

Derek Elsworth

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Professional Preparation/Education

Portsmouth Polytechnic, Portsmouth, UK, Engineering Geology, B.Sc. (1979)
Imperial College, London, UK, Engineering Rock Mechanics, M.Sc., DIC (1980)
University of California, Berkeley, Engineering, Ph.D. (1984)

Appointments/Professional Experience:

1997 - Pres. Professor, Energy and Mineral Engineering, Pennsylvania State University.
2000 - 2003 Associate Dean for Research, College of Earth & Mineral Sciences, Penn State
1991 - 1997 Associate Professor, Mineral Engineering, Pennsylvania State University.
1985 - 1991 Assistant Professor, Mineral Engineering, Pennsylvania State University.
1990 - 1993 Adjunct Professor, Earth Sciences and WCGR, University of Waterloo.
1984 - 1984 Visiting Assistant Professor, Civil Engineering, University of Toronto.
1984 Research Associate, Lawrence Berkeley Laboratory.
1980 - 1982 Engineer D.R. Piteau and Assocs., and Komex Consultants. Calgary, Canada.

Publications Related to Proposal

- Sang, G., Liu, S., Elsworth, D., Yang, Y., Fan, L. (2020) Evaluation and modelling of water vapor sorption and transport in nanoporous shale. *Int. J. Coal Geol.* Vol. 228, 103553. <https://doi.org/10.1016/j.coal.2020.103553>
- Numerical simulation of an in-situ fluid injection experiment into a fault using coupled X-FEM analysis. *R. Mech. R. Eng.* <https://doi.org/10.1007/s00603-020-02301-1>
- Sang, G., Liu, S., Elsworth, D., Zhang, R., Bleuel, M. (2020) Pore-scale water vapor condensation behaviors in shale: an experimental study. *Transp. in Porous Media.* Vol. 135, pp. 713-734. <https://doi.org/10.1007/s11242-020-01497-8>
- Li, W., Liu, J., Zeng, J., Leong, Y.-K., Elsworth, D., Tian, J., Li, L. (2020) A fully coupled multidomain and Multiphysics model for evaluation of shale gas extraction. *Fuel.* Vol. 278. 118214. <https://doi.org/10.1016/j.fuel.2020.118214>
- Chen, Z., Elsworth, D., Wang, M. (2020) Does low-viscosity fracturing fluid always create complex fractures. *J. Geophys. Res.*, Vol. 125. e2020JB020332. <https://doi.org/10.1029/2020JB020332> pdf
- Shokouhi, P., Jin, J., Wood, C., Rivière, Madara, B., Elsworth, D., Marone, C. (2020) Dynamic stressing of naturally fractured rocks: on the relation between transient changes in permeability and elastic wave velocity. *Geophys. Res. Lett.* Vol. 47. E2019GL083557. <https://doi.org/10.1029/2019GL083557>
- Im, K.J., Elsworth, D., Wang, C. (2019) Cyclic permeability evolution during repose then reactivation of fractures and faults. *J. Geophys. Res.*, Vol. 124, pp. 4492-406. <https://doi.org/10.1029/2019JB017309>
- Wang, C., Elsworth, D., Fang, Y. (2019) Ensemble shear strength, stability, and permeability of mixed mineralogy fault gouge recovered from 3D granular models. *J. Geophys. Res.* Vol. 124. <https://doi.org/10.1029/2018JB016066>
- Fang, Y., Elsworth, D., Wang, C., Jia, Y. (2018) Mineralogical controls on frictional strength, stability and shear permeability evolution of fractures. *J. Geophys. Res.* Vol. 123. <https://doi.org/10.1029/2017JB015338>

- Im, K.J., Elsworth, D., Fang, Y. (2018) The influence of preslip sealing on the permeability evolution of fractures and faults. *Geophys. Res. Lett.*, Vol. 45. <https://doi.org/10.1002/2017GL076216>
- Wang, C., Elsworth, D., Fang, Y. (2017) Influence of weakening minerals on the ensemble strength and slip stability of faults. *J. Geophys. Res.* Vol. 122. pp 7090-7110. <http://dx.doi.org/10.1002/2016JB013687>
- Fang, Y., Elsworth, D., Wang, C., Ishibashi, T., Fitts, J.P. (2017) Frictional stability-permeability relationships for fractures in shales. *J. Geophys. Res.* , Vol. 122, pp. 1760-1776. <http://dx.doi.org/10.1002/2016JB013435>
- Guglielmi, Y., Cappa, F., Avouac, J.-P., Henry, P., Elsworth, D. (2015) Seismicity triggered by fluid-injection-induced aseismic slip. *Science*. Vol. 348, pp. 1224-1226. <http://dx.doi.org/10.1126/science.aab0476>

Synergistic Activities

Recent Keynotes: [2019]

Int. Forum on Unconventional Energy. Henan Polytechnic Uni., Jiaozuo, China
 10th Int. Conf. on Field Exploration and Development. Xi'an, China
 6th Int. Conf. on Unconventional Geomechanics. Beijing;
 1st Summit on Deep Earth Drilling and Resource Development. China University of Geosciences, Wuhan
 27th ISRM Online Lecture. <https://www.isrm.net/gca/?id=1385> [Invited]
 ARMA-CUPB Geothermal International Conference, Beijing
 Int. Symp. on Multi-Physics Study of Hydro-Dynamically Induced Landslides: Lille, France
 Int. Conf. on Energy Resources, Environment and Sustainable Development, Xuzhou
 International Young Scholars Forum on Physics and Chemistry in Geomaterials. Wuhan, China
 Int. Conf. on Geothermal Development in China. Weifang, China
 [2018] *Six*; [2017] *Four*; [2016] *Five*; [2015] *Four*.

Recently Convened Meetings:

Co-Convener, 6th *Unconventional Geomechanics Symposium*, CUMT-Beijing, China. 2019.
 Co-Convener, 4th *Unconventional Geomechanics Symposium*, Shenyang, China. 2017.
 Convener ARMA-AAPG-SedHeat Workshop on “*Sedimentary Geothermal Systems.*” June 2016.
 Co-Convener Penrose Conference on “*Geothermal Fluids in Deep Sedimentary Basins.*” October 2013.

Recent Advisory Activities:

Stanford University – DOE - Energy Frontiers Research Center, External Advisory Board (2018-).
 China Jinping International Physics Laboratory, International Advisory Committee (2016-).
 National Academy (NASSEM) Committee on Geological and Geotechnical Engineering (2016-2018).
 President, ARMA Foundation (2014-).
 ARMA, Chair of Fellows (2011-2018).
 Mine Safety and Health Research Advisory Committee, DHHS (2011-2013).

Honorary Appointments:

2019 – Adjunct Professor, Shandong University, Jinan, China
 2018 – Visiting Professor, IROAST, Kumamoto University, Japan
 2018 – Adjunct Professor, China University of Mining and Technology, Beijing
 2017 – Adjunct Professor, Henan Polytechnic University, Jiazhou, China
 2016 Darcy Professor, Utrecht University, Netherlands
 2016 – 2023 Adjunct Professor, Northeastern University, Shenyang, China
 2014 – 2020 Adjunct Professor, Chinese Academy of Sciences, Wuhan, China