited Lecturer, Ambient Noise Imaging and Monitoring Workshop, Cargese, Corsica (2015 - 2015)
- Co-Director, Southern California Earthquake Center (2014 - present)
- AGU Scientific Trends Task Force, AGU (2014 - 2014)
- California Earthquake Early Warning Model Committee, California Office of Emergency Services (2014 - 2014)
- Co-Chair, Joint SEG-AGU Workshop on Advances in Active/Passive Full Wavefield Seismic Imaging and Monitoring Techniques, SEG (2014 - 2014)
- Gutenberg Lecture, EGU (2014 - 2014)
- Invited Speaker, Earthquake Mechanics to Mitigation Workshop, Burlington House, London, UK (2014 - 2014)
- Invited Speaker, MIT Earth, Atmospheric, and Planetary Sciences Dept. Lecture Series (2014 - 2014)
- Invited Speaker, SCEC Annual Meeting, Palm Springs, CA (2014 - 2014)
- Invited Speaker, Physics Department, New Mexico State University (2014 - 2014)
- Invited Speaker, Institut de Physique du Globe de Paris, Paris, France (2014 - 2014)
- Invited Speaker, EGU: Seismicity, Metamorphism and Geophysical Properties of the Lithosphere, Vienna, Austria (2014 - 2014)
- Invited Speaker, Advances in Active + Passive “Full-Wavefield” Seismic Imaging: From Reservoirs to Plate Tectonics, Joint SEG/AGU Workshop, Vancouver, Canada (2014 - 2014)
- Keynote Lecturer, SEG Workshop on Microseismic Source Mechanisms: Rock and Fluid Physics, Modeling, and Estimation from Passive Seismic Data, Denver, CO (2014 - 2014)
- Lecturer, Summer School on “Earthquakes: Nucleation, Triggering, and Relationship with Aseismic Processes”, Cargese, Corsica (2014 - 2014)
- Member, IRIS Large-N Working Group, IRIS (2014 - 2014)
- Search Committee, Geophysical Research Letters Editor in Chief, AGU (2014 - 2014)
- AGU Expert Outreach Network (AEON), AGU (2013 - present)
- Chair, Advanced National Seismic System Steering Committee (2013 - present)
- Co-Director, Stanford Center for Induced and Triggered Seismicity (2013 - present)
- Geologist, California Seismic Safety Commission (2013 - present)
- Member, USGS Scientific Earthquake Studies Advisory Committee. (2013 - present)
- Member, California Earthquake Prediction Evaluation Council (2013 - present)
- AGU Seismology Section, President-Elect., AGU (2013 - 2014)
- Invited Speaker, SCEC Annual Meeting, Palm Springs, CA (2013 - 2013)
- Invited Speaker, New Mexico Museum of Natural History and Science, Albuquerque, New Mexico (2013 - 2013)
- Invited Speaker, Current Research in Earth Science, Rice University (2013 - 2013)
- Invited Speaker, SUM Workshop, USTC, Hefei, China (2013 - 2013)
- Invited Speaker, International Forum of Research Institutes for Disaster Risk Reduction, Kyoto, Japan. (2013 - 2013)

