

Dr. Steven B. Kidder

Department of Earth & Atmospheric Science, The City College of New York, Marshak Science Building
160 Convent Avenue, New York, New York, 10031 | 1.212.650.8431 | kidder.ccnyc@gmail.com

EDUCATION

California Institute of Technology

Ph.D., Geology, 2012

Brown University

Visiting Graduate Student, 2009

University of Arizona

M.S., Geology, 2002

University of Minnesota

B.S., Geology, 1999

POSITIONS HELD

The City College of New York (CCNY)

Assistant Professor, 2014 – present

American Museum of Natural History

Research Associate, 2015 – present

University of Otago

NSF Postdoctoral Scholar, 2012 – 2014

California Institute of Technology

Postdoctoral Scholar, 2012

University of Arizona

Research Staff, 2003 – 2005

RESEARCH INTERESTS

Lithospheric rheology, tectonics, deformation mechanisms & microstructures, structural geology, paleopiezometry, arc magmatism & evolution of the continental crust

AWARDS

NSF EAR - Tectonics, Decoding the Stress History of the Alpine Fault

\$273,938, 2015

NSF Earth Sciences Postdoctoral Fellowship

\$170,000, 2011

NSF International Research Fellowship

\$165,000, 2011

Best Poster

Earth & Planetary Student Research Symposium
University of California, Los Angeles, 2008

NSF Earth Sciences Graduate Fellowship

Honorable Mention, 2000

University of Minnesota:

Donath Honors Scholarship in Geosciences, 1998

Richard C. Dennis Undergraduate Scholarship in Geosciences, 1998

Ruhnke Scholarship in Geological Engineering, 1997, 1998

Presidential Scholarship, 1994, 1995, 1996

Field Camp Scholarship, 1997, 1998

Dean's List, 1995, 1996, 1997, 1998

FIELD WORK

I have worked in structurally complex sedimentary, metamorphic and igneous terrains in New Zealand, Taiwan, Central and Southern California, the Nepalese Himalaya, the Argentine Sierras Pampeanas, the Appalachians, and Colorado Plateau

TEACHING

College Courses

City College of New York:

Structural Geology, 2014, 2015

System Science of the Earth, 2014, 2015

Teaching Assistantships

California Institute of Technology:

Earth and Environment, 2010, Head TA

Tectonics and Crustal Structure of Southern California, 2008

Structural Geology, 2007

University of Arizona:

Igneous and Metamorphic Petrology, 2002

Structural Geology 2001, 1999

Oceanography, 2001

University Minnesota:

The Dynamic Earth, 1998, 1999

Guest Lecturer

Structural Geology:

Caltech, 2010, 2011

University of Connecticut, 2009

University of Arizona, 2000

Field Trip Guide

Salinian Block, California

led field trips for Caltech, University of Southern California, Giessen University (Germany), and the Ventana Wilderness Society to the Salinian block, 2003 – 2004

INVITED TALKS

Constraining Crustal Stress and Rheology from Grain Size Piezometry, *Princeton University*, scheduled October 2, 2015

How Squishy is the Middle Crust?, *City University of New York Graduate Center*, April 30, 2015

Transient Stress Magnitudes in the Middle Crust along the Alpine Fault, *University of Cambridge*, 2015

How Squishy is the Middle Crust?, *Queens College*, 2014

Microstructural and Trace Element Constraints on Stress and Temperature in the Middle Crust, *American Museum of Natural History*, 2014

Advances in Quantifying Crustal Stress Magnitudes, *Lamont-Doherty Earth Observatory*, 2014

Deciphering the Stress History of Middle Crustal Rocks, *University of Texas Institute for Geophysics Seminar*, 2010

Deciphering the Stress History of Rocks, *UCLA Seismology and Tectonics Seminar*, 2010

Estimating Differential Stress and Rheology in Taiwan using Rocks, *Brown University*, 2009

Modeling Flat Subduction Initiation and Accretion of the Pelona and Related Schists of Southern California, *Southern California Earthquake Center (SCEC) LAD workshop*, 2008

Emplacement of the Pelona and related schists: models and recent geological observations from Salinia, *UCLA Seismology and Tectonics Seminar*, 2008

Inverted metamorphism and high temperatures in the Pelona and related schists of S. California: reevaluating the shear heating model, *University of S. California Crustal Dynamics Seminar*, 2006

