John Noel Hooker

(he/him)
Curriculum Vitae
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Institution address:	School of Mathematics, Science and Engineering University of the Incarnate Word 4301 Broadway San Antonio, TX 78209
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Academic Background

B.A. Geological Sciences, The University of Texas at Austin, May 2000
M.S. Geological Sciences, The University of Texas at Austin, August 2004
Ph.D. Geological Sciences, The University of Texas at Austin, December 2012

Areas of Expertise

Geologic fractures, geomechanics, sedimentary mineralogy and petrology, scanning electron microscopy, numerical modeling, statistics

Key Publications

Hooker, J.N. and Fisher, D.M., 2021, How cementation and fluid flow influence slip behavior at the subduction interface, *Geology*

- Introduces MEFISTO, a model for fluid-flow and diagenesis on the subduction interface
- Establishes the role of mineral redistribution in aftershock sequences

Hooker et al., 2020, Shale anisotropy and natural hydraulic fracture propagation, *JGR—Solid Earth*

- Shows how shale fissility increases top-seal effectiveness

Hooker et al., 2018, Microfracture spacing distributions and the evolution of fracture patterns in sandstones, *Journal of Structural Geology*

- Reconstructs the opening history of an array of natural fractures
- Top-eight most cited article since 2018, according to publisher (September 2020)

Hooker, J.N. and Katz, R.F., 2015, Vein spacing in extending, layered rock: the effect of synkinematic cementation, *American Journal of Science*

- Introduces a numerical model for the physical effects of fracture cementation during opening

Hooker et al., 2013, Fracture-aperture size–frequency, spatial distribution, and growth processes in strata-bounded and non-strata-bounded fractures, Cambrian Mesón Group, NW Argentina, *Journal of Structural Geology*

- Jackson School of Geosciences Bronze Award for student-authored publication
- 2013 Second most downloaded article for journal, July-September, according to publisher

Professional Work Experience

Assistant Professor, University of the Incarnate Word (August 2021–present)
Teaching of undergraduate Earth and environmental science courses
Mentoring of environmental science majors
Research in Earth and environmental science

Assistant Teaching Professor, Penn State University (August 2017–June 2021)
Teaching of undergraduate Earth science courses
Research on physical and chemical aspects of natural fracturing
Undergraduate research supervision

Postdoctoral Research Associate, University of Oxford (November 2012–July 2017)
Fracture research for Shell-Oxford Geoscience Lab
Tutorial lecturing for undergraduate Earth science majors
Graduate research supervision
Matlab coding

Research Scientist Associate, Bureau of Economic Geology, UT Austin (August 2004–October 2012)
Research for Fracture Research and Application Consortium
Field and SEM-scale fracture analysis
Fluid inclusion microthermometry

Graduate Research Assistant, Bureau of Economic Geology, UT Austin (June 2001–August 2004)
SEM fracture analysis
Assistance with field trips and logistics

Teaching Assistant, Department of Geological Sciences, UT Austin (Fall 2000–Spring 2001)
Introductory and field geology courses

Research Assistant, Department of Geological Sciences, UT Austin (February 1998–May 2000)
SEM image analysis of microfractures
Topographic map drafting

Courses Taught

EARTH 100, Environment Earth, Penn State University

- Science general education requirement for PSU undergraduates
- Taught five times since 2017
- 80 – 100 students
- In-person, Zoom, and Canvas Learning Management System interfaces
- Averaged ≥ 6.0 (out of 7) in 9 of 9 student-feedback categories

EARTH 103, Earth in the future, Penn State University (World Campus)

- Online offering for PSU Earth Sustainability Certificate
- Taught twice since 2020
- 12 to ~100 students
- Averaged ≥ 6.0 (out of 7) in 8 of 9 student-feedback categories

EARTH 2, Energy and Earth's environment, Penn State University (World Campus)

- Online offering for PSU Earth Sustainability Certificate
- Fall semester 2020
- 30 students

GEOSC 202, Chemical processes in geology, Penn State University

- Requirement for geoscience majors
- Taught twice since 2017
- ~25 students, 1 TA
- Two instructor-led field trips
- Averaged ≥ 6.0 (out of 7) in 8 of 9 student-feedback categories

GEOSC 452, Hydrogeology, Penn State University

- Upper-division requirement/elective for geoscience and engineering majors
- Taught three times since 2018
- 40 – 50 students
- Instructor-led field trip

GEOSC 454, Geology of oil and gas, Penn State University

- Upper-division requirement/elective for geoscience and engineering majors
- Taught three times since 2018
- 60 – 90 students, 2 TAs
- Averaged ≥ 6.0 (out of 7) in 8 of 9 student-feedback categories