- Invited Speaker, SCEC-ERI Workshop on the Diversity of Earthquakes, Naka Gora, Japan (2013 - 2013)
- Invited Speaker, Invited Speaker, Cascadia Anniversary Public Lecture, North Bend, Oregon. (2013 - 2013)
- Invited Speaker, ISTerre, Universite' Joseph Fourier, Grenoble, France (2013 - 2013)
- Invited Speaker, AGU Meeting of the Americas, Special Session on " Tectonic Tremor and Slow-Slip Events", Cancun, Mexico., AGU (2013 - 2013)
- Invited Speaker, JASON Fall Meeting, McLean, VA (2012 - 2012)
- Invited Speaker, Penn State University, Earth Sciences Colloquium (2012 - 2012)
- Invited Speaker, Geophysical Institute, University of Alaska, Fairbanks, AK. (2012 - 2012)
- Invited Speaker, Central Washington University, Ellensberg, WA (2012 - 2012)
- Invited Speaker, IRIS Open House, Washington, DC (2012 - 2012)
- Invited Speaker, University of British Columbia, Earth and Ocean Science Colloquium (2012 - 2012)
- Invited Speaker, Oregon Museum of Science and Industry, Portland, OR (2012 - 2012)
- Invited Speaker, International Workshop of Special Project for Reducing Vulnerability for Urban Mega-Earthquake Disasters, Matsushima, Japan. (2012 - 2012)
- Invited Speaker, ARCS Foundation "Frontiers of Science", San Francisco (2012 - 2012)
- Invited Speaker, University of California Santa Cruz, Whole Earth Seminar (2012 - 2012)
- Invited Speaker, "Anticipated Science to Meet New Challenges," IRIS Workshop, Boise, Idaho (2012 - 2012)
- Invited Speaker, Southern California Earthquake Center, "Research Year in Review," Palm Springs, California (2012 - 2012)
- Member, Science Committee: ECGS Workshop on "Earthquake Source Physics at Various Scales" (2012 - 2012)
- Distinguished Speaker, Rochester Insitute of Technology (2011 - 2011)
- Invited Speaker, US Geological Survey, Earthquake Science Center, Menlo Park, California (2011 - 2011)
- Invited Speaker, Earthquake Early Warning Summit: Delivering Earthquake Warnings to the US West Coast, UC Berkeley (2011 - 2011)
- Invited Speaker, KAUST, Earth Sciences and Engineering Seminar, Thuwal, Saudi Arabia (2011 - 2011)
- Invited Speaker, Stanford University Symposium on the Great Tohoku, Japan Disaster (2011 - 2011)
- Invited Speaker, NSF Research Exposition, "Which Hazards are in Your Backyard?" National Science Foundation, Arlington, VA (2011 - 2011)
- Invited Speaker, National Science Foundation Hazards Research Showcase, Washington, DC (2011 - 2011)
- Invited Speaker, Center for Position, Navigation, and Time, Stanford, California (2011 - 2011)
- Invited Speaker, KAUST-IAMCS Workshop on Multiscale Modeling, Advanced Discretization Techniques, and Simulation of Wave Propagation, Thuwal, Saudi Arabia (2011 - 2011)
- Invited Speaker, Southern California Earthquake Center, "Research Year in Review," Palm Springs, California (2011 - 2011)
- Board of Reviewing Editors, Science (2010 - 2014)
- Chair, IRIS Planning Committee, IRIS (2010 - 2013)
- Member, Scientific Review Panel of the Working Group on California Earthquake Probabilities for the Uniform California Earthquake Rupture Forecast: Version 3. (2010 - 2013)
- Member, IRIS Coordinating Committee., IRIS (2010 - 2013)
- Chair, AGU Seismology Section Fellowship Committee (2010 - 2012)
- Resource Expert, Nuclear Regulatory Commission Senior Seismic Hazard Analysis Committee (2010 - 2012)
- Chair, Review Committee for the Yucca Mountain Extreme Ground Motion Report (2010 - 2011)
- Convenor, Special Session on “Triggering, Tremor, and Transient Slip”, IRIS Workshop, Snowbird, Utah (2010 - 2010)
- Invited Participant, National Science and Technology Council Subcommittee on Disaster Reduction Workshop on “Rebuilding for Resilience: How Science and Engineering Can Inform Haiti’s Reconstruction,” Coral Gables, FL (2010 - 2010)
- Invited Speaker, Workshop for Geophysical Hazards and Plate Boundary Processes in Central America, Mexico and the Caribbean, Heredia, Costa Rica (2010 - 2010)