Rocks of Hastings and Beyond, *Hastings Natural History Reservation*, 2005

ENRICHMENT

Spanish Language, conversational, some translation experience

Salsa/Rueda Instructor, University of Arizona club, 2001 – 2003

Jazz Pianist, various University of Minnesota ensembles, 1994 – 1997

Music Director and Pianist, *American Cabaret Theatre*, summers, 1993 – 1995

SERVICE

Graduate Advisor

Department of Earth & Environmental Science, The City College of New York, 2014 – present

Tectonophysics Fridays

founded, organized and led a weekly graduate seminar at the University of Otago, 2012 – 2014

Science Outreach

presented work to the Otago Gem and Mineral Club, judged the Southern Arizona Regional Science and Engineering Fair, led geology hikes for middle school classes and partnered with a local science coordinator to develop classroom exercises in Pasadena, hosted elementary students and their parents at Caltech's *Science Saturday*, created a sandbox model and youtube [video](#) about the Grand Canyon

Pasadena Rheology Society

founded an informal discussion group of professors and students from Caltech, California State University Northridge, and University of Southern California, 2008 – 2012

Student-run symposiums and events

Zilchbrau (Caltech) co-chair, 2006; participant, 2007 – 2011

Geodaze (University of Arizona) committee member, 2002; co-chair, 2001

Monterey County Geologic Maps

produced and published online a series of geologic maps in collaboration with Hastings Natural History Reservation, 2003

Geology Club

University of Minnesota, Vice President, 1998 – 1999

PUBLICATIONS

Kidder, S. B., Hirth, G., Avouac, J. P., Behr, W., under revision, Regime change: The influence of a stepped stress history on the grain size, microstructure and rheology of experimentally deformed quartzite, *Journal of Structural Geology*

Cross, A. J., **Kidder, S. B.**, Prior, D. J., 2015, Using quartz sheared around garnet porphyroclasts to evaluate microstructural evolution in nature, *Journal of Structural Geology*, doi:10.1016/j.jsg.2015.02.012

Kidder, S. B., and Prior, D. J., 2014, Reversed scan direction reduces electron beam damage in EBSD maps, *Journal of Microscopy*, doi: 10.1111/jmi.12140

- Chapman, A. D., Ducea, M. N., **Kidder, S. B.**, Petrescu, L., 2014, Geochemical constraints on the petrogenesis of the Salinian arc, central California: implications for the origin of intermediate magmas, *Lithos*, v. 200-201, p. 126-141, doi:10.1016/j.lithos.2014.04.011
- Kidder, S. B.**, Herman, F., Saleeby, J. B., Avouac, J. P., Ducea, M. N., Chapman, A. D., 2013 Shear heating not a cause of inverted metamorphism, *Geology*, v. 41, p. 899-902, doi:10.1130/G34289.1
- Kidder, S. B.**, Avouac, J.P., Chan, Y. C., 2013, Application of titanium-in-quartz thermobarometry to greenschist facies veins and recrystallized quartzites in the Hsuehshan range, Taiwan, *Solid Earth*, doi:10.5194/sed-4-663-2012
- Kidder, S. B.**, Avouac, J.P., Chan, Y. C., 2012, Constraints from rocks in the Taiwan orogen on crustal stress levels and rheology, *Journal of Geophysical Research*, v.117, B09408, doi:10.1029/2012JB009303
- Chapman, A. D., Saleeby, J. B., Wood, D. F., Piasecki, A., **Kidder, S. B.**, Ducea, M. N. Farley, K. A., 2012, Late Cretaceous gravitational collapse of the southern Sierra Nevada batholith, California, *Geosphere*, v. 8, no. 2., doi:10.1130/GES00740.1
- Chapman, A. D., **Kidder, S. B.**, Saleeby, J. B., and Ducea, M. N., 2010, Role of extrusion of the Rand and Sierra de Salinas schists in Late Cretaceous extension and rotation of the southern Sierra Nevada and vicinity, *Tectonics*, v. 29, doi:10.1029/2009TC002597
- Ducea, M. N., **Kidder, S. B.**, Chesley, J. T., and Saleeby, J. B., 2009, Tectonic underplating of trench sediments beneath magmatic arcs: the central California example, *International Geology Review*, v. 51, no. 1, p. 1-26
- Ducea, M. N., **Kidder, S. B.**, and Chesley, J. T., 2007, A geologic window into a subduction megathrust, *EOS*, v. 88, no. 27, 3, p. 277-284
- Kidder, S. B.**, and Ducea, M. N., 2006, High temperatures and inverted metamorphism in the schist of Sierra de Salinas, California, *Earth and Planetary Science Letters*, 241, p. 422-437
- Barbeau, D. L., Ducea M. N., Gehrels, G. E., **Kidder, S. B.**, Wetmore, P. H., and Saleeby, J. B., 2005, U-Pb detrital-zircon geochronology of northern Salinian basement and cover rocks, *GSA Bulletin*, v. 117; no. 3/4; doi: 10.1130/B25496.1
- Brady, R., Ducea M. N., **Kidder, S. B.**, and Saleeby, J. B., 2005, Distribution of radiogenic heat production as a function of depth in the Sierra Nevada Batholith, California, *Lithos*, 86, p. 229-244
- Dickinson, W. R., Ducea, M. D., Rosenberg, L. I., Greene, H. G., Graham, S. A., Clark, J. C., Weber, G. E., **Kidder, S. B.**, Ernst, H. G., and Brabb, E. E., 2005, Net Dextral Slip, Neogene San Gregorio-Hosgri fault zone, coastal California: geologic evidence and tectonic implications, *GSA Special Paper*, no. 391
- Kidder, S. B.**, Ducea, M. N., Gehrels, G. C., Patchett, P. J., Vervoort, J., 2003, Tectonic and magmatic development of the Salinian Coast Ridge Belt, California, *Tectonics*, v. 22, no. 5, doi:10.1029/2002TC001409
- Ducea, M. N., House, M., **Kidder, S. B.**, 2003, Late Cenozoic denudation and uplift rates in the Santa Lucia Mountains, California, *Geology*, v. 31, no. 2, p. 139-142
- Ducea, M. N., **Kidder, S. B.**, Zandt, G., 2003, Arc composition at mid-crustal depths: Insights from the Coast Ridge Belt, Santa Lucia Mountains, California, *Geophysical Research Letters*, v. 30, no. 13. doi:10.1029/2002GL016297