All Publications

Articles

Hooker, J.N. and Fisher, D.M., 2021. How cementation and fluid flow influence slip behavior at the subduction interface. Geology, doi: 10.1130/G48741.1

Hoyt, E.M. and Hooker, J.N., 2021. Silica diagenesis and natural fracturing in limestone: An example from the Ordovician of Central Pennsylvania. Marine & Petroleum Geology 132, 105240. doi: 10.1016/j.marpetgeo.2021.105240

Tabatabaei, M., Dahi Taleghani, A., and Hooker, J.N., 2021. Debonding of cemented natural fractures during core recovery. Journal of Structural Geology 144, 104272. doi: 10.1016/j.jsg.2020.104272

Abu-Mahfouz, I.S., Cartwright, J., Idiz, E., Hooker, J.N., and Robinson, S.A., 2020. Silica diagenesis promotes early hydrocarbon migration. Geology 48 (5), 483 – 487.

Al-Fahmi, M., J.N. Hooker, A.S. Al-Mojel, and J.A. Cartwright, 2020. New scaling of fractures in a giant carbonate platform from outcrops and subsurface. In press, Journal of Structural Geology.

Hooker, J.N., Ruhl, M., Dickson, A.J., Hansen, L.N., Idiz, E., Hesselbo, S.P., and Cartwright, J., 2020. Shale anisotropy and natural hydraulic fracture propagation: An example from the Jurassic (Toarcian) Posidonienschiefer, Germany. Journal of Geophysical Research—Solid Earth, doi: 10.1029/2019JB018442

Abu-Mahfouz, I.S., Cartwright, J., Idiz, E., Hooker, J.N., Robinson, S., and van den Boorn, S., 2019. Genesis and role of bitumen in fracture development during early catagenesis. Petroleum Geoscience 25 (4), 371-388. doi: 10.1144/petgeo2018-179

Fisher, D.M., Hooker, J.N., and Oakley, D.O.S., 2019. Numerical models for slip on the subduction interface motivated by field observations. Lithosphere, doi:10.1130/L1008.1

Laubach, S.E., Lander, R.H., Criscenti, L.J., Anovitz, L.M., Urai, J.L., Pollyea, R.M., Hooker, J.N., Narr, W., Evans, M.A., Kerisit, S.N., Olson, J.E., Dewers, T., Fisher, D.M., Bodnar, R., Evans, B., Dove, P., Bonnell, L.M., Marder, M.P., and Pyrak-Nolte, L., 2019. The role of chemistry in fracture pattern development and opportunities to advance interpretations of geological materials. Reviews of Geophysics 57 (3), 1065-1111. doi: 10.1029/2019RG000671

Meng, Q., Hooker, J.N., and Cartwright, J., 2019. Progressive accretion of antitaxial crystal fibres: implications for the kinematics and dynamics of vein dilation. Journal of Structural Geology 126, 25-36.

Ukar, E., Laubach, S.E., and Hooker, J.N., 2019. Outcrops as guides to subsurface natural fractures: example from the Nikanassin Formation tight-gas sandstone, Grande Cache, Alberta Foothills, Canada. Marine and Petroleum Geology 103, 255-275.

Ghosh, S., Hooker, J.N., Bontempi, C., and Slatt, R.M., 2018. High-resolution stratigraphic characterization of natural fracture attributes in the Woodford Shale, Arbuckle Wilderness and US-77D Outcrops, Murray County, Oklahoma. Interpretation 6 (1), SC29-SC41. doi: 10.1190/int-2017-0056.1

Hooker, J.N., Abu-Mahfouz, I.S., Meng, Q., and Cartwright, J., 2018. Fractures in mudrocks: advances in constraining timing and understanding mechanisms. Journal of Structural Geology 125, 166-173. doi: 10.1016/j.jsg.2018.04.020

Hooker, J.N. and Cartwright, J., 2018. Dolomite overgrowths suggest a primary origin of cone-in-cone. Geological Magazine 155 (3), 568-585. doi: 10.1017/S0016756816000807

Hooker, J.N., Laubach, S.E., and Marrett, R., 2018. Microfracture spacing distributions and the evolution of fracture patterns in sandstones. Journal of Structural Geology 108, 66-79. doi: 10.1016/j.jsg.2017.04.001

Laubach, S.E., Hundley, T.H., Hooker, J.N., and Marrett, R., 2018. Spatial arrangement and size distribution of normal faults, Buckskin Detachment upper plate, Western Arizona. Journal of Structural Geology 108, 230-242.

