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Researcher ID: H-6656-2014

## Biography

Jiamin Wan's graduate education is in hydrology and geochemistry. Since graduation, she has been employed in the Earth Sciences Division of Lawrence Berkeley National Laboratory, and is currently a Staff Scientist. Her research is focused on interfacial, wetting, and capillary phenomena in geologic materials, and on biogeochemical reactions and subsurface transport of contaminants, colloids and nanoparticles. Her studies under high-pressure and high-temperature reservoir conditions combine pore-scale microscopy of fluid interfacial dynamics with surface spectroscopy and macroscopic interfacial measurements to understand mechanisms controlling CO<sub>2</sub>, water, and oil interactions. She currently has over 80 publications (25/81 as the first author) in peer-reviewed journals. She has been the lead principal investigator for many projects over the past two decades, obtaining funding through competitive peer-reviewed processes.

## Research Interests

- **Interfacial phenomenon in hydrogeological media:** Dynamic wetting and fluid-fluid interfacial tensions under atmosphere and elevated (deep subsurface) pressures and temperatures; colloid stability, partitioning, and transport.
- **CO<sub>2</sub> enhanced oil recovery (CO<sub>2</sub>-EOR):** altering CO<sub>2</sub> apparent viscosity (using foams) and varying wettability to control fluids mobility; to test these in high-pressure micromodels and cores.
- **Hydraulic fracturing:** developing new fracturing fluids as the alternative to water-based fracturing fluids; understanding the fluids-rock interactions and manipulating the interfacial properties.
- **Geological CO<sub>2</sub> sequestration:** studies of mechanisms controlling CO<sub>2</sub> mobility and trapping, and caprock integrity through pore-scale microscopy, surface spectroscopy, and macroscopic interfacial measurements under elevated P-T conditions.
- **Contaminant biogeochemistry and plume remediation:** studies of reactions, transport, and remediation of contaminants including U and Cr.
- **Soil C and N transport and transformations and their impacts on C cycling:** from the unsaturated zone to groundwater.

## Education

- Ph.D. Hydrology, 1989-1993, New Mexico Institute of Mining and Technology, NM, USA
- Ph.D. Candidate in Geochemistry, 1986-89, New Mexico Institute of Mining and Technology, NM, USA (past the candidacy exams and then switched to Hydrology)
- M.S. Geochemistry, 1981-84, Institute of Geochemistry, Chinese Academy of Science, China
- B.S., Chemistry, 1977-1981, Beijing University of Iron and Steel Technology, China

## Professional Experience

- 1997- present: Staff Geological Scientist, Earth Sciences Division, LBNL
- 1995 -1997: Scientist, Earth Sciences Division, LBNL
- 1993 -1995: Postdoctoral Research Fellow, Earth Sciences Division, LBNL
- 1989 -1993: Graduate Research Associate in Hydrology, New Mexico Tech, NM
- 1984 -1986: Research Associate, Institute of Geochemistry, Chinese Academy of Sciences

