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EDUCATION

California Institute of Technology, Pasadena, California

Doctor of Philosophy, Environmental Engineering Science, June 2001

Thesis: "Geochemistry of uranium at mineral surfaces: Rates of sorption-desorption and dissolution-precipitation reactions"

Master of Science, Environmental Engineering Science, June 1998

Carnegie Mellon University, Pittsburgh, Pennsylvania

Bachelor of Science, Civil Engineering, with honors, May 1996

PROFESSIONAL EXPERIENCE

Washington University, St. Louis, Missouri, 2002-present

Walter E. Browne Professor of Environmental Engineering, 2014-present

Assistant Vice Provost, 2022-present

Associate Professor, 2008-2014

Assistant Professor, 2002-2008

Department of Energy, Environmental and Chemical Engineering (2006-present)

Department of Civil Engineering (2002-2006)

Princeton University, Princeton, New Jersey, 2012-2013

William R. Kenan, Jr. Visiting Professor for Distinguished Teaching in the Department of Civil and Environmental Engineering and the Keller Center for Innovation and Engineering Education

University of Vienna, Vienna, Austria, November-December 2007

Guest Professor, Department of Earth Sciences, Geography, and Astronomy

Princeton University, Princeton, New Jersey, 2001-2002

Research Associate, Geosciences

California Institute of Technology, Pasadena, California, 1996-2001

Graduate Research Assistant, Environmental Engineering Science

Battelle Memorial Institute, Columbus, Ohio, Summers 1993-1996

Research Intern, Environmental Restoration

Carnegie Mellon University, Pittsburgh, Pennsylvania, 1995-1996

Undergraduate Research Assistant, Civil and Environmental Engineering

HONORS AND AWARDS

- 2022 Perry McCarty Distinguished Lecturer, Stanford University
- 2022 AEESP Distinguished Service Award for Outstanding Service as Chair of the AEESP Conference Planning Committee
- 2020 AEESP Award for Outstanding Teaching in Environmental Engineering & Science
- PE of the Year in Education for 2019-2020, St. Louis Chapter of the Missouri Society of Professional Engineers
- Top Reviewer Award for *AWWA Water Science*, 2019
- Honorary Professor in the School of Water Resources and the Environment, China University of Geosciences, 2015.
- *Chemical Geology* Most Cited Article 2005 to 2010 for “Forsterite dissolution and magnesite precipitation at conditions relevant for deep saline aquifer storage and sequestration of carbon dioxide”, awarded in 2011
- Emerson Excellence in Teaching Award, 2010
- Journal of Environmental Engineering, 2009 Excellence in Review
- Department of Energy, Environmental and Chemical Engineering Teaching Award, 2009
- Dean’s Award for Excellence in Teaching, 2008
- *Environmental Science and Technology* Excellence in Review Award, 2005
- Association of Graduate Students Big Fish Award, 2005
- Caltech Graduate Dean’s Award for Outstanding Community Service, 2001
- National Science Foundation Graduate Research Fellowship, 1996-1999

PUBLICATIONS

(Web of Science, December 22, 2022. 4,960 Citations. H-index = 42)

Peer-Reviewed Archival Journal Publications

1. **Giammar, Daniel E.**, David M. Greene, Anushka Mishrra, Nalini Rao, Josh Sperling, Michael Talmadge, Ariel Miara, Kurban A. Sitterley, Alana Wilson, Sertac Akar, Parthiv Kurup, Jennifer Stokes-Draut, and Katie Coughlin, Cost and energy metrics for municipal water reuse, *ACS ES&T Engineering*, 2(3): 489-507, 2022.
2. King, Patrick W., Sigrid Peldszus, Anushka Mishrra, Benjamin F. Trueman, Kimia Aghasadeghi, Graham A. Gagnon, **Daniel E. Giammar**, and Peter M. Huck, Role of natural organic matter and hardness on lead release from galvanic corrosion, *Environmental Science: Water Research and Technology*, 8: 1687-1699, 2022.
3. Pan Weiyi, Jeffrey G. Catalano, and **Daniel E. Giammar**, Redox-driven Recrystallization of PbO₂, *Environmental Science & Technology*, 56: 7864-7872, 2022.
4. Zhao, Juntao, Marfua Mowla, Zezhen Pan, Daniel Bao, **Daniel E. Giammar**, Yandi Hu, and Stacey M. Louie, Lead phosphate deposition in porous media and implications for lead remediation, *Water Research*, 214: 118200, 2022.
5. Chatterjee, Anamika, Ke Zhang, Yue Rao, Neha Sharma, **Daniel E. Giammar**, and Kimberly M. Parker, Metal-catalyzed hydrolysis of RNA in aqueous environments, accepted in *Environmental Science & Technology*, 56(6): 3564-3574, 2022.
6. Yan, Jinshu, Neha Sharma, Elaine D. Flynn, Daniel E. Giammar, Grace E. Schwartz, Scott C. Brooks, Pamela Weisenhorn, Kenneth M. Kemner, Edward J. O’Loughlin, Daniel I. Kaplan, Jeffrey G. Catalano, Consistent controls on trace metal micronutrient speciation in wetland soils and stream sediments, *Geochimica et Cosmochimica Acta*, 317: 234-254, 2022.

7. Satpathy, Anshuman, Jeffrey G. Catalano, and Daniel E. Giammar, Reduction of U(VI) on chemically reduced montmorillonite and surface complexation modeling of adsorbed U(IV), *Environmental Science & Technology*, 56(7): 4111-4120, 2022.
8. Clark, Gemma G., Weiyi Pan, Daniel E. Giammar, and Thanh H. Nguyen, Influence of point-of-use filters and stagnation on water quality at a preschool and under laboratory conditions, *Water Research*, 211: 118034, 2022.
9. Bae, Yeunook, Nyssa M. Crompton, Neha Sharma, Jeffrey G. Catalano, and Daniel E. Giammar, Impact of dissolved oxygen and pH on the removal of selenium from water by iron electrocoagulation, *Water Research*, 213: 118159, 2022.
10. Sharma, Neha, Elaine D. Flynn, Jeffrey G. Catalano, and **Daniel E. Giammar**, Copper availability governs nitrous oxide accumulation in wetland soils and stream sediments, *Geochimica et Cosmochimica Acta*, 327: 96-115, 2022.
11. Neha Sharma, Zixuan Wang, Jeffrey G. Catalano, and **Daniel E. Giammar**, Dynamic responses of trace metal bioaccessibility to fluctuating redox conditions in wetland soils and stream sediments, *ACS Earth and Space Chemistry*, 6(5): 1331-1344, 2022.
12. Chardi, Kyle, Anshuman Satpathy, Walter D.C. Schenkeveld, Naresh Kumar, Vincent Noël, Stephan M. Kraemer, and **Daniel E. Giammar**, Ligand-induced U mobilization from chemogenic uraninite and biogenic non-crystalline uranium under anoxic conditions, *Environmental Science & Technology*, 56(10): 6369-6379, 2022.
13. Johnson, Elizabeth R., Weiyi Pan, and **Daniel E. Giammar**, Capture and Extraction of Particulate Lead from Point-of-Use Filters, accepted in *ACS ES&T Engineering* in July 2022.
14. Ledingham, Greg, Weiyi Pan, **Daniel E. Giammar**, and Jeffrey G. Catalano, Exchange of adsorbed Pb(II) at the rutile surface: Rates and mechanisms, *Environmental Science & Technology*, 56(17): 12169-12178, 2022.
15. Satpathy, Anshuman, Qihuang Wang, **Daniel E. Giammar**, and Zimeng Wang, Intercomparison and refinement of surface complexation models for U(VI) adsorption to goethite based on a metadata analysis, *Environmental Science & Technology*, 55(13): 9352-9361, 2021.
16. Mishra, Anushka, Ziqi Wang, Vicky Sidorkiewicz, and **Daniel E. Giammar**, Effect of sodium silicate on lead release from lead service lines, *Water Research*, 188: 116485, 2021.
17. Aghasadeghi, Kimia, Sigrid Peldzus, Benjamin F. Trueman, Anushka Mishra, Mitchell G. Cooke, Robin M. Slawson, **Daniel E. Giammar**, Graham A. Gagnon, and Peter M. Huck, Pilot-scale comparison of sodium silicates, orthophosphate and pH adjustment to reduce lead release from lead service lines, *Water Research*, 195 (2021): 116955, 2021.
18. Pan, Weiyi, Elizabeth R. Johnson, and **Daniel E. Giammar**, Lead phosphate particles in tap water: Challenges for point-of-use filters, *Environmental Science & Technology Letters*, 8(3): 244-249, 2021.
19. Mishra, Anushka, Elizabeth Johnson, and **Daniel E. Giammar**, Estimating lead concentrations in drinking water after stagnation in lead service lines using water quality data from across the United States, *Environmental Science & Technology Letters*, 8(10): 878-883, 2021.
20. Pan, Weiyi, Greg J. Ledingham, Jeffrey G. Catalano, and **Daniel E. Giammar**, Effects of Cu(II) and Zn(II) on PbO₂ reductive dissolution under drinking water conditions: Short term inhibition and long term enhancement, *Environmental Science & Technology*, 55: 14397-14406, 2021.
21. Pasteris, Jill, Yeunook Bae, **Daniel E. Giammar**, Sydney N. Dybing, Claude H. Yoder, Juntao Zhao, and Yandi Hu, Worth a closer look: Raman spectra of lead-pipe scale, *Minerals*, 11(10): 1047, 2021.

