



**GEORGE J. MORIDIS**, Ph.D., P.E.

*Hydrogeology/Geological Engineering  
Ground-water Modeling  
Petroleum Reservoir Engineering*

Dr. George Moridis has over 43 years of experience as a research reservoir engineer. Dr. Moridis has had a distinguished career with Lawrence Berkeley National Laboratory, University of California at Berkeley. Dr. Moridis is a professor and holder of the Robert L. Whiting Chair of Petroleum Engineering in the Harold Vance Department of Petroleum Engineering at Texas A&M University. Dr. Moridis has been an Associate of Hydrodynamics for over 22 years, and is a key member of our energy storage team. Dr. Moridis is responsible for development of reservoir energy storage system performance models for Hydrodynamics' CAES, natural gas, and hydrogen storage projects in solution mined salt caverns for the Delta, Utah project, for six depleted gas reservoirs through the U.S., and the Norton Mine. Dr. Moridis has performed gas storage simulation design models for two depleted gas storage field in the Republic of Georgia. Dr. Moridis is unique in having developed the latest version of the TOUGH2 modeling code. This allows us the capability to modify the source code to better represent unique storage reservoir conditions.

#### **EDUCATION**

1987 Ph.D. (Reservoir Engineering), Texas A&M University, Texas  
1982 M.Sc. (Agricultural and Civil Engineering), Texas A&M University, Texas  
1980 M.E. (Chemical Engineering), National Metsovion Technical University, Greece  
1979 B.Sc. with Honors, (Chemical Engineering), National Metsovion Technical University, Greece

#### **CURRENT POSITION**

Associate with The *Hydrodynamics* Group, LLC  
Department Chair, Department of Petroleum Engineering, Texas A&M University  
Group Leader, Subsurface Contaminant Containment Technologies (1991 to present)  
Group Leader, Gas Hydrate Studies (1998 to present)  
Lawrence Berkeley National Laboratory, Earth Sciences Division

#### **EXPERIENCE**

1991- Present

*Group Leader and Principal Investigator, Contaminant Hydrology (2000 to present)*  
*Group Leader and Principal Investigator, Subsurface Containment Technologies (1991 to present)*  
Principal Investigator, Simulation of Gas Hydrate Flow and behavior (1998 to present)  
Principal Investigator, Ferrofluid and magnetic fluid studies (1997 to present)  
In charge of code development and simulation studies of (a) radionuclide transport at the Yucca Mountain Repository Site, (b) fate and transport of contaminants in support of the remediation effort at the LBNL, (c) radionuclide containment at the BNL site, and (d) gas production from hydrate accumulations. Dr. Moridis is head of linear equation solver package of the TOUGH2 family of codes.

1989- 1991

*Research Engineer, Groundwater Research Program  
Civil Engineering Dept. and Agr. Engineering Dept., Texas A&M University*

1987- 1989

*Senior Scientist, Water Management Department  
International Rice Research Institute (United Nations - FAO), Philippines*

## **PATENTS**

US Patent No. 5,836,390, A method for formation of subsurface barriers using viscous liquids.

A patent on environmental applications of Ferrofluids is pending.

## **PUBLICATIONS**

Dr. Moridis has authored and co-authored 30 peer-reviewed publications, and over 100 reports and book chapters.

## **SELECTED PUBLICATIONS**

Huang, T, Moridis, G., Blasingame, T: 2023, Feasibility Analysis of Hydrogen Storage in Depleted Natural Reservoirs Through a Multi-Phase Reservoir Simulator, Society of Petroleum Engineers SPE-212701-MS.

King, M.J., Moridis, G., 2022, *Compressed Air Energy Storage in Aquifer and Depleted Gas Storage Reservoirs*: Chapter in Handbook of Energy Storage, Willey Press, London, UK.

Moridis, G.J., and D.L. Reddell, The Laplace Transform Finite Difference (LTFD) method for simulation of flow through porous media, *Water Resources Research*, 27(8), 1873-1884, 1991.

Moridis, G.J., and D.L. Reddell, Secondary Recovery of Water by Air Injection: 1. The Concept and the Mathematical and Numerical Model, 1991. *Water Resources Research*, 27(9), 2337-2352, 1991

Moridis, G.J., and D.L. Reddell, Secondary Recovery of Water by Air Injection: 2. The Simultaneous Solution Method, 1991. *Water Resources Research*, 27(9), 2353-2368, 1991.

Moridis, G.J., and D.L. Reddell, Secondary Recovery of Water by Air Injection: 3. Evaluation of Feasibility, *Water Resources Research*, 27(9), 2369-2379, 1991.

Moridis, G.J., D.A. McVay, and D.L. Reddell, The Laplace Transform Finite Difference (LTFD) Method for the Simulation of Compressible Liquid Flow in Reservoirs, (LBL Report No. 32060), SPE Advanced Technology Series, 2(2), 122-131, 1994.

Moridis, G. J., and E. J. Kansa, The Laplace Transform MultiQuadratics method: A Highly Accurate Scheme for the Numerical Solution of Linear Partial Differential Equations, (LBL Report No. 35011), *Journal of Applied Science & Computations*, 1(2), 375-407, 1994.

Moridis, G. J., The Transformational Decomposition (TD) Method for Compressible Fluid Flow Simulations, (LBL Report No. 33149), SPE Advanced Technology Series, 3(1), 101-110, 1995.