**Peer-reviewed Publications** (H-6656-2014, H-index 29)

1. **Wan, J.**, T.K. Tokunaga, P.D. Ashby, Y. Kim, M. Voltolini, B. Gilbert, and D.J. DePaolo. Supercritical CO<sub>2</sub> uptake by nonswelling phyllosilicates. *PNAS*, DOI: 10.1073/pnas.1710853114. 2018
2. **Wan, J.**, Y. Kim, M.J. Mulvihill, and T. K. Tokunaga. Dilution destabilizes engineered ligand-coated nanoparticles in aqueous suspensions. *Environmental Toxicology and Chemistry*. doi: 10.1002/etc.4103. 2018
3. Hu, R. **J. Wan**, Z. Yang, Y.F. Chen, and T.K. Tokunaga, Wettability and flow rate impacts on immiscible displacement: A theoretical model. *Geophysical Research Letters*, doi: 10.1002/2017GL076600. 2018
4. **Wan, J.**, T.K. Tokunaga, W. Dong, and Y. Kim. Extracting natural biosurfactants from humus deposits for subsurface engineering applications. *Energy & Fuels* 31 (11), 11902-11910. DOI: 10.1021/acs.energyfuels.7b02203. 2017
5. Hu, R. **J. Wan**, Y. Kim, and T.K. Tokunaga. Wettability impact on supercritical CO<sub>2</sub> capillary trapping: Pore-scale visualization and quantification. *Water Resources Research*, DOI: 10.1002/2017WR020721. 2017
6. Hu, R., **J. Wan**, Y. Kim, and T.K. Tokunaga. Wettability effects on supercritical CO<sub>2</sub>-brine immiscible displacement during drainage: Pore-scale observation and 3D simulation. *Int. J. Greenhouse Gas Control*, 60, 129-139, [doi.org/10.1016/j.ijggc.2017.03.011](https://doi.org/10.1016/j.ijggc.2017.03.011). 2017.
7. Dong, W., **J. Wan**, T.K. Tokunaga, B Gilbert, and K.H. Williams. Transport and humification of dissolved organic matter within a semi-arid floodplain. *J. Environ. Sci.*, in press, DOI:[10.1016/j.jes.2016.12.011](https://doi.org/10.1016/j.jes.2016.12.011). 2017.
8. Zhang, L., D. Kim, Y. Kim, **J. Wan**, and Y-S. Jun. Effects of Phosphate on Biotite Dissolution and Secondary Precipitation: Implications for Geologic CO<sub>2</sub> Sequestration. *Physical Chemistry Chemical Physics*, DOI: 10.1039/c7cp05158a. 2017
9. Tokunaga, T. K., Shen, W., **Wan, J.**, Kim, Y., Cihan, A., Zhang, Y., & Finsterle, S. Water saturation relations and their diffusion-limited equilibration in gas shale: Implications for gas flow in unconventional reservoirs. *Water Resources Research*, 53, 9757–9770. DOI.org/10.1002/2017WR021153. 2017
10. Tokunaga, T.K., S. Finsterle, Y. Kim, **J. Wan**, A. Lanzirotti, and M. Newville. Ion diffusion within water films in unsaturated porous media. *Environ. Sci. Technol.* 51, 4338-4346, DOI:10.1021/acs.est.6b05891. 2017
11. Roman, S., M.O. Abu-Al-Saud, T.K. Tokunaga, **J. Wan**, A.R. Kavscek, and H. Tchelepi. Measurements and simulation of liquid films during drainage displacements and snap-off in constricted capillary tubes. *Journal of Colloid and Interface Science*, 507, 279-289. DOI: [10.1016/j.jcis.2017.07.092](https://doi.org/10.1016/j.jcis.2017.07.092). 2017
12. Wang, S., T. K. Tokunaga, **J. Wan**, W. Dong, and Y. Kim, Capillary pressure-saturation relations in quartz and carbonate sands: Limitations for correlating capillary and wettability influences on air, oil, and supercritical CO<sub>2</sub> trapping, *Water Resour. Res.*, 52, doi:10.1002/2016WR018816, 2016.
13. Zhang, L., Y. Kim, H. Jung, **J. Wan**, Y. S. Jun, Effects of Salinity-Induced Chemical Reactions on Biotite Wettability Changes under Geologic CO<sub>2</sub> Sequestration Conditions, *Environ Sci Tech Let* 3(3): 92-97. doi: 10.1021/acs.estlett.5b00359, 2016.