22. Yan, Jinshu, Neha Sharma, Elaine D. Flynn, **Daniel E. Giammar**, Grace E. Schwartz, Scott C. Brooks, Pamela Weisenhorn, Kenneth M. Kemner, Edward J. O'Loughlin, Daniel I. Kaplan, Jeffrey G. Catalano, accepted in *Geochimica et Cosmochimica Acta* in October 2021.
23. Giammar, Daniel E., David M. Greene, Anushka Mishra, Nalini Rao, Josh Sperling, Michael Talmadge, Ariel Miara, Kurban A. Sitterley, Alana Wilson, Sertac Akar, Parthiv Kurup, Jennifer Stokes-Draut, and Katie Coughlin, Cost and energy metrics for municipal water reuse, *ACS ES&T Engineering*, published online (10.1021/acsestengg.1c00351) December 2021.
24. Bae, Yeunook, Jill D. Pasteris, and **Daniel E. Giammar**, The ability of phosphate to prevent lead release from pipe scale when switching from free chlorine to monochloramine, *Environmental Science & Technology*, 54(2): 879-888, 2020.
25. Li, Guiwei, Weiyi Pan, Lili Zhang, Ziqiao Wang, Baoyou Shi, and **Daniel E. Giammar**, Effect of Cu(II) on Mn(II) oxidation by free chlorine to form Mn oxides at drinking water conditions, *Environmental Science & Technology*, 54(3): 1963-1972, 2020.
26. Liao Peng, Chao Pan, Wenyu Ding, Wenlu Li, Songhu Yuan, John D. Fortner and **Daniel E. Giammar**, Formation and transport of Cr(III)-NOM-Fe colloids upon reaction of Cr(VI) with NOM-Fe(II) colloids at anoxic-oxic interfaces, *Environmental Science & Technology*, 54(7): 4256-4266, 2020.
27. Bae, Yeunook, Jill D. Pasteris, and **Daniel E. Giammar**, Impact of orthophosphate on lead release from pipe scale in high-pH, low-alkalinity water, *Water Research*, 177: 115764, 2020.
28. Li, Guiwei, Yeunook Bae, Anushka Mishra, Baoyou Shi, and **Daniel E. Giammar**, Effect of aluminum on lead release to drinking water from scales of corrosion products, *Environmental Science & Technology*, 54: 6142-6151, 2020.
29. Pan, Chao and **Daniel E. Giammar**, Interplay of transport processes and interfacial chemistry affecting chromium reduction and reoxidation with iron and manganese, *Frontiers of Environmental Science and Engineering*, 14(5): 81, 2020.
30. Sharma, Neha, Anushree Ghosh, John D. Fortner, and **Daniel E. Giammar**, Modeling performance of rhamnolipid-coated engineered iron oxide nanoparticles for U(VI) sorption and separation, *Environmental Science: Nano*, 7: 2010-2020, 2020.
31. Bae, Yeunook, Jill D. Pasteris, and **Daniel E. Giammar**, Impact of iron-rich scale in service lines on lead release to water, *AWWA Water Science*, e1188, 2020.
32. Pan, Weiyi, Elizabeth R. Johnson, and **Daniel E. Giammar**, Accumulation on and Extraction of Lead from Point-of-use Filters for Evaluating Lead Exposure from Drinking Water, *Environmental Science: Water Research & Technology*, 6: 2734-2741, 2020.
33. Qian, Ao, Chao Pan, Songhu Yuan, and **Daniel E. Giammar**, Cr(VI) formation from $\text{Cr}_x\text{Fe}_{1-x}(\text{OH})_3$ induced by Mn(II) oxidation on the surface of $\text{Cr}_x\text{Fe}_{1-x}(\text{OH})_3$, *ACS Earth and Space Chemistry*, 4: 1558-1564, 2020.
34. Kim, Changwoo, Seung Soo Lee, Kit Tan Kwan, Wenlu Li, Brandon J. Lafferty, Daniel E. Giammar, and John D. Fortner, Surface functionalized nanoscale metal oxides for arsenic (V), chromium (VI), and uranium (VI) sorption: Considering single- and multi-sorbate dynamics, *Environmental Science: Nano*, 7: 3805-3813, 2020.
35. Pan, Chao, Huan Liu, Jeffrey G. Catalano, Zimeng Wang, Ao Qian, and **Daniel E. Giammar**, Understanding the roles of dissolution and diffusion in $\text{Cr}(\text{OH})_3$ oxidation by $\delta\text{-MnO}_2$, *ACS Earth and Space Chemistry*, 3: 357-365, 2019.
36. Qian, Ao, Wen Zhang, Cheng Shi, Chao Pan, **Daniel E. Giammar**, Songhu Yuan, Hongliang Zhang, and Zimeng Wang, Geochemical stability of dissolved Mn(III) in the presence of pyrophosphate as a

- model ligand: Complexation and disproportionation, *Environmental Science & Technology*, 53: 5768-5777, 2019.
37. Pan, Weiyi, Chao Pan, Yeunook Bae, and **Daniel E. Giammar**, The role of manganese in accelerating the oxidation of Pb(II) carbonate solids to Pb(IV) at drinking water conditions, *Environmental Science & Technology*, 53: 6699-6707, 2019.
 38. Pan, Zezhen, Xiaoming Zhu, Anshuman Satpathy, Wenlu Li, John D. Fortner, and **Daniel E. Giammar**, Cr(VI) Adsorption on Engineered Iron Oxide Nanoparticles: Exploring Complexation Processes and Water Chemistry, *Environmental Science & Technology*, 53: 11913-11921, 2019.
 39. Pan, Weiyi, Lia Schattner, Justin Guilak, and **Daniel E. Giammar**, Impact of Cu(II) and Zn(II) on the reductive dissolution of Pb(IV) oxide, *Environmental Science & Technology Letters*, 2019, 6: 745-751.
 40. Kim, Changwoo, Seung Soo Lee, Brandon J. Lafferty, **Daniel E. Giammar**, and John D. Fortner, Engineered superparamagnetic nanomaterials for arsenic(V) and chromium(VI) sorption and separation: Quantifying the role of organic surface coatings, *Environmental Science: Nano*, 5: 556-563, 2018.
 41. Xiong, Wei, Rachel K. Wells, Jake A. Horner, Herbert T. Schaef, Philip A. Skemer, and **Daniel E. Giammar**, CO₂ Mineral Sequestration in Naturally Porous Basalt, *Environmental Science and Technology Letters*, 5: 142-147, 2018.
 42. Wen, Hang, Zezhen Pan, **Daniel Giammar**, and Li Li, Enhanced uranium immobilization by phosphate amendment: Effect of geochemical and flow conditions, *Environmental Science and Technology*, 52(10): 5841-5850, 2018.
 43. Dai, Chong, Juntao Zhao, **Daniel Giammar**, Jill Pasteris, Xiaobing Zuo, and Yandi Hu, Heterogeneous lead phosphate nucleation at organic-water interfaces: implications for lead immobilization, *ACS Earth and Space Chemistry*, 2(9) 869-877, 2018.
 44. Menefee, Anne H., **Daniel E. Giammar**, and Brian R. Ellis, Permanent CO₂ trapping through localized and chemical gradient-driven basalt carbonation, *Environmental Science and Technology*, 52(15): 8954-8964, 2018.
 45. Rivera-Nunez, Zorimar, Lora Ionatti, Zezhen Pan, and **Daniel Giammar**, Water metal contaminants in a potentially mineral deficient population of Haiti, *International Journal of Environmental Health Research*, 28(12): 1-9, 2018.
 46. Zhao, Juntao, **Daniel E. Giammar**, Jill D. Pasteris, Chong Dai, and Yandi Hu, Formation and aggregation of lead phosphate nanoparticles: Implications for lead immobilization in water supply systems, *Environmental Science and Technology*, 52(21): 12612-12623, 2018.
 47. Xiong, Wei, Rachel K. Wells, and **Daniel E. Giammar**, Carbon sequestration in olivine and basalt powder packed beds, *Environmental Science & Technology*, 51(4): 2105-2112, 2017
 48. Wells, Rachel K., Wei Xiong, Erika Sesti, Jinlei Cui, **Daniel Giammar**, Philip Skemer, Sophia E. Hayes, and Mark S. Conradi, Spatially-variable carbonation reactions in polycrystalline olivine, *Geochimica et Cosmochimica Acta*, 204: 252-266, 2017.
 49. Pan, Chao, Lyndsay D. Troyer, Peng Liao, Jeffrey G. Catalano, Wenlu Li, and **Daniel E. Giammar**, The effect of humic acid on the removal of chromium(VI) and the production of solids in iron electrocoagulation, *Environmental Science & Technology*, 51(11): 6308-6318, 2017.
 50. Adeoye, Jubilee T., Anne H. Menefee, Wei Xiong, Rachel K. Wells, **Daniel E. Giammar**, Philip Skemer, and Brian R. Ellis, Effect of transport limitations and fluid properties on reaction products in fractures of unaltered and serpentinized basalt exposed to high P_{CO2} fluids, *International Journal of Greenhouse Gas Control*, 63: 310-320, 2017.

51. Menefee, Anne; Li, Peiyuan; **Giammar, Daniel**; Ellis, Brian, Roles of transport limitations and mineral heterogeneity in carbonation of fractured basalts, *Environmental Science & Technology*, 51: 9352-9362, 2017.
52. Pan, Zezhen, Wenlu Li, John D. Fortner and **Daniel E. Giammar**, Measurement and Surface Complexation Modeling of U(VI) Adsorption to Engineered Iron Oxide Nanoparticles, *Environmental Science & Technology*, 51: 9219-9226, 2017.
53. Wells, Rachel K., Wei Xiong, **Daniel E. Giammar**, and Philip Skemer, Dissolution and surface roughening of Columbia River flood basalt at geologic carbon sequestration conditions, *Chemical Geology*, 467: 100-109, 2017.
54. Pan, Chao, Huan Liu, Jeffrey G. Catalano, Ao Qian, Zimeng Wang, and **Daniel E. Giammar**, Rates of oxidation of Cr(III) in $\text{Cr}_x\text{Fe}_{1-x}(\text{OH})_3$ solids by manganese oxide: The influence of pH and iron content, *Environmental Science & Technology*, 51(21): 12416-12423, 2017.
55. Liao, Peng, Wenlu Li, Yi Jiang, Jiewei Wu, Songhu Yuan, John Fortner, and **Daniel Giammar**, Formation, aggregation, and deposition dynamics of NOM-iron colloids at anoxic-oxic interfaces, *Environmental Science & Technology* 51(21): 12235-12245, 2017.
56. Xiong, Wei, Rachel K. Wells, Anne H. Menefee, Philip Skemer, Brian R. Ellis, and **Daniel E. Giammar**, CO_2 mineral trapping in fractured basalt, *International Journal of Greenhouse Gas Control*, 66: 204-217, 2017.
57. Wang, L, Burns, S.R., **Giammar, D.E.**, and J.D. Fortner, Element mobilization from Bakken shales as a function of water chemistry, *Chemosphere*, 149: 286-293, 2016.
58. Troyer, L., Maillot, F., Wang, Z., Wang, Z., Mehta, V.S., **Giammar, D.E.**, and J.G. Catalano, Effect of phosphate on U(VI) sorption to montmorillonite: Ternary complexation and precipitation barriers, *Geochimica et Cosmochimica Acta*, 175: 86-99, 2016.
59. Mehta, V.S., Maillot, F., Wang, Z., Catalano, J.G. and **D.E. Giammar**, Effect of reaction pathway on the extent and mechanism of uranium(VI) immobilization with calcium and phosphate, *Environmental Science & Technology*, 50(6): 3128-3136, 2016.
60. Schenkeveld, Walter; Wang, Zimeng; **Giammar, Daniel**; Kraemer, Stephan, Synergistic effects between biogenic ligands and a reductant in Fe acquisition from calcareous soil, *Environmental Science & Technology*, 50: 6381-6388, 2016.
61. Cui, J., Sesti, E.L, Moore, J.K., **Giammar, D.**, and S.E Hayes, Evidence from ^{29}Si solid-state NMR of dissolution reactions of forsterite, *Environmental Engineering Science*, 33(10): 799-805, 2016.
62. Xie, Xiongfei, **Daniel E. Giammar**, and Zimeng Wang, MINFIT: A Spreadsheet-based tool for parameter estimation in an equilibrium speciation software program, *Environmental Science & Technology*, 50(20): 11112-11120, 2016.
63. Pan, Zezhen, **Daniel E. Giammar**, Vrajesh Mehta, Lyndsay D. Troyer, Jeffrey G. Catalano, and Zheming Wang, Phosphate-induced immobilization of uranium in Hanford sediments, *Environmental Science & Technology*, 50(24): 13486-13494, 2016.
64. Pan, Chao, Lyndsay D. Troyer, Jeffrey G. Catalano, and **Daniel E. Giammar**, Dynamics of chromium(VI) removal from drinking water by iron electrocoagulation, *Environmental Science & Technology*, 50(24): 13502-13510, 2016.
65. Mehta, V.S., Maillot, F., Wang, Z., Catalano, J.G. and **D.E. Giammar**, Transport of U(VI) through sediments amended with phosphate to induce *in situ* uranium immobilization, *Water Research*, 69: 307-317, 2015.
66. Wang, L, J.D. Fortner, and **D.E. Giammar**, Impact of water chemistry on elemental mobilization from Eagle Ford Shale, *Environmental Engineering Science*, 32(4): 310-320, 2015.
67. Wang, L. and **D.E. Giammar**, Effects of pH, dissolved oxygen, and aqueous ferrous iron on the adsorption of arsenic to lepidocrocite, *Journal of Colloid and Interface Science*, 448: 331-338, 2015.

