

Curriculum Vitae Yingqi Zhang

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EDUCATION

- 2002 **Doctorate**, *University of Vermont (UVM), Burlington, Vermont*
Major field: Hydrogeology
- 1995 **Master**, *Tsinghua University, Beijing, China*
Major field: Hydrology and Water Resources
- 1993 **Bachelor**, *Tsinghua University, Beijing, China*
Major field: Hydraulic & Hydropower Construction Engineering
Minor field: Electronics and Computer Technology

PROFESSIONAL TRAINING

- 2016 DOE Lab-Corps – Creating Market Pathways for Laboratory
Research, NREL
- 2012 UC Berkeley & Berkeley Lab 2012 Leadership Development Program,
UC Berkeley Center for Executive Education

RESEARCH INTERESTS

Numerical modeling of multiphase flow in porous media; optimization; parameter estimation; geostatistical methods; uncertainty and risk analysis; and system-level modeling.

Applications include geological carbon sequestration; underground natural gas storage; geothermal exploration; groundwater monitoring network design; subsurface energy storage; environmental remediation and nuclear waste management.

PROFESSIONAL EXPERIENCE

- since 2006 **Geological Scientist**, *Energy Geosciences Division,
Lawrence Berkeley National Laboratory, Berkeley, California*
- 2003 – 2006 **Post-Doctoral Fellow**, *Earth Sciences Division,
Lawrence Berkeley National Laboratory, Berkeley, California*
- 1998 – 2002 **Research Assistant**, *Department of Civil and Environmental
Engineering, University of Vermont (UVM), Burlington, VT*
- 1996 – 1998 **Project Engineer**, “Southern China Strategic Energy Planning
Project”, *Hydraulic Design and Planning Institute, Beijing, China*

SYNERGISTIC ACTIVITIES

POC of iTOUGH2 and TOUGH3

Instructor “TOUGH Short Course”: LBNL (2012~2018)

Instructor “iTOUGH Short Course”: LBNL (2012)

Guest Lecturer, “Advanced Course in Optimization of Subsurface Source Finding, Monitoring Well Network and Remediation,” HGL, Feb 8th, 2010.

PEER-REVIEWED JOURNAL PUBLICATIONS

Ren, J., Y. Wang, and **Y. Zhang**, A numerical simulation of a dry-out process for CO₂ sequestration in heterogeneous deep saline aquifers, *Greenhouse Gases Science and Technology*, <https://doi.org/10.1002/ghg.1821>, 2018

Zhang, Y., Y. Jung, B. Freifeld, and S. Finsterle, Using distributed temperature sensing to detect CO₂ leakage along the injection well casing, *Int. J. Greenhouse Gas Control*, doi: 10.1016/j.ijggc.2018.04.011, 2018.

Tokunaga, T. K., W. Shen, J. Wan, Y. Kim, A. Cihan, **Y. Zhang**, and S. Finsterle, Water Saturation Relations and Their Diffusion-Limited Equilibration in Gas Shale: Implications for Gas Flow in Unconventional Reservoirs, *Water Resource Research*, <https://doi.org/10.1002/2017WR021153>, 2017

D. L. Siler, **Y. Zhang**, N. F. Spycher, P. F. Dobson, J. S. McClain, E. Gasperikova, R. A. Zierenberg, P. Schiffman, C. Ferguson, A. Fowler, C. Cantwell, Play-fairway analysis for geothermal resources and exploration risk in the Modoc Plateau region. *Geothermics* 29, <http://dx.doi.org/10.1016/j.geothermics.2017.04.003>, 2017

Sun, X., Q. Han, **Y. Zhang**, C. Feng, X. Liu, and W. Gong, Experimental Investigation of Laws during Floor Heave of Circular Roadway in 10° Inclined Rock, *Advances in Materials Science and Engineering*, <https://doi.org/10.1155/2017/3503602>, 2017

Blanco-Martin, L., J. Rutqvist, C. Doughty, **Y. Zhang**, S. Finsterle, and C.M. Oldenburg, Coupled geomechanics and flow modeling to investigate thermally induced compaction of diatomite in heavy oil reservoirs produced using cyclic steaming, *Journal of Petroleum Science and Engineering*, doi:10.1016/j.petrol.2016.09.002, 2016.