14. Arora, B., N.F. Spycher, C.I. Steefel, S. Molins, M. Bill, M.E. Conrad, W.M. Dong, B. Faybishenko, T.K. Tokunaga, **J.M. Wan**, K.H. Williams, S.B. Yabusaki, Influence of hydrological, biogeochemical and temperature transients on subsurface carbon fluxes in a flood plain environment. *Biogeochemistry* 127, 2-3, 367-396, doi: 10.1007/s10533-016-0186-8, 2016.
15. Tokunaga, T.K., Y. Kim, M.S. Conrad, M. Bill, C. Hobson, K.H. Williams, W. Dong, **J. Wan**, M. Robbins, P. Long, B. Faybishenko, J. Christensen, S.S. Hubbard, Deep vadose zone respiration contributions to CO<sub>2</sub> fluxes from a semi-arid floodplain. *Vadose Zone J.* 15, doi: 10.2136/vzj2015.10.0136, 2016.
16. Bikkina, P, **J. Wan**, Y. Kim, T. J. Kneafsey, and T. K. Tokunaga, Influence of wettability and permeability heterogeneity on miscible CO<sub>2</sub> flooding efficiency, *Fuel*, in press, 2015.
17. Chen, C., **J. Wan**, and Y. Song, Water contact angles on Quartz surfaces under supercritical CO<sub>2</sub> sequestration conditions: Experimental and molecular dynamic simulation studies. *IJGGC* 42 655–665, 2015.
18. Shen, W., **J. Wan**, T.K. Tokunaga, Y. Kim, X. Li, Porosity calculation, pore size distribution and mineral identification within shale rocks: Application of scanning electron microscopy and energy dispersive spectroscopy, *EJGE, Bund.* 19, 1477-1490, 2015.
19. **Wan, J. M.**, Kim, Y., Tokunaga, T. K., Contact angle measurement ambiguity in supercritical CO<sub>2</sub>-water-mineral systems: Mica as an example, *International Journal of Greenhouse Gas Control*, 31, 128-137, Doi 10.1016/J.ijggc.2014.09.029, 2014.
20. Dong, W. M., **Wan, J. M.**, Additive Surface Complexation Modeling of Uranium(VI) Adsorption onto Quartz-Sand Dominated Sediments, *Environmental Science & Technology*, 48, (12), 6569-6577, Doi 10.1021/Es501782g, 2014.
21. Tokunaga, T. K., **J. Wan**, J.-W. Jung, T. W. Kim, Y. Kim, and W. Dong, Capillary pressure and saturation relations for supercritical CO<sub>2</sub> and brine in sand: High-pressure P<sub>c</sub>(S<sub>w</sub>) controller/meter measurements and capillary scaling predictions, *Water Resour. Res.*, 49, 4566–4579, 2013.
22. Tokunaga, T.K., and **J. Wan**, Capillary pressure and mineral wettability influences on reservoir CO<sub>2</sub> capacity. *in Reviews in Mineralogy and Geochemistry*, D.J. DePaolo, D.R. Cole, A. Navrotsky, and I.C. Bourg, eds., Vol. 77, Chapter 14, pp. 481-503, 2013.
23. Torkzaban, S., S. A. Bradford, **J. Wan**, T. K. Tokunaga, and A. Masoudih, Release of quantum dot nanoparticles in porous media: role of cation exchange and aging time, *Environ. Sci. Technol.*, 47, 11528-11536, 2013.
24. **Wan, J.**, T. K. Tokunaga, W. Dong, M. E. Denham, and S. S. Hubbard, Persistent source influences on the trailing edge of a groundwater plume, and natural attenuation timeframes: The F-Area Savannah River Site, *Environ. Sci. Technol.* 46, 4490–4497, 2012.
25. Tokunaga, T.K., **J. Wan**, and M.E. Denham, Estimates of vadose zone drainage from a capped seepage basin, *Vadose Zone J.*, web-released 2012.
26. Dong, W., T.K. Tokunaga, J.A. Davis, **J. Wan**, Uranium(VI) adsorption and surface complexation modeling on background sediments from the F-Area, Savannah River Site, *Environ. Sci. Technol.* 46, 1565-71, 2012.
27. Jung, J. and **J. Wan**, Supercritical CO<sub>2</sub> and ionic strength effects on wettability of silica surfaces: Equilibrium contact angle measurements, *Energy & Fuels*, 26, 6053-6059, 2012.
28. Kim, Y., **J. Wan**, T. J. Kneafsey, and T. K. Tokunaga, Dewetting of silica surfaces upon reactions with supercritical CO<sub>2</sub> and brine: Pore-scale studies in micromodels, *Environ. Sci. Technol.*, 46 (7), pp 4228–4235, 2012.
29. Torkzaban, S., **J. Wan**, T.K. Tokunaga, S. A. Bradford, Impacts of bridging complexation on the transport of surface-modified nanoparticles in saturated sand, *Journal of Contaminant Hydrology* 136–137, 86–95, 2012.
30. Tokunaga, T. K., Y. Kim, **J. Wan**, L. Yang, Aqueous uranium(VI) concentrations controlled by calcium uranyl vanadate precipitates. *Environ. Sci. Technol.* 46, 7471-7477, 2012.

