MONICA R. BARBERY

CV

CONTACT

Department of Earth, Environmental & Planetary Sciences (DEEPS)
Brown University
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EDUCATION

2022 Ph.D. in Geophysics, Texas A&M University
Frictional Weakening During Earthquake Slip on Faults: A Laboratory Study of Sliding-Surface Temperature During High-Speed Slip in Granite Under Biaxial Loading Conditions
Advisors: Frederick M. Chester & Judith S. Chester

2015 M.S. in Environmental & Earth Science, University of Texas at Arlington
Constraining the near tip stresses around propagating earthquake ruptures: frictional response and off-fault tensile crack development
Advisor: W. Ashley Griffith

2010 B.S. in Geology *cum laude*, University of Texas at Arlington

RESEARCH POSITIONS

2024 – Senior Research Associate, Brown University
2022 – 2024 NSF Postdoctoral Fellow, Brown University
2015 – 2022 Graduate Research Assistant, Texas A&M University
2013 – 2015 Graduate Research Assistant, University of Texas at Arlington
2010 GIS Assistant, PALEOMAP Project
2009 EDMAP Summer Research Intern, University of Texas at Arlington

FELLOWSHIPS & AWARDS

2022 – 2024 Postdoctoral Fellowship, National Science Foundation
2020 – 2021 Michael T. Halbouty Graduate Fellowship, College of Geosciences, Texas A&M
2021 Outstanding Student Paper Award, Department of Geology & Geophysics, Texas A&M
2019 – 2020 John & Frances Handin Graduate Fellowship, Center for Tectonophysics, Texas A&M
2019 Outstanding Student Presentation Award, American Geophysical Union
2019 Service Award, Department of Geology & Geophysics, Texas A&M
2010 Wanda Slagle Scholarship, University of Texas at Arlington

GRANTS

2024 – 2025 Collaborative Research Project, SCEC, PI, "Experimental constraints on shallow earthquake rupture propagation in altered serpentinite gouge: implications for northern CA including the Bartlett Springs fault" ($20,021)

2024 – 2027 EAR Geophysics, NSF, PI, "Assessing the roles of wear and roughness on dynamic fault friction" ($414,829)

2022 – 2024 EAR Postdoctoral Fellowship, NSF, PI, "Investigating the competition between thermal pressurization and dilatancy on rough surfaces at earthquake slip rates" ($174,000)

2018 Graduate Student Research Grant, GSA, "Slip zone structure following repeated slip events" ($1,900)

TEACHING

2018 – 2021 Graduate Teaching Assistant, Texas A&M University

- Structural Geology & Tectonics (F2018, F2019, S2020, S2021)

  Prepared and instructed all laboratory lectures, exercises, and exams for 2-3 weekly laboratory sections with 20-30 students per section.

- Physical Geology (S2019)

  Prepared and instructed all laboratory lectures, exercises, and exams for 3 weekly laboratory sections with 30 students per section.

- Summer Field Geology (Sum2018)

  Assisted with and instructed field lectures and field area walkthroughs, graded exercises and projects, and provided field and base camp assistance to 30 students.

2013 Graduate Teaching Assistant, University of Texas at Arlington

- Structural Geology (S2013)

  Assisted with laboratory lectures, hosted office hours, and graded all laboratory exercises for 2 weekly lab sections with 20 students per section.

INVITED LECTURES

2024 California Institute of Technology, SeismoLab Seminar

2024 Bridgewater State University, Department of Geosciences Seminar

2023 University of Southern California, Computational Infrastructure for Geodynamics Seminar

2022 Brown University, Department of Earth, Environmental, & Planetary Sciences Colloquium

SERVICE & OUTREACH

2023 – Active reviewer for Geophysical Research Letters, Journal of Geophysical Research: Solid Earth, & National Science Foundation

2022 – DEEPS Career Opportunities and Research in Earth Science (CORES) outreach team member, Brown University

2022 – AGU Outstanding Student Presentation Awards Judge

2024 DEEPS Research Experience for Undergraduates bi-weekly discussion leader for 9-student cohort, Brown University

2023 – 2024 AGU Local Science Partner

2019 – 2020 Research Symposium Chair, Geology & Geophysics, Texas A&M

2018 – 2019 President, Geology & Geophysics Graduate Student Council, Texas A&M

2018 – 2019 Graduate Student Recruitment Committee, Geology & Geophysics, Texas A&M

2017 – 2018 Quality of Life Chair, Graduate & Professional Student Council, Texas A&M
2017 – 2018 Lab Tour Guide, STEM 4 Innovation Conference for K-12 Education, Texas A&M
2016 – 2018 Senator, Graduate & Professional Student Council, Texas A&M

RESEARCH MENTORING

2024 Brandt Bechtel, Research Experience for Undergraduates Intern, Brown University
2018 – 2019 Elizabeth Smith, B.S. Geology, Texas A&M University
2016 – 2017 Preston Fleck, B.S. Geophysics, Texas A&M University

WORKSHOPS & CERTIFICATIONS

2022 The Sheridan Teaching Seminar Reflective Teaching Certificate, Brown University
2022 Technical Advancements in Experimental Rock Deformation Workshop, SZ4D, Portland, ME
2020 In-Situ Studies of Rock Deformation Research RCN Workshop (virtual)
2019 Empower Yourself for Public Speaking Workshop, SCEC, Palm Springs, CA
2019 Center for the Integration of Research, Teaching, and Learning Practitioner (CIRTL) Certificate
2017 Public Communications Theory and Practice for Scientists Workshop, SCEC, Palm Springs, CA

MEMBERSHIPS

Geological Society of America
Statewide California Earthquake Center
American Geophysical Union

PUBLICATIONS (*In Prep)

*Barbery, M. R. & Tullis, T. E. (in prep). Thermal pressurization is delayed at elevated slip rates when surface roughness approaches natural fault roughness.