- Invited Speaker, Earthscope Institute on the Spectrum of Fault Slip, Portland, Oregon (2010 - 2010)
- Invited Speaker, Next Generation Attenuation for CEUS (NGA-East) SSHAC Workshop, UC Berkeley (2010 - 2010)
- Invited Speaker, Stanford Computational Sciences Seminar (2010 - 2010)
- Invited Speaker, Hokudan Symposium on Active Faulting, Awaji City, Japan (2010 - 2010)
- Invited Speaker, Earth and Space Sciences Colloquium, University of Washington (2010 - 2010)
- Invited Speaker, 3rd SCEC-ERI Joint Workshop on "Earthquake Hazards in Urban Areas", Tokyo, Japan (2010 - 2010)
- Science Committee member, EarthScope Institute on "Transient Fault Slip and the Spectrum of Tectonic Slip Behaviors", Portland, Oregon (2010 - 2010)
- Invited Speaker, Scripps Institution of Oceanography Earth Science Section Seminar (2009 - 2009)
- Invited Speaker, Earth and Planetary Science Colloquium, University of California, Berkeley (2009 - 2009)
- Invited Speaker, 6th International Workshop on Statistical Seismology, Granlibakken, California. (2009 - 2009)
- Invited Speaker, Department of Earth Sciences, University of California Santa Barbara (2009 - 2009)
- Invited Speaker, Loma Prieta Earthquake Commemorative Symposium, San Francisco (2009 - 2009)
- Invited Speaker, NSF Workshop on "Vision for Research and Development in Simulation-Based Engineering and Science in the Next Decade", Washington, D.C (2009 - 2009)
- Member, NSF, Cyber-Enabled Discovery and Innovation Proposal Review Panel (2009 - 2009)
- AGU Seismology Committee, AGU (2008 - 2010)
- Committee member, Seismological Society of America, Annual Meeting Organizing Committee, Monterey, California (2008 - 2009)
- Brinson Lecturer, Carnegie Institute of Washington, Department of Terrestrial Magnetism (2008 - 2008)
- Convenor, Special Session on Episodic Tremor and Slip, IRIS Workshop, Stevenson, Washington (2008 - 2008)
- Convenor, AGU Special Session on Borehole Geodetic and Seismic Networks: Techniques and Results (2008 - 2008)
- Convenor, AGU Union Session on Episodic Tremor and Slip: Insights into a Newly Discovered Process (2008 - 2008)
- Invited Speaker, Earthquake Research Institute, University of Tokyo (2008 - 2008)
- Invited Speaker, University of Southern California (2008 - 2008)
- Invited Speaker, Workshop on Long Range Science Plan for Seismology, Lakewood, Colorado (2008 - 2008)
- Invited Speaker, Gordon Research Conference on "Real Time Rheology" (2008 - 2008)
- Invited Speaker, (Summer) Science Lecture Series, Stanford University (2008 - 2008)
- Invited Speaker, Shimizu Corporation, Tokyo, Japan (2008 - 2008)
- Invited Speaker, Caltech Seismological Laboratory (2008 - 2008)
- Invited Speaker, 7th U.S. Japan Natural Resource Panel on Earthquake Research, Seattle, Washington (2008 - 2008)
- Invited Speaker, Los Alamos National Laboratory, Earth and Environmental Sciences "Frontiers in Science" Colloquia (2008 - 2008)
- Member, USGS-NEHRP External Program Southern California Proposal Review Panel (2007 - present)
- Deputy Director, Southern California Earthquake Center (2007 - 2014)
- Invited Participant, NSF CyberInfrastructure Workshop (2007 - 2007)
- Invited Presentation, "Ground Motion in the 1906 Earthquake", San Mateo County Council of Cities, Menlo Park, CA (2007 - 2007)
- Invited Speaker, Earth Science Colloquia, Lamont Doherty Earth Observatory (2007 - 2007)
- Invited Speaker, Earth and Environmental Sciences, New Mexico Tech (2007 - 2007)
- Invited Speaker, Special Session on "Integrated Borehole Geodetic and Seismic Networks: A Developing Tool for Earth Science", Seismological Society of America Meeting, Hawaii (2007 - 2007)
- Invited Speaker, Caltech Seismological laboratory (2007 - 2007)
- Invited Speaker, AGU Special Session on "Integrated Geodetic and Seismic Networks: Science and Data" (2007 - 2007)