**CONFERENCE
ABSTRACTS**

- Kidder, S. B., Avouac, J. P., Hirth, G., Toy, V. G., Prior, D. J., Some Progress with Grain Size Piezometry, *Tectonic Studies Group Annual Meeting*, Jan., 2015
- Kidder, S. B., Toy, V. G., Prior, D. J., 2014, Transient Stress Magnitudes in the Middle Crust along the Alpine Fault, *Eos Trans. AGU*, Fall Meet. Suppl.
- Kidder, S. B., 2014, Transient Stress Magnitudes in the middle crust along the Alpine Fault, Gordon Research Conference on Rock Deformation, Proctor Academy, NH
- Kidder, S. B., 2014, Advances in Quantifying Crustal Stress Magnitudes, *3rd Biennial Structural Geology & Tectonics Forum 2014*, Golden, CO
- Kidder, S. B., and Prior, D. J., 2014, Reversed scan direction reduces electron beam damage in EBSD maps, *EBSD 2014 – Electron Backscattered Diffraction Topical Conference*, Pittsburgh, PA
- MacRae, C., Wilson, N., Torpy, A., Kidder, S. B., Li, Z., Delle Piane, C., and Dewhurst, D., 2014, Quartz Overgrowths in Shales and Sandstones studied by EPMA and SIMS, IUMAS, Hartford, CT
- Little, T., Gillam, B., Prior, D., Kidder, S., Cross, A., Ellis, S., Al'bot, O, and Toy, V., 2013, Foliation fanning in the hanging wall of the Alpine Fault, Caentral Southern Alps, GSNZ annual conference
- Chapman, A. D., Ducea M. N., Kidder, S. B., Saleeby, J. B., 2012, Igniting a magmatic flare-up: the Salinian arc, central, California, *GSA Abstracts with Programs*, Vol. 44, No. 7, p.489
- Kidder, S. B., Avouac, J. P., Chan, Y. C., 2012, Constraints from rocks in the Taiwan orogen on crustal stress levels and rheology, Gordon Research Conference on Rock Deformation, Proctor Academy, NH
- Toy, V., Prior, D., Kidder, S. B., Norris, R., Reid, Z., Lindroos, M. B., 2011, The value of paleopiezometry of quartz as a method of estimating flow stress in New Zealand's Alpine Fault Zone, *Eos Trans. AGU*, Fall Meet. Suppl.
- Kidder, S. B., Avouac, J.P., Chan, Y. C., 2011, Testing Titanium-in-quartz thermobarometry at low temperatures in veins and deformed quartzite, *GSA Abstracts with Programs*, Vol. 43, No. 5, p. 94
- Kidder, S. B., Avouac, J.P., Chan, Y. C., Chen, C. T., 2010, Rheology of impure quartzite under geologic conditions, *Eos Trans. AGU*, T33E-08
- Kidder, S. B., Hirth, G. H., Avouac, J. P., 2010, Kinetics of grain size evolution in experimentally deformed quartzite, Gordon Research Conference on Rock Deformation, Tilton School, NH
- Saleeby, J., Chapman, A. D., Kidder, S. B., 2010, Dispersal of southern Sierra Nevada Batholith (SNB) crustal fragments across and along the trace of the San Andreas Fault (SAF)– What constitutes the central Salinia basement, *GSA Abstracts with Programs, Cordilleran Section*, v. 42, no. 4, p. 43
- Chapman, A. D., Kidder, S. B., Saleeby, J. B., and Ducea, M. N., 2009, Role of extrusion of the Rand and Sierra de Salinas schists in Late Cretaceous extension and rotation of the southern Sierra Nevada and vicinity, *GSA Abstracts with Programs*, v. 41, no. 7, p. 590
- Ducea, M. N., Kidder, S. B., Saleeby, J. B., 2009, Tectonic underplating of trench sediments beneath magmatic arcs—The Laramide example in the western U.S.A., *GSA Abstracts with Programs*, v. 41, no. 7, p. 589