Meng, Q., Hooker, J.N., and Cartwright, J., 2018. Displacive widening of calcite veins in shale: insights into the force of crystallization. Journal of Sedimentary Research 88, 327-343. doi: 10.2110/jsr.2018.18

Meng, Q., Hooker, J.N., and Cartwright, J., 2018. Role of pressure solution in the formation of bedding-parallel calcite veins in an immature shale (Cretaceous, southern UK). Geological Magazine, doi: 10.1017/S0016756818000377

Meng, Q., Hooker, J.N., and Cartwright, J., 2018. Quantifying vein attributes in massive mudstones (Triassic, SW England): implications for progressive evolution of opening-mode fracture networks. Marine and Petroleum Geology 98, 523-532.

Hooker, J.N., Cartwright, J., Stephenson, B., Silver, C., Dickson, A.J., and Hsieh, Y.-T., 2017. Fluid evolution in fracturing black shales, Appalachian Basin. AAPG Bulletin 101 (8), 1203-1238.

Hooker, J.N., Huggett, J.M., Cartwright, J., and Ali Hussein, M., 2017. Regional-scale development of opening-mode calcite veins due to silica diagenesis. Geochemistry, Geophysics, Geosystems, doi: 10.1002/2017GC006888

Huggett, J., Hooker, J.N., and Cartwright, J., 2017. Lithologic controls on diagenesis and diagenetic sequence in the Al Hasa phosphorite, Muwaqqar chalk marl, and Um Rijam chert formations, Jordan. Arabian Journal of Geosciences, doi: 10.1007/s12517-017-3038-5

Meng, Q., Hooker, J.N., and Cartwright, J., 2017. Early overpressuring in organic-rich shales during burial: evidence from fibrous calcite veins in the Lower Jurassic Shales-with-Beef member in the Wessex Basin, UK. Journal of the Geological Society, doi:10.1144/jgs2016-145

Meng, Q., Hooker, J.N., and Cartwright, J., 2017. Genesis of natural hydraulic fractures as an indicator of basin inversion. Journal of Structural Geology 102, 1-20. doi: 10.1016/j.jsg.2017.07.001

Meng, Q., Hooker, J.N., and Cartwright, J., 2017. Lithological control on fracture cementation in the Keuper Marl (Triassic), north Somerset, UK. Geological Magazine, doi: 10.1017/S001675681700070X

Hooker, J.N. and Katz, R.F., 2015. Vein spacing in extending, layered rock: the effect of synkinematic cementation. American Journal of Science 315, 557-588. doi: 10.2475/06.2015.03

Hooker, J.N., Larson, T.E., Eakin, A., Laubach, S.E., Eichhubl, P., Fall, A., and Marrett, R., 2015. Fracturing and fluid-flow in a sub-décollement sandstone; or, a leak in the basement. Journal of the Geological Society 172, 428-442. doi:10.1144/jgs2014-128

Stephenson, B., Cartwright, J., Hooker, J.N., and Hnat, J., 2015. What actually controls SRV? Three concepts to debate a stimulation or stimulate a debate! Society of Petroleum Engineers paper SPE-175909-MS, 10 p.

Hooker, J.N., Laubach, S.E., and Marrett, R., 2014. A universal power-law scaling exponent for fracture apertures in sandstones. Geological Society of America Bulletin 126 (9-10), 1340-1362. doi: 10.1130/B30945.1

Laubach, S.E., Eichhubl, P., Hargrove, P., Ellis, M.A., and Hooker, J.N., 2014. Fault core and damage zone fracture attributes vary along strike owing to interaction of fracture growth, quartz accumulation, and differing sandstone composition. Journal of Structural Geology 68, 207-226. doi: 10.1016/j.jsg.2014.08.007

Hesselbo, S.P., Bjerrum, C.J., Hinnov, L.A., MacNiocaill, C., Riding, J.B., van de Schootbrugge, B. and the Mochras Revisited Science Team [incl. Hooker, J.N.], 2013. Mochras borehole revisited: a new global standard for Early Jurassic earth history. Scientific Drilling 16, 81-91.

Hooker, J.N., Laubach, S.E., and Marrett, R., 2013. Fracture-aperture size—frequency, spatial distribution, and growth processes in strata-bounded and non-strata-bounded fractures, Cambrian Mesón Group, NW Argentina. Journal of Structural Geology 54, 54-71.

Hooker, J.N., Gomez, L., Laubach, S.E., Gale, J.F.W., and Marrett, R., 2012. Effects of diagenesis (cement precipitation) during fracture opening on fracture aperture-size scaling in carbonate rocks. *In* Garland, J., S.E. Laubach, J.E. Neilson and K.J. Whidden, eds., Advances in Carbonate Exploration and Reservoir Analysis, Geological Society of London Special Publication 370, 187-206.