68. Hinkle, M.A., Wang, Z., **Giammar, D.E.** and J.G. Catalano, Interaction of Fe(II) with phosphate and sulfate on iron oxide surfaces, *Geochimica et Cosmochimica Acta*, 158: 130-146, 2015.
69. Surface, J.A., Wang, F., Zhu, Y., Hayes, S.E., **Giammar, D.E.**, and M.S. Conradi, Determining pH at elevated pressure and temperature using *in situ* ^{13}C NMR, *Environmental Science & Technology*, 49: 1631-1638, 2015.
70. Wang, Z., Schenkeveld, W.D.C., Kraemer, S.M., and **D.E. Giammar**, Synergistic effect of reductive and ligand controlled dissolution of goethite, *Environmental Science & Technology*, 49(12): 7236-7244, 2015.
71. Lezama Pacheco, J., Cerrato, J., Veeramani, H., Alessi, D., Suvorova, E., Bernier-Latmani, R., **Giammar, D.**, Long, P., Williams, K. and J. Bargar, Long-term in-situ oxidation of biogenic uraninite in an alluvial aquifer: Impact of dissolved oxygen and calcium, *Environmental Science & Technology*, 49(12): 7340-7347, 2015.
72. Wang, Z., Ulrich, K.-U., Pan, C., and **D.E. Giammar**, Measurement and modeling of U(IV) adsorption to metal oxide minerals, *Environmental Science & Technology Letters*, 2: 227-232, 2015.
73. Xiong W. and **D.E. Giammar**, Forsterite carbonation in zones with transport limited by diffusion, *Environmental Science & Technology Letters*, 1: 333-338, 2014. [dx.doi.org/10.1021/ez500182s](https://doi.org/10.1021/ez500182s) |
74. **Giammar, D.E.**, Wang, F., Guo, B., Surface, J.A., Peters, C.A., Conradi, M.S., and S.E. Hayes, Impacts of diffusive transport on carbonate mineral formation from magnesium silicate- CO_2 -water reactions, *Environmental Science & Technology*, 48(24): 14344-14351, 2014.
75. Alessi, Daniel; Lezama Pacheco, Juan; Janot, Noémie; Suvorova, Elena; Cerrato, Jose; **Giammar, Daniel**; Davis, James; Fox, Patricia; Williams, Kenneth; Long, Philip; Handley, Kim; Bernier-Latmani, Rizlan; Bargar, John, Speciation and reactivity of uranium products formed during in situ bioremediation in a shallow alluvial aquifer, *Environmental Science and Technology*, 48(21): 12842-12850, 2014.
76. Wang, Z., Xiong, W., Tebo, B.M. and **D.E. Giammar**, Oxidative UO_2 dissolution induced by soluble Mn(III), *Environmental Science & Technology*, 48(1): 289-298, 2014.
77. Mehta, V., Maillot, F., Wang, Z., Catalano, J. G., and **D.E. Giammar**. Effect of co-solutes on the products and solubility of uranium(VI) precipitated with phosphate, *Chemical Geology*, 364: 66-75, 2014.
78. Noel, J.D., Wang, Y. and **D.E. Giammar**, Effect of water chemistry on the dissolution rate of the lead corrosion product hydrocerussite, *Water Research*, 54: 237-246, 2014.
79. Wang, Z., Tebo, B.M. and **D.E. Giammar**, Effects of Mn(II) on UO_2 dissolution under anoxic and oxic conditions, *Environmental Science and Technology*, 48(10): 5546-5554, 2014.
80. Wang, Y., Wu, J., Wang, Z., Terenyi, A., and **D.E. Giammar**, Adsorption of Pb(II) to PbO_2 : Implications for reductive dissolution of PbO_2 , *Journal of Colloid and Interface Science*, 389: 236-243, 2013.
81. Wang, Z., Lee, S.-W., Kapoor, P., Tebo, B.M., and **D.E. Giammar**, Uraninite oxidation and dissolution induced by manganese oxide: A redox reaction between two insoluble minerals, *Geochimica et Cosmochimica Acta*, 100(1): 24-40, 2013.
82. Wang, F., and **D.E. Giammar**, Forsterite dissolution in saline water at elevated temperature and high CO_2 pressure, *Environmental Science & Technology*, 47: 168-173, 2013.
83. Jun, Y.-S., **Giammar, D.E.** and C.J. Werth, Impacts of geochemical reactions on geologic carbon sequestration, *Environmental Science & Technology*, 47: 3-8, 2013.
84. Wang, Z., Lee, S.-W., Catalano, J.G., Lezama-Pacheco, J.S., Bargar, J.R., Tebo, B.M. and **D.E. Giammar**, Adsorption of uranium(VI) to manganese oxides: X-ray absorption spectroscopy and surface complexation modeling, *Environmental Science & Technology*, 47: 850-858, 2013.

85. Wang, Z. and **D.E. Giammar**, Mass action expressions for bidentate adsorption in surface complexation modeling: Theory and practice, *Environmental Science & Technology*, 47: 3982-3996, 2013.
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87. Wang, Y., Mehta, V., Welter, G.J., and **D.E. Giammar**, Effect of connection methods on lead release from galvanic corrosion, *Journal American Water Works Association*, E337-E351, 2013.
88. Cerrato, J., Ashner, M., Alessi, D., Lezama, J., Bernier-Latmani, R., Bargar, J., and **D.E. Giammar**, Relative reactivity of uraninite and non-crystalline U(IV) species, *Environmental Science & Technology*, 47: 9756-9763, 2013.
89. Hutchinson, T.J., Basappa, L., Dikshit, A., Luo, Y., Catalano, J.G. and **D.E. Giammar**, Fate of metals in fly ash during aging in laboratory-scale ash ponds, *Environmental Engineering Science*, 29(12): 1085-1091, 2012.
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91. Wang, Y., He, J., Mehta, V., Welter, G.J., and **D.E. Giammar**, Impact of galvanic corrosion on lead release from aged lead service lines, *Water Research*, 46: 5049-5060, 2012.
92. Singh, A., Catalano, J.G., Ulrich, K.-U. and **D.E. Giammar**, Molecular-scale structure of uranium(VI) immobilized with goethite and phosphate, *Environmental Science & Technology*, 46: 6604-6611, 2012.
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94. **Giammar, D.E.**, Cerrato, J.M., Mehta, V., Wang, Z., Wang, Y., Pepping, T.J., Ulrich, K.-U., Lezama-Pacheco, J.S., and J.R. Bargar, Effect of diffusive transport limitations on UO_2 dissolution, *Water Research*, 46: 6023-6032, 2012.
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100. Ulrich, K.-U., Veeramani, H., Bernier-Latmani, R. and **D.E. Giammar**, Speciation-dependent kinetics of uranium(VI) bioreduction, *Geomicrobiology Journal*, 28:396-409, 2011.

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103. Case, D.H., Wang, F., and **D.E. Giammar**, Precipitation of magnesium carbonates as a function of parameters important to geological carbon sequestration, *Environmental Engineering Science*, 28(12): 881-889, 2011.
104. Wang, Y, Xie, Y, Li, W., Wang, Z., and **D.E. Giammar**, Formation of lead(IV) oxide corrosion products from lead(II) compounds, *Environmental Science and Technology*, 44(23): 8950-8956, 2010.
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106. Xie, Y., Wang, Y., and **D.E. Giammar**, Impact of chlorine disinfectants on dissolution of the lead corrosion product PbO₂, *Environmental Science and Technology*, 44(18): 7082-7088, 2010.
107. Xie, Y., Wang, Y., Singhal, V., and **D.E. Giammar**, Effects of pH and carbonate concentration on dissolution rates of the lead corrosion product PbO₂, *Environmental Science and Technology*, 44(3): 1093-1099, 2010.
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110. Zeng, H., Singh, A., Basak, S., Ulrich, K.-U., Sahu, M., Biswas, P., Catalano, J.G, and **D.E. Giammar**, Nanoscale size effects on uranium(VI) adsorption to hematite, *Environmental Science and Technology*, 43(5): 1373-1378, 2009.
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115. **Giammar, D.E.**, Xie, L., and J.D. Pasteris, Immobilization of lead with nanocrystalline carbonated apatite present in fish bone, 25(5): 725-735, *Environmental Engineering Science*, 2008.
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120. Noel, J.D., Biswas, P., and **D.E. Giammar**, Evaluation of a sequential extraction procedure for distinguishing mechanisms of mercury immobilization in coal combustion fly ash, *Journal of the Air and Waste Management Association*, 57(7): 856-867, 2007.
121. Yuan, Z., Ramaswami, B., Casaletto, D., Falke, S., Angenent, L. T. and **D.E. Giammar**, Evaluation of chemical indicators for tracking and apportionment of phosphorus to Table Rock Lake in Southwest Missouri, USA, *Water Research*, 41: 1525-1533, 2007.
122. **Giammar, D.E.**, Maus, C.J., and L. Xie, Effect of particle size and crystalline phase on lead adsorption to titanium dioxide nanoparticles, *Environmental Engineering Science*, 24(1): 85-95, 2007.
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127. **Giammar, D.E.** and J.G. Hering, Time scales for sorption-desorption and surface precipitation of uranyl on goethite, *Environmental Science and Technology*, 35: 3332-3337, 2001.
128. **Giammar, D.E.** and D.A. Dzombak, Copper complexation with the mellitic acid series, *Journal of Solution Chemistry*, 27: 89-105, 1998.