31. **Wan, J.**, W. Dong, T. K. Tokunaga. Method to attenuate U(VI) mobility in acidic waste plumes using humic acids, *Environ. Sci. Technol.* 45, 2331-2337, 2011.
32. Torkzaban, S., **Wan, J.**, Kim, Y., Mulvihill, M., and Tokunaga, T. K., Transport and deposition of functionalized CdTe nanoparticles in saturated porous media. *J. Contaminant Hydrology*, 118, 208-217, 2010.
33. Mulvihill, M.J., S.E. Habas, I.J. La Plante, **J. Wan**, and T. Mokari, The influence of size, shape, and surface coating on the stability of aqueous nanoparticle suspensions, *J. Phys. Chem*, 22 (18), 5251–5257, 2010.
34. **Wan, J.**, Y. Kim, T.K. Tokunaga, Z. Wang, S. Dixit, C.I. Steefel, E. Saiz, M. Kunz, and N. Tamura. Spatially resolved U(VI) partitioning and speciation: Implications for plume scale behavior of contaminant U in the Hanford vadose zone. *Environ. Sci. Technol.* 43, 2247-2253, 2009.
35. Tokunaga, T.K., Y. Kim, and **J. Wan**. Potential remediation approach for uranium-contaminated groundwaters through potassium uranyl vanadate precipitation. *Environ. Sci. Technol.*, 43, 5467-5471, 2009.
36. **Wan, J.**, T.K. Tokunaga, Y. Kim, E. Brodie, R. Daly, T.C. Hazen, and M.K. Firestone. Effects of organic carbon supply rates on uranium mobility in a previously bioreduced contaminated sediment. *Environ. Sci. Technol.* 42, 7573-7579, 2008.
37. Tokunaga, T.K., **Wan, J.**, Kim, Y., R.A. Daly, E.L. Brodie, T.C. Hazen, D. Herman, and M.K. Firestone. Influences of organic carbon supply rate on uranium reduction in initially oxidizing, contaminated sediment. *Environ. Sci. Technol.* 42, 8901-8907, 2008.
38. **Wan, J.**, T.K. Tokunaga, Y. Kim, Z. Wang, A. Lanzirrotti, E. Saiz, and R.J. Serne, Effect of saline waste solution infiltration rates on uranium retention and spatial distribution in Hanford sediments, *Environ. Sci. Technol.*, 42, 1973-1979, 2008.
39. Tokunaga, T.K., **J. Wan**, Y. Kim, S.R. Sutton, M. Newville, A. Lanzirrotti, and W. Rao. Real-time X-ray absorption spectroscopy of uranium, iron, and manganese in contaminated sediments during bioreduction. *Environ. Sci. Technol.*, 42, 2839-2844, 2008.
40. Zheng, Z., G. Zhang, **J. Wan**, Reactive transport modeling of column experiments on the evolution of saline-alkaline waste solutions, *Journal of Contaminant Hydrology*, 97, 42-54, 2008.
41. He, Y.T., **J. Wan**, and T.K. Tokunaga, Kinetic stability of hematite nanoparticles: the effect of particle sizes, *J. Nanopart. Res.*, 10:321-332, 2008.
42. Faybishenko, B., T. C. Hazen, P. E. Long, E. L. Brodie, M. E. Conrad, S. S. Hubbard, J. N. Christensen, D. Joyner, S. E. Borglin, R. Chakraborty, K. H. Williams, J. E. Peterson, J. Chen, S. T. Brown, T. K. Tokunaga, **J. Wan**, M. Firestone, D. R. Newcomer, C. T. Resch, K. Cantrell, A. Willett, and S. Koenigsberg, In situ long-term reductive immobilization of Cr(VI) in groundwater using Hydrogen Release Compound, *Environ. Sci. Technol.*, 42 (22), 8478-8485, 2008.
43. Tokunaga, T.K., **J. Wan**, A. Lanzirrotti, S.R. Sutton, and M. Newville, Long-term stability of organic carbon-stimulated chromate reduction in contaminated soils, and its relation to manganese redox status, *Environ. Sci. Technol.*, 41 (12) 4326-31, 2007.
44. **Wan, J.**, T. Tyliczszak, T.K. Tokunaga, Organic carbon distribution and elemental correlations: Applications of STXM and NEXAFS spectroscopy, *Geochim. Cosmochim. Acta*, 71, 5439-49, 2007.
45. McKinley, J. P., J. M. Zachara, **J. Wan**, D. E. McCready, and S. M. Heald, Geochemical controls on contaminant uranium in vadose Hanford formation sediments at the 200 Area and 300 Area, Hanford Site, Washington, *Vadose Zone J.* 6(4) 1004–1017, 2007.
46. Brodie, E.L., T.Z. DeSantis, D.C. Joyner, S. Baek, J.T. Larsen, G.L. Andersen, T.C. Hazen, D.J. Herman, T.K. Tokunaga, **J. Wan**, and M.K. Firestone, Application of a high-density oligonucleotide microarray approach to study bacterial population dynamics during uranium reduction and reoxidation. *Appl. Environ. Microbiol.* 72:6288-6298, 2006.