Kidder, S. B., Herman, F., Saleeby, J. B., Avouac, J. P., and Ducea, M. N., 2008, A 2D kinematic-thermal model of flat subduction initiation and accretion of the Pelona and related schists of southern California, *GSA Abstracts with Programs, Cordilleran Section*, v. 40, no. 1, p. 48

Kidder, S. B., and Avouac, J. P., 2008, Constraining crustal flow laws with microstructural analysis of rocks exhumed from active orogens, Gordon Research Conference on Rock Deformation, Tilton School, NH

Herman, F., Gurnis, M., Mueller, D. and Kidder, S. B., 2008, Geodynamic modeling of the onset and demise of Cretaceous—Eocene flat subduction in North America, *EGU Geophysical Research Abstracts*, v. 10

Kidder, S. B., Herman, F., Saleeby, J. B., Avouac, J. P., and Ducea, M. N., 2008, 2D kinematic-thermal models of flat subduction initiation and accretion of the Pelona and related schists of southern California, Earth and Planetary Student Research Symposium, UCLA

Kidder, S. B., Herman, F., Saleeby, J. B., Avouac, J. P., and Ducea, M. N., 2007, Modeling flat subduction initiation and accretion of the Pelona and related schists of southern California, *Eos Trans. AGU*, Abstract T44A-06

Dickinson, W. R., Ducea, M. D., Rosenberg, L. I., Greene, H. G., Graham, S. A., Clark, J. C., Weber, G. E., Kidder, S. B., Ernst, H. G., and Brabb, E. E., 2005, Net Dextral Slip, Neogene San Gregorio-Hosgri fault zone, coastal California: geologic evidence and tectonic implications, *GSA Abstracts with Programs, Cordilleran Section*, v. 37, no. 4

Ducea, M. N., Kidder, S. B., Chesley, J., 2005, Salinia: a crustal cross section through a shallow subduction zone exposing the subduction megathrust, *GSA Abstracts with Programs, Cordilleran Section*, v. 37, no. 4, p. 52

Brady, R., Ducea M. N., Kidder, S. B., and Saleeby, J. B., 2004, Results of radiogenic heat production measurements through the entire thickness of the Sierra Nevada batholith, California: a non-exponential distribution controlled by hydrothermal processes, *GSA Abstracts with Programs*, v. 36, no. 5, p. 342

Kidder, S. B., Ducea M. N., Barbeau, D. L., and Gehrels, G. E., 2004, The Cretaceous Salinian continental arc: Overview and new advances, *GSA Abstracts with Programs*, v. 36, no. 5, p. 342

Kidder, S. B., Ducea, M. N., Gehrels G. G., and Duschatko, B., 2001, A large range of Sr and Nd isotope ratios in a small deep-crustal exposure of a Cretaceous Cordilleran arc: Implications for arc magma evolution, *Eos Trans. AGU*, 82(47), Fall Meet. Suppl., Abstract T41C-0884

Bump, A. P., Davis, G. H., Bilinski, G. E., Sanders, A. E., Kidder, S. B., 2000, Progressive development of brittle and semi-brittle structures on the Monument Uplift, Utah, and their implications for regional strain, *GSA Abstracts with Programs, Rocky Mountain Section*, 32; 5, p. 4

Kidder, S. B., and Ducea M. N., 2000, Composition of a Cordilleran arc root and the role of the lower crust in arc magmatism; preliminary evidence from the Santa Lucia Mountains, California, *Eos Trans. AGU*, 81(48), Suppl., Abstract V51A-17