Iñigo, J.F., Laubach, S.E., and Hooker, J.N., 2012. Fracture abundance and patterns in the Subandean fold and thrust belt, Devonian Huamampampa Formation petroleum reservoirs and outcrops, Argentina and Bolivia. Marine and Petroleum Geology 35 (1), 201-218. doi: 10.1016/j.marpetgeo.2012.01.010

Hooker, J.N., Laubach, S.E., Gomez, L., Marrett, R., Eichhubl, P., Diaz-Tushman, K., and Pinzon, E.A., 2011. Fracture size, frequency, and strain in the Cambrian Eriboll Formation sandstones, NW Scotland. Scottish Journal of Geology 47, 45-56.

Hooker, J.N., Laubach, S.E., Kaylor, A., Eichhubl, P., and Fall, A., 2011. Size, spacing, and opening history of natural fractures, preliminary results from El Alamar Formation, NE Mexico. Gulf Coast Association of Geological Societies Transactions 61, 233-243.

Eichhubl, P., Hooker, J.N., and Laubach, S.E., 2010. Pure and shear-enhanced compaction bands in Aztec Sandstone. Journal of Structural Geology 32, 1873-1886.

Hooker, J.N., and Laubach, S.E., 2010. Using empirical trends in fracture size-frequency data to constrain subsurface fracture abundance. *In* 44th U.S. Rock Mechanics Symposium and 5th U.S.–Canada Rock Mechanics Symposium Proceedings, Salt Lake City, June 27–30: ARMA 10-325, 11 p.

Hooker, J.N., 2009. Argentina, Texas, and minute fractures. *In* Laubach, S.E. and Tinker, S.W., eds., 2009. Earth's art: celebrating the Centennial of the Bureau of Economic Geology, 1909–2009: The University of Texas at Austin, Bureau of Economic Geology, 106-107.

Hooker, J.N., Gale, J.F.W., Gomez, L., Laubach, S.E., Marrett, R., and Reed, R.M., 2009. Aperture-size scaling variations in a low-strain opening-mode fracture set, Cozzette Sandstone, Colorado. Journal of Structural Geology 31, 707-718.

Hooker, J.N., and Laubach, S.E., 2007. The geologic history of quartz grains, as revealed by color SEM-CL. Gulf Coast Association of Geological Societies Transactions 57, 375-386.

Hooker, J.N., Marrett, R., and Laubach, S.E., 2002. Timing of faults and extension fractures in the Sierra Madre Oriental, northeastern Mexico. Gulf Coast Association of Geological Societies Transactions 52, 421-428.

Abstracts

Swami, V. and Hooker, J.N., 2021. Investigating Mineral Precipitation and Dissolution During CO_2 Injection. National Council for Science and the Environment Drawdown 2021 Conference.

Fisher, D.M. and Hooker, J.N., 2020. Role of fluid flow, silica kinetics, and fault zone strengthening in slip behavior within the seismogenic zone. AGU Fall Meeting, abstract T055-02.
Hooker, J.N. and Fisher, D.M., 2020. Exploring feedbacks between subduction-zone seismicity, mineral reactions, and fluid pressure using an integrated numerical model: MEFISTO. AGU Fall Meeting, abstract T040-0020.
Hooker, J.N., Marrett, R., and Laubach, S.E., 2020. Sandstone fracture clustering at the outcrop and microscopic scales. GSA Annual Meeting, abstract 46-2.
Fisher, D.M., Hooker, J.N., Smye, A., and Marone, C., 2019. Kinetic, mechanical, and fluid flow models for the behavior of the subduction interface. AGU Fall Meeting, abstract T43B-05.
Fisher, D.M., Smye, A.J., Hooker, J.N., and Marone, C., 2019. Silica kinetics and the formation and evolution of asperities along the subduction interface. GSA Annual Meeting, abstract 84-10.
Laubach, S.E., Wang, Q., Forstner, S., and Hooker, J.N., 2019. Chemical effects on opening-mode fracture size and spatial arrangement. GSA Annual Meeting, abstract 142-15.
Abu-Mahfouz, I.S., Hooker, J.N., Gross, M.R., and Cartwright, J., 2018. Natural fracture systems in mudrocks (Upper Cretacous–Eocene), Jordan. The Petroleum Group Conference, The Geology of Fractured Reservoirs, The Geological Society, London, October 24–25.
Fisher, D.M., Smye, A., Hooker, J.N., Oakley, D.O., and Yamaguchi, A., 2018. Silica kinetics and subduction zone slip behavior. AGU Fall Meeting, abstract T11C-08.
Hooker, J.N., Fisher, D.M., and Oakley, D.O., 2018. Modeling diagenesis on subduction interfaces. AGU Fall Meeting, abstract T21E-1592.
Laubach, S.E., Olson, J.E., Lander, R.H., and Hooker, J.N., 2017. Chemical-mechanical feedback and fracture size and spacing patterns. Deformation Mechanisms, Rheology, and Tectonics 21st International Meeting, programme p. 85.
Hooker, J.N. and Cartwright, J., 2015. Kinematics of cone-in-cone growth, with implications for timing and formation mechanism. AGU Fall Meeting, abstract MR41B-2639.
Eichhubl, P. and Hooker, J.N., 2013. Fracture reactivation in chemically reactive rock systems. AGU Fall Meeting, abstract MR24A-05.
Fall, A., Ukar, E., Eichhubl, P., and Hooker, J.N., 2013. Outcrop to core comparison of natural fractures in a tight gas sandstone reservoir, Alberta Foothills, Canada. *In* American Association of Petroleum Geologists Annual Convention and Exhibition, Pittsburgh, Pennsylvania, May 19–22, abstracts, CD-ROM.
Hooker, J.N. and Laubach, S.E., 2013. Natural fracturing, by depth. Geophysical Research Abstracts 15, Abstract No. EGU2013-13725.
Ukar, E., Eichhubl, P., Fall, A., and Hooker, J.N., 2013. Structural-diagenetic controls on fracture opening in tight gas sandstone reservoirs, Alberta Foothills. Geophysical Research Abstracts 15, Abstract No. EGU2013-13327.
Hooker, J.N. and Laubach, S.E., 2012. Diagenetic controls on fracture size distributions. Geological Society of America Abstracts with Programs 44 (7), 594.
Ukar, E., Eichhubl, P., Fall, A., and Hooker, J.N., 2012. Structural-diagenetic controls on fracture opening in tight gas sandstone reservoirs, Alberta Foothills. EOS 93 (52), fall meeting supplement, Abstract No. T21A-2555.
Hooker, J.N., Eichhubl, P., and Laubach, S. E., 2012. Reconstructing the growth of a fracture set using fluid inclusion microthermometry, El Alamar Formation (Triassic), NE Mexico. EOS 93 (52), fall meeting supplement, Abstract No. T21A-2556.
Eichhubl, P., Gale, J.F.W., Olson, J., Laubach, S.E., Hooker, J.N., Fall, A., Weisenberger, T., and Ukar, E., 2012. What can outcrop and core based observations tell us about natural fractures in unconventional reservoirs? American Association of Petroleum Geologists, Annual Convention, Abstract 1236894.