Archival Journal Publications that are not Peer Reviewed

1. Weiyi Pan and Daniel E. Giammar, Point-of-use Filters for Lead Removal from Tap Water: Opportunities and Challenges, *Environmental Science & Technology*, 56(8): 4718-4720, 2022.
2. Wang, Zimeng and Daniel Giammar, Tackling deficiencies in the presentation and interpretation of adsorption results for new materials, *Environmental Science & Technology*, 53(10): 5543-5544, 2019.
3. Lowry, Greg, Dan Giammar, et al., Why was my paper rejected without review?, *Environmental Science & Technology*, 54(19): 11641-11644, 2020.

Peer-Reviewed Book Chapters and Technical Reports

1. Bae, Yeunook and **Daniel Giammar**. 2019. Processes controlling the development of effective lead corrosion control with orthophosphate, Project No. 4686. Water Research Foundation, Denver, Colorado. ISBN 978-60573-449-1.
2. Wang, Z. and **D.E. Giammar**. 2015. Metal contaminant oxidation mediated by manganese redox cycling in subsurface environments, Chapter 2, pp. 29-50, in *Advances in the Environmental Biogeochemistry of Manganese Oxides*, Eds. Feng, X., Li, W., Zhu, M., and D.L. Sparks, American Chemical Society, Washington, DC

3. Welter, G., **Giammar, D.**, Wang, Y., and A. Cantor. 2013. *Galvanic corrosion following partial lead service line replacement*. Project 4349. Water Research Foundation, Denver, Colorado.
4. Wang, Y., Xie, Y., and **D.E. Giammar**. 2012. *Lead(IV) oxide formation and stability in drinking water distribution systems*. Project No. 4211. Water Research Foundation, Denver, Colorado. ISBN 978-1-60573-180-3.
5. **Giammar, D.E.**, Nelson, K.S., Noel, J.D., and Y. Xie. 2010. *Water chemistry effects on dissolution rates of lead corrosion products*. Project No. 4064. Water Research Foundation, Denver, Colorado. ISBN 978-1-60573-087-5.
6. Xie, L. and **D.E. Giammar**, Influence of phosphate on adsorption and surface precipitation of lead on iron oxide surfaces, in *Adsorption of Metals by Geomedia II*, Barnett, M.O and D.B. Kent, Editors, Elsevier, Vol. 7, 349-373, 2008.
7. Angenent L.T., B. Ramaswami, S.R. Falke, Z. Yuan, and **D.E. Giammar**. 2006. *Evaluation of Chemical and Biological Indicators for Source Apportionment of Phosphorus in Table Rock Lake, on the Missouri-Arkansas Border*. Project No. WU-HT-03-00. Prepared for the National Decentralized Water Resources Capacity Development Project, Washington University, St. Louis, MO, by the Environmental Engineering Science Program, Washington University in St. Louis.

Other Technical Reports

1. Giammar, Daniel, Sunny Jiang, Pei Xu, Richard Breckinridge, Jordan Macknick, Nalini Rao, David Sedlak, and Jennifer Stokes-Draut. 2021. NAWI Technology Roadmap: Municipal Sector, DOE Publication DOE/GO-102021-5565.
2. Childress, Amy, Daniel Giammar, Sunny Jiang, Richard Breckinridge, Andrew Howell, Jordan Macknick, David Sedlak, and Jennifer-Stokes-Draut. 2021. NAWI Technology Roadmap: Power Sector, DOE Publication DOE/GO-102021-5566.

CONFERENCE PRESENTATIONS AND PROCEEDINGS

Selected presentations since 2018

1. Anushka Mishrra, Ziqi Wang, and Daniel Giammar, Silicate update by lead corrosion products and its effect on lead release, ACS Fall 2022 National Meeting.
2. Weiye Pan, Greg Ledingham, Jeffrey Catalano, and Daniel Giammar, Interactions between PbO₂ and cations at drinking water conditions, ACS Spring 2022 National Meeting.
3. Anushka Mishrra, Lin Zhang, Fangqiong Ling, Nicole Blute, and Daniel Giammar, Impact of blending of advanced treated water with conventional drinking water on metal release and microbial diversity in premise plumbing, ACS Spring 2022 National Meeting.
4. Neha Sharma, Scott Brooks, Jeffrey Catalano, and Daniel Giammar, Quantifying labile trace metal concentrations and desorption kinetics in freshwater sediments using diffusion-based sampling devices, ACS Spring 2022 National Meeting.
5. Yao Ma, Daniel Giammar, and Roger Arnold, Impacts of polyphosphate presence in blended-phosphate corrosion inhibitors on lead release from lead service lines, ACS Spring 2022 National Meeting.
6. Neha Sharma, Zixuan Wang, Jeffrey Catalano, and Daniel Giammar, Impacts of oscillating redox conditions on trace metal mobilization in natural aquatic systems, ACS Spring 2022 National Meeting
7. (invited) Daniel Giammar, Elizabeth Johnson, and Weiye Pan, Point-of-use water treatment devices and lead-containing particles: Accumulation, release, and transport, ACS Fall 2021 Meeting.

8. (invited) Daniel Giammar, Anshuman Satpathy, and Jeffrey Catalano, Stability of uranium on montmorillonite, Interfaces Against Pollution 2021, May 15-17, 2021, Wuhan, China (attended remotely).
9. (invited) Daniel Giammar, Insights into lead corrosion control from pipe scale analysis, AWWA Lead & Water Quality Virtual Summit, April 7-8, 2021.
10. Kyle Chardi, Daniel Giammar, Walter Schenkeveld, Naresh Kumar, and Stephan Kraemer, Ligand-induced mobilization of tetravalent uranium, ACS Spring 2021 National Meeting.
11. Weiyi Pan and Daniel Giammar, Lead phosphate nanoparticles in drinking water: Challenges for point-of-use filters, ACS Spring 2021 National Meeting.
12. Anshuman Satpathy, Daniel Giammar, and Jeffrey Catalano, U(VI) reduction by structural iron(II) present in montmorillonite, ACS Spring 2021 National Meeting.
13. Neha Sharma, Jinshu Yan, Elaine Flynn, Jeffrey Catalano, and Daniel Giammar, Role of copper availability on denitrification in natural systems, ACS Spring 2021 National Meeting.
14. Nicole Blute, Jacqueline Rhoades, Daniel Giammar, and Anushka Mishra, Water quality integration and blending strategies to prevent corrosion outcomes with potable reuse, International Potable Reuse Symposium, February 10-11, Atlanta, Georgia
15. Daniel Giammar, Yeunook Bae, Anushka Mishra, Vicky Sidorkiewicz, and Jill Pasteris, Effects of orthophosphate and sodium silicate addition on controlling lead release, Water Quality Technology Conference, November 3-7, 2019, Dallas, Texas.
16. Yeunook Bae, Viola Liu, Guiwei Li, Anushka Mishra, Jill Pasteris, and Daniel Giammar, The role of orthophosphate to limit lead release from pipe scales when switching disinfectant from free chlorine to monochloramine, Water Quality Technology Conference, November 3-7, 2019, Dallas, Texas.
17. Anushka Mishra, Daniel Giammar, Ziqi Wang, and Vicky Sidorkiewicz, Effect of sodium silicate addition on lead release from premise plumbing and lead service lines, Water Quality Technology Conference, November 3-7, 2019, Dallas, Texas.
18. Guiwei Li, Daniel Giammar, and Baoyou Shi, Catalytic effect of different Al(III) species residual on Mn(II) oxidation by chlorine in drinking water distribution, Water Quality Technology Conference, November 3-7, 2019, Dallas, Texas.
19. Daniel Giammar and Jeff Catalano, Geochemical controls of the bioavailability of metal nutrients in wetland soils, International Symposium on Environmental Geochemistry, August 7-10, 2019, Beijing, China. (invited)
20. Daniel Giammar, Yeunook Bae, Anushka Mishra, and Jill Pasteris, Impact of changes in water chemistry on release of lead from lead service lines used for water supply, 2019 AEESP Education and Research Conference, May 14-16, 2019, Tempe, Arizona.
21. Neha Sharma, John Fortner, and Daniel Giammar, U(VI) removal using rhamnolipid stabilized iron oxide nanoparticles, *257th American Chemical Society National Meeting*, March 31 – April 4, 2019, Orlando, Florida.
22. Daniel Giammar, Yeunook Bae, Weiyi Pan, Chao Pan, Anna Ivarson, and Jill Pasteris, Response of lead pipe scales to changes in water chemistry, *2018 Water Quality Technology Conference*, November 11-14, 2018, Toronto Ontario.

INVITED SEMINAR PRESENTATIONS

Selected presentations (out of 85) since 2001.

1. The end of the pipe: Using aquatic chemistry to predict, control, and monitor lead concentrations in tap water, Perry McCarty Distinguished Lecture, Department of Civil and Environmental Engineering, Stanford University, October 17, 2022.
2. Role of Manganese in Accelerating the Formation of Pb(IV) Oxide at Drinking Water Conditions, American Water Works Association Manganese Subcommittee, July 14, 2022.
3. Getting the Lead Out: From Leaded Gasoline and Air Quality to Lead Pipes and Drinking Water, Fudan University Environmental Geoscience Webinar Series, November 8, 2021.
4. The End of the pipe: Controlling and monitoring lead in tap water, Department of Civil and Environmental Engineering, Marquette University, October 20, 2021.
5. The End of the pipe: Using aquatic chemistry to control lead in tap water, Department of Civil and Environmental Engineering, University of Pittsburgh, April 2, 2021.
6. The End of the pipe: Using aquatic chemistry to control lead in tap water, Environmental Engineering Seminar Series, Ecole Polytechnique Federale de Lausanne, November 24, 2020.
7. The End of the pipe: Using aquatic chemistry to control lead in tap water, September 4, 2020, Environmental Engineering Program, University of Colorado.
8. Lead in drinking water: The role of water chemistry and reactions at the pipe scale-water interface, March 14, 2019, Department of Civil and Environmental Engineering, Cornell University.
9. Lead in drinking water: The role of water chemistry and reactions at the pipe scale-water interface, January 31, 2019, Department of Civil and Environmental Engineering, University of Texas - Austin.
10. Measuring and modeling uranium adsorption at solid-water interfaces, October 11, 2018, Peking University, Beijing, China.
11. Geochemical reactions and transport processes involved in geologic carbon sequestration, September 21, 2018, Department of Earth and Ocean Sciences and Department of Civil and Environmental Engineering, Duke University.
12. Coupling of geochemical reactions and transport processes during geologic carbon sequestration, September 15, 2015, Department of Geography and Environmental Engineering, Johns Hopkins University.
13. The role of solid-water interfaces in controlling the mobility of heavy metals and metalloids in natural and engineered aquatic systems, June 8 and 15, 2015, China University of Geosciences (Wuhan and Beijing)
14. Influence of interfacial processes on the fate and transport of uranium in the environment, February 26, 2015, Environmental Engineering and Earth Science Program, Notre Dame University.
15. Impact of galvanic corrosion on lead release from aged lead service lines, Polytechnique de Montreal, June 18, 2012, Montreal, Canada.
16. Biogeochemical processes affecting the environmental fate and transport of uranium, University of Iowa, Department of Civil and Environmental Engineering, February 8, 2008.
17. Adsorption of toxic metals and metalloids to nanostructured metal oxides, The Swiss Federal Institute of Aquatic Science and Technology (Eawag), August 14, 2007.
18. Processes controlling the long-term stability of uranium in contaminated environments: the role reactions at the solid-water interface, California Institute of Technology, Environmental Science and Engineering, May 16, 2007.