Finsterle, S., M. Commer, J. Edmiston, Y. Jung, M.B. Kowalsky, G.S.H. Pau, H. Wainwright, and **Y. Zhang**, iTOUGH2: A simulation-optimization framework for analyzing multiphysics subsurface systems, *Computers and Geosciences*, doi:10.1016/j.cageo.2016.09.005, 2016

R. J. Pawar, G. Bromhal, S. Chu, R. M. Dilmore, C. Oldenburg, P. Stauffer, **Y. Zhang**, G. Guthrie, The National Risk Assessment Partnership’s Integrated Assessment Model for Carbon Storage: A Tool to Support Decision Making Amidst Uncertainty, *Int. J. Greenhouse Gas Control*, 52, <http://dx.doi.org/10.1016/j.ijggc.2016.06.015>

Zhang, Y., C. M. Oldenburg, and L. Pan, Fast estimation of dense gas dispersion from multiple continuous CO₂ surface leakage sources for risk assessment, *Int. J. Greenhouse Gas Control*, 49, <http://dx.doi.org/10.1016/j.ijggc.2016.03.002>. 2016

- Zhang, Y.**, Y. Liu, G. Pau, S. Oladyskin, and S. Finsterle, Evaluation of multiple reduced-order models to enhance confidence in global sensitivity analyses, *Int. J. Greenhouse Gas Control.*, 49. <http://dx.doi.org/10.1016/j.ijggc.2016.03.003>. 2016
- Pau, G.S.H., S. Finsterle, and **Y. Zhang**, Fast high-resolution prediction of multi-phase flow in fractured formations. *Advances in Water Resources* 88, 80–85, 2016.
- Fan, R., Y. Gao, Y. Pan, and **Y. Zhang**, Research on cool injection and extraction performance of borehole cool energy storage for ground coupled heat pump system, *Energy and Buildings*, [doi:10.1016/j.enbuild.2015.05.006](https://doi.org/10.1016/j.enbuild.2015.05.006), 101, 2015.
- Pau, G.S.H., **Y. Zhang**, S. Finsterle, H. Wainwright, and J. Birkholzer, Reduced order modeling in iTOUGH2, *Computers & Geosciences*, [doi:10.1016/j.cageo.2013.08.008](https://doi.org/10.1016/j.cageo.2013.08.008), 2013
- Pau, G. S. H., **Y. Zhang** and S. Finsterle, Reduced order models for many-query subsurface flow applications, *Comput Geosci.* 17:705–721 DOI 10.1007/s10596-013-9349-z. 2013
- Finsterle S., **Y. Zhang**, L. Pan, P. Dobson and K. Oglesby, Microhole arrays for improved heat mining from enhanced geothermal systems. *Geothermics* 47 104– 115, 2013
- Zhang, Y.**, L. Pan, K. Pruess and S. Finsterle, A time-convolution approach for modeling heat exchange between a wellbore and surrounding formation, *Geothermics* 40, 261-266, 2011
- Zhang, Y.**, Using the Choquet integral for screening geological CO₂ storage sites, *Greenhouse Gas Sci Technol.* 1:1–5; DOI: 10.1002/ghg, 2011.
- Zhang, Y.**, H. Liu, and J. Houseworth, A Modified Generalized Likelihood Uncertainty Estimation (GLUE) Methodology for Considering the Subjectivity of Likelihood Function Selection, *Journal of Hydrologic Engineering*, Vol. 16, No. 6, June 1, 2011
- Zhang, Y.**, S. Hubbard, and S. Finsterle, A Numerical Study on Sustainable Groundwater Pumping near Rivers, *Ground Water*, DOI: 10.1111/j.1745-6584.2010.00743.x, Vol. 49, No. 3, May-June 2011.
- Finsterle, S., and **Y. Zhang**, Solving iTOUGH2 simulation and optimization problems using the PEST protocol, *Environmental Modelling and Software*, 26, 959–968, [10.1016/j.envsoft.2011.02.008](https://doi.org/10.1016/j.envsoft.2011.02.008), 2011.
- Finsterle, S. and **Y. Zhang**, Error handling strategies in multiphase inverse modeling, *Computers and Geosciences*, [doi:10.1016/j.cageo.2010.11.009](https://doi.org/10.1016/j.cageo.2010.11.009), 2010
- Zhang, Y.**, B. Freifeld, S. Finsterle, et al., Single-well experimental design for studying residual trapping of supercritical carbon dioxide, *Int. J. Greenhouse Gas Control*, [doi:10.1016/j.ijggc.2010.06.011](https://doi.org/10.1016/j.ijggc.2010.06.011), 2010
- Zhang, Y.**, C.M. Oldenburg, and S. Finsterle, Percolation-Theory and Fuzzy Rule-Based Probability Estimation of Fault Leakage at Geologic Carbon Sequestration Sites, *Environ. Earth Sci.*, [doi: 10.1007/s12665-009-0131-4](https://doi.org/10.1007/s12665-009-0131-4). Feb. 2010.
- Apps, J. A., L. Zheng, **Y. Zhang**, T. Xu and J. T. Birkholzer, Evaluation of Potential Changes in Groundwater Quality in Response to CO₂ Leakage from Deep Geologic Storage, *Transp Porous Med.*, DOI 10.1007/s11242-009-9509-8, Jan. 2010