- Invited Speaker, Extreme Ground Motion Workshop, Southern California Earthquake Center Annual Meeting, Palm Springs (2007 - 2007)
- Invited Speaker, AGU Special Session on "Global Adventures in Earthquake Predictability Experiments" (2007 - 2007)
- Guest Editor, Seismological Society of America Bulletin on the Centennial of the 1906 San Francisco Earthquake (2006 - 2008)
- Convenor, AGU (Fall) Meeting Special Session on "Global Strike-Slip Fault Systems: Oblique Divergence, Oblique" (2006 - 2006)
- Invited Speaker, California Press Association, San Francisco (2006 - 2006)
- Invited Speaker, U.S. Geological Survey, Menlo Park (2006 - 2006)
- Invited Speaker, I| GPP UC Santa Cruz (2006 - 2006)
- Invited Speaker, Cafe Scientifique, Palo Alto, California (2006 - 2006)
- Invited Speaker, SCEC-ERI Joint Workshop on Strong Ground Motion Prediction, Oxnard, California (2006 - 2006)
- Plenary Speaker, SSA/EERI 100th Anniversary Earthquake Conference, San Francisco, California (2006 - 2006)
- Invited Speaker, US Geological Survey, Menlo Park, California (2005 - 2004)
- Convenor, AGU Session on "Earth Structure From Crust to Core: Twenty Years of Science During the IRIS Era" (2004 - 2004)
- Invited Speaker, University of Southern California (2004 - 2004)
- Invited Speaker, Berkeley Seismological Laboratory, University of California, Berkeley (2004 - 2004)
- Invited Speaker, GPP, Scripps Institution of Oceanography (2004 - 2004)
- Member, USGS-NEHRP External Program Review Panel (2004 - 2004)
- Member, Plate Boundary Observatory Standing Committee (2003 - 2008)
- Associate Editor, G-Cubed (Geochemistry, Geophysics, Geosystems) (2003 - 2006)
- Chair, IRIS Publications and Meetings Subcommittee (2003 - 2006)
- Member, Incorporated Research Institutions in Seismology (IRIS) Executive Committee (2003 - 2006)
- Member, Berkeley Seismological Laboratory Advisory Committee (2003 - 2006)
- Stanford Earth Science Representative, 1906 Earthquake Centennial Alliance (2003 - 2006)
- Member, American Geophysical Union Index Committee (2003 - 2005)
- Member, Program Committee, AGU Chapman Conference on Radiated Energy and the Physics of Faulting (2003 - 2005)
- Co-Chair, IRIS/UNAVCO Workshop on Sampling Across the Frequency Spectrum, Yosemite (2003 - 2003)
- Invited Speaker, Southern California Earthquake Center Annual Meeting, Oxnard, California (2003 - 2003)
- Invited Speaker, University of California, Riverside (2003 - 2003)
- Invited Speaker, Seismic Energy Scaling Workshop, Livermore, California (2003 - 2003)
- Invited Speaker, NAS Japanese-American Frontiers of Science Meeting, Kanagawa, Japan (2003 - 2003)
- Invited Speaker, SIAM Conference on Computational Science and Engineering, San Diego (2003 - 2003)
- Invited Speaker and Panelist, SCEC Workshop on Converting Advances in Seismology into Earthquake Science, Caltech, Pasadena (2003 - 2003)
- Member, Southern California Earthquake Datacenter Advisory Committee (2003 - 2003)
- Vice Chair, Executive Committee, Southern California Earthquake Center (2002 - 2007)
- Co-Chair, Earthquake Source Physics Committee, Southern California Earthquake Center (2002 - 2005)
- Member, NRC Committee to Develop a Long-Term Research Agenda for the Network for Earthquake Engineering Simulation (2002 - 2003)
- Invited Speaker, US-Japan Cooperative Research for Urban Earthquake Disaster Mitigation, Kyoto, Japan (2002 - 2002)
- Invited Speaker, SCEC Fault and Rock Mechanics Workshop (2002 - 2002)
- Secretary, Seismology Section of the American Geophysical Union (2002 - 2002)
- Invited Speaker, Strong Motion Prediction Workshop: US-Japan Urban Earthquake Hazards Program, Tokyo, Japan (2002 - 2001)