RESEARCH GRANTS AND CONTRACTS

Current Research Projects

1. Tailored reductants for selenium removal in iron electrocoagulation, Department of Energy National Alliance for Water Innovation, \$1,650,403, October 1, 2021 – September 30, 2024, PI is Giammar, Co-PIs are Catalano, Monnell (EPRI), and Stokes-Draut (LBNL).
2. Structural and interfacial geochemistry of rare earth and platinum group elements, Department of Energy, \$2,544,000, September 1, 2021 – September 30, 2024, PI is Catalano, Co-PIs are Giammar and Eric Bylaska and Eugene Ilton (Pacific Northwest National Laboratory).
3. Considerations and blending strategies for drinking water system integration with alternative water supplies, Water Research Foundation, \$400,000 (\$150,000 is WUSTL Share), February 1, 2020 – July 1, 2023, PI is Nicole Blute with Hazen and Sawyer; Giammar is a Co-PI.
4. Using phosphate-based corrosion inhibitors and sequestrants to meet multiple water treatment objectives, Water Research Foundation, \$647,242 (\$52,000 to WUSTL), March 1, 2022 – September 30, 2023, PI is Roger Arnold (Hazen and Sawyer), Giammar is one of several Co-PIs.
5. Pipe-Loop Testing with Harvested Erie County Water Authority Pipes, Hazen and Sawyer, \$149,973, November 1, 2021 – October 31, 2023, PI is Giammar.
6. 2021 Association of Environmental Engineering and Science Professors (AEESP) Research and Education Conference, \$99,252, July 1, 2021 – June 30, 2023, PI is Giammar, Co-PI's are Zhen He and Avni Solanki.
7. MRI: Acquisition of a High Temperature and Pressure Solid-state NMR Spectrometer, \$886,362, September 1, 2021 – August 31, 2024, PI is Foston, Co-PIs are Barnes, Biswas, Giammar, and Ramani
8. MRI: Acquisition of a Laboratory-Based X-ray Absorption and Emission Spectroscopy Instrument, \$295,464, September 1, 2021 – August 31, 2024, PI is Catalano, Co-PIs are Bose, Giammar, Krawczynski, and Ogliore

Completed Research Projects – Federal and other Externally Supported Projects

1. Trace Metal Dynamics and Limitations on Biogeochemical Cycling in Wetland Soils and Hyporheic Zones, Department of Energy Subsurface Biogeochemical Research Program, \$600,000 (234,421 to Giammar), August 1, 2018 – January 31, 2022, PI is Catalano, Co-PIs are Giammar, Kemner, and Brooks.
2. 2021 Association of Environmental Engineering and Science Professors (AEESP) Research and Education Conference, National Institute of Environmental Health Sciences, \$15,000, April 13, 2021 – September 30, 2022, PI is Giammar, Co-PI's are Joel Burken, Rajan Chakrabarty, Young-Shin Jun, and Fangqiong Ling.
3. Impact of redox-driven recrystallization on the stability and reactivity of UO_2 and PbO_2 , National Science Foundation, \$400,000, August 1, 2017 – July 31, 2021, PI is Giammar; Co-PI is Catalano.
4. National Alliance for Water Innovation, Department of Energy, \$149,638, January 1, 2020 – May 31, 2021, Sub-recipient to Lawrence Berkeley National Laboratory (Peter Fiske is PI), Washington University PI is Giammar.
5. Collaborative Research: Rates and mechanisms of lead phosphate formation, aggregation, and deposition for more efficient corrosion control, National Science Foundation, July 1, 2016 – June 30, 2019, \$154,111, PI is Giammar; Co-PI is Pasteris.
6. Impact of microstructure on the containment and migration of CO_2 in fractured basalts, Department of Energy Office of Fossil Energy, October 1, 2014 – March 31, 2018, \$1,284,701, PI is Giammar, Co-

PI's are Sophia Hayes, Phil Skemer and Mark Conradi at WUSTL and Brian Ellis at the University of Michigan.

7. Evaluating trace metal limitations on methane fluxes in terrestrial ecosystems, Department of Energy, September 1, 2015 – August 31, 2017, \$100,000, PI is Catalano; Co-PI's are Giammar, Bradley, Hasenmueller (SLU), and Chambers (UCF).
8. Platform Nanoscale Sorbents for Advanced Separation and Recovery of Metals and Metalloids in Water, National Science Foundation, September 1, 2014 – August 31, 2017, PI is John Fortner and Giammar is Co-PI, \$329,835.
9. Dominant mechanisms of uranium-phosphate reactions in subsurface sediments, Department of Energy Subsurface Biogeochemical Research Program, \$624,385 (WUSTL amount), PI is Catalano (Co-PIs are Giammar and Wang (PNNL)), September 1, 2011 – August 31, 2015.
10. Performance and Mechanisms of Iron Electrocoagulation for Removal of Chromium(VI) from Drinking Water, National Science Foundation, September 1, 2013 – August 31, 2016, \$330,000, PI is Giammar (Co-PI is Catalano)
11. SLAC Science Focus Area for Environmental Remediation Science Program, sub-contract from Stanford Linear Accelerator Center (PI is John Bargar), DOE Environmental Remediation Science Program, March 1, 2009 – December 31, 2012, \$307,941 (Washington University Amount).
12. Manganese Redox Mediation of UO₂ Stability and Uranium Fate in the Subsurface: Molecular and Meter Scale Dynamics, Department of Energy, 2010-2013, (\$249,000 to WUSTL), PI is Tebo - OHSU (Co-PI's are Giammar – WUSTL and Bernier-Latmani – EPFL).
13. CAREER: Interfacial Reactions Affecting Heavy Metal Fate and Transport: An Integrated Research and Education Plan, National Science Foundation, \$400,000, April 1, 2006 – March 31, 2012.
14. Coupled Biogeochemical Processes Governing the Stability of Bacteriogenic Uraninite and Release of U(VI) in Heterogeneous Media: Molecular to Meter Scales, DOE Environmental Management Science Program (EMSP): Transport of Contaminants in Subsurface Environments at DOE Sites, \$304,181 (WUSTL amount), April 1, 2006 – May 31, 2009. (Lead PI is John Bargar (Stanford Synchrotron Radiation Lab): Other Co-PI's Rizlan Bencheikh-Latmani (Ecole Polytechnique Federale Lausanne) and Brad Tebo (Oregon Health Sciences University)).
15. NER: Nanoscale Size Effects on the Biogeochemical Reactivity of Iron Oxides in Active Environmental Nanosystems, National Science Foundation, July 15, 2006 – November 30, 2007, \$114,998, PI is Giammar (Co-PI's are Biswas and Wrenn).
16. Integrated System for Elemental Analysis of Aerosols and Aqueous Solutions, Air Force Office of Scientific Research through Defense University Research Instrumentation Program, \$233,400, , PI is Pratim Biswas (Co-PI's are Buhro, Chen, Giammar, and Wrenn), April 2005-April 2006.
17. Evaluation of Chemical and Biological Tracers for Phosphorus Source Apportionment in Table Rock Lake, on the Missouri-Arkansas Border, National Decentralized Water Resources Capacity Development Project, November 1, 2003 through April 30, 2005, \$263,382, Co-PI with Lars Angenent.

Completed Research Projects – Non-Federal External Support

18. Laboratory-Scale Investigation of Corrosion Control for Buffalo Water, Hazen and Sawyer, January 1 – December 31, 2021, \$35,998.
19. Processes Controlling the Time for Orthophosphate to Achieve Effective Corrosion Control, Water Research Foundation, July 1, 2016 – June 30, 2019, \$75,000, PI is Giammar.
20. Corrosion Control with Sodium Silicates, PQ Corporation, January 1, 2018 – December 31, 2019, \$188,537, PI is Giammar.

21. Iron Electrocoagulation for Efficient Removal of Selenium from Flue Gas Desulfurization Wastewaters, Consortium for Clean Coal Utilization, June 1, 2015 – December 31, 2016, \$63,703, PI is Giammar; Co-PI is Catalano.
22. Coupled geochemical and transport processes in geologic carbon sequestration: Evolution of geochemical gradients and flow properties in diffusion-limited zones, Consortium for Clean Coal Utilization, \$241,995, PI is Giammar (Co-PI's are Hayes (WUSTL), Mehra (IITB), and Peters (Princeton)), July 1, 2012 – December 31, 2015.
23. Impact of Galvanic Corrosion on Lead Release Following Partial Lead Service Line Replacement, Water Research Foundation, lead PI is Greg Welter (O'Brien and Gere) and Co-PI's are Giammar and Abigail Cantor (Process Research Solutions), \$87,560 (Washington University amount), March 1, 2011 – February 28, 2013.
24. Mechanisms and Kinetics of Multiphase Fluid-Formation Mineral Reactions in Carbon Dioxide Geologic Sequestration, Consortium for Clean Coal Utilization, \$520,000 (\$202,319 for Giammar), May 1, 2009 – May 31, 2013, PI is Jun (Co-PI is Giammar; International Partners are Mehra and Shimada)
25. Lead and Copper Rule revision data gaps: Evaluation of coupling method and orthophosphate addition on lead release following partial lead service line replacement, \$32,001 (WUSTL amount), October 1, 2011 – September 30, 2013, PI is Welter of O'Brien and Gere Engineers, Giammar is a Co-PI. Funded as an extension of project "Impact of galvanic corrosion on lead release following partial lead service line replacement."
26. Rates and mechanisms of processes influencing lead(IV) oxide formation and stability in drinking water distribution systems, American Water Works Association Research Foundation, \$149,847, April 1, 2009 – October 1, 2012.
27. Life cycles of metals in coal combustion: metal release and capture, speciation in fly ash, and transformations during ash reuse and storage, Consortium for Clean Coal Utilization, \$320,000 (\$154,976 for Giammar), May 1, 2009 – April 30, 2012, PI is Giammar (Co-PI's are Biswas and Catalano; International Partners are Hao and Dikshit)
28. Influence of Water Chemistry on the Dissolution and Transformation Rates of Lead Corrosion Products, American Water Works Association Research Foundation, \$234,771, September 1, 2006 – March 1, 2010.
29. Ameren and Powerspan Low Sulfur Coal Emissions Reduction Project, funded by the U.S. EPA through the Missouri Department of Natural Resources, \$151,110, January 1, 2006 – December 31, 2007. PI is Biswas (Co-PI is Giammar).
30. Phase III Continuation of Mercury Capture Studies Using Inorganic Sorbents, Ameren UE in June 2004, \$90,000, 12 months, Co-PI with Biswas. Approved October 2004 for project period January-December 2005.
31. Phase II (1) Testing of Novel Sorbents for Mercury Capture and Design of Sorbent Injectors for Pilot Scale Testing; (2) Viability of Enriched Oxygen Coal Combustion, Ameren UE, an industrial partner of the Washington University Environmental Engineering Program, \$99,315, 15 months. Co-PI with Pratim Biswas.