- Zheng, L., J. A., Apps, **Y. Zhang**, T. Xu and J. T. Birkholzer, On mobilization of lead and arsenic in groundwater in response to CO₂ leakage from deep geological storage, *Chemical Geology* 268, 281–297, doi:10.1016/j.chemgeo.2009.09.007. 2009.
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- Zhang, Y.**, C. M. Oldenburg, S. Finsterle, and G. S. Bodvarsson. System-level modeling for economic evaluation of geological CO₂ storage in gas reservoirs. *Energy Conservation and Management*. doi:10.1016/j.enconman.2007.01.018. 2007
- Liu, H., **Y. Zhang**, and F. J. Molz, Scale Dependence of the Effective Matrix Diffusion Coefficient: Some Analytical Results, *Vadose Zone Journal*, 6: 679-683. 2007
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- Zhang, Y.**, H. Liu, Q. Zhou, and S. Finsterle, Effects of Diffusive Property Heterogeneity on Effective Matrix Diffusion Coefficient for Fractured Rock, *Water Resour. Res.* VOL. 42, W04405, doi:10.1029/2005WR004513, 2006.
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- Zhang, Y.**, G. F. Pinder and G. S. Herrera, Least Cost Design of Groundwater Quality Monitoring Networks. *Water Resour. Res.*, 41, W08412, doi:10.1029/2005WR003936, 2005.
- Zhang, Y.**, C. M. Oldenburg and S.M. Benson, Vadose Zone Remediation of Carbon Dioxide Leakage from Geologic Carbon Dioxide Sequestration Sites, *Vadose Zone Journal*, 3:858–866, 2004.
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BOOK CHAPTERS

Oldenburg, C., S. Bryant, JP Nicot, N. Kumar, **Y. Zhang**, P. Jordan, L Pan, P. Granvolt, F. Chow, Chapter 21 – Model components of the Certification Framework for Geologic Carbon Storage Risk Assessment. *Carbon Dioxide Capture for Storage in Deep Geologic Formations – Results from CO₂ Capture Project, Volume Three: Advances in CO₂ Capture and Storage Technology Results (2004-2009)*, Edited by Lars Ingolf Eide