*Barbery, M. R., Hirth, G. & Tullis, T. E. (in prep). Geometric asperities enhance fault locking in laboratory experiments.

*Barbery, M. R., Chester, F. M. & Chester, J. S. (in prep). Exploring the role of mineralogy and roughness on hotspot development in high-velocity friction experiments.

Barbery, M. R., Chester, F. M. & Chester, J. S. (2023). Investigating dynamic weakening in laboratory faults using multi-scale flash heating coupled with mm-scale contact evolution. Journal of Geophysical Research: Solid Earth, 128, e2023JB027110. https://doi.org/10.1029/2023JB027110

Barbery, M. R., Chester, F. M. & Chester, J. S. (2021). Characterizing the distribution of temperature and normal stress on flash heated granite at seismic slip rates. Journal of Geophysical Research: Solid Earth, 126, e2020JB021353. https://doi.org/10.1029/2020JB021353

CONFERENCE PRESENTATIONS (*Invited, +talk)

+Barbery, M.R., Tullis, T.E, Meyers, C. (2023) Exploring the competition between thermal pressurization and dilatancy hardening on rough sliding surfaces during high-velocity friction experiments. Abstract MR44A-03, AGU, San Francisco, CA.

Tullis, T.E., Meyers, C., Barbery, M.R. (2023) New high-speed capabilities of the Tullis high-pressure rotary shear apparatus. Abstract MR23B-0076, AGU, San Francisco, CA.

*+Barbery, M.R., Chester, F M. & Chester, J. S. (2022) Sliding Friction with Multi-Scale Flash-Heating and mm-Scale Contact Evolution in Granite, Gordon Research Seminar, Lewiston, ME.

*+Barbery, M.R., Chester, F M. & Chester, J. S. (2022) Exploring the Roles of Mineralogy and Roughness on Hotspot Development in High-Velocity Sliding Experiments on Faults in Westerly Granite, Abstract T53A-04, Chicago, IL.

Barbery, M.R., Chester, F M. & Chester, J. S. (2022) Multi-scale flash-weakening incorporating inhomogeneous normal stress in high-velocity friction experiments on granite. Abstract 159, SCEC, Palm Springs, CA.

+Barbery, M.R., Chester F.M. & Chester J.S. (2021) Investigating flash weakening coupled with local, contact-scale temperature using high-speed friction experiments on granite. Abstract MR44A-01, AGU, virtual.

Barbery, M.R., Chester, F. M. & Chester, J. S. (2021) Investigating the influence of mm-scale contact processes on dynamic weakening in high-speed rock friction experiments. Abstract 171, SCEC, virtual.

Barbery, M.R., Chester F.M. & Chester J.S. (2020) Investigation of transient and hysteretic flash-weakening behavior observed in high-speed friction experiments. Abstract 10726, SCEC, virtual.

+Barbery, M.R., Chester F.M. & Chester J.S. (2019) Temperature and stress distribution on flash heated contacts in granite at seismic slip rates. Abstract MR42A-02, AGU, San Francisco, CA.

Barbery, M.R., Chester, F. M. & Chester, J. S. (2019) Controlling the life-time and rest-time of asperity contact populations to investigate the temperature and stress distribution in flash-weakened frictional surfaces in granite. Abstract 9726, SCEC, Palm Springs, CA.

Barbery, M., Saber, O., Chester F.M. & Chester J.S. (2017) Investigation of multi-scale flash weakening of rock surfaces during high-speed slip. Abstract MR33B-0462, AGU, New Orleans, LA.

Barbery, M., Saber, O., Chester F.M. & Chester J.S. (2017) Examination of multi-scale flash-heating at seismic slip rates in granite. Abstract 7819, SCEC, Palm Springs, CA.

Barbery, M., Chester F.M., Chester J.S. & Saber, O. (2016) The Effects of Gouge Accumulation on High-Speed Rock Friction. Abstract S21B-2701, AGU, San Francisco, CA.

Barbery, M., Chester, F. M., Chester, J. S. & Saber, O. (2016) Dynamic Weakening of Sliding Friction and the Influence of Gouge Development. Abstract 6878, SCEC, Palm Springs, CA.

Saber, O., Chester, F.M., Alvarado, J.L. & Barbery, M. (2015) Investigation of transient friction in rock at low to high slip-rates using a new biaxial. Abstract MR33A-2639, AGU, San Francisco, Dec.

+Barbery, M., Wu, X., Rodrigues, B., Griffith, W.A. & Prakash, V. (2014) Modified Torsional Kolsky Bar Experiments Elucidate the Relationship Between Work and Velocity Weakening Behavior of Westerly Granite and SAFOD Gouges. Abstract S51D-07, AGU, San Francisco, CA.