CONSULTING EXPERIENCE

Consultant to Hazen and Sawyer regarding corrosion control studies in Denver, Erie County (NY), and Cobb County Marietta Water Authority.

Consultant to CDM Smith regarding corrosion control study in Evanston, IL, Pittsburgh, PA, Wausau, WI, and Aurora, IL.

Consultant to Ramboll on corrosion control study for Rochester Water Works and Monroe County Water Authority.

Consulting expert to the City of Chicago regarding lead corrosion control, 2016-present.

Consultant to NRDC providing scientific and technical assistance regarding *Concerned Pastors for Social Action v. Khouri*, No. 16-cv-10277, 2016-2020.

Consultant to NRDC providing scientific and technical assistance regarding potential litigation related to the City of Newark's and the State of New Jersey's violations of the Safe Drinking Water Act, 2018-2020.

Member of expert panel on abatement of lead corrosivity convened by the Providence Water Supply Board, July 2012 – present.

TEACHING EXPERIENCE

New courses developed:

- The Energy Water Nexus (Fall 2012 while on sabbatical at Princeton University – together with Eric Larson and Sankaran Sundaresan)
- Environmental Implications of Energy Technologies (Spring 2013 while on sabbatical at Princeton University)
- Aquatic Chemistry (Fall 2004)
- Sustainable Water Resources Engineering (Fall 2003)

Substantial revisions of existing courses:

- Introduction to Environmental Engineering (Spring 2003)
- Physical and Chemical Methods for Water Treatment (Spring 2004)
- Environmental Chemistry (Fall 2005)
- Environmental Engineering Laboratory (Spring 2011)

Courses Taught in Last Twelve Years

Term	Course ¹	Course Name	Students	Evaluation ²
SP22	EECE 533	Physical and Chemical Processes for Water Treatment	25	6.58/7.00
F21	EECE 101	Introduction to Energy, Environmental and Chemical Engineering	25	6.61/7.00
SP21	EECE 533	Physical and Chemical Processes for Water Treatment	18	6.67/7.00
F20	EECE 101	Introduction to Energy, Environmental and Chemical Engineering	45	6.15/7.00
SP20	EECE 533	Physical and Chemical Processes for Water Treatment	27	6.75/7.00
F19	EECE 101	Introduction to Energy, Environmental and Chemical Engineering	28	6.29/7.00
SP19	EECE 533	Physical and Chemical Processes for Water Treatment	23	6.78/7.00
F18	EECE101	Introduction to Energy, Environmental and Chemical Engineering	21	6.71/7.00
F18	EECE425	Environmental Engineering Laboratory	13	6.30/7.00

SP18	EECE533	Physical and Chemical Processes for Water Treatment	21	6.90/7.00
F17	EECE101	Introduction to Energy, Environmental and Chemical Engineering	26	6.31/7.00
F17	EECE425	Environmental Engineering Laboratory	4	NA
SP17	EECE533	Physical and Chemical Processes for Water Treatment	12	6.75/7.00
F16	EECE101	Introduction to Energy, Environmental and Chemical Engineering	35	6.61/7.00
F16	EECE425	Environmental Engineering Laboratory	12	5.91/7.00
SP16	EECE533	Physical and Chemical Processes for Water Treatment	16	5.80/7.00
F15	EECE101	Introduction to Energy, Environmental and Chemical Engineering	24	6.14/7.00
F15	EECE425	Environmental Engineering Laboratory	24	6.29/7.00
SP15	EECE533	Physical and Chemical Processes for Water Treatment	25	6.38/7.00
F14	EECE101	Introduction to Energy, Environmental and Chemical Engineering	40	6.05/7.00
F14	EECE425	Environmental Engineering Laboratory	11	5.57/7.00
SP14	EECE533	Physical and Chemical Processes for Water Treatment	10	6.63/7.00
F13	EECE101	Introduction to Energy, Environmental and Chemical Engineering	79	4.50/5.00
SP13	CEE304	Environmental Implications of Energy Technologies (at Princeton)	79	4.50/5.00
SP12	EECE425	Environmental Engineering Laboratory	5	6.00/7.00
F11	EECE101	Introduction to Energy, Environmental and Chemical Engineering	53	5.84/7.00
F11	EECE533	Physical and Chemical Processes for Water Treatment	13	6.63/7.00
SP11	EECE425	Environmental Engineering Laboratory	16	5.00/7.00
F10	EECE101	Introduction to Energy, Environmental and Chemical Engineering	45	6.35/7.00
F10	EECE443	Environmental Chemistry	38	6.76/7.00
SP10	EECE262	Introduction to Environmental Engineering	22	6.60/7.00
F09	EECE101	Introduction to Energy, Environmental and Chemical Engineering	47	5.67/7.00
F09	EECE443	Environmental Chemistry	26	5.94/7.00
SP09	EECE262	Introduction to Environmental Engineering	23	6.07/7.00

¹ EECE101 Co-taught with Jay Turner (2008-2017) and Trent Silbaugh (2018, 2020-2021) and EECE425 co-taught with Avni Solanki in 2018; ² Evaluation score is for “teaching quality” for 2017-present and for “overall course satisfaction” for 2009-2016.

Guest Lecturer

- Earth’s Future: Causes and Consequences of Global Climate Change (2015-2019, 2022)
- Environmental Mineralogy
- Environmental Chemistry
- Environmental Geochemistry
- Energy for the 21st Century (while on sabbatical at Princeton University)

STUDENTS AND POST-DOCTORAL ASSOCIATES ADVISED

Doctoral Students

Graduated

Neha Sharma, Ph.D. thesis defended September 2022, “Fate of metals in presence of minerals and mineral-organic assemblages.”

Weiyi Pan, Ph.D. May 2022, “Lead(IV) oxide in drinking water systems: Formation, dissolution, redox-driven recrystallization, and implications for lead control.”

Anshuman Satpathy, Ph.D April 2021, “Interactions of Aqueous U(VI) with Goethite, Montmorillonite, and $\text{UO}_2(\text{s})$.”

Yeunook Bae, Ph.D. July 2019, “Lead release from corrosion scales on lead service lines: Impact of phosphate and scale composition.”

Wei Xiong, Ph.D. May 2017, “The effect of diffusive transport on mineral carbonation in geological carbon sequestration.”

Chao Pan, Ph.D. November 2017, “Coupling of oxidation-reduction reactions of chromium, iron and manganese: Implications for the fate and mobility of chromium in aquatic environments.”

Zezhen Pan, Ph.D. August 2017, “Sorption of metals onto natural sediments and engineered iron oxide nanoparticles.”

Lin Wang, Ph.D. May 2015, “Interfacial chemistry of trace elements at mineral surfaces in engineered water systems,”

Vrajesh Mehta, Ph.D. August 2014, “Dominant mechanisms of uranium(VI)-phosphate interactions in subsurface environments: An *in situ* remediation perspective.”

Zimeng Wang, Ph.D. December 2013, “Coupling of the biogeochemical cycles of uranium and manganese: Implications for the fate and transport of uranium in subsurface environments.”

Fei Wang, Ph.D. August 2013, “Silicate mineral dissolution and associated carbonate precipitation at conditions relevant to geologic carbon sequestration.”

Yin Wang, Ph.D. December 2012, “Redox reactions influencing lead concentrations in drinking water: Formation and dissolution of lead(IV) oxide and impact of galvanic corrosion.”

Yanjiao Xie, Ph.D. July 2010, “Dissolution, formation, and transformation of the lead corrosion product PbO_2 : Rates and mechanisms of reactions that control lead release in drinking water distribution systems,” Current position: Research Scientist, Nalco Corporation.

Abhas Singh, Ph.D. June 2010, “Geochemical factors affecting uranium fate and transport in soil and groundwater in the presence of phosphate.”

Hui Zeng, Ph.D. December 2008, “Reactions of inorganic contaminants at the surfaces of nanostructured iron oxides.”

Liyun Xie, Ph.D. May 2007, “Reactions at the mineral-water interface affecting lead mobility in soil and sediments.”

Current

Xicheng He, Ph.D. expected May 2026, Selenium removal from water

Yao Ma, Ph.D. expected May 2024, Lead corrosion control

Anushka Mishra, Ph.D. successfully defended November 2022 and will complete all requirements January 2023, Control of lead concentrations in service lines and premise plumbing

Elmira Ramazanova, Ph.D. expected May 2026, Rare earth element association with minerals

Zehua Wang, Ph.D. expected May 2027, Lead corrosion control

Yihang Yuan, Ph.D. expected May 2025, Selenium removal by iron electrocoagulation

Visitors

Kyle Chardi, 2019-2020, Ph.D. student at University of Vienna

Guiwei Li, 2019-2020, Ph.D. student at University of the Chinese Academy of Sciences

Peng Liao, 2014-2015, Ph.D. student at China University of Geoscience

Ao Qian, 2016-2017, Ph.D. student at China University of Geoscience

Masters Students

Graduated

James Noel, M.S. May 2006, “The determination of mercury binding mechanisms in coal combustion byproducts through a sequential extraction process,” current position: doctoral student in Environmental Engineering at Washington University.

Katherine Nelson-Nguyen, M.S. January 2009, Dissolution rates of lead phosphate solids in drinking water distribution systems.

Wei Wan, M.S. May 2010, Electrocoagulation for removal of arsenic from drinking water.

