

Curriculum Vitae Stefan Finsterle

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EDUCATION

1993 Ph.D. Hydrogeology Swiss Federal Institute of Technology, Zürich, Switzerland
1988 M.S. Env. Eng. Swiss Federal Institute of Technology, Zürich, Switzerland
1985 B.S. Env. Eng. Swiss Federal Institute of Technology, Zürich, Switzerland

RESEARCH INTERESTS

Inverse modeling of non-isothermal multiphase flow systems; fracture and unsaturated zone hydrology; optimization; geostatistics; test design and data analysis.

WORK HISTORY

since 10/2016 **Consultant**, *Finsterle GeoConsulting, Kensington, California*
2005/06/15 **Lecturer**, *University of California, Berkeley, California*
2001 – 9/2016 **Staff Geological Scientist** (Head Hydrogeology Department February 2006–December 2008), *Earth Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, California*
1996 **Visiting Assistant Professor**, *College of Sciences, Clemson University, South Carolina*
1995 **Visiting Scientist**, *School of Engineering, University of Auckland, Auckland, New Zealand*
1994 – 2001 **Geological Scientist**, *Earth Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, California*
1993 – 1994 **Post-Doctoral Fellow**, *Earth Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, California*
1988 – 1993 **Research Engineer**, *Laboratory of Hydraulics, Hydrology, and Glaciology, Swiss Federal Institute of Technology (ETH), Zürich, Switzerland*

SOFTWARE

Main developer of iTOUGH2 inverse modeling code (<http://esd.lbl.gov/iTOUGH2>)

RECOGNITIONS

2011 U.S. Department of Energy Secretarial Honor Award
2010 Guest Professor, Jilin University, Changchun, Jilin, China
2005/2012 Berkeley Lab Technology Transfer Award
2003 Berkeley Lab Outstanding Performance Award
1993 Medal of the Swiss Federal Institute of Technology, ETH, Zürich, Switzerland, for an outstanding doctoral dissertation
1989 Diplompreis des Schweizerischen Kulturingenieur Vereins, for an outstanding master thesis in land surveying