Weisenberger, T., Fall, A., Hooker, J.N., Eichhubl, P., Laubach, S.E., and Davis, J.S., 2012. Predicting fracture porosity degradation by calcite cement in Mesaverde Group sandstones, Piceance Basin, Canada. American Association of Petroleum Geologists, Annual Convention, Abstract 1232574.

Hooker, J.N., Eichhubl, P., Xu, G., Ahn, H., Fall, A., Hargrove, P., Laubach, S.E., and Ukar, E., 2011. Effects of fracture reactivation and diagenesis on fracture network evolution: Cambrian Eriboll Formation, NW Scotland. EOS 92 (52), fall meeting supplement, Abstract No. H21B-1097.

Hooker, J.N., Laubach, S.E., Gale, J.F.W., and Gomez, L.A., 2011. Crack-seal deformation and the development of power-law size distributions of fractures in sedimentary rocks. AAPG International Conference and Exhibition, Milan, Italy, 23–26 October, AAPG Search and Discovery Article 90135.

Hooker, J.N., Fall, A., Kaylor, A., Xu, G., Ahn, H., Eichhubl, P., and Laubach, S.E., 2011. Predicting open natural fractures in unconventional sandstone reservoirs: spatial distribution, diagenesis, timing, and opening rates. American Association of Petroleum Geologists Annual Convention and Exhibition Abstracts Volume 20, 85–86.

Maybin, N.A., Hooker, J.N., Ahn, H., Laubach, S.E., and Marrett, R., 2011. Microstructure of a fault zone—Cambrian Mesón Group, NW Argentina. 30th Annual NABGG Technology Conference, San Francisco, September 8, 2011.

Hooker, J.N., Gale, J.F.W., Gomez, L.A., Laubach, S.E., and Reed, R.M., 2010. The relationship between fracture cement patterns and fracture-set size distributions in carbonate rocks (extended abstract). The Petroleum Group Conference, Advances in Carbonate Exploration and Reservoir Analysis, The Geological Society, London, November 4–5, p. 87–89.

Eichhubl, P., Hooker, J.N., Fall, A., and Laubach, S.E., 2010. Strain rates of opening-mode fractures in deep basinal settings. European Geosciences Union-Geophysical Research Abstracts 12, Abstract No. EGU2010-5645.

Kaylor, A., Eichhubl, P., Laubach, S.E., Fall, A., and Hooker, J.N., 2010. A fluid inclusion and cathodoluminescence approach to model fracture growth in the Triassic-Jurassic La Boca Formation, Northeastern Mexico. Geological Society of America Abstracts with Programs 42 (5), 472.

