
CONTACT

Department of Geology and Geophysics
University of Utah
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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
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POSITIONS

- 2026 – Assistant Professor, University of Utah
- 2024 – 2025 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 USGS EDMAP Summer Research Intern, University of Texas at Arlington
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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
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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

- 2026 – Instructor, University of Utah
- Structural Geology & Tectonics (S2026)
- 2025 Instructor, Brown University
- Structural Geology (S2025)
- 2018 – 2021 Graduate Teaching Assistant, Texas A&M University
- Structural Geology & Tectonics (F2018, F2019, S2020, S2021)
- Physical Geology (S2019)
- Summer Field Geology (Sum2018)
- 2013 Graduate Teaching Assistant, University of Texas at Arlington
- Structural Geology (S2013)

INVITED LECTURES

- 2025 Dynamic Rupture Workshop, Southern California Earthquake Center
- 2025 Florida State University, Department of Earth, Ocean, and Atmospheric Sciences Seminar
- 2025 University of Utah, Department of Geology and Geophysics Distinguished Lecture Series
- 2025 University of Oregon, Department of Earth Sciences Seminar
- 2024 Columbia University, Marine & Polar Geophysics Division Seminar
- 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, The Seismic Record, & The National Science Foundation
- 2025 AGU First-Time Presenter Feedback Program reviewer
- 2022 – 2024 AGU Outstanding Student Presentation Awards Judge
- 2022 – 2024 DEEPS Career Opportunities and Research in Earth Science (CORES) outreach team member, Brown University

2024	DEEPS Research Experience for Undergraduates bi-weekly discussion leader for 9-student cohort, Brown University
2023 – 2024	AGU Local Science Partner
2018 – 2019	President, Geology & Geophysics Graduate Student Council, Texas A&M
2018 – 2019	Graduate Student Recruitment Committee, Dept. of Geology & Geophysics, 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 –	Daniel Lukens, undergraduate researcher, Brown University
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

2025	Dynamic Rupture Workshop, Statewide California Earthquake Center (virtual)
2025	Community Rheology Model (CRM) Workshop, Statewide California Earthquake Center, Palm Springs, CA
2024	SZNet: Virtual Workshop - Rheology and Stress, SZ4D (virtual)
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 (*Selected in prep)

- *Barbery, M. R. & Tullis, T. E. (in prep). Thermal pressurization is delayed in experiments on rough laboratory faults.
- *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., Hirth, G. & Tullis, T. E. (2025). Strong asperities nucleate earthquakes on laboratory faults. *Geology*. <https://doi.org/10.1130/G52853.1>
- 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>

SELECTED CONFERENCE PRESENTATIONS (*Invited, +talk)

- *+Barbery, M.R., Hirth, G. & Tullis, T.E (2025) Strong asperities nucleate earthquakes in experiments on creeping, bimaterial laboratory faults. AGU, Washington DC.
- Barbery, M.R., & Tullis, T.E (2025) Thermal pressurization is suppressed in experiments on rough laboratory faults. AGU, Washington DC.
- +Barbery, M.R., Hirth, G. & Tullis, T.E (2024) Exploring the role of macroscopic roughness on fault stability using rotary shear experiments on diabase and talc. AGU, Washington DC.
- Barbery, M.R., & Tullis, T.E (2024) Investigating thermal pressurization during high-speed friction experiments on rough and gouge lined sliding surfaces. AGU, Washington DC.
- +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.