- Member, California Integrated Seismic Network Advisory Committee (2001 - 2006)
- Guest Editor, Earth and Planetary Sciences, Special Volume on Slip and Flow Processes Near the Base of the Seismogenic Zone (2001 - 2002)
- Invited Speaker, Disaster Prevention Research Institute, Kyoto, Japan (2001 - 2001)
- Member, Board of Directors, Southern California Earthquake Center (2000 - 2007)
- Member, Local Organizing Committee and Chair of Scientific Program Committee, Seismological Society of America 95th Annual Meeting, San Francisco, California (2000 - 2001)
- Invited Speaker, Third Bi-Annual U.S.-Japan Natural Resources Panel on Earthquake Research, Menlo Park, California (2000 - 2000)
- Invited Speaker, US-Japan Workshop on the Relation between Foreshocks and Mainshock Initiation, Kyoto, Japan (2000 - 2000)
- Invited Speaker, International School on Geophysics, 17th Course: Fault Interaction by Stress Transfer: New Horizons for Understanding Earthquake Occurrence, Erice, Sicily (2000 - 2000)
- Member, Plate Boundary Observatory, San Andreas Fault Component Review Pane (2000 - 2000)
- Member, USGS-NEHRP External Program Review Panel (1999 - 2002)
- Member, Local Organizing Committee, Seismological Society of America Meeting (1999 - 2001)
- Convenor, SSA Special Session, Earthquake Sources and Fault Mechanics: Observations and Insights, Seattle, Washington (1999 - 1999)
- Invited Speaker, American Geophysical Union Meeting, Special Session on The Loma Prieta Earthquake, 10th Anniversary, San Francisco, California (1999 - 1999)
- Invited Speaker, University of California, Berkeley (1999 - 1999)
- Invited Speaker, University of Southern California, Los Angeles (1999 - 1999)
- Invited Speaker, American Geophysical Union Meeting, Special Session on Dynamic Fracturing of Rock and Rock-Like Materials, San Francisco, California (1999 - 1999)
- Invited Speaker, USGS, Menlo Park (1999 - 1999)
- Invited Speaker, Symposium on Earthquake Processes, Centennial Meeting of the Cordilleran Section of the GSA, Berkeley, California (1999 - 1999)
- Invited Speaker, California Institute of Technology (1999 - 1999)
- Invited Speaker, IRIS Special Session, The Science of Earthquakes, Fish Camp, California (1999 - 1999)
- Lecturer, Pacific Engineering Research Workshop for Undergraduate Civil Engineering Students (1999 - 1999)
- Member, IRIS (Incorporated Research Institutions for Seismology) Board of Directors (1998 - 2007)
- Panelist, National Science Foundation Seismology and Geophysics Proposal Review Panel (1998 - 2000)
- Chair, Best Student Paper Award Selection Committee, AGU Seismology Section (1998 - 1998)
- Convenor, AGU Session, Earthquake Dynamics (1998 - 1998)
- Invited Speaker, SCEC Workshop on Earthquake Source Physics, Snowbird, Utah (1998 - 1998)
- Invited Speaker, Structural Eng. World Conf., Near-Source Ground Motion for the Analysis of Structural Response (1998 - 1998)
- Consulting Editor for Geophysics, 9th Edition of the Encyclopedia of Science and Technology, McGraw Hill (1997 - 2001)
- Member, NRC Committee on the Science of Earthquakes (1996 - 2001)
- Consulting Editor in Geophysics, McGraw-Hill Yearbook of Science and Technology (1996 - 2000)
- Associate Editor, Journal of Geophysical Research (1996 - 1998)

PROFESSIONAL EDUCATION

- Ph.D, Massachusetts Institute of Technology , Geophysics (1989)
- B.S., University of California at Santa Cruz , Geophysics (1982)

LINKS

- Earthquake Seismology: https://pangea.stanford.edu/researchgroups/seismo/

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Research

My research group studies earthquakes. We develop and apply techniques for analyzing seismograms to understand how earthquakes work and to quantify the hazards they pose. We have a longstanding interest in understanding the scaling of radiated energy with earthquake size and to understand the mechanics of earthquakes and tectonic tremor. More recently we have embarked on a study of the mechanics of intermediate-depth earthquakes. Some of our research aims to predict the level and variability of strong shaking in large earthquakes by studying weak ground motion in both the ambient seismic field and tectonic tremor.

Teaching

I teach or co-teach courses for graduate students in seismology and for undergraduates in seismology, earthquake and volcano hazards, and introductory geophysics.

Professional Activities

Lawson Lecturer, (2015), Beno Gutenberg Medal, European Geosciences Union (2014); IRIS-SSA Distinguished Lecturer (2012); Fellow, American Geophysical Union (2008); Co-Director, Southern California Earthquake Center (2014-present); Seismology Section President, American Geophysical Union (2014-2015); Chair, Advanced National Seismic System Steering Committee (2013-present); Chair, IRIS Planning Committee (2010-2013); Plate Boundary Observatory Standing Committee (2004-08); Incorporated Research Institutions for Seismology Executive Committee (2004-06

Teaching

COURSES

2026-27

- Earthquake Seismology: GEOPHYS 287 (Win)
- Introductory Seismology: GEOPHYS 130 (Aut)
- Seismology: GEOPHYS 385Q (Aut, Win, Spr)

2025-26

- Earthquakes and Volcanoes: EARTHSYS 113, GEOPHYS 90 (Spr)
- Introduction to the Foundations of Contemporary Geophysics: EARTHSYS 110, GEOPHYS 110 (Win)
- Seismology: GEOPHYS 385Q (Aut, Win, Spr)

2024-25

- Earthquake Seismology: GEOPHYS 287 (Win)
- Introductory Seismology: GEOPHYS 130 (Aut)
- Seismology: GEOPHYS 385Q (Aut, Win, Spr, Sum)

2023-24

- Earthquakes and Volcanoes: EARTHSYS 113, GEOPHYS 90 (Spr)
- Seismology: GEOPHYS 385Q (Aut, Win, Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Nathan Girmay

Doctoral Dissertation Advisor (AC)