Kaylor, A., Laubach, S.E., Fall, A., and Hooker, J.N., 2010. A fluid inclusion and cathodoluminescence approach to model fracture growth in the Triassic-Jurassic La Boca Formation, northeastern Mexico. GSA Denver Annual Meeting, October 31–November 3, Paper No. 194-2.

Eichhubl, P., Fall, A., Hooker, J.N., Davis, J.S., Becker, S.P., Laubach, S.E., and Bodnar, R.J., 2010. Timing and stratigraphic distribution of natural fractures in tight gas reservoirs in the Piceance Creek field, Colorado, USA, based on fluid inclusion and fracture scaling analyses. AAPG International Conference: The geology of unconventional gas plays: The Geological Society, London, October 5–6, p. 51.

Hooker, J. N., 2009. Fracture-size scaling patterns in the Cambrian Mesón Group, Argentina. Geological Society of America Annual Meeting, Portland, October 18–21, Paper No. 173-14.

Lander, R.H., Solano-Acosta, W., Thomas, A.R., Reed, R.M., Kacewicz, M., Bonnell, L.M., and Hooker, J.N., 2009. Simulation of fault sealing from quartz cementation within cataclastic deformation zones. AAPG Hedberg Conference, Basin and Petroleum Systems Modeling: New Horizons in Research and Applications, May 3-7, 2009, Napa, California, U.S.A. AAPG Search and Discovery Article 90091.

Eichhubl, P., Laubach, S.E., Hooker, J.N., and Fall, A., 2009. 10-19 s^{-1}. EOS Transactions AGU 90 (52), Fall meeting supplement, Abstract T41E-02.

Becker, S.P., Hooker, J.N., Eichhubl, P., Laubach, S.E., Lander, R.H., Bonnell, L., Reed, R.M., and Fall, A., 2009. History of fracture development and diagenesis in Piceance Basin tight gas reservoirs: insights from fluid inclusion and fracture scaling analyses. AAPG Annual Convention 18, p. 18.

Hooker, J.N., Gale, J.F.W., Laubach, S.E., Gomez, L., Marrett, R., and Reed, R.M., 2007. Power-law scaling of fracture aperture sizes in otherwise undeformed foreland basin sandstone: an example from the Cozzette Sandstone, Piceance Basin, Colorado. EOS 88 (52), Fall meeting supplement, Abstract T42C-01.

Hooker, J.N., Laubach, S.E., Gale, J.F.W., and Reed, R.M., 2006. Microfractures in sandstone. AAPG Annual Convention 15, p. 49.

Reed, R.M., Laubach, S.E., and Hooker, J.N., 2003. The role of quartz-lined microfractures in sandstone diagenesis. Austin Geological Society Newsletter 37 (6), 12–13.

Reed, R.M., Laubach, S.E., Clift, S.J., Hooker, J.N., and Makowitz, A., 2002. Macrofractures, microfractures, and fracture-cement relations in Permian sandstones from the Val Verde Basin, West Texas. Geological Society of America Abstracts with Programs 34 (3), A11.

Reed, R.M., Laubach, S.E., and Hooker, J.N., 2002. The role of quartz-lined microfractures in sandstone diagenesis. Geological Society of America Abstracts with Programs 34 (6), A372.

Contract Reports

Fomel, S., Eichhubl, P., Klokov, A., Olson, J.E., Sheibani, F., Laubach, S.E., Weisenberger, T., Hooker, J.N., and Fall, A., 2014. Multiazimuth seismic diffraction imaging for fracture characterization in low-permeability gas formations. Report prepared for the Research Partnership to Secure Energy for America (RPSEA), 168 p.

Hooker, J.N. and Katz, R.F., 2014. Numerical modelling of the effects of synkinematic cement on fracture spacing in layered rock. Shell-Oxford Research Note No. 1. Internal report prepared for Shell, 35 p.

Hooker, J.N., Laubach, S.E., Weisenberger, T., Olson, J., and Holder, J., 2012. Microstructure and diagenesis of Lajas Formation core samples, Neuquen Basin: The University of Texas at Austin, Bureau of Economic Geology, Fracture Research and Application Consortium, report prepared for YPF, 38 p.

Hooker, J.N., 2008. Quintuco core examination report: The University of Texas at Austin, Bureau of Economic Geology, confidential report prepared for YPF S.A., 14 p.

Hooker, J.N., Eichhubl, P., Reed, R.M., and Laubach, S.E., 2006. Wind River Basin study: initial analysis of Tensleep Formation: The University of Texas at Austin, Bureau of Economic Geology, topical report prepared for FRAC Industrial Associates, 13 p.