Ziqi Wang, M.S. 2020, A thesis on the interactions between lead pipe scales and dissolved silica from the addition of sodium silicate as a corrosion inhibitor

Post-doctoral Research Associates

Jose Manuel Cerrato	Stability of biogenic uranium(IV)	2010-2013
Lisa Blue	Stability of biogenic uranium(IV)	2009-2010
Yun Luo	Speciation of metals in coal fly ash	2009-2011
Kai-Uwe Ulrich	Coupled uranium-manganese biogeochemical cycles	2006-2009
Yin Wang	Uranium remediation	2012-2013
Zimeng Wang	Iron biogeochemistry	2013-2014
Rachel Wells	Geologic carbon sequestration (co-advised with P. Skemer)	2015-2018
Zhiwen Yuan	Chemical indicators for pollutant source apportionment.	2004-2005
Beizhan Yan	Microbially-mediated reduction of iron oxide nanoparticles	2006-2007

Undergraduates:

<u>Year</u>	<u>Subject</u>	<u>Program*</u>
Andrea Alemán Reyes	2021 Lead in drinking water	WUSEF (Univ. Puerto Rico)
Maiko Arashiro	2006 Arsenic treatment	REU (Pomona College)
Matt Ashner	2011 Uranium bioremediation	ChE UG Research (WUSTL)
Charlie Barrows	2009-11 Uranium bioremediation	Chemistry UG Research
Alexis Boleda	2010 Carbon sequestration	ChE UG Research (WUSTL)
Scott Burns	2014 Metals from shales	ChE UG Research (WUSTL)
David Case	2008-10 Carbon sequestration	Chem. UG Research (WUSTL)
Chi Chun Chan	2018 Lead water chemistry	International Intern (HKUST)
Samuel Crawford	2006 Mercury and iron oxides	REU (WUSTL)
Vince DeCapio	2003 Lead adsorption	REU (West Virginia)
Scott Dixon	2006-7 Uranium bioremediation	SSM UG Research
Claire Dreesen	2004 Pollutant source apportionment	REU (Rice University)
Claire Farnsworth	2003-5 Lead adsorption	REU (WUSTL)
Brian Fisher	2005 Arsenic treatment	REU (Clarkson)
Andrew Frangos	2009 Metals in fly ash	ChE UG Research (WUSTL)

Stephanie Giles	2006	Lead soil remediation	REU (Beloit)
Angelica Gonzalez	2003	Goethite coated sand	REU (Univ. Texas El Paso)
Kelley Greenman	2008-9	Carbon sequestration	EnSt Senior Thesis
Justin Guilak	2020	Lead in drinking water	Summer Research (Rice)
Lauren Heeg	2014	Chromium in drinking water	ChE UG Research (WUSTL)
Tom Hutchison	2010	Metals in fly ash	ChE UG Research (WUSTL)
Elizabeth Johnson	2018-	Lead in Drinking Water	ChE UG Research (WUSTL)
Anna Ivarson	2015-18	Metals in Soils and Lead	ChE UG Research (WUSTL)
Pratyul Kapoor	2011	Uranium-manganese cycles	International Intern (IIT-GN)
Hannah Koenig	2016	Lead Corrosion Control	ChE Summer Research (WUSTL)
Kerry Kreitman	2008	Uranium bioremediation	CivE UG Research (WUSTL)
Edgar Leslie	2007	Uranium bioremediation	CivE UG Research (WUSTL)
Erica Levine	2011	Carbon sequestration	REU (WUSTL)
Violla Liu	2018-19	Lead in drinking water	ChE UG Research (WUSTL)
Yuk Ki Lo	2019	Lead in Drinking Water	MAGEEP (HKUST)
Manvitha Marni	2014-6	Iron oxide dissolution	ChE UG Research (WUSTL)
Carolyn Maus	2005-7	Adsorption to nanoparticles	REU (WUSTL) and ChE UG
Maya Mehrotra	2022-	Selenium removal	EnvE UG Research (WUSTL)
Jessica Mohatt	2004-7	Arsenic treatment	REU (WUSTL)
Carolyn Moore	2002-3	Lead in contaminated soils	ChE Intern
Jake Muilenberg	2019	Metals in wetlands	ChE UG Research (WUSTL)
Tyler Nading	2008-9	Lead in drinking water	CivE UG Research (WUSTL)
Daniel Pagan	2004	Contaminant transport	REU (WUSTL)
T.J. Pepping	2009-11	Arsenic electrocoagulation	ChE UG Research (WUSTL)
Lia Schattner	2017-	Lead in drinking water	ChE UG Research (WUSTL)
Matt Sculnick	2006-7	Uranium bioremediation	CivE UG Research (WUSTL)
Lindsay Soh	2005	Surface-mediated reduction	REU (Berkeley)
Bella Stull	2022-	Lead in drinking water	EnvE UG Research (WUSTL)
Eloise Thompson	2020-21	Lead in drinking water	EnvE UG Research (WUSTL)
Max Trachtenberg	2021-22	Lead in Drinking Water	EnvE UG Research (WUSTL)
Jacky Tse	2017	Metals in soils	MAGEEP (HKUST)
Xiaoming Zhu	2016	Nanoparticle Sorbents	MAGEEP (HKUST)
Xiaochen Zuo	2012	Arsenic treatment	ChE UG Research (WUSTL)

<u>High School Students</u>	<u>Year</u>	<u>Subject</u>	<u>Program</u>
Olivia Crowell	2019	Lead in drinking water	St. Louis STARS
Justin Guilak	2018	Lead in drinking water	St. Louis STARS
Leanne Dang	2017	Lead in drinking water	St. Louis STARS
Wenyu Ding	2015	Chromium transport	Follow-up from summer program
Justin Guilak	2018	Lead in drinking water	St. Louis STARS
Sarah Huynh	2009	Lead in drinking water	St. Louis STARS
Nevin Peeples	2008	Lead in drinking water	St. Louis STARS
Nevel Vaidyan	2014	Metals in urban gardens	St. Louis STARS

HONORS AND AWARDS RECEIVED BY STUDENTS

- Anushka Mishra, Ph.D. Student, 2022 C. Ellen Gonter Graduate Student Paper Award, Division of Environmental Chemistry of the American Chemical Society
- Yao Ma, Ph.D. Student, 2022 Mid-American Environmental Engineering Conference Best Presentation Award
- Weiyi Pan, Ph.D. Student, 2022 1st Place Prize in the Fresh Ideas Student Poster Competition at the Missouri Joint Conference of the Missouri AWWA Section and the Missouri Water Environment Association.
- Neha Sharma, Ph.D. Student, 2021 Graduate Student Award in Environmental Chemistry from the American Chemical Society Division of Environmental Chemistry
- Anushka Mishra, Ph.D. Student, 2021 Abel Wolman Fellowship from the American Water Works Association
- Anushka Mishra, Ph.D. Student, 2021 Graduate Student Award in Environmental Chemistry from the American Chemical Society Division of Environmental Chemistry
- Weiyi Pan, Ph.D. Student, 2020 Graduate Student Award in Environmental Chemistry from the American Chemical Society Division of Environmental Chemistry
- Yeunook Bae, Ph.D. Student, Best Student Paper Award at 2019 Water Quality Technology Conference.
- Anushka Mishra, Ph.D. Student, 2019 Mid-American Environmental Engineering Conference Best Presentation Award
- Viola Liu, B.S. Chemical Engineering, American Chemical Society Environmental Chemistry Division Undergraduate Award, 2019
- Yeunook Bae, Ph.D. Student, 2018 Water Quality Technology Conference, Second Prize in the Student Poster Competition
- Yeunook Bae, Ph.D. Student, 2018 Mid-American Environmental Engineering Conference Best Presentation Award
- Justin Guilak, High School Student, 2018 Award for Excellence in Research for St. Louis STARS
- Yeunook Bae, Ph.D. Student, 2018 Graduate Student Paper Award from the American Chemical Society Division of Environmental Chemistry
- Chao Pan, Ph.D. Student, 2018 Graduate Student Award in Environmental Chemistry from the American Chemical Society Division of Environmental Chemistry
- Yeunook Bae, Ph.D. Student, 2016 Mid-American Environmental Engineering Conference Best Presentation Award
- Leah Gable, Ph.D. student on collaborative project, 2015 Outstanding Poster Award of the Institute for Public Health 8th Annual Conference
- Chao Pan, Ph.D. Student, 2015 Department of Energy, Environmental and Chemical Engineering Graduate Student Teaching Award
- Neel Vaidyan, High School Student, 2014 LMI Aerospace STARS Excellence in Research Award
- Vrajesh Mehta, Ph.D. student, Student Paper Competition Award Winner for the Ninth International Conference on Remediation of Chlorinated and Recalcitrant Compounds for “Column-scale evaluation of *in situ* uranium immobilization in sediments amended with phosphate.”
- Zimeng Wang, Ph.D. student, 2013 Graduate Student Award in Environmental Chemistry from the American Chemical Society Division of Environmental Chemistry

- Matthew Ashner, B.S. Chemical Engineering, American Chemical Society Environmental Chemistry Division Undergraduate Award, 2012
- Vrajesh Mehta, Ph.D. student, Student Travel Award for Department of Energy Subsurface Biogeochemical Research Program PI's Meeting, April 2012
- Yin Wang, Ph.D. student, Best Student Paper Award at 2011 Water Quality Technology Conference.
- Fei Wang, Ph.D. student, Student Travel Award for American Chemical Society National Meeting for Outstanding Presentation on Carbon Sequestration, September 2011.
- Zimeng Wang, Ph.D. student, Student Travel Award for Department of Energy Subsurface Biogeochemical Research Program PI's Meeting, April 2011
- Charles Barrows, B.S. Chemistry, 2011 Arthur Wahl Award for Undergraduate Achievement in Chemistry, Washington University Department of Chemistry
- Yanjiao Xie, Ph.D. Student, 2010 Department of Energy, Environmental and Chemical Engineering Graduate Student Research Award
- Zimeng Wang, Ph.D. Student, 2010 Department of Energy, Environmental and Chemical Engineering Graduate Student Teaching Award
- David Case, B.S. Chemistry, 2010 Sam Weissman Award for Undergraduate Achievement in Chemistry, Washington University Department of Chemistry
- David Case, B.S. Chemistry, 2010 National Science Foundation Graduate Research Fellowship
- Yanjiao Xie, Ph.D. student, 2010 Graduate Student Award of the American Chemical Society Division of Environmental Chemistry
- Abhas Singh, Ph.D. student, Student Travel Award for Department of Energy Environmental Remediation Science Program PI's Meeting, April 2009
- Kelley Greenman, Undergraduate, 2009 Outstanding Overall Achievement in Environmental Studies
- Nevin Peebles, High School Student, 2008 LMI/D 3 Technologies Award for Excellence in Research

PROFESSIONAL SERVICE, DEVELOPMENT, AND ASSOCIATIONS

Licensed Professional Engineer in the State of Missouri, 2011-present (Number PE-2011015742)

Editorial Positions

- **Associate Editor**, *Environmental Science & Technology*, 2014-present
- **Associate Editor**, *Geochimica et Cosmochimica Acta*, 2012-2013
- **Member of Peer Review Editorial Board (2013-2014), Member of Journal Editorial Board (2014-2017)**, *Journal – American Water Works Association*
- **Guest Editor**, together with Young-Shin Jun and Charlie Werth, of a special issue of *Environmental Science & Technology* (Issue 1 of Volume 47) on geological carbon sequestration, 2011-2013.