47. Zheng, Z., **J. Wan**, and X. Song. Sodium meta-autunite colloids: Synthesis, characterization, and stability. *Colloids Surfaces A. Physicochemical Eng. Aspects*, 274, 48-55, 2006.
48. **Wan, J.** and T.K. Tokunaga, Comments on “Pore-scale visualization of colloid transport and retention in partly saturated porous media”, *Vadose Zone J.*, 4, 954-956, 2005.
49. Tokunaga, T.K., K.R. Olson, and **J. Wan**, Infiltration flux distributions in unsaturated rock deposits and their potential implications for fractured rock formations. *Geophys. Res. Lett.* 32, L05405, doi:10.1029/2004GL022203, 2005.
50. **Wan, J.**, T.K. Tokunaga, E. Brodie, Z. Wang, Z. Zheng, T.C. Hazen, M.K. Firestone, S.R. Sutton, Reoxidation of bioreduced U under reducing conditions. *Environ. Sci. Technol.*, 39, 6162-69, 2005.
51. Tokunaga, T. K., **J. Wan**, J. Pena, E. Brodie, M.K. Firestone, and T.C. Hazen, Uranium reduction in sediments under diffusion-limited transport of organic carbon, *Environ. Sci. Technol.*, 39, 7077-83, 2005.
52. Zhang, G., Z. Zheng, **J. Wan**, Modeling reactive geochemical transport of concentrated aqueous solutions in variably saturated media. *Water Resour. Res.*, 41, W02018, doi: 10.1029/ 2004 WR003097, 2005.
53. Zheng, Z. and **J. Wan**, Release of contaminant U(VI) from soils, *Radiochim. Acta*, 93, 1–7, 2005.
54. Tokunaga, T.K., **J. Wan**, J. Pena, S.R. Sutton, and M. Newville. Hexavalent uranium diffusion in soils from concentrated acidic and alkaline solutions. *Environ. Sci. Technol.* 38, 3056-3062, 2004.
55. **Wan, J.**, T.K. Tokunaga, J.T. Larsen, and R.J. Serne, Geochemical evolution of highly alkaline and saline tank waste plumes during seepage through vadose zone sediments, *Geochim. Cosmochim. Acta.* 68, 491-502, 2004.
56. **Wan, J.**, J.T. Larsen, T.K. Tokunaga, Z. Zheng, pH neutralization and zonation in alkaline-saline tank waste plumes. *Environ. Sci. Technol.* 38, 1321-1329, 2004.
57. **Wan, J.**, T.K. Tokunaga, E. Saiz, J.T. Larsen, Z. Zheng, R.A. Couture, Colloid formation at waste plume fronts. *Environ. Sci. Technol.* 38, 5603-5608, 2004.
58. Tokunaga, T.K., K.R. Olson, and **J. Wan**. Conditions necessary for capillary hysteresis in porous media: Tests of grain-size and surface tension influences. *Water Resour. Res.* 40, W05111, 2004.
59. Zheng, Z., T.K. Tokunaga, and **J. Wan**, Influence of calcium carbonate on U(VI) sorption to soils. *Environ. Sci. Technol.* 37, 5603-5608, 2003.
60. Tokunaga, T.K., **J. Wan**, T.C. Hazen, E. Schwartz, M.K. Firestone, S.R. Sutton, M. Newville, K.R. Olson, A. Lanzirrotti, and W. Rao. Distribution of chromium contamination and microbial activity in soil aggregates. *J. Environ. Qual.* 32, 541-549, 2003.
61. Tokunaga, T.K., K.R. Olson, and **J. Wan**, Moisture characteristics of Hanford gravels: Bulk, grain-surface, and intragranular components. *Vadose Zone J.* 2, 322-329, 2003.
62. Tokunaga, T.K., **J. Wan**, M.K. Firestone, T.C. Hazen, K.R. Olson, D.J. Herman, S.R. Sutton, and A. Lanzirrotti, In-situ reduction of Cr(VI) in heavily contaminated soils through organic carbon amendment. *J. Environ. Qual.* 32, 1641-1649, 2003.
63. **Wan, J.**, T.K. Tokunaga, Partitioning of clay colloids at air-water interfaces, *J. Colloid Interface Sci.* 247, 54-61, 2002.
64. Tokunaga, T.K., **J. Wan**, and K.R. Olson, Saturation-matric potential relations in gravel. *Water Resour. Res.*, 38(10), 1214, 2002.
65. **Wan, J.**, S. Veerapaneni, F. Gabelle, and T.K. Tokunaga, Generation of stable micro-bubbles and their transport through porous media, *Water Resour. Res.*, 37, 1173-1182, 2001.
66. Tokunaga, T.K., and **J. Wan**, Surface-zone flow in unsaturated rock fractures, *Water Resour. Res.*, 37, 287-296, 2001.
67. Tokunaga, T.K., and **J. Wan**, Approximate boundaries between different flow regimes in fractured rocks. *Water Resour. Res.*, 37, 2103-2111, 2001.