Hudec, M.R., Jackson, M.P.A., Dooley, T., Hooker, J.N., Wood, L.J., and Montoya, P., 2006. Applied Geodynamics Laboratory annual report to Industrial Associates for 2005: slide set 24: The University of Texas at Austin, Bureau of Economic Geology, contract report prepared for Amerada Hess, Anadarko Petroleum Corporation, BHP Billiton, BP Production, Chevron, ConocoPhillips, ENI, EnCana, ExxonMobil, Hydro Oil and Energy, Marathon Oil Company, Petrobras, Repsol, Shell, Total, and Woodside, CD-ROM.

Jackson, M.P.A., Dooley, T., and Hooker, J.N., 2005. Fault intensity around exposed salt diapirs: The University of Texas at Austin, Bureau of Economic Geology, final report prepared for BP, 14 p. + apps.

Gale, J.F.W., Hooker, J.N., Laubach, S.E., and Reed, R.M., 2005. Fracture analysis of Frontier Fm. Samples: The University of Texas at Austin, Bureau of Economic Geology, Fracture Research and Application Consortium, case study reports prepared for Shell, 13 p.

Gale, J.F.W., Reed, R.M., Hooker, J.N., and Holder, J., 2004. Fracture analysis of metamorphic rocks from Dorozsma field, Hungary: The University of Texas at Austin, Bureau of Economic Geology, final case study report prepared for Schlumberger, 17 p. + apps.

Gale, J.F.W., Reed, R.M., Gomez, L.A., Hooker, J.N., Holder, J., and Rijken, P., 2004. Fracture analysis of Cretaceous carbonates from Gaviota field, N. Spain: The University of Texas at Austin, Bureau of Economic Geology, final report prepared for RepsolYPF Gaviota Vield Project, 13 p. + apps.

Gale, J.F.W., Reed, R.M., Gomez, L.A., Rijken, P., and Hooker, J.N., 2004. Deep valley fracture analysis project, pilot study: The University of Texas at Austin, Bureau of Economic Geology, report of findings prepared for Fracture Research and Application Consortium in collaboration with Tom Brown, Inc. (Midland), 15 p. + apps.

Theses
Fault timing in the Sierra Madre Oriental, northeastern Mexico. (Master's, 2004)
Fracture scaling and diagenesis. (PhD, 2012)

Research Support

Gladys Snyder Education Grant ($4800, declined), 2021

GDL Foundation Fellowship ($7500), 2018

Science team member: ICDP project 'Integrated understanding of the early Jurassic earth system and timescale' (PI Steve Hesselbo, U. of Exeter, £1.5 million), 2015

GDL Foundation Fellowship ($2500), 2009

Co-PI: Cathodoluminescence of sandstone microfractures, JSG Seed Grant ($19,000), 2006

AAPG Grant-In-Aid ($1500), 2002

Lecturing and Supervision

Student supervision
Swami, Varsha (Bachelor's, 2020). Thesis: Experimental carbonation of olivine sand for mineral CO_2 sequestration. Penn State University.

Hoyt, Emily (Bachelor's, 2019). Thesis: Investigating mechanisms for stratified layer-parallel fractures in Coburn Formation limestone. Penn State University.

Abu-Mahfouz, Isra'a (Ph.D., 2019). Thesis: Genesis of natural fracture systems in mudrocks (Upper Cretaceous – Eocene), Jordan. University of Oxford (Co-supervised with J. Cartwright).

Smith, Jonathan (Master's, 2015). Thesis: Fracture patterns in stratified rock: observations and numerical models. University of Oxford (Co-supervised with R. Katz).

Assistant teaching
Introduction to geology, The University of Texas at Austin, Fall 2000

Geology in the field, The University of Texas at Austin, Spring 2001

Tutorial lectures
Lecture title: Evaporites and basin structural evolution.
St Anne's College, Oxford, Michaelmas term 2013
St Edmund Hall, Oxford, Michaelmas term 2013

Lecture title: Major problems in chert formation.
University College, Oxford, Trinity term 2015
St Anne's College, Oxford, Trinity term 2015
University College, Oxford, Trinity term 2016

Presentations and Addresses

Modeling the effects of mineral precipitation on subduction zone dynamics: invited seminar speaker, Appalachian State University, February 19, 2021.

Natural fracture size scaling: Current methods and future directions: Fracture Research and Application Consortium Annual Meeting, November 9, 2020.

Models of the subduction interface motivated by field observations: presented at Penn State Geosciences Geodynamics Seminar (with D.M. Fisher and D.O. Oakley), March 1, 2018.

Effects of diagenesis on fracture pattern-evolution; or, Why fracture cement is important: presented at Penn State Geosciences Geodynamics Seminar, September 7, 2017.

Effects of diagenesis on fracture opening and pattern-evolution: invited seminar speaker, the Lyell Center, Heriot-Watt University, Edinburgh, Scotland, May 18, 2017.