Alex Dzubay, Yanlan Hu, Trey Knudson, Robert Ni, Xing Tan, Yifan Yu

Publications

PUBLICATIONS

- **Machine Learning Developments and Applications in Solid-Earth Geosciences: Fad or Future?** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Li, Y., O'Malley, D., Beroza, G., Curtis, A., Johnson, P.
  2023; 128 (1)

- **Risk-Informed Recommendations for Managing Hydraulic Fracturing-Induced Seismicity via Traffic Light Protocols** *BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA*
  Schultz, R., Beroza, G., Ellsworth, W., Baker, J.
  2020; 110 (5): 2411–22

- **Seismology with Dark Data: Image-Based Processing of Analog Records Using Machine Learning for the Rangely Earthquake Control Experiment** *SEISMOLOGICAL RESEARCH LETTERS*
  Wang, K., Ellsworth, W. L., Beroza, G. C., Williams, G., Zhang, M., Schroeder, D., Rubinstein, J.
  2019; 90 (2): 553–62

- **Shallow V-S Imaging of the Groningen Area from Joint Inversion of Multimode Surface Waves and H/V Spectral Ratios** *SEISMOLOGICAL RESEARCH LETTERS*
  Spica, Z., Perton, M., Nakata, N., Liu, X., Beroza, G. C.
  2018; 89 (5): 1720–29

- **On the Nature of Higher-Order Ambient Seismic Field Correlations** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Sheng, Y., Nakata, N., Beroza, G. C.
  2018; 123 (9): 7969–82

- **Aftershock forecasts turn to AI** *NATURE*
  Beroza, G. C.
  2018; 560 (7720): 556–57

- **The Ambient Seismic Field at Groningen Gas Field: An Overview from the Surface to Reservoir Depth** *SEISMOLOGICAL RESEARCH LETTERS*
  Spica, Z. J., Nakata, N., Liu, X., Campman, X., Tang, Z., Beroza, G. C.
  2018; 89 (4): 1450–66

- **Locality-Sensitive Hashing for Earthquake Detection: A Case Study of Scaling Data-Driven Science** *PROCEEDINGS OF THE VLDB ENDOWMENT*
  Rong, K., Yoon, C. E., Bergen, K. J., Elezabi, H., Bailis, P., Levis, P., Beroza, G. C.
  2018; 11 (11): 1674–87

- **Detecting earthquakes over a seismic network using single-station similarity measures** *GEOPHYSICAL JOURNAL INTERNATIONAL*
  Bergen, K. J., Beroza, G. C.
  2018; 213 (3): 1984–98

- **Strong Shaking Predicted in Tokyo From an Expected M7+Itoigawa-Shizuoka Earthquake** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Denolle, M. A., Boue, P., Hirata, N., Beroza, G. C.
  2018; 123 (5): 3968–92

- **Evaluating the 2016 One-Year Seismic Hazard Model for the Central and Eastern United States Using Instrumental Ground-Motion Data** *SEISMOLOGICAL RESEARCH LETTERS*
  Mousavi, S., Beroza, G. C.
  2018; 89 (3): 1185–96

- **Site characterization at Groningen gas field area through joint surface-borehole H/V analysis** *GEOPHYSICAL JOURNAL INTERNATIONAL*
  Spica, Z. J., Perton, M., Nakata, N., Liu, X., Beroza, G. C.
  2018; 212 (1): 412–21
- **Multicomponent C3 Green's Functions for Improved Long-Period Ground-Motion Prediction** *BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA*
  Sheng, Y., Denolle, M. A., Beroza, G. C.
  2017; 107 (6): 2836–45
- **Lateral heterogeneity imaged by small-aperture ScS retrieval from the ambient seismic field** *GEOPHYSICAL RESEARCH LETTERS*
  Spica, Z., Perton, M., Beroza, G. C.
  2017; 44 (16): 8276–84
- **Stress drops of induced and tectonic earthquakes in the central United States are indistinguishable** *SCIENCE ADVANCES*
  Huang, Y., Ellsworth, W. L., Beroza, G. C.
  2017; 3 (8)
- **Tectonic tremor and LFEs on a reverse fault in Taiwan** *GEOPHYSICAL RESEARCH LETTERS*
  Aguiar, A. C., Chao, K., Beroza, G. C.
  2017; 44 (13): 6683–91
- **Seismicity During the Initial Stages of the Guy-Greenbrier, Arkansas, Earthquake Sequence** *Journal of Geophysical Research – Solid Earth*
  Yoon, C. E., Huang, Y., Ellsworth, W. L., Beroza, G. C.
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