Reviewing for Journals. *ACS Earth and Space Chemistry, Adsorption of Metals by Geomedia II (book), American Mineralogist, Applied Geochemistry, Aquatic Geochemistry, Central European Journal of Chemistry, Chemical Engineering Journal, Chemical Geology, Chemosphere, Colloids and Surfaces A: Physicochemical and Engineering Aspects, Corrosion, Critical Reviews in Environmental Science and Technology, Energy and Fuels, Environmental Engineering Science, Environmental Pollution, Environmental Science and Technology, Geochimica et Cosmochimica Acta, Geochemical Transactions, Geomicrobiology Journal, Geology, Industrial and Engineering Chemistry Research, International Journal of Environment and Waste Management, International Journal of Greenhouse Gas Control, Journal American Water Works Association, Journal of Colloid and Interface Science, Journal of*

Contaminant Hydrology, Journal of Environmental Engineering, Journal of Environmental Engineering and Science, Journal of Environmental Management, Journal of Environmental Quality, Journal of Hazardous Materials, Journal of Hydrology, Journal of Industrial Microbiology and Biotechnology, Journal of Materials Research, Journal of Nanoparticle Research, Mine Water and the Environment, Soil Science Society of America, Science, Waste Management, Water Research, Water Resources Research

National Proposal Review

National Science Foundation,
Department of Energy
Strategic Environmental Research and Development Program (SERDP)
ACS Petroleum Research Fund
Qatar National Research Fund National Priorities Research Program
Stanford Synchrotron Radiation Lightsource

Service on National Scientific Committees

- Panel Co-Lead for Department of Energy Basic Research Needs Workshop on the Energy-Water Nexus, Washington, DC, January 4-6, 2017 (Susan Hubbard, Matthew Tirrell, and David Sholl chairs).
- Invited Participant in President's Council of Advisors on Science and Technology workshop on "Science and Technology to Ensure the Safety of the Nation's Drinking Water", Washington, DC, May 18, 2016
- Panelist in "Subsurface Complex System Science Relevant to Contaminant Fate and Transport," a workshop sponsored by the U.S. Department of Energy Office of Biological and Environmental Research, Gaithersburg, Maryland, August 3-5, 2009
- WATERS Network and Collaborative Large-Scale Engineering Analysis Network for Environmental Research (CLEANER) Program of Waters Network,
- Center for Sustainable Engineering (NSF-sponsored center), invited participant in advisory workshop, January 9-10, 2008.
- Participant in "Frontiers in Environmental Engineering Education" workshop at Arizona State University sponsored by the National Science Foundation, January 8-10, 2007.

Conference and Symposium Organization

Environmental Engineering at the Confluence, 2022 AEESP Research and Education Conference, June 28-30, 2022, Conference Chair
Virtual Appetizer for the AEESP Research and Education Conference, July 14-15, 2021, Conference Chair
Conference Chair for Annual Mid-America Environmental Engineering Conference, Washington University, St. Louis, Missouri, 2021, 2017, 2013, 2009
Chemistry of Drinking Water Distribution Systems and Infrastructure, 2018 American Chemical Society Spring National Meeting in New Orleans, March 18-22, co-organized with Yandi Hu and Haizhou Liu.
New Challenges on Metals and Metalloids: Chemistry, Treatment, and the Impacts on Water Quality, 2016 American Chemical Society Spring National Meeting in San Diego, March 13-17, co-organized with Haizhou Liu.
Geochemical Impacts of Human Activities Theme, 2011 Goldschmidt Conference in Prague, August 2011, theme co-coordinator with Steve Banwart.

Environmental and Geochemical Aspects of Carbon Sequestration, 2010 American Chemical Society Spring National Meeting in San Francisco, March 21-25, co-organized with Young-Shin Jun and Charles Werth.

Molecular-scale Chemical and Biogeochemical Processes Affecting the Mobility of Metal and Radionuclide Contaminants in the Subsurface, 2008 Goldschmidt Conference in Vancouver, July 13-18, 2008, co-organized with John Bargar, Rizlan Bernier-Latmani, and Brad Tebo

Reactions at Mineral-Water Interfaces – The Role of Solute Adsorption on Contaminant Co-Adsorption, Mineral Dissolution and Colloid Behavior, 2006 Geological Society of America Annual Meeting in Philadelphia, October 22-25, 2006, co-organized with John Lenhart

Biotic and Abiotic Factors Affecting Contaminant Transformation at Iron Oxide Surfaces. 2007 American Chemical Society Spring National Meeting in Chicago, March 25-29, co-organized with Mike McCormick and Ed O’Loughlin

Service to Professional Organizations

- Member of the Conference Site Collection Committee of the Association of Environmental Engineering and Science Professors, 2022-present
- Member of Project Advisory Committee for Water Research Foundation project Metals Accumulation and Release with the Distribution System: Evaluation of Mechanisms and Mitigation (Jian Zhang, Project Manager), 2012 – 2015.
- Member of Project Advisory Committee for Water Research Foundation project Non-Intrusive Methodology for Assessing Lead and Copper Corrosion (Jonathan Cuppett, Project Manager), 2010 – 2013.
- Organizer of Association of Environmental Engineering and Science Professors’ workshop *Navigating the Academic Job Search*, University of Iowa, Iowa city, Iowa, July 26, 2009.
- Member of the Student Services Committee of the Association of Environmental Engineering and Science Professors, 2005-2012

Professional Development

Faculty Transformational Leadership Institute, 2022-2023, Washington University in St. Louis.

Center for Integrative Research on Cognition, Learning, and Education (CIRCLE), Faculty Fellow, 2016-2017, to promote active learning in STEM courses.

Summer STEM Faculty Institute on Teaching, Washington University Teaching Center, June 17-19, 2014.

Engineering in Transition, Workshop for the Center for Sustainable Engineering, Carnegie Mellon University, July 17-19, 2006.

Association of Environmental Engineering and Science Professors workshop “Successful Academic Careers: Mentoring, Funding, Winning CAREER Awards,” Clarkson University, July 24, 2005.

Professional Association Memberships

American Academy of Environmental Engineers

American Chemical Society

American Society of Civil Engineers

American Water Works Association

Association of Environmental Engineering and Science Professors

The Geochemical Society

Water Environment Foundation

Tau Beta Pi Engineering Honor Society

Chi Epsilon Civil Engineering Honor Society

UNIVERSITY SERVICE

Assistant Vice Provost, 2022-2023, Faculty implementation lead for environmental research priority of the university strategic plan.

Energy, Environmental, and Chemical Engineering Department

Chair of task force to develop an environmental engineering major, 2018

Chair of faculty search committee in environmental engineering, 2017-2018

Associate Director, Consortium for Clean Coal Utilization, 2017-2020

Chair of faculty search committee, 2015-2016

Chair of faculty search committee in metabolic engineering, 2011-2012

Coordinator of the Environmental Engineering Science Minor, 2010-

Graduate Program Coordinator, 2006-2009

Chair of faculty search committee in environmental engineering, 2008-2010.

Member of Undergraduate Studies Committee, 2019-

Member of search committee for Director of Tyson Research Center, 2013-2014 (Barbara Schaal and Holden Thorp, co-chairs)

McKelvey School of Engineering

Member of Affirmative Action Monitoring Committee, 2015-

Member of Faculty Working Group of McKelvey Diversity, Equity, and Inclusion Committee, 2021-

Liaison to the Faculty of Arts and Sciences, 2016-2021

Member of Tenure and Promotion Committee, 2016-2021

Member of Decanal Review Committee, 2019

Mentor of students in workshop on submitting NSF Graduate Research Fellowship applications, 2016

Member of Search Committee for the Dean of the School of Engineering and Applied Science, 2014-2015 (Mahendra Gupta, chair)

Member of Faculty and Staff Campaign Committee, 2013-2018

Speaker of the Faculty Assembly, 2009-2010

Member of Advisory Committee on the Appointment of the Dean of Engineering, 2009-2010 (Joe Ackerman and Shelly Sakiyama-Elbert, co-chairs)

Member of Committee on Training of Women in STEM Fields, 2010-2012 (Barbara Baumgartner and Bill Buhro, co-chairs)

McDonnell International Scholars Academy

McDonnell Academy Ambassador to the Hong Kong University of Science and Technology, 2015-

Coordinator of a workshop on environmental nanotechnology at the Seventh International Symposium, Beijing, October 11-14, 2018.

Coordinator of Water Quality and Water Resources session at the Second International Symposium on Energy and Environment, Hong Kong, December 8-10, 2008.

Co-coordinator of Water Resources and Aquatic Processes Group, International Symposium on Energy and Environment, May 4-7, 2007.

COMMUNITY OUTREACH

Water Quality Activities for St. Louis Students

Laboratory tours and discussion with Lego League Students for the Hydrodynamic Challenge, September 2017 (groups from Clayton, Parkway, and Rockwood School Districts).

Field sampling and analysis of water quality in Forest Park for 40 students from the summer Eco-Academy of the Gifted Resource Council, June 2005 and 2011.

Classroom activities on carbon sequestration, water quality, water and wastewater treatment, environmental impacts of consumer products, and life cycle assessment for students in the Gifted Resource Council's Eco-Academy, June 2004, 2005, 2006, 2007, 2008, 2009, 2011, and 2014 2016, 2018, 2021.

Hands-on activities in drinking water treatment for 20 middle school students participating in "Moving and Shaking: An Introduction to Engineering," a St. Louis Area Gifted Resource Council Learning Lab; October 23, 2003; November 6, 2004; November 12, 2005; October 14, 2006; October 13, 2007; February 7, 2009; October 31, 2009.

Presentations to the General Public and to Professional Organizations

Impacts of Water Chemistry on Lead Corrosion Control, March 4, 2019, St. Louis Environmental and Water Resources Institute Spring Seminar.

Causes and Control of Lead Release from Lead Service Lines used for Drinking Water Supply, February 13, 2017, St. Louis Chapter of the National Association of Corrosion Engineers

Healthy Soils – Good for Plants and for People, February 17, 2016, Pints 'n' Plants, St. Louis, Missouri.

Chemistry and Engineering for Producing and Supplying Clean Drinking Water, November 22, 2014, Science in St. Louis, St. Louis, Missouri

Muddy Rivers, Drinking Water, Beer, and Sewage: Engineering Water Quality at the Confluence, January 25, 2012, Science on Tap, St. Louis, Missouri

Water Quality Assistance for City of St. Louis, 2004-2006

Analyze monthly samples collected by City personnel in Forest Park waterways. Stakeholder in the Forest Park Water Quality Plan.

Science Advisory Board of the St. Louis Confluence Riverkeeper, Member, 2010-2012