68. Gabelle, F., **J. Wan**, and T.K. Tokunaga. Removal of U(VI) from contaminated sediments by surfactants, *J. Environ. Qual.*, 30, 470-478, 2001.
69. Tokunaga, T.K., **J. Wan**, M.K. Firestone, T.C. Hazen, E. Schwartz, S.R. Sutton, M. Newville, Chromium diffusion and reduction in soil aggregates, *Environ. Sci. Technol.*, 35, 3169-3174, 2001.
70. Veerapaneni, S., **J. Wan**, and T. K. Tokunaga, Particle motion in film flow, *Environ. Sci. Technol.*, 34, 2465-2471, 2000.
71. **Wan, J.**, T.K. Tokunaga, T. Orr, and J. O'Neill, Glass casts of rock fractures: A new tool for studying flow and transport, *Water Resour. Res.*, 36, 355-360, 2000.
72. Tokunaga, T.K., **J. Wan**, and S.R. Sutton. Transient film flow on rough fracture surfaces, *Water Resour. Res.*, 36, 1737-1746, 2000.
73. **Wan, J.** and T.K. Tokunaga, Measuring partition coefficients of colloids at air-water interfaces, *Environ. Sci. Technol.*, 32, 3293-3298, 1998.
74. **Wan, J.** and T.K. Tokunaga, Film-straining of colloids in unsaturated porous media: conceptual model and experimental testing, *Environ. Sci. Technol.*, 31, 2413-2420, 1997.
75. Tokunaga, T.K. and **J. Wan**, Water film flow along fracture surfaces of porous rock, *Water Resour. Res.*, 33, 1287-1295, 1997.
76. **Wan, J.**, T.K. Tokunaga, C.F. Tsang, and G.S. Bodvarsson, Improved glass micromodel methods for studies of flow and transport in fractured porous media, *Water Resour. Res.*, 32, 1955-1964, 1996.
77. **Wan, J.**, T.K. Tokunaga, and C.F. Tsang, Bacterial sedimentation through a porous medium, *Water Resour. Res.*, 31, 1627-1636, 1995.
78. **Wan, J.**, and J.L. Wilson, Colloid transport in unsaturated porous media, *Water Resour. Res.*, 30, 857, 1994.
79. **Wan, J.**, J.L. Wilson, and T. Kieft, Influence of the gas-water interface on transport of microorganisms through unsaturated porous media, *Appl. Environ. Microbio.*, 60, 509 1994.
80. **Wan, J.** and J.L. Wilson, Visualization of the role of the gas-water interface on the fate and transport of colloids in porous media, *Water Resour. Res.*, 30, 11-23, 1994.