Peer-Reviewed Journal Articles, Stefan Finsterle

1. Tokunaga, T.K., S. **Finsterle**, Y. Kim, J. Wan, A. Lanzirrotti, and M. Newville, Ion diffusion through water films in unsaturated soils, *Environmental Science and Technology*, (submitted), 2016.
2. Morzfeld, M., M.S. Day, R. W. Grout, G.S.H. Pau, S. **Finsterle**, and J.B. Bell, Iterative importance sampling algorithms for parameter estimation, *SIAM Journal on Scientific Computing*, (submitted), 2016.
3. Hannon, M.J., and S. **Finsterle**, Considering anisotropy in multidimensional pressure-pulse-decay experiments, *Trans. Por. Media*, (submitted), 2016
4. Borgia, A., C.M. Oldenburg, R. Zhang, L. Pan, T.M. Daley, S. **Finsterle**, and R.S. Ramakrishnan, Simulating CO₂ injection into fractures and faults for improved characterization of EGS sites, *Geothermics*, (submitted), 2016.
5. Liu, Y., G.S.H. Pau, and S. **Finsterle**, Implicit sampling combined with reduced order modeling for the inversion of vadose zone hydrological data, *Computers and Geosciences*, (submitted), 2016.
6. Rinaldi, A.P., J. Rutqvist, S. **Finsterle**, and H.-H. Liu, Inverse modeling of ground surface uplift and pressure with iTOUGH2-PEST and TOUGH-FLAC: The case of CO₂ Injection at In Salah, Algeria, *Computers and Geosciences*, (submitted), 2016.
7. Jung, Y., G.S.H. Pau, S. **Finsterle**, and R. Pollyea, TOUGH3: A new efficient version of the TOUGH suite of multiphase flow and transport simulators, *Computers and Geosciences*, doi:10.1016/j.cageo.2016.09.009, 2016.
8. **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*, 10.1016/j.cageo.2016.09.005, 2016.
9. 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.
10. Zhang, Y., Y. Liu, G.S.H. Pau, S. Oladyshekin, and S. **Finsterle**, Evaluation of multiple reduced-order models to enhance confidence in global sensitivity analyses, *International Journal of Greenhouse Gas Control*, 49, 217–226, doi:10.1016/j.ijggc.2016.03.003, 2016.
11. Pau, G.S.H., S. **Finsterle**, and Y. Zhang, Fast high-resolution prediction of multi-phase flow in fractured formations, *Adv. Water Resour.*, 88, 80–85, doi:10.1016/j.adwatres.2015.12.008, 2016.
12. **Finsterle**, S., Practical notes on local data-worth analysis, *Water Resour. Res.*, 51(12), 9904–9924, doi:10.1002/2015WR017445, 2015.
13. Magnusdottir, L., and S. **Finsterle**, An iTOUGH2 equation-of-state module for modeling supercritical conditions in geothermal reservoirs, *Geothermics*, 57, 8–17, doi:10.1016/j.geothermics.2015.05.003, 2015.
14. Takeda, M., T. Hiratsuka, M. Manaka, S. **Finsterle**, and K. Ito, Experimental examination of the relationships among chemico-osmotic, hydraulic and diffusion parameters of Wakkanai mudstones, *Journal of Geophysical Research: Solid Earth*, doi:10.1002/2013JB010421, 2014.
15. Freedman, V.L., X. Chen, S. **Finsterle**, M.D. Freshley, I. Gorton, L.J. Gosink, E.H. Keating, C.S. Lansing, W.A.M. Moerglein, C.J. Murray, G.S.H. Pau, E. Porter, S. Purohit, M. Rockhold, K.L. Schuchardt, C. Sivaramakrishnan, V.V. Vesselinov, and S. R. Waichler, A high-performance workflow system for subsurface simulation, *Environmental Modelling & Software*, doi:10.1016/j.envsoft.2014.01.030, 55, 176–189, 2014.
16. Poskas, P., A. Narkuniene, D. Grigaliuniene, and S. **Finsterle**, Comparison of radionuclide releases from a conceptual geological repository for RBMK-1500 and BWR spent nuclear fuel, *Nuclear Technology*, 185(3), 322–335, doi:10.1382/NT13-52, 2014.

