

GLENN E. HAMMOND

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EDUCATION AND TRAINING

2003 Ph.D., Civil and Environmental Engineering, University of Illinois at Urbana-Champaign

1999 M.S., Civil and Environmental Engineering, University of Illinois at Urbana-Champaign

1997 B.S., Magna Cum Laude, Civil and Environmental Engineering, Brigham Young University

RESEARCH AND PROFESSIONAL EXPERIENCE

2013-present, **Principal Member Technical Staff**, Sandia National Laboratories. *PFLOTRAN development in support of the performance assessment framework for WIPP. Simulation of hydro-geophysical inversion and biogeochemical transport at Hanford 300 Area. Community-based development of subsurface simulators (IDEAS).*

2013, **Scientist IV**, Pacific Northwest National Laboratory. *Development of biogeochemistry modules for NGEE-Arctic. Technical expert and developer for DOE EM's ASCEM (i.e., geochemical reaction modules).*

2005-2012, **Scientist III**, Pacific Northwest National Laboratory. *Development of the parallel multiphase flow and multicomponent biogeochemical transport code PFLOTRAN for the DOE SciDAC-II Project Modeling Multiscale-Multiphase-Multicomponent Subsurface Reactive Flows using Advanced Computing. Simulation of plume-scale uranium migration at Hanford 300 Area utilizing massively-parallel high performance computing*

2003-2005, **Senior Member Technical Staff**, Sandia National Laboratories. *Coupled laboratory experimentation and high-fidelity Navier-Stokes flow and transport modeling using massively parallel HPC to verify accuracy of EPANET pipe joint mixing. Massively parallel Navier-Stokes simulation of bio-agent release within a turbulent airport terminal environment in support of sensor placement, threat assessment, and episode mitigation (DHS). Development of Java-based interactive geochemical transport sensitivity analysis model (NRC). High-resolution simulation of infiltrometer experiments for verification of ERT technology*

2000, **Visiting Graduate Fellow**, Los Alamos National Laboratory

1999-2003, **DOE Computational Science Graduate Fellow**, University of Illinois at Urbana-Champaign

1997-1999, **Graduate Research Assistant**, University of Illinois at Urbana-Champaign

1994-1997, **Undergraduate Research Assistant**, Brigham Young University.

SELECTED PUBLICATIONS (*h-index of 4 from 9 publications*)

Hammond, G.E., P.C. Lichtner and R.T. Mills (2014) Evaluating the Performance of Parallel Subsurface Simulators: An Illustrative Example with PFLOTRAN. 50, doi:10.1002/2012WR013483.

Chen, X., G. Hammond, C. Murray, M. Rockhold, V. Vermeul and J. Zachara (2013) Application of Ensemble-based Data Assimilation Techniques for Aquifer Characterization using Tracer Data at Hanford 300 Area, *Water Resources Research*, 49, doi:10.1002/2012WR013285.

Keys, D., L. Curfman McInnes, C. Woodward, W. Gropp, E. Myra, M. Pernice, J. Bell, J. Brown, J. Connors, E. Constantinescu, D. Estep, K. Evans, C. Farhat, A. Hakim, G. Hammond, G. Hansen, J. Hill, T. Isaac, X. Jiao, K. Jordan, D. Kaushik, E. Kaxiras, K. Lee, A. Lott, Q. Lu, J. Magerlein, R. Maxwell, M. McCourt, M. Mehl, R. Pawlowski, A. Randles, D. Reynolds, B. Riviere, T. Scheibe, J. Shadid, B. Sheehan, M. Shephard, A. Siegel, B. Smith, X. Tang, C. Wilson and B. Wohlmuth (2013) Multiphysics Simulations: Challenges and Opportunities, *International Journal of High Performance Computing Applications*, v27, n1, p4-83, doi: 10.1177/1094342012468181.

- Navarre-Sitchler, A., R.M. Maxwell, E.R. Siirila, G.E. Hammond and P.C. Lichtner (2013) Elucidating geochemical response of shallow heterogeneous aquifers to CO₂ leakage using high-performance computing: implications for monitoring CO₂ sequestration, *Advances in Water Resources*, v53, p45-55, doi:10.1016/j.advwatres.2012.10.005.
- Gardner, W.P., G. Hammond and P. Lichtner (2013) High Performance Simulation of Environmental Tracers in Heterogeneous Domains, *Groundwater*, doi:10.1111/gwat.12148.
- Chen, X., H. Murakami, M. Hahn, G.E. Hammond, M.L. Rockhold, J.M. Zachara and Y. Rubin (2012) Three-Dimensional Bayesian Geostatistical Aquifer Characterization at the Hanford 300 Area using Tracer Test Data, *Water Resources Research*, 48, doi:10.1029/2011WR010675.
- Hammond, G.E., P.C. Lichtner, C. Lu and R.T. Mills (2012) Chapter: PFLOTRAN: Reactive flow and transport code for use on laptops to leadership-class supercomputers, *Ebook: Groundwater Reactive Transport Models*, Editors: Zhang F., G.T. Yeh, and J.C. Parker, Bentham Science Publishers, p141-159, eISBN: 978-1-60805-306-3, doi:10.2174/978160805306311201010141.
- Lichtner, P.C. and G.E. Hammond (2012) Using High Performance Computing to Understand Roles of Labile and Nonlabile U(VI) on Hanford 300 Area Plume Longevity, *Vadose Zone Journal*, v11, n2, doi:10.2136/vzj2011.0097.
- Hammond, G.E., P.C. Lichtner and M.L. Rockhold (2011) Stochastic Simulation of Uranium Migration at the Hanford 300 Area, *Journal of Contaminant Hydrology*, v120-121, p115-128, doi:10.1016/j.jconhyd.2010.04.005.
- Hammond, G.E. and P.C. Lichtner (2010) Field-Scale Modeling for the Natural Attenuation of Uranium at the Hanford 300 Area using High Performance Computing, *Water Resources Research*, 46, W09527, doi:10.1029/2009WR008819.
- Hammond, G.E., A.J. Valocchi and P.C. Lichtner (2005) Application of Jacobian-free Newton-Krylov with physics-based preconditioning to biogeochemical transport, *Advances in Water Resources*, v28, n4, p359-376.

SYNERGISTIC ACTIVITIES

- Sandia Computational Science Division (9200) Award for Excellence (2004)
- Sandia Employee Recognition Award Nomination (2004)
- Outstanding Student Paper Award, Biogeochemistry, AGU 2002 Fall Meeting
- Department of Energy Computational Science Graduate Fellowship (1999-2003)
- PNNL EMSL HPCS-3/HPCS-4 Supercomputer Source Selection Panel, 2006-2008, 2011-2012
- DOE BER Environmental Remediation Sciences Program Proposal Review Panel
- DOE ASCR SBIR Program Proposal Review Panel