Moridis, G.J., and K. Pruess, Flow and Transport Simulations Using T2CG1, a Package of Conjugate Gradient Solvers for the TOUGH2 Family of Codes, LBL Report No. 36235, April 1995.

Moridis, G.J., L. Myer, P. Persoff, S. Finsterle, J.A. Apps, D. Vasco, S. Muller, P. Yen, P. Williams, B. Freifeld, and K. Pruess, First-Level Field Demonstration of Subsurface Barrier Technology Using Viscous Liquids, LBL Report No. 37520, 1995.

Moridis, G.J., L. Myer, P. Persoff, S. Finsterle, J.A. Apps, D. Vasco, S. Muller, P. Yen, and K. Pruess, A Field Test of a Waste Containment Technology using a new Generation of Injectable Barrier Liquids, in review, *ASCE Geotechnical and Geoenvironmental Engineering Journal* (LBL Report No. 38817, August 1996).

Moridis, G.J., P. Persoff, J. Apps, A. James, C. Oldenburg, A. McGrath, B. Freifeld, L. Myer, L. Pellerin, and K. Pruess, A Design Study for the Isolation of the 281-3H Retention Basin at the Savannah River Site Using the Viscous Barrier Technology, LBL Report No. 38920, September 1996.

- Moridis, G.J., P. Yen, P. Persoff, S. Finsterle, P. Williams, L. Myer, and K. Pruess, A Design Study for a Medium-Scale Demonstration of the Viscous Barrier Technology, LBNL Report No. 38916, 1996.
- Moridis, G.J., P. Persoff, J. Apps, A. James, C. Oldenburg, A. McGrath, B. Freifeld, L. Myer, L. Pellerin, and K. Pruess, A Design Study for the Isolation of the 281-3H Retention Basin at the Savannah River Site Using the Viscous Barrier Technology, LBNL Report No. 38920, November 1996.
- Persoff, P., G.J. Moridis, J. Apps, and K. Pruess, Evaluation Tests for Colloidal Silica in Grouting Applications, *ASTM Journal of Testing and Evaluation*, 21(3), 264-269, 1998 (LBNL Report No. 39348, 1997).
- Persoff, P., G.J. Moridis, J.A. Apps, and J.M. Wang, Effects of Dilution and Contaminants on Colloidal Silica Grouts, in press, *ASCE Geotechnical and Geoenvironmental Engineering Journal*, (LBNL Report No. 40129, Nov. 1997).
- Moridis, G.J., S.E. Borglin, C.M. Oldenburg, and A. Becker, FY 1997 Annual Report-Theoretical and Experimental Investigations of Ferrofluids for Guiding and Detecting Liquids in the Subsurface, LBNL Report No. 41069, March 1998.
- Moridis, G.J., and C.M. Oldenburg, Principles of Ferrofluid Flow in Porous Media, in review, *Transport in Porous Media* (LBNL Report No. 40127, March 1998).
- Moridis, G.J., and K. Pruess, T2SOLV: An enhanced Package of Solvers for the TOUGH2 Family of Reservoir Simulation Codes, *Geothermics*, 27(4), 415-444, 1998.
- Moridis, G., J. Apps, K. Pruess, and L. Myer, EOSHYDR: A TOUGH2 Module for CH<sub>4</sub>-Hydrate Release and Flow in the Subsurface, LBNL Report No. 42386, September 1998.
- Moridis, G.J., Semianalytical Solutions for Parameter Estimation in Diffusion Cell Experiments, *Water Resources Research*, 35(6), 1729-1740 (LBNL Report No. 42484, January 1999).
- Moridis, G.J., S. Finsterle, and J. Heiser, Evaluation of Alternative Designs for an Injectable Barrier at the Brookhaven National Laboratory Site, Long Island, New York, *Water Resources Research*, 35(10), 2937-2953, 1999 (LBNL Report No. 41763, January 1999).
- Moridis, G.J., Y.-S. Wu, and K. Pruess, EOS<sub>n</sub>T: A TOUGH2 Module for the Simulation of Water Flow and Solute/Colloid Transport in the Subsurface, LBNL Report No. 42351, March 1999.
- Oldenburg, C.M., S.E. Borglin, and G.J. Moridis, Numerical Simulation of Ferrofluid Flow in the Subsurface, *Transport in Porous Media*, 38, 319-344, 2000 (LBNL Report No. 40146, March 1998).
- Borglin, S., G.J. Moridis, and C.M. Oldenburg, Experimental Investigations of Magnetically-Driven Flow of Ferrofluids Through Porous Media, *Transport in Porous Media*, 41, 61-80, 2000 (also LBNL Report No. 40126, Lawrence Berkeley National Laboratory, March 1998).
- Moridis, G.J., and G. Bodvarsson, Semi-Analytical Solutions of Radioactive or Reactive Tracer Transport in Layered Fractured Media, LBNL Report No. 44155, September 1999.
- Moridis, G.J., Q.-H. Hu, Y.-S. Wu, and G. Bodvarsson, Modeling Studies of Radionuclide Transport in the Vadose Zone at Yucca Mountain, Nevada, LBNL Report No. 45870, May 2000.
- Moridis, G.J., Semi-Analytical Solutions of Radioactive or Reactive Solute Transport in Layered Fractured Media, LBNL Report No. 45871, May 2000.