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18. **Finsterle**, S., E.L. Sonnenthal, and N. Spycher, Advances in subsurface modeling: The TOUGH suite of simulators, *Computers & Geosciences*, doi:10.1016/j.cageo.2013.06.009, 65, 2–12, 2014.
19. Wellmann, J.F., S. **Finsterle**, and A. Croucher, Integrating structural geological data into the inverse modelling framework of iTOUGH2, *Computers & Geosciences*, 65, 95–109, doi:10.1016/j.cageo.2013.10.014, 2014.
20. Wainwright, H., S. **Finsterle**, Y. Jung, Q. Zhou, and J.T. Birkholzer, Making sense of global sensitivity analyses, *Computers & Geosciences*, 65, 84–94, doi:10.1016/j.cageo.2013.06.006, 2014.
21. Pau, G.S.H., Y. Zhang, S. **Finsterle**, H. Wainwright, and J. Birkholzer, Reduced order modeling in iTOUGH2, *Computers & Geosciences*, 65, 118–126, doi:10.1016/j.cageo.2013.08.008, 2014.
22. Commer, M., M.B. Kowalsky, J. Doetsch, G. Newman, and S. **Finsterle**, MPiTOUGH2: A parallel parameter estimation framework for hydrological and hydrogeophysical applications, *Computers & Geosciences*, 65, 127–135, doi:10.1016/j.cageo.2013.06.011, 2014.
23. Rechar, R.P., H.H. Liu, Y.W. Tsang, and S. **Finsterle**, Characterization of natural barrier of Yucca Mountain disposal system for spent nuclear fuel and high-level radioactive waste, *Reliability Engineering & System Safety*, 122, 32–52, doi:10.1016/j.ress.2013.06.020, 2014.
24. Akhavan, M., P.T. Imhoff, S. Andres, and S. **Finsterle**, Model evaluation of impacts on denitrification under rapid infiltration basin systems, *J. Contam. Hydrol.*, 152, 18–34, doi:10.1016/j.jconhyd.2013.05.007, 2013.
25. Wainwright, H.M., S. **Finsterle**, Q. Zhou, and J.T. Birkholzer, Modeling the performance of large-scale CO₂ storage systems: A comparison of different sensitivity analysis methods, *International Journal of Greenhouse Gas Control*, 17, 189–205, doi:10.1016/j.ijggc.2013.05.007, 2013.
26. Doetsch, J., M.B. Kowalsky, C. Doughty, S. **Finsterle**, J.B. Ajo-Franklin, C.R. Carrigan, X. Yang, S.D. Hovorka, and T.M. Daley, Constraining CO₂ simulations by coupled modeling and inversion of electrical resistance and gas composition data, *International Journal of Greenhouse Gas Control*, 18, 510–522, doi:10.1016/j.ijggc.2013.04.011, 2013.
27. Pau, G., Y. Zhang, and S. **Finsterle**, Reduced order models for many-query subsurface flow applications, *Computational Geosciences*, 17(4), 705–721, doi:10.1007/s10596-013-9349-z, 2013.
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29. Shi, X., M. Ye, S. **Finsterle**, and J. Wu, Comparing nonlinear regression and Markov Chain Monte Carlo methods for assessment of prediction uncertainty in vadose zone modeling, *Vadose Zone J.*, 11(4), doi:10.2136/vzj2011.0147, 2012.
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31. Akhavan, M., P.T. Imhoff, S. **Finsterle**, and A.S. Andres, Application of a coupled overland flow-vadose zone model to rapid infiltration basin systems, *Vadose Zone J.*, 11(2), doi:10.2136/vzj2011.0140, 2012.
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34. Oldenburg, C.M., B.M. Freifeld, K. Pruess, L. Pan, S. **Finsterle**, and G.J. Moridis, Numerical simulations of the Macondo well blowout reveal strong control of oil flow by reservoir permeability

and exsolution of gas, *Proceedings of the National Academy of Sciences*, 109(50), 20254–20259, doi:10.1073/pnas.1105165108, 2011.

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38. Jung, Y., P. Imhoff, and S. **Finsterle**, Estimation of landfill gas generation rate and gas permeability field of refuse using inverse modeling, *Transport in Porous Media*, 90(1), 41–58, doi:10.1007/s11242-010-9659-8, 2011.
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53. Kowalsky, M.B., J. Birkholzer, J. Peterson, S. **Finsterle**, S. Mukhopadhyay, and Y. Tsang, Sensitivity analysis for joint inversion of ground-penetrating radar and thermal-hydrological data from a large-scale underground heater test, *Nuclear Technology*, 164(2), 169–179, 2008.
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59. Revil, A., N. Linde, A. Cerepi, D. Jougnot, S. Matthäi, and S. **Finsterle**, Electrokinetic coupling in unsaturated porous media, *J. Colloid Interface Sci.*, 313, 315–327, doi:10.1016/j.jcis.2007.03.037, 2007.
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66. Kowalsky, M.B., S. **Finsterle**, J. Peterson, S. Hubbard, Y. Rubin, E. Majer, A. Ward, and G. Gee, Estimation of field-scale soil hydraulic parameters and dielectric parameters through joint inversion of GPR and hydrological data, *Water Resour. Res.*, 41, W11425, doi:10.1029/2005WR004237, 2005.
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73. Unger, A., S. **Finsterle**, and G. S. Bodvarsson, Transport of radon gas into a tunnel at Yucca Mountain—estimating large-scale fractured tuff hydraulic properties and implications for the ventilation system, *Journal of Contam. Hydrol.*, 70, 152–171, 2004.
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85. Ahlers, C. F., S. **Finsterle**, and G. S. Bodvarsson, Characterization of subsurface pneumatic response at Yucca Mountain, *J. Contam. Hydr.*, 38(1–3), 47–68, 1999.
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6 Book Chapters

214 Conference Papers and Abstracts

49 Technical Reports

35 Invited Talks