Chemical-mechanical feedback and fracture size and spacing patterns: presented at the Deformation Mechanisms, Rheology, and Tectonics 21st International Meeting, Inverness, Scotland, May 4, 2017.

Fracture research in mudrocks, with emphasis on the Jordanian oil shales: technical presentation to JOSCo, Amman, Jordan, April 22, 2015.

Cone-in-cone formation: NIGL research seminar, British Geological Survey, Keyworth, UK, February 20, 2015.

Natural fracturing, by depth. Poster presented at European Geosciences Union Annual Meeting, Vienna, Austria, April 7–12, 2013.

Estimating subsurface fracture spacing using microscopic fractures: Bureau of Economic Geology research seminar, The University of Texas at Austin, Austin, Texas, March 23, 2012.

Geologic fracture scaling: Department of Geological Sciences Technical Seminar, The University of Texas at Austin, February 15, 2011.

The relationship between fracture cement patterns and fracture-set size distributions in carbonate rocks: presented at Advances in Carbonate Exploration and Reservoir Analysis, The Geological Society of London Conference, London, UK, November 4–5, 2010.

Using empirical trends in fracture size-frequency data to constrain subsurface fracture abundance: presented at 44th U.S. Rock Mechanics Symposium and 5th U.S.-Canada Rock Mechanics Symposium, Salt Lake City, Utah, June 27–30, 2010.

Fracture intensity in tectonically quiescent basins: what information can be derived from core samples?: presented at Asosiacion Mexicana de Geologos Petroleros Simposio: Nuevas Tendencias en la Caracterizacion y Explotacion de Yacimientos Fracturados, Villahermosa, Tabasco, Mexico, November 22, 2009.

Fracture Research and Application Consortium: presented to RepsolYPF (with J.E. Olson), Buenos Aires, Argentina, May 2008.

Color SEM-CL as a quartz grain provenance indicator: presented at Bureau of Economic Geology Research Seminar, The University of Texas at Austin, Austin, Texas, November 2007.

SEM-CL and fracture scaling; or, Too many microfractures!: Bureau of Economic Geology research seminar, The University of Texas at Austin, Austin, Texas, April 21, 2006.

Quartz grain provenance using SEM-CL: presented at JSG Seed Grant Workshop (with S.E. Laubach), Austin, Texas, April 7, 2006.

Committee Responsibilities and Professional Activities

Member, Sustainability in Education Committee, UIW, 2021–present

Member, Penn State Unlearning Racism in the Geosciences (URGE) pod, 2021

Co-Chair (with H. Riegel), Topical Session T23, A Multidisciplinary View of Brittle Structures in Layered Rock, Geological Society of America Annual Meeting, October 2020

Faculty Mentor, Imperial Barrel Award competition, Penn State Geosciences, Spring 2020

- First Place, Eastern (U.S.) Section

Faculty Mentor, Project Drawdown Scholar (Eduardo Granata-Rodriguez), Project Title: Enhancing the impact of Gen Ed-level environmental science at Penn State using Drawdown solutions, Summer 2019

Demonstration Leader, Junior Education Day, Nittany Mineralogical Society, March 2019

Review Board Member, GDL Foundation grants and fellowships, October 2014–present

Postdoctoral Representative, Workplace and Equality Committee, University of Oxford Department of Earth Sciences, September 2014–July 2017

Member of Common Room, Wolfson College, Oxford, March 2013–July 2017

Reservoir Geomechanics online course certification, Stanford University, June 2015

Convenor, Annual Meeting Oral and Poster Session, Faulted and fractured reservoirs: structure and uncertainty, mechanics, reactions and flow, European Geosciences Union, April 2013

Judges Chair, Gulf Coast Association of Geological Societies Annual Meeting, October 2012

Co-Chair, Symposium Oral Session, Discontinuties I, American Rock Mechanics Association, June 2010

Co-Chair, National Convention Poster Session, Integration of Structural Geology on a Range of Scales, American Association of Petroleum Geologists, April 2008

Co-Chair, Fall Meeting Oral Session, Deformation of Sediment and Sedimentary Rock at Scales from Grains to Basins: Field and Laboratory Observations, Theoretical and Numerical Models IV, American Geophysical Union, December 2007

Journal Reviewer:

AAPG Bulletin
Geological Magazine
Geological Society [London] Special Publications
Geology
Geophysical Journal International
GSA Bulletin
International Journal of Earth Sciences
Journal of Geochemical Exploration
Journal of Geophysical Research
Journal of Petroleum Science and Engineering
Journal of Structural Geology
Marine and Petroleum Geology
Results in Geophysical Sciences
Sedimentology
SPE Reservoir Evaluation & Engineering-Formation Evaluation
Tectonophysics
Water Resources Research

Grant Proposal Reviewer:

National Science Foundation