

LYNN B. REID

1412 E. Rochdale Place
Chicago, IL 60615

+1-773-493-5332
lynnreid@alum.mit.edu

PROFILE

Simulation expert with **extensive educational background and work experience** in civil and environmental engineering, oil & gas, mathematics, geostatistics, and high performance computing.

Skilled **programming and software design** in Fortran90, C++, scripting, and HTML.

Proficient on **Linux, Unix, Windows, and Macintosh** platforms, including high-performance parallel platforms. Administered Unix and NT-server networks.

Implemented computer simulations of physical principals: developed **porous media models, geophysical data processing, inverse data assimilation, geostatistical analysis, astronomical supernovae simulations.**

Experienced with **subsurface databases, three-dimensional earth modeling, and high-end data visualization packages.**

EXPERIENCE

- 2005–current** **Scientific Programmer**, ASC FLASH Center, University of Chicago, Chicago, IL, USA. Design and implementation of FLASH3, a modular parallel simulation code for solving compressible flow problems. Programming in Fortran90 and Python using MPI and parallel I/O libraries, including algorithm development, application deployment, and debugging on high-performance platforms ranging from multi-core desktops to supercomputers. Areas of specialization include nuclear reaction networks, multi-grid Poisson solvers, and verification. Analysis of simulation results using visualization with IDL and VisIt. Writing and editing technical papers, presentations, documentation, and grants in LaTeX and MS Office.
- 2000–current** **Independent Programmer**, Thigma Consulting LLC, Chicago, IL, USA. Design and development of scientific software. Currently programming in Visual C++ on Windows platforms for 2-D and 3-D analysis and display of oil industry data. Client support.
- 1999–2000** **Geostatistician**, RDS Resource, Aberdeen, Scotland, UK. Primary responsibility for spatial data analysis, statistical, and numerical consulting within upstream oil services firm. Brainstorming and troubleshooting for projects, especially petroleum engineering subsurface simulations; education of coworkers.
- 1998** **Geophysical Applications Programmer**, READ Well Services Ltd., Aberdeen, Scotland UK. Development and programming of novel algorithms for acquisition, processing, and inversion of various data types, including multi-finger caliper and vertical seismic profiling. Maintenance of Unix and NT networks, and development of Intranet, Internet, and HTML documentation.
- 1996–1997** **Irrigation Engineer**, University of Sydney, Australia. Application of mathematical techniques to computer modeling for unsaturated groundwater flow and light infiltration. Developed field sampling strategies and automatic mesh generation tools. Supervised doctoral candidates.
- 1987–1989** **Staff Engineer**, ENVIRON Corporation, Princeton, NJ USA. Multiple responsibilities within private environmental consulting firm. Numerically modeled groundwater flow, contaminant transport, and surface water quality. Presented results to clients and regulatory agencies.
- 1984–1985** **Teaching Assistant and Instructor**, Summer Geology Institute, Princeton University, Princeton, NJ USA. Taught introductory personal computer use, and developed assignments for an undergraduate engineering course. Taught basic geology to high school science teachers and led field trips.

EDUCATION

1996 **Massachusetts Institute of Technology**, Cambridge, MA, USA
Sc.D. (Doctorate in Civil and Environmental Engineering)

Thesis *A functional inverse approach for three-dimensional characterization of subsurface contamination.* Advisor: Professor Dennis McLaughlin.

Doctoral research developed methodology for mapping hydraulic conductivity distribution in subsurface reservoirs from scattered well measurements. Novel approach employed analytical solutions of flow and transport equations, extensive stochastic groundwater modeling, data inversion, and uncertainty analysis. Applied techniques to field site contaminated with coal gasification wastes.

1987 **University of Dundee**, Dundee, Scotland.
M.Sc. (Applied Mathematics).

Thesis: *Galerkin finite element schemes applied to a non-linear reaction diffusion equation.* Advisor: Professor A. Ron Mitchell.

Thesis developed finite element solutions to a non-linear equation describing flow in porous media.

1985 **Princeton University**, Princeton, NJ, USA
B.S.E. (Geological Engineering), *summa cum laude*.

Thesis: *Analysis of spatial input uncertainty: An application to groundwater flow in Woburn, Massachusetts.* Advisor: Professor George F. Pinder.

Thesis investigated the effects of spatial variation in hydraulic conductivity; utilized Monte Carlo simulations of a groundwater flow model of water supply to a suburban town. Kriging and two-dimensional correlation schemes were utilized to characterize the structure of hydraulic conductivity and perform conditional simulations.

PERSONAL

USA Citizen; full UK work permit.

SELECTED PUBLICATIONS

L.M. Hochstein, F. Shull, **L.B. Reid** (2008). The role of MPI in development time: a case study, *Proceedings of the 2008 ACM/IEEE conference on Supercomputing*.

A. Dubey, **L.B. Reid**, K. Weide, K. Antypas, M.K. Ganapathy, K. Riley, D. Sheeler, A. Siegal (2008). The FLASH code architecture, *Parallel Computing*, submitted.

A. Dubey, **L.B. Reid**, R. Fisher (2008). Introduction to FLASH 3.0, with application to supersonic turbulence, *Physica Scripta*, T132, 014046.

R. Fisher, S. Abarzhi, K. Antypas, S.M. Asida, A.C. Calder, F. Cattaneo, P. Constantin, A. Dubey, I. Foster, J.B. Gallagher, M.K. Ganapathy, C.C. Glendenin, L. Kadanoff, D.Q. Lamb, S. Needham, M. Papka, M. T. Plewa, **L.B. Reid**, P. Rich, K. Riley, D. Sheeler (2008). Terascale Turbulence Computation on BG/L Using the FLASH3 Code, *IBM Journal of Research and Development*, 52:1/2, 127-137.

A. Dubey, R. Fisher, C. Graziani, G.C. Jordan IV, D.Q. Lamb, **L.B. Reid**, P. Rich, D. Sheeler, D. Townsley, K. Weide (2008). Challenges of extreme computing using the FLASH code, *Numerical Modeling of Space Plasma Flows*, N.V. Pogorelov, E. Audi, G.P. Zank, eds., 385, 145-+.

D. McLaughlin, **L.B. Reid**, Li Shuguang, J. Hyman (1993). A stochastic method for characterizing ground-water contamination, *Ground Water* 31:2, 237-249.