### **Awards and Honors**

- “Outstanding Contributions in Geosciences Research” from U.S. Department of Energy Office of Basic Energy Science, August 1998.
- The Langmuir Award, from New Mexico Institute of Mining and Technology, 1995.
- First place as "Outstanding Dissertation Award for the Water Resources" in Environmental and Biological Sciences, The Universities Council of Water Resources, 1993.
- Graduate Student Award, Division of Environmental Chemistry of Am. Chem. Soc. 1993.
- Graduate Student Paper Award, from the American Chemical Society, 1993.

### **Grant Awards (as lead PI) through Peer-Reviewed Competitive Proposals**

- 2008-2010 (\$1.5 M), DOE–BER: Environmental impacts of engineered nano-materials.
- 2006-2008 (\$1.4 M), DOE–ERSP: Hydrological and geochemical studies of alkaline plumes at the 200 Area the Hanford Site.
- 2003-2005 (\$1.2 M), DOE–EMSP: Development of U waste plumes at the Hanford Site.
- 2005-2007 (\$0.6 M), DOE–BES: Nanoparticles fate and transport in the subsurface.
- 2002-2004 (\$ 1.12 M), DOE–NABIR: Coupled transport and bioreduction of U(VI) in sediments.
- 2000-2002 (\$ 1.0 M), DOE–EMSP: Evolution of alkaline-saline waste plumes in the Hanford Site

- 2002-2004 (\$ 0.6 M), DOE–BES: Interfacial properties of colloids and nanoparticles in subsurface.
- 1999-2001 (\$ 1.2 M), DOE–NABIR: Mesoscale biotransformation dynamics of Cr and U
- 1999-2001 (\$ 0.6 M), DOE–BES: Unsaturated flow and colloid transport
- 1997-1999 (\$1.2 M), DOE–EMSP: Sorption of organics and metals onto gas-water interfaces: implications on contaminant transport and remediation
- 1996-1998 (\$ 0.6 M), DOE–BES: Colloid transport in unsaturated porous media.

**Service to Scholarly Journals** as a reviewer for:

- 1998-present - Environmental Science & Technology
- 1997-present - Water Resources Research
- 2002-present - Journal of Colloid & Interface Science
- 2005-present - Geochimica et Cosmochimica Acta
- 2007-present - Vadose Zone Journal
- 2008-present - Journal of Contaminant Hydrology
- 2012-present - Energy and Fuel

**Research Supervision and Mentoring:**

Lu Wang (Oct. 2015- Oct. 2016, PhD student)  
 Ran Hu (March 2015- August 2016, Postdoc)  
 Weijun Shen (Oct. 2014- Oct. 2015, PhD student)  
 Cong Chen (Oct. 2013- Oct. 2014, visiting professor, Dalian University of Technology)  
 Prem Bikkina (June 2013- July 2014, Postdoc)  
 Wenming Dong (2009-2016, Science Engineering Associate)  
 Jongwon Jung (2010-2012, Postdoc)  
 Guang Shi (2011-2012, Postdoc)  
 Martin Mulvihill (2010-2011, Molecular Foundry Postdoc, funded by my project)  
 Susan Habas (2009-2010, Molecular Foundry Postdoc, funded by my project)  
 Saeed Torkzaban (2009-2011, Postdoc)  
 Thomas He (2005-2007, Postdoc)  
 Guiling Han (2005-2006, Visiting Scientist)  
 Joern Larsen (2003-2005, RA)  
 Jasquelin Pena (2002-2004, RA)  
 Zuoping Zheng (2002-2004, Postdoc)  
 Frederic Gadelle (2000-2002, Postdoc)  
 Egbert Schwartz (1999-2001 UCB Postdoc, funded by my project)  
 Srinivas Veerapaneni (1999-2001, Postdoc)  
 Gordon Vrdoljak (1999-2000, postdoc)  
 Dominic Joyner (1998-2000, RA)  
 Mark Yahnke (1998-1999, RA)  
 Ann Sweet (